



Calendar

Semmelweis University

Faculty of Medicine • Faculty of Dentistry
Faculty of Pharmaceutical Sciences • Faculty of Health Sciences

2021 / 2022

Budapest

www.semmelweis.hu

“Medical students can only be prepared for patient care
when practising by hospital beds;
Not only the teachers explaining diseases will teach them then,
but diseases themselves...
Let theory be combined with practice as it is in real life,
and make students visit sickhouses once they
are studying to be medical doctors;
also have them take care of patients with all the
knowledge that is expected from doctors.”

Lajos Markusovszky (1815-1893)

C A L E N D A R

S E M M E L W E I S U N I V E R S I T Y

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B u d a p e s t

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SEMMELWEIS UNIVERSITY



Detailed history of Semmelweis University

I. The history of the Medical Faculty (1769-1951)

The Nagyszombat (now Trnava) university founded in 1635 by PÁZMÁNY Péter archbishop of Esztergom and the former Jesuit order institution was given a royal rank during Maria Theresa's reign and turned from a truncated university to a real one with the addition of the missing fourth faculty, the Medical Faculty. All of the above formed an integral part of the comprehensive, imperial level reform process with the recognition in the background that health care is a key interest of the state and requires a high level of public intervention. The plans of the Medical Faculty in Nagyszombat was elaborated by the royal physician of the queen, the Dutchman Gerard van Swieten, based on the Medical Faculty in Vienna reformed by him as well. Organisation started with the decree of Maria Theresa dated on 7 November 1769. Before this, the whole university had received a royal rank with a royal charter on 17 July that year. To host the new faculty, a separate building was constructed according to the plans of Franz Anton Hillebrandt, which was completed in May 1772. Education was able to start in 1770, first with five faculties: Physiology and Pharmacology (PRANDT Ádám Ignác), Anatomy (TRNKA Vencel), Surgery (PLENCK József Jakab), Botany and Chemistry (WINTERL Jakab József) and General Pathology (SHORETITS Mihály), i.e. the actual clinics. Due to the lack of an own clinics, the education of general pathology faced severe difficulties, and the lack of the corpses and the botanical garden was also a great problem. By moving the university to Buda in 1777, these problems seemed to be solved.

The Ratio Educationis I issued simultaneously with the transfer to Buda modified the management of the University. The consistory considered as the representative of the state, which had been heading the university since 1767, was replaced by the university council (senate), however, practically with the same members. The magistratus academicus re-elected every year, which administered mostly the ritual issues, remained on. To lead the whole institution, a president and a director general and to lead the faculties, faculty directors (faculty presidents) were elected. A bit later (in 1786), Joseph II deleted this position (except the Medical Faculty) and their scope of authority was taken away by the previously marginalised deans. This time, the method of appointment of the tutors was also regulated. Based on the opinion of the faculty, the senate submitted a proposal to the king who decided on the appointment through the Royal Council of Governors.

It was on 25 March 1780 when Maria Theresa issued the Diploma Inaugurale, called as the "Magna Charta" of the university, in which she set among other general regulations the legal status of the university and the financial basis of the maintenance thereof. The successor of the

Queen, Joseph II was also dealing with the fate of the University. During his personal visits he decided on the translocation of the institution to Pest, which took place in 1784. The Medical Faculty found a home in a former Jesuits' monastery at the corner of Hatvani (now Kossuth Lajos) and Újvilág (now Semmelweis) streets. The frequent relocations held back educational activity, since the majority of resources was directed to the establishment of the conditions. The rapidly developing Pest provided a larger and more diverse patient population than before and the number of clinical beds also increased up to 16. The reconstructed building of the monastery proved to be small for the growing number of departments (Theoretical Medicine, Natural History in 1784; Veterinary in 1787; Public Medicine and Special Medical Studies in 1793; Theoretical Surgery in 1808; Obstetrics in 1812 and Ophthalmology in 1817) and the increasing number of students. Practical Training was strongly held back by that contrary to the international practice, the clinics were located not in the city hospital, but in the building of the faculty, therefore, there was no possibility to regularly change the patient population necessary for education. Although there were many attempts by the faculty to involve the Saint Roch Hospital to expand the institutions of the faculty, they were systematically rejected due to the resistance of the city magistrate. Contrary to this, from the 20's, the clinical trend emphasising practical education was established, the main representative of which was BENE Ferenc, the introducer of vaccinations against pox.

Initially, based on the idea of van Swieten, the duration of the medical training was not regulated. First, a decree in 1774 determined the training period of physicians to be 5 years and according to the study regulation in 1786, it became 4 years. After tightening the examinations, the mutual recognition of medical diplomas had been valid since the reign of Joseph II (the principle of the so-called conformetur), at least as regards Vienna-Prague-Cracow-Pest. In 1804, Vienna left this agreement and obtained a privilege against the others. The surgeon master and civil surgeon training were 2 years long, while the pharmacist training was of 1 year. Midwives were trained in short courses started each semester. In 1787, the Veterinary course joined as well.

The end of the century, showing a vivid university life was replaced by the retrograde mentality of the era of Francis I. This is reflected by the Ratio Educationis II in 1806, created in the spirit of centralisation and the deprivation of the freedom

of education, which was dealing with the Medical Faculty in a much deeper level than the previous one. It stipulated in details the teaching material and the obligations of the professors, it updated the order of the education and comprehensive exam and increased the length of education to 5 years. The president (praeses universitatis) executing the intent of the government and his deputy and the vice president (vice-praes) who was at the same time the chancellor of the university played a key role in the management of the university. The university magistrate consisting of rectors, deans and seniors had only limited power. At the end of the 1810's, even the faculty director position was reset, however, the professional supervision of the Medical Faculty was exercised by the national chief medical officer.

As in terms of the French revolutionary ideas feared by the government, medical training was a neutral area, at the beginning of the 19th Century, this was the only faculty able to perform considerable scientific activity and more significant developments. Contrary to the efforts, the substantial conditions of education became worse and worse due to overcrowding and the increasing demands. The devastation of the icy flood in 1838 increased on the problems in an extent that even the parliament was dealing with the situation of the Medical Faculty.

Under these narrow circumstances, the tutors of the faculty tried to keep up with the pace of international medical science which started to develop and specialise that time. In the light of the above should one consider that overtaking Vienna, Pest was one of the first cities to found an individual faculty of veterinary in 1793, which included the contracted forensic medicine and public health as well. Vaccination against pox has been applied in Hungary since 1799 and in 1824, headed by GEBHARDT Ferenc, a Central Vaccination Institute was established within the Medical Faculty. One of the most significant scientist of his era, KITAIBEL Pál was also among the tutors of this faculty. The Institute of Pathology founded in 1844 by ARÁNYI Lajos was one of the oldest similar institution in the world. At the beginning of 1847, only few months after the first experiment in the Massachussets Hospital, Balassa tried anaesthesia with ether. The first anaesthetic surgery was performed few days later by SCHOEPPF-MEREI Ágost. The faculty was continuously playing key role in the fight against the great Hungarian epidemics (typhus, yellow fever, pox and the cholera leading to riots in 1831 and 1848-49).

The medical and surgical training courses were taught in Latin from the beginning. Education in Hungarian was first dealt with at the end of the 18th Century. RÁCZ Sámuel, who was the fifth professor of the medical faculty in 1793/94 to hold the position of rector, issued the first Hungarian physiology book in 1789 with the title “A physiologia rövid sommája” (Short summary of physiology), which was considered as the first Hungarian university textbook as well. In 1830, law allowed the use of Hungarian language and 3 years later, the first doctorate was written in Hungarian by FLÓR Ferenc and in 1844, Hungarian became the official language. Contrary to the national partiality of the tutors, the education in Hungarian was accepted by the Medical Faculty with reservations, since many of the students – and even some of the tutors – did not speak Hungarian and the Hungarian medical language was practically missing. Finally, the Hungarian as the language of education was introduced in 1848. The lower degree courses (surgeon master, midwife, veterinarian) had been held in the national languages since the beginnings, i.e. in Hungarian, German and Slovakian.

In the legal code of April 1848, a separate article (Art. XIX, 1848) was dealing with the university and promulgated the independence of the university and the principle of liberal freedom of education. The majority of the tutors and students actively took part in the freedom fight. Therefore, the reprisal after the surrender severely affected the tutors of the university. Many were forced to go to prison (BALASSA János), to hide (BUGÁT Pál) or to emigrate (e.g. SCHÖPF-MEREI who later founded a children's hospital in Manchester). Certification procedures were performed, the tutors might hold their position depending on their loyalty and authority harassments were permanent. Tutors loyal to the emperor, but often of secondary level were employed by the faculty. At the time of the absolutism, the language of education and administration became the German instead of the Hungarian. Instead of the educational order of 1848, in the spirit of the “conformetur” principle, the Vienna order of 1833 was introduced. At the same time, there were modernisations as well. In this way, the secondary school maturity became obligatory and the faculty director position was deleted. Although experts were trained still in 9 faculties, the surgeon master course slowly faded and based on the pattern in Lemberg, Olmütz and Salzburg, this training was suspended also in Pest. In 1872, the guilds were also dissolved. As regards the language issue, a shift occurred

only after the large foreign policy defeat of the royal court. In 1859, a delegation of students went to Vienna to restore the Hungarian language. In 1860, the right of autonomous rector and dean election was extended also to the university of Pest. As a result of the October Diploma, the main subjects were taught in Hungarian and the others in German, Slovakian or Latin depending on the demands. Finally, it was the Article XLIV of 1868 after the Austro-Hungarian Compromise to reinstate the Hungarian language. This time, many tutors not speaking Hungarian left the university, e.g. the outstanding physiologist, Jan Nepomuk Czermák resigned as well contrary to the efforts of his Hungarian colleagues to make him stay.

The harmonised medical training was introduced in 1872, thus, since 1878, only one medical diploma has been existed with the name “doctor of the universal medical sciences”. The new university decree in 1875 determined the order of the new and universal medical doctor comprehensive exam in addition to the provision of the freedom of education and the autonomy. In 1881, the duration of the academic year also changed. Earlier it had been between November and August and since that time, it has been between September and June. Due to the poor facilities, the main problem of the medical faculty was the lack of space. Although in 1848, the clinics were transferred from the Újvilág utca building, it proved to be only temporary, since after the suppression of the freedom fight, they returned there. The Saint Roch Hospital refused on to host the clinics and the capital failed to provide a site for the constructions for a long time. The acquisition of the Kunewalder house (located that time in the Országút, today in the Múzeum körút) in 1858 was a temporary relief that time, which was originally bought for the Institute of Veterinary. The surgery (Balassa), the zoology, the physiology and the obstetrics headed by Semmelweis that time were able to move here. The administration of the faculty and the library got temporary home in buildings nearby. A real solution was brought only by the large-scale constructions started in 1873 with a cost of 25 million kronen, which were finished only in 1911. This time, the Üllői út considered that time as a rather outer belt area became the axis of the Medical Faculty, where the clinics, the institutions and the administration were located in two sites. Simultaneously, new, often parallel departments sufficiently equipped in the level of the era were established one after the other. The number of such departments almost

quadrupled until the 1880's. In these still unique developments, EÖTVÖS József and TREFORT Ágoston ministers of the Ministry of Religion and Public Education, BERZEVICZY Albert state secretary, MARKUSOVSKY Lajos councillor and on behalf of the Medical Faculty BALASSA János, KORÁNYI Frigyes and the later secretary of state, TÓTH Lajos played key role.

With the rapid development of the clinics, the catch-up of the lagging behind was successful. Parallely to the constructions, the "medical school of Budapest" became clear around Balassa having launched a medical weekly "Orvosi Hetilap" and Markusovszky. As an effect of Semmelweis, this was the place where the deliberate prevention of surgical infections was started. Public health was among the first to get a department in Budapest, headed by the outstanding bacteriologist, FODOR József. By continuing the work of Schoepf-Merei and Sauer, KORÁNYI Frigyes was the one to begin the establishment of a Hungarian internal medicine school on a state-of-the-art foundation. His work was carried on by his son, Sándor. JENDRASSIK Ernő, named also as the Hungarian Charcot was one of the founders of neurology, DOLLINGER Gyula was that of orthopaedics and TAUFFER Vilmos was that of the surgical obstetrics and gynaecology. LUMNICZER Sándor, the founder of modern surgery was the first to use the Lister's system of antisepsis. Owing to the work of SCHULEK Vilmos, GRÓSZ Emil and IMRE József, Hungarian ophthalmology became this time famous throughout Europe. As regards paediatrics, the Bókays and KOPITS Jenő, the international expert of hip dislocation deserve mention. The first director of the Hungarian Pasteur Institution, HÓGYES Endre set the foundations of the later Nobel prize winner invention of BÁRÁNY Róbert. With the research of the fine structure of the nervous system, the anatomist LENHOSSÉK Mihály achieved the recognition of his Nobel prize winner colleague, Santiago Ramón y Cajal who considered him as his fellow during the creation of neuron studies. In stomatology, the work of ÁRKÖVI József, while in pharmacology, that of BALOGH Kálmán were outstanding. In 1907, the Radiology got a separate institute headed by the founder of radiology in Hungary, ALEXANDER Béla. Physiology became a modern science in the Medical Faculty owing to the outstanding Czermak of Czech origin. He was followed by JENDRASSIK Jenő whose aim was the foundation of the modern Hungarian physiology school.

The number of students drastically increased. In the 1860's, their number was between 400-500, while in the 1880's, it exceeded 1000. In the 1860's, the first student associations were established. In 1862, aid society and 5 years later, a self-education association was founded. The end of the century was the first time when the issue of the admission of women arose. The medical faculty had generally a rejecting opinion thereabout. The first Hungarian female physician, countess HUGONNAY Vilma succeeded to achieve the recognition of her diploma obtained in 1879 only after 17 years of administrative struggling. In 1895, a decree made it possible for women to participate in trainings and practices in humanities, medical studies and pharmacology. The first female physician graduated in Budapest, STEINBERGER Sarolta was inaugurated on 3 November 1900. A real change in the training of female physicians was brought only by the world war.

During the World War I, the majority of the students and the tutors joined the army and the half of the beds the number of which increased to 2000 were maintained for the injured. The change to war industry and the economic exhaustion of the Monarchy drastically decreased the financial supply of education and also of the university. The war almost eliminated the students, however, after their disarmament, there was a dumping. Compared to the last year in peace, more than twice as many (6526) medical students wanted to continue their interrupted studies.

The revolution and the dictatorship of the proletariat triggered further chaos in 1918-19. The university was made subject to stringent central administration and there were significant transformations. There were changes in the personnel and the tutors considered as right wing were deprived of their positions. During the short existence of the Council Government, its measures could not be long-lasting. By rising to power of the counterrevolution, the faculty council qualified the events after 31 October 1919 as "ex lex" and further changes in personnel and certification procedures were started. Tutors were removed from the faculty, among others HEVESY György, one of the founders of nuclear medicine who later won the Nobel prize abroad or the outstanding ophthalmologist, GRÓSZ Emil, but his removal was only temporary.

From the annexed areas, a smaller migration started to the remaining "Mutilated Hungary" and especially to Budapest. Mostly the state-employed intellectuals (public officers, physicians, teachers etc.) were forced to migrate, partly as their

job was linked to the language and partly as they could have been hardly employed by a newly settling foreign state. The largest overcapacity was experienced in the field of physicians, mostly in Budapest, therefore, the fight for making a living was quite harsh. In addition to the too large number of students and the experience from the revolutions, this was also a reason of the issue of the Act XXV of 1920 also known as "numerus clausus", the initiation of which just started from the Medical Faculty of Budapest. The point of this act was to tighten the conditions of the admission to university, with which on the one hand, they tried to decrease the number of students in further education and on the other they tried to exclude anyone who had taken part in the revolution and to limit the number of Jewish students. This latter affected especially the Medical Faculty, since as it was a course of open access, many Jewish youngsters have selected the medical profession since the beginning. On the other hand, this act was beneficial for the spread of protectionism. At the same time, the faculty tried to block the admission of women as well. On 14 April 1921, the university in Budapest took the name of its founder, PÁZMÁNY Péter and had this name until 1950.

The economic crisis aggravated on by the mutilation of the country led to a financial crisis for the university it had never experienced before. The situation had just begun to normalise when the crisis in 1929 resulted again the decrease in the financial resources spent on education and health care. Unemployment appeared among the physicians as well, the workforce reduction in the university exceeded 10%, the investments stopped and the quarter of the beds had to be left empty due to financial reasons. The number of students sharply decreased as well (in 1925-26 there were 1729, in 1930-31 only 1234 students), contrary to the international trends.

The reform of the medical training which had been on agenda for a long time was introduced in 1922. As a main principle, the researcher and practising physician trainings were in focus. The duration of the education increased to 6 years instead of 5, the comprehensive exams were separated in four cycles and the number of the courses announced was also increased. Later, the system of comprehensive exams was modified on, but it was entered into force only in 1943. In 1936, the classification of the diplomas changed. This was the time when the qualifications used even today, i.e. the rite, the

cum laude and the summa cum laude were introduced. After a long time, also the pharmacist education was renewed by increasing the duration of the education from 2 years to 4 and by decreasing the practice from two years to one. Thereafter, the start of the pharmaceutical studies was not linked to a prior practice in a pharmacy, but after the maturity exam, one could immediately enrol.

Between the two world wars, internationally acknowledged schools were operating in the Medical Faculty, such as the school of KORÁNYI Sándor who developed on the school founded by his father. Among his results, the elaboration of the functional examination methods of kidney and the reduction of tuberculosis are outstanding. Many of his students became academicians and heads of department, such as RUSZNYÁK István, HETÉNYI Géza and HAYNAL Imre. The research on cancer made by KROMPECHER Ödön who described the basocellular cancer, that on nucleins, complementaries and enzymes by LIEBERMANN Leó or that on morphology by SCHAFFER Károly were significant. As regards pathoanatomy, BUDAY Kálmán clarified the pathogenesis of necrotic stomatitis and mellitis. In microbiology PREISZ Hugó, in biochemistry HÁRI Pál, in physiology FARKAS Géza and in biology HUZELLA Tivadar can be mentioned. In the fields of clinical medicine, the paediatrician HEIM Pál, BÓKAY János and BÁLINT Rezső, the surgeon VEREBÉLY Tibor and the ophthalmologists GRÓSZ Emil and BLASKOVICS László were the outstanding experts of their fields.

Apart from the military duty affecting the tutors as well and the care of the injured, the World War II had not trigger any special disturbance in the life of the Medical Faculty until 1944. With the approach of the front, the majority of the tutors were deployed. The rise to power of the Arrow Cross Party on 15 October 1944 posed new threats on the university and thus, the Medical Faculty as well. Contrary to the categorical order of the government, the university denied to move to Germany. Afterwards, there were plans to transfer the clinics and laboratories to Buda, however, they were mostly thwarted partly due to the repeat resistance of the faculty and partly due to the difficulties in transportation. Before the closure of the shell of fortress lines, the engineering, medicine, pharmacy and veterinary senior students were carried to Germany with a military call-up, i.e. the representatives of every programme considered as important regarding the continuation of the war. In this way, about 600 medical and

pharmacist students from the Medical Faculty Budapest were settled partly to Halle and partly to Austria with some of the education staff. They succeeded to return only after the war among huge difficulties and with the mediation of the university, with American passport.

Together with the city, the faculty was also heavily hit by the siege of Budapest. The damage in the buildings were enormous (four clinics were severely hit) and the majority of the equipment was also destroyed. The total damage was around 13 million golden pengő (at 1938). The largest devastation affected the Internal Medicine II, the Gynaecology I, the Dermatology, the Surgery II and the Paediatric Clinics, but several other buildings were damaged as well. This was aggravated by the freezing of the drainage system and the plundering affecting the whole city. Contrary to all these, the clinics were operating even in case of the siege, often under impossible circumstances. Even the Institute of Physiology and the Patho-anatomy department started to perform the care of the injured.

After the war, the tutors were significantly changed according to the taste of the new political forces having the power. The main tool of this was the certification procedure. It describes the ratios well that against 15 out of the 27 regular tutors of the medical faculty, procedures were launched or they were dismissed with various sanctions. In addition to this, in January 1945, IMRE József professor died which led the Ophthalmology Clinic to get empty. In addition to them, 6 honorary extraordinary tutors, 17 private professors and 11 physicians were dismissed. Out of the physicians above, 44 were still in Germany with the students carried there.

From June 1945 until his emigration, the Nobel Prize winner professor SZENT-GYÖRGYI Albert was among the tutors of the faculty, who was that time the head of the Department of Physiology and Medical Chemistry. From 1945, there was a sharp increase in the number of the students, which exceeded multiple times the capacity of the faculty, therefore, from 1947/48 onwards, they were forced to introduce admission examination. After the rising of the Communist Party to power, one of the most important factors became the origin of the candidate, therefore, the social composition of the students significantly changed. Soon, almost 25% was the ratio of the students from worker or pawn origin. The National Association of Peoples' Colleges was founded and from the academic year 1951/52, the Scientific Students' Association movement was introduced based on Soviet pattern. In 1948, education was reformed again. The examinations were tightened, education turned more pragmatic and the medical chemistry and physics were included into the curriculum, in addition to the biology in 1950. Due to political reasons, the Marxism and Leninism, the Russian language and the national defence knowledge were also added.

In this period, multiple hospitals were attached to universities by forming clinics. Therefore, the number of beds increased to 3167 in 1955 from the 1178 in 1946. In parallel, specialisation was going on within the disciplines, which led to further separations in the clinics as well. Areas with larger and larger costs entered into research, therefore, fallback behind the rich countries was evident. This was worsened on by the isolation policy in the 1950's when there was Soviet influence also in science.

II. History of the separate Medical University: BOTE, SOTE (1951-2000)

After 1949, the Hungarian higher education underwent consecutive reforms. Due to the fight against churches, the name of the university was modified, therefore, instead of its founder, PÁZMÁNY Péter, the university got the name of one of its most prominent scientist tutors, EÖTVÖS Loránd on 1 September 1950. At the end of 1950, the Council of Ministers discontinued the former practice and traditions and decided the creation of specialist universities subject to the sectoral

ministries. They wanted to reach it partly by founding new institutions and partly by the division of the currently existing ones. During the reorganisation, the Soviet higher education system of the 1930's was taken as example, disregarding that since that time, this had been significantly modified also in the Soviet Union by resetting the unified management of higher education. The deadline of the completion of the action was planned to be on 1 February 1951. Within the framework of

this, the medical faculties of the universities were separated and transformed into separate specialist universities. In a parallel way, the new medical universities were subordinated not to the Ministry of Religion and Public Education, but the newly formed Ministry of Health. Therefore, from 1 February 1951, the Faculty of Medicine of the Eötvös Loránd University continued its operation as a separate Medical University of Budapest.

In 1955, the organisational transformations went on. Within the University, 3 faculties were formed (with their former names: Faculty of General Medicine, Faculty of Dentistry and Faculty of Pharmacy). On 1 September 1955, the rectorate was established. The pharmacist training was transferred permanently to the medical university from the Eötvös Loránd University back in 1951 and in 1952, the dentist training of new system was started. Finally, on 7 November 1969, for the 200th Anniversary of the Faculty of Medicine, the university took the name of SEMMELWEIS Ignác.

Separation had, however, some disadvantages as well. From certain aspects, the distance from the humanities and the Faculty of Sciences led to drawbacks for the medical profession. The everyday life of the new university was made more difficult by that it had only the narrowest professional institutes and the conditions for the cultural and sports life or the rooms suitable for hosting large events were missing. They were able to be terminated only by the large investments of the 1970's. After the separation of the university, the separation from the BEAC university sports club also took place to form the Orvosegyetem Sport Club (OSC, Medical University Sports Club). The fencers and waterpolo players of the OSC have been the regular and successful participants of the Olympic Games and world championships.

The prints of the war had not even disappeared when as a protest against the communist power, the revolution broke

out on 23 October 1956. In the student movements, the students of the medical university also took place and after the breaking out of the armed fight, the role of our university aimed mostly at the care of the injured, since our institutions were in the centre of the war in Budapest. The staff of the affected clinics and institutions exhibited superhuman and heroic withstand multiple times. Further buildings were damaged and the most severely hit building was the Dermatology clinic. The reprisal after the communist restoration did not avoid our university either. The victim of this reprisal was the innocently slandered and executed TÓTH Ilona senior physician student who is considered today as the martyr of our university.

After consolidation, the emerging external relations from the 1960's facilitated us to keep up with the scientific international profession. In the following decades, serious developments were performed as well. The most important of them were the reconstruction of the Dermatology clinics demolished in 1956, the huge theoretical building finished in 1978, the Ophthalmology clinic I and the delivery of the Transplantation and Surgery Clinics in the beginning of the 1990's. In the clinics, healing and education took place this time with more than 3100 beds.

The increase of the ratio of the international students has started to grow since the 1970's. This time, they arrived mostly from the developing countries and mostly from the so-called democratic countries. Education in German language started in 1983 and after an experiment in 1987, the regular education in English language started in 1989.

The Act LXXX of 1993 on Higher Education made it the task of the universities to prepare for scientific degree and to award the PhD degree, based on which the Semmelweis University got its Doctoral School accredited in the same year and until 2018, it started 47 programmes.

III. The history of Semmelweis University (2000–2021)

At the end of the 1990's, the transformation of the Hungarian higher education network was put on agenda with the aim of institutional integration. The final stage of this process was determined by the Act LII of 1999 on the Transformation of the Higher Education Institutional Network. Accordingly, even in July that year, three universities (the Semmelweis University of Medicine, the Haynal Imre University of Health Sciences and the University of Physical Education) elaborated the plan of the organisational, operational and financial policy of the university to be created, together with the call for application for the rector and the director general. After the preparatory work, on 1 January 2000, Semmelweis University was established by the merger of the Semmelweis University of Medicine, the Haynal Imre University of Health Sciences and the University of Physical Education, which consisted of the following faculties: Faculty of General Medicine, Faculty of Health Sciences, College Faculty of Health, Faculty of Dentistry, Faculty of Pharmacy and Faculty of Physical Education and Sport Sciences. From this group, the Faculty of Health Sciences of the Haynal Imre University of Health Sciences was removed and based on a governmental decree, it ceased to exist. (The successor of the Haynal Imre University of Health Sciences was the new organisation, the National Medical Centre formed from it, which was known as Szabolcs utca Hospital until its closure in 2007.) The College Faculty of Health of the Haynal Imre University of Health Sciences remained on the part of the university, which continued its operation from the end of 2001 with 5 faculties: Faculty of General Medicine, College Faculty of Health (from 2007 with the name of Faculty of Health Sciences), Faculty of Dentistry, Faculty of Pharmacy and Faculty of Physical Education and Sport Sciences. In its decision no 62/2008 on 29 May 2008, the Senate of Semmelweis University decided to found its sixth faculty, the Faculty of Health and Public Services with the participation of three institutions working in the border of natural sciences and social sciences, i.e. the Health Services Management Training Centre, the Institute of Mental Health and the Institute of Health Informatics, Development and Further Training. The faculty started its activity in January 2010 and the inaugural meeting of the Faculty Council was

held on 21 April 2010. The new faculty has mostly social science orientation, however, it integrated interdisciplinary trainings at the border of sciences. With its programmes, it covers the whole educational spectrum including the basic training, the master training, the doctoral training and the postgraduate specialist training courses in the field of health-care management, mental and community health and health informatics.

In addition to the structural reorganisation, the new millennium brought significant developments as well. In 2003, the College Faculty of Health succeeded to move to a new site instead of its earlier fragmentation (Óbuda, Újpest, Józsefváros), to the Vas utca close to the centre of the university, into the fastidiously renovated building of the former Pajor sanatorium and later Balassa János Hospital. The Educational Centre of the Faculty of Dentistry was built between 2006-2007 in the site of the Pátria printing house, in the Szentkirályi utca. Almost all of the clinics and departments of the faculty moved to this state-of-the-art building. In September 2008, the plan of a long-standing desire of a second theoretical building, back from the 1960's came true in the form of the Theoretical Medical Centre in the Tűzoltó utca, which won several architectural professional prizes. In the gross 27,000 m² of the building, there are research laboratories, study rooms, student laboratories, lecture rooms, a modern animal house and seven seminar rooms. The two latter investment was performed in the so-called PPP construction. Among the renovations of buildings, the multistage project of the Central Management Building (Üllői út 26) started in 2008 has to be mentioned, the first stage of which, the renovation, was finished in 2009 and the project was completed by the formation of the loft in 2012. The Ophthalmology Clinic in the Mária utca and the 1st Department of Pathology and Experimental Cancer Research were renovated in 2013. In the summer of 2012, the large-scale development of the Outer Clinical Site, the Korányi project was started, which is one of the most significant investment of the previous century of the university.

Between 2008 and 2010, Semmelweis University started three off-site trainings abroad. The first was the Asklepios Campus Hamburg, within the framework of which the stu-

dents studying in German language continue their studies in the Hamburg campus according to the Hungarian curriculum, after the theoretical training in Budapest and they get the medical (M.D.) diploma of the Semmelweis University at the end of the training. In cooperation with the L.U.de.S University, Lugano, Switzerland, the Italian and English language physiotherapy basic training (BSc) started in 2009, with the same curriculum as the Faculty of Health. In 2010, the Faculty of Health and Public Services established an off-site training in Bratislava. The postgraduate health management training programme organised jointly with the Health Management Academy, Bratislava was held in Slovakian language with two groups, one in 2010 and in 2012.

In 2010, Semmelweis University won the title of Prestigious Research University related to which it performed a large-scale tender with the title “Modern Medical Science Technologies in the Semmelweis University”. Within the framework of a tender of almost 3 billion Hungarian Forints, outstanding results were achieved in five distinguished fields of research: personalised medicine, imaging procedures and bioimaging, bio-engineering and nanomedicine, molecular medicine and in the integrative educational module. The university won the Research University qualification for the period 2013-16 as well, which is still possessed.

In Hungary in 2011, Semmelweis University was the first among the medical universities to develop e-learning learning materials within the framework of a two-year Social Renewal Operational Programme (TÁMOP) and the possibility became open to hold on-line examinations. Even in that year, the E-learning and Digital Content Development Centre was founded, which performs the coordination tasks of the development of the university learning materials.

In 2013, the Central Institute of Stomatology was terminated, the role of which was taken away by the Department of Community Dentistry within the university. This Department renovated in 2019 is the largest institute of the Faculty of

Dentistry in terms of staff and floor area and in addition to the continuous patient care, it takes part in the education, specialist physician training and further education tasks as well. In 2014, the Thoracic Surgery Department was established, which is operating on the basis of the National Institute of Oncology. In December 2015, the first successful lung transplantation in Hungary was performed here.

On 1 September 2014, the Faculty of Physical Education and Sport Sciences spun off Semmelweis University and it continued its operation separately again, with the name of University of Physical Education.

In the end of 2014, similarly to many Hungarian institutes of higher education, with the introduction of the chancellor position, the management system of Semmelweis University was changed. Education, research and patient care are managed by the rector, while the tasks regarding the operation and the management of the university were transferred to the chancellor. From 2015, the management of the Clinical Centre of the university was taken by the vice-rector for clinical affairs from the rector. In 2016, as a separate patient care institution of the university, the Centre of Oncology was formed after its spin-off from the Department of Radiology and Oncotherapy. On 1 August 2017, the Pető András College and its part, the Institute of Conductive Education joined the University, which has been operating as the Pető András Faculty. In this way, the number of faculties increased to six again.

In 2018, the university celebrated the 200th anniversary of the birth of Semmelweis Ignác after whom the university got its name and with the solemn opening ceremony of the academic year 2019/2020, the jubilee year of the university starts, with which we pay tribute to the 250th anniversary of the foundation of the university.

Compiled by
dr. MOLNÁR László – SÁGI Zenina – DOBOZI Pálma



BENE Ferenc,
tutor of internal medicine
1775-1858



BÓKAI János,
tutor of paediatrics
1822-1884



BALASSA János,
tutor of surgery, the director of the
Medical Faculty in 1848/49
1814-1868



ARÁNYI Lajos,
the first tutor of pathology
1812-1887



SEMMELWEIS Ignác,
painted by THAN Mór
1818-1865



WAGNER János,
tutor of internal medicine
1811-1889



JENDRASSIK Jenő,
tutor of physiology
1824-1891



LENHOSSÉK József from 1864,
tutor of anatomy
1818-1888



GENERSICH Antal,
tutor of pathology
1842-1918



LUMNICZER Sándor,
tutor of surgery
1821-1892



MIHALKOVICS Géza,
tutor of anatomy
1844-1899



HÓGYES Endre,
tutor of general medicine
1847-1906



FODOR József,
the first tutor of the independent
public health
1843-1901



TAUFFER Vilmos,
tutor of obstetrics and gynaecology
1851-1934



KORÁNYI Sándor,
tutor of internal medicine
1866-1944



NÉKÁM Lajos,
tutor of dermatology
1868-1957



KROMPECHER Ödön,
tutor of pathology
1870-1926



HUZELLA Tivadar,
the director of the Institute of Histology
and Embryology
1886-1950



BALOGH Károly,
the first dean of the Faculty of Dentistry
1895-1973



HAYNAL Imre,
the director of the Department of Internal Medicine II
1892-1979



MOZSONYI Sándor,
the first dean of the
Faculty of Pharmacy
1889-1976



SZENT-GYÖRGYI Albert,
Nobel Prize winner,
tutor of biochemistry
1893-1986



BALÓ József,
tutor of pathology
1895-1979



SZENTÁGOTHAJ János, neuroscientist,
tutor of anatomy
1912-1994

Changing the operating model (2021—)

On its decision 1/2021 (I. 28.) the Senate of Semmelweis University - including its six faculties, public education and vocational institutions, as well as its clinical centre forming an organic unit with its medical and health sciences training - supported the change of the operating model of Semmelweis University. The state transfers its maintenance rights to a public interest foundation to be established by the state for the maintenance of Semmelweis University, thus contributing to the achievement of the university's strategic goals and the development of Hungarian medical and health science education and patient care.

Semmelweis University is already an elite university of international reputation, known and respected, which has reached the limits of its development due to current environmental constraints. A change of model could create the opportunity to achieve the goal of becoming one of the world's top 100 universities.

The vision of Semmelweis University is to be recognised as one of the world's leading universities, and as such, ensuring the unity of theoretical education, basic and translational research and clinical care, while respecting tradition. The university's further goal is to implement the training of excellent professionals in medical and health sciences along with closely related pedagogical fields by widely applying the results of modern technology. The university employs methods of the highest level of healing, focusing on the areas of health preservation, disease prevention, personalized medicine, and societal expectations, and serving the rise of the nation.

The operational model (public law framework) of the University has not changed significantly in the last three decades. Since its establishment, it has operated as a central budgetary body, as part of public finances, regarding its management, financing, employment and motivation. The socio-economic environment of the University, as well as the sectoral governance of higher education, poses challenges to the current operating model which the institution can hardly meet within its current operational framework.

A change in operation model is necessary to enable the university to meet its own quality expectations and those of the market and knowledge industry.

The new model that will emerge as a result of the transformation will make it possible to achieve strategic goals:

1. By 2030, **Semmelweis University will become one of Europe's five most successful universities in the medical sciences and one of the top 100 out of 28,000 universities in the world.**
2. Ensuring the sovereignty of Hungarian-language health-care in Hungary and the nation, **the entire system of medical and health professional training will be renewed as part of the curriculum reform** launched in the year of the 250th anniversary of Semmelweis University.
3. Semmelweis University will train some **of Europe's top doctors, dentists, pharmacists, conductors**, health and health related management as well as social science professionals.
4. A **key export product** of Semmelweis University is **its foreign-language medical training**, which generates significant revenues at national level, and **which can be expanded** by various means in the coming years.
5. Graduates of Semmelweis University are doctors and health professionals **who know the Christian cultural roots that are so important in the field of medicine, and who not only understand the value of health, but live it.**
6. Semmelweis University's **clinical patient care activities will be renewed by developing a complete public care portfolio., thus enhancing the health security of the Hungarian population and increasing trust in health-care.**
7. Health and pharmaceutical developments that ensure national sovereignty are **implemented on the research and innovation base** of the University.
8. The research output of Semmelweis University can be significantly increased in a practical, translational direction as a result of **patient-centred health industry co-operation with national and international partners in line with governmental goals. In this process domestic health industry players will be given a prominent role.**
9. Leadership in data-driven support for health and health-care industry paradigm shift.

The aim of Semmelweis University is to contribute to the creation of a world-class medical and health sciences university in Hungary, to become a national educational and scientific base for disease management, and to support the re-launch of the economy through its developments.

In accordance with the provisions of Act XX of 2021 on „public trusts funds performing public function” and Act XX of 2021 on the “National Foundation for Health and Medical Training, the transfer of assets to the Foundation for National Health Care and Medical Education and Semmelweis University”, the Semmelweis University will continue to operate as a public interest university in the form of a foundation from 1 August 2021. The executive body of the foun-

dation is the board of trustees, which exercises all the powers that do not fall within the competence of the founder or other foundation organization or body, in particular the maintenance rights of the university specified in the act on higher education. The Board of Trustees consists of five (5) natural persons. The members of the Board of Trustees are the Chairman and the members of the Board of Trustees.

Written by:
dr. László Molnár
Sági Zenina
Pálma Dobozi
Beatrix Valyon

HONORARY DOCTORS OF THE MEDICAL FACULTY OF BUDAPEST DURING THE UNIVERSITY'S SCIENCE ERA

1895/96	Tivadar Károly, royal prince from Bavaria John Shaw Billings, professor from Philadelphia Rudolf Virchow, professor from Berlin Joseph Lister, professor from London Adolf Anders Retzius, professor from Stockholm Guido Bacelli, professor from Rome Pierre-Paul-Émile Roux, professor from Paris Károly Than, professor of Budapest	1914/15	Otto Karl Schjerning, professor of Berlin
		1928/29	Friedrich Schmidt-Ott, Minister of State of Prussia
		1930/31	Harvey Williams Cushing, professor of Harvard University in Cambridge
		1934/35	Jenő Sipőcz, Lord Mayor of Budapest
		1935/36	Ferdinand-Jean Darier, Chairman of the French Society of Dermatology Anton Freiherr von Eiselsberg, professor from Vienna Karl Albert Ludwig Aschoff, professor from Freiburg August Krogh, professor from Copenhagen Granville Harrison Ross, professor at Yale University Charles Scott Sherrington, professor from Oxford Frederick Gowland Hopkins, professor from Cambridge Gustave Roussy, professor from Paris
1899/1900	Tivadar Duka, chief doctor Col. Emeritus of the royal Bengal army of England, on the occasion of his 50th anniversary of operation	1942/43	Károly Szendy, Mayor of Budapest
1909/10	Albert Apponyi, Minister of Culture, on the occasion of the XVI. International Medical Congress held in Budapest		
1911/12	Heinrich Wilhelm Waldeyer, professor from Berlin, on occasion of his 50th jubilee as a doctor		

LIST OF PERSONS AWARDED WITH THE „DOCTOR HONORIS CAUSA” TITLE AT THE BUDAPEST/SEMMELWEIS UNIVERSITY OF MEDICAL SCIENCES

1967	Boris Vasilyevich Petrovsky (Soviet Union)	1972	Marcelino G. Candau (Switzerland)
1969	Pyotr Kuzmich Anohin (Soviet Union) Assen Hadyolov (Bulgaria) György Békéssy (USA) Vasily Vasilyevich Parin (Soviet Union) Daniel Bovet (Italy) Stefan Milcu (Romania) Karl Fellingner (Austria) Samuel Rapaport (Germany) Jules François (Belgium) Pyotr Grigoryevich Sergiyev (Soviet Union)	1976	Britton Chance (USA) Leonid Semyonovich Persyanilov (Soviet Union) Tadeusz Krwawicz (Poland) Vasyl Vasilyevich Zakusov (Soviet Union)
		1978	Uktam Aripov (Soviet Union)
		1980	Nikolai Nikolaevich Blohin (Soviet Union)
		1982	George Weder (USA)
		1983	Philip Gerald Mechanick (USA) Viking Olov Björk (Sweden)

1984	Walter Birkmayer (Austria) Arje Scheinen (Finland)	1995	Takao Yamauro (Japan) H. W. Wouters (Netherlands)
1985	Jens J. Pintborg (Denmark) Armand Hammer (USA) Klaus Thureau (Germany)	1996	Károly Balogh (USA) Thomas Rabe (Germany) Horst Cotta (Germany) Eberhard Ritz (Germany) Viktor E. Frankl (Austria) Heikki Ruskoaho (Finland) John A. Hobkirk (England) Thomas Schiff (USA) Dieter Ernst Lange (Germany) Volkmar Schneider (Germany)
1986	Hans Altmann (Austria) Mitropan Studenikin (Soviet Union)	1997	Theodor Hellbrügge (Germany) Hans-Günter Sonntag (Germany) Thomas Kenner (Austria) Moussa B. H. Youdim (Israel) Edward R. Perl (USA)
1987	John Gergely (USA) Halldan I. Mahler (Denmark) Shogo Sasaki (Japan) Ludwig Mecklinger (Germany) F. Gotthard Schettler (Germany)	1998	Bernd Brinkmann (Germany) Frank A. Chervenak (USA) Asim Kurjak (Croatia) Ferenc Robicsek (USA) Werner Schmidt (Germany) André Haynal (Switzerland)
1988	László Ernster (Sweden) Jan Solich (Czechoslovakia) Dieter Schleger (Germany) Emeric Szilágyi (USA) Thomas P. Singer (USA) George B. Udvarhelyi (USA)	1999	Luis Gabriel Navar (USA) Nikolaus Freudenberg (Germany) Stefan Pollak (Germany) Tamás Hacki (Germany) Norbert Schwenzer (Germany) Thomas D. Kerényi (USA) Georg Stingl (Austria) Thomas Michael Krieg (Germany) Michael Wahl (Germany) Juhani Leppäluoto (Finland) Klaus Wolff (Austria)
1989	Douve D. Breimer (Netherlands)		
1990	Yoshinori Nozawa (Japan) Walter Künzel (Germany) Herbert Oelshcläger (Germany) Jerzy Maj (Poland) Martin Reivich (USA)		
1991	Friedrich Wilhelm Ahnefeld (Germany) László Róbert (France) Endre A. Balázs (USA) Benno Runnebaum (Germany) Herbert Braunsteiner (Austria) Heitaroh Iwata (Japan)		
1992	Merton Sandler (England) Hans Weidinger (Germany)		
1993	György Ács (USA) László Iffy (USA)		
1994	Ursula Lachnit-Fixon (Germany) Milan Chalabala (Slovakia) Felix Unger (Austria) Ulrich Joos (Germany) Isaac van der Wald (Netherlands) Sergio Ferri (Italy)		

LIST OF PERSONS AWARDED WITH THE „DOCTOR HONORIS CAUSA” TITLE AT SEMMELWEIS UNIVERSITY

2000	Allen Cowley (USA) Péter Illés (Germany) Iván Kiss (Germany) Ryszard Jerzy Gryglewski (Poland) Emmanuel van Praagh (France) Claes B. Wollheim (Switzerland) Gottfried O. H. Naumann (Germany) Gabriel P. Haas (USA) Gerd Schmitz (Germany) Elemér Zsigmond (USA)	2004	Stephen Katz (USA) Sebastian G. B. Amyes (England) Sir George Radda (England) Michael Marberger (Austria) István Seri (USA) Peter Gängler (Germany) Osmo Hänninen (Finland) Albert William Taylor (USA) Barry D. Kahan (USA)
2001	Pekka Juhani Saukko (Finland) Leo M. Sreebny (USA) N. Joan Abbott (England) Christopher Squier (USA) Ádám Tegzess (Netherlands) Gottfried Heinisch (Austria) Herbert Rübben (Germany) Han C. G. Kemper (Netherlands)	2005	Vilmos Vécsei (Austria) Louis Ignarro (USA) Gyöngyi Szabó (USA) Heinrich Schmidt-Gayk (Germany) Jos Hendrik Willem Hoogmartens (Belgium) Cynthia K. Larive (USA) Tibor Hortobágyi (USA) Vladimir Brusic (Australia)
2002	Jacques Rogge (Belgium, Switzerland) Sataro Goto (Japan) Matthias Brandis (Germany) John Holloszy (USA) János Alpár (USA) Denys Wheatley (England) Angelo Benedetti (Italy) Ferenc Jolesz (USA) Tatsuo Nagai (Japan)	2006	Uwe Wilhelm Joseph Heemann (Germany) Philippe Morel (Switzerland) Rolf Christian Gaillard (Switzerland) Mátyás Sándor (USA) Hideki Ohno (Japan)
2003	Thomas E. Andreoli (USA) Michael Georgieff (Germany) László Víg (Hungary) György Gosztonyi (Germany) Martin Black (England) Helmut Hahn (Germany) Thomas Detre (USA) Carl Hermann Lücking (Germany) David B. Ferguson (England) Marteen J. H. Slooff (Netherlands)	2007	John Raymond Garrett (England) Michael Landthaler (Germany) Kamal K. Midha (Canada) Gertrud Pfister (Denmark) Roberto Romero (USA) Heinz Schilcher (Germany) Jörg Schubert (Germany) Clemens Sorg (Austria)
		2008	Olaf Bodamer (Austria) Péter Pál Bucsky (Germany) Kelvin Davies (USA) Gabor Kaley (USA) Anton Sculean (Netherlands)

2009	Maynard R. Case (England) Christopher R. Chapple (England) László Endrényi (Canada) Zsuzsanna Fábry (Hungary – USA) Bruno Grandi (Italy) Jerzy Kosiewicz (Poland) Karl-Heinz Kuck (Germany) Peter Malfertheiner (Germany) Franco Mantero (Italy) Éva Mezey (Hungary – USA) Georg Petroianu (Germany – USA) Tamás Péter Sótónyi (Hungary)	2013	Peter Gabor Medveczky (USA) Arthur J. Moss (USA) Gerhard M. Kostner (Austria) Marie T. O'Toole (USA) Peep Veski (Estonia) Kai-Ming Chan (China) Paul G. M. Luiten (Netherlands)
2010	Roger Y. Tsien (USA) Masaki Kitajima (Japan) Hartmut P. H. Neumann (Germany) István Boldogh (USA) Constantin Copotoiu (Marosvásárhely, Romania)	2014	Richard M. Satava (USA) René Sylvain Kahn (Netherlands) Péter Gloviczki (USA) Herbert Ehringer (Austria)
2011	Péter Ferenczi (Austria) Dirk Pickuth (Germany) Andrzej Wiecek (Poland) Renato V. Iozzo (USA) Örs Nagy (Romania) István Bocskai (Romania) James S. Skinner (USA)	2015	Shigeru Saito (Japan) Pál Pacher (USA) Jacques Marescaux (France) Leena Kaarina Bruckner-Tudermann (Germany) Stephan Züchner (Germany) Fausto J. Pinto (Portugal) György Kálmán Béla Sándor (Finland) Panos Macheras (Greece) Attila A. Hincal (Turkey)
2012	Pierre Corvol (France) Tibor Juhász (USA) George Berci (USA) Axel Ullrich (Germany) Jozef Corveleyn (Belgium) Joseph Kutzin (Switzerland) Daan Braveman (USA) Imre G. Csizmadia (Canada) Árpád Gyéresi (Marosvásárhely, Romania) Vinod P. Shah (JSS University of Mysore, India) Jürgen Michael Steinacker (Germany)	2016	László Bögre (England) Walter Klepetko (Austria) Lajos Okolicsányi (Italy) György Kúnos (USA) Josep Figueras (Spain) Henning H. Blume (Germany) Gábor Tigyi (USA)
		2017	Gerhard Hindricks (Germany) Christine Baylis (USA) Rainer Schulz (Germany) Mikael Björnstedt (Sweden) Keiichi Maruyama (Japan) Josef Smolen (Austria) Clive G. Wilson (England) Stefan Offermanns (Germany)

2018	Dr. Miklos Sahin-Toth (USA)	2020	Prof. Hans Henkes (Németország)
	Dr. Maria Antonietta Stazi (Italy)		Prof. Gerasimos Filipatto (Görögország)
	Dr. Piotr L. Chlosta (Poland)		Dr. Markó-Varga György (Svédország)
	Dr. Jianguang Xu (China)		Prof. Dr. Jude Fitzgibbon (Anglia)
	Dr. Daan J. A. Crommelin (Netherlands)		Prof. Dr. Udo Hoffmann (USA)
	Dr. Olavi Pelkonen (Finland)	2021	Prof. Stefan Anker (Germany)
2019	Prof. Dr. Scott David Solomon (USA)		Prof. Mariann Pavone-Gyöngyösi (Austria)
	Offermanns, Stefan (Németország)		Prof. Gary Francis Baxter (England)
	Komajda, Michel (Franciaország)		Prof. Olschewski Andrea (Austria)
	Hausenloy, Derek John (Szingapúr)		Prof. Shahrokh Francis Shariat (Austria)
	Bax, Jeroen (Hollandia)		Prof. Carlos J. Bustamante (USA)
	Hogendoorn, Pancras (Hollandia)		Prof. Ondrej Viklicky (Czech Republic)
	Madonna, Rosalinda (Olaszország-USA)		Prof. Hans Henri Marcel Paul Kluge (Denmark)
	Schirmacher, Peter (Németország)		
	Mühlebach, Stefan (Svájc)		
	Tóth István (Ausztrália)		

PRIVATE TUTORS OF SEMMELWEIS UNIVERSITY

1995	Dr. Árpád Mayer head physician, Uzsoki Hospital, Oncology Centre
	Dr. László Takácsi Nagy deputy head physician, Uzsoki street Hospital, Oncology Centre
1996	Dr. Elemér Nemesánszky head physician, Buda Hospital of the Hospitaller Order of Saint John of God
	Dr. István Hartyánszky, chief physician, National Institute Of Cardiology
	Dr. János Strausz medical director, Törökbálint Institute of Pulmonology
	Dr. Szabolcs Ottó deputy director-general chief physician, National Oncological Institute
	Dr. András S. Szabó associate professor, Head of Department, Saint Stephen University
1997	Dr. Endre Ludwig head physician, Péterfy Sándor street Hospital
	Dr. Béla Goldschmidt head physician, Saint Roch Hospital
	Dr. János Hamar head physician, National Institute of Traumatology
	Dr. György Jermendy head physician, Bajcsy-Zsilinszky Metropolitan Hospital
	Dr. György Karmos senior research fellow, Hungarian Academy of Sciences, Institute of Psychology
	Dr. Elek Kisida head physician, Buda Hospital of the Hospitaller Order of Saint John of God
	Dr. Tibor Raposa head physician, Saint Stephen Metropolitan Hospital
	Dr. Géza Tasnádi head physician, Pál Heim Metropolitan Municipality Children's Hospital
	Dr. István Péter Temesvári head physician, National Institute of Rheumatology and Physiotherapy
	Dr. József Tóth head physician, National Oncological Institute
	Dr. Károly Sándor Tóth head physician, Saint Margaret Hospital
	Dr. Valéria Váradi head physician, Saint Margaret Hospital
	Dr. Gábor Pethő director of quality assurance, Pharmavit Ltd.

- 1998 Dr. Hedvig Bodánszky consultant, National Medical Centre
 Dr. István Láng chief physician, National Oncology Institute
 Dr. Béla Lombay head physician, B-A-Z County Hospital, Radiology Institute, Department of Paediatric Radiology
 Dr. János Radó physician, Virányos Clinic
 Dr. Károly Simon head physician, Saint Emeric Hospital-Clinic
- 1999 Dr. György Bodoky chief physician, Saint Ladislaus Hospital
 Dr. Kristóf Nékám head physician, Buda Hospital of the Hospitaller Order of Saint John of God
 Dr. Gyula Poór director-general chief physician, National Institute of Rheumatology and Physiotherapy
 Dr. László Simon head physician, Tolna County Municipal Hospital, Szekszárd
 Dr. Attila Tankó medical specialist, District II. Municipality Clinic
 Dr. Gábor Veres director-general chief physician, Balatonfüred State Hospital
 Dr. István Vermes chief physician, Medical Spectrum, Twente (Netherlands)
 Dr. Bosco Camelo associate professor, University of Rome
 Dr. Péter Göblyös head physician, National Institute of Hematology and Immunology
- 2000 Dr. Miklós Bély head physician, Buda Hospital of the Hospitaller Order of Saint John of God
 Dr. György Berencsi head physician, Béla Johan National Epidemiology Centre
 Dr. Tamás Szabó Head of the scientific group, Central School of Sport
- 2001 Dr. Sándor Frenyó head physician, National Traumatology Institute
 Dr. Ferenc Horkay head physician, National Cardiology Institute
 Dr. Krisztina Kádár chief physician, National Cardiology Institute
 Dr. Lajos Kotsis chief physician, National Korányi Institute of TBC and Pulmonology
 Dr. Ilona Kovalszky senior research fellow, No. I. Institute of Pathology and Experimental Cancer Research
 Dr. Aladár Rónaszéki head physician, Elizabeth Hospital of Péterfy Sándor street Hospital
 Dr. Ágnes Szebeni head physician Emeritus, Ministry of Home Affairs Central Hospital
 Dr. András Végh head physician, Pál Heim Metropolitan Municipality Children's Hospital
 Dr. Gábor Winkler head physician, Saint John Hospital
- 2002 Dr. Mátyás J. Baló (Banga) head physician, Central Hospital of the Hungarian Homeland Defence Forces, Department of Internal Medicine
 Dr. Béla Büki chief physician, Kremsi Hospital, Department of Otolaryngology
 Dr. Sándor Czirják chief physician, Deputy Director-General, National Scientific Institute of Neurosurgery
 Dr. Gyula Domján head physician, Saint Roch Hospital, No. I. Department of Internal Medicine
 Dr. Sándor Dubecz chief physician, National Oncology Institute, Department of General Surgery and Thoracic Surgery
 Dr. Lajos Kullmann director-general chief physician, National Medical Rehabilitative Institute
 Dr. Ádám László head physician, Bajcsy-Zsilinszky Hospital, Department of Obstetrics and Gynecology
 Dr. Károly Nagy deputy scientific director, National Institute of Dermatology and Venereology
 Dr. Erzsébet Temesvári senior research fellow, National Institute of Dermatology and Venereology

- 2003 Dr. Áron Altorjay head physician, Fejér County Saint George Hospital
Dr. István Bodrogi head physician, National Oncology Institute
Dr. Károly Cseh head physician, Sándor Korányi Hospital and Clinic
Dr. Gábor Faludi head physician, Kútvölgyi Clinical Array
Dr. Irén Herjavec head physician, National Korányi Institute of TBC and Pulmonology
Dr. Kálmán Róna scientific consultant, Department of Forensic Medicine
Dr. György Szeifert chief physician, National Scientific Institute of Neurosurgery
Dr. Imre Klebovics head of science department, EGIS Pharmaceuticals PLC
- 2004 Dr. Jenő Julow head physician, National Scientific Institute of Neurosurgery
Dr. László Bognár head physician, National Scientific Institute of Neurosurgery
- 2005 Dr. György Bagdy head of laboratory, scientific director, National Institute of Psychiatry and Neurology
Dr. Katalin Borbély head physician, National Scientific Institute of Neurosurgery
- 2006 Dr. Ildikó Horváth head physician, National Korányi Institute of TBC and Pulmonology, doctor of the Hungarian Academy of Sciences
Dr. László Dézsi research supervisor, Gedeon Richter PLC Research Department of Pharmacology and Drug Safety
Dr. Tamás Szamosi consultant, No. II. Clinic of Paediatrics
- 2007 Dr. Róbert Veres head physician, National Scientific Institute of Neurosurgery
- 2008 Dr. Attila Csekeő head physician, National Korányi Institute of TBC and Pulmonology
- 2009 Dr. Péter Andréka head physician, György Gottsegen National Cardiology Institute, Department of Cardiology
Dr. István Szikora deputy director-general chief physician, National Neuroscience Institute
- 2010 Dr. Tamás Görcs lecturer, Department of Anatomy, Histology and Embryology
Dr. György Keleti head physician comm. Joint Saint Emeric and Saint Ladislaus Hospital, Surgery Department
Dr. Ödön Gaál graduate chemist emeritus, National Institute of Nutritional Science (1972-2005)
- 2011 Dr. Béla Schumann director, Laborexper Kft.
Dr. Miklós Lőw chemist emeritus, Gedeon Richter PLC
Dr. András Bálint project manager chief physician, Saint Emeric Municipal Hospital, General Surgery Section
Dr. Miklós Merksz head physician, Pál Heim Metropolitan Municipality Children's Hospital, Department of Urologic Surgery
Dr. András Telekes head physician, Bajcsy-Zsilinszky Metropolitan Hospital-Clinic, Department of Oncology
- 2013 Dr. Attila Vörös chief physician, State Medical Centre - Central Hospital of the Hungarian Homeland Defence Forces
Dr. Zoltán Takács-Nagy head physician, National Oncology Institute, Department of Radiotherapy

- 2014 Dr. György Ostoharics-Horváth chief physician, Aladár Petz County Hospital, Department of Psychiatry, Mental Hygiene and Addictology
- 2015 Dr. Sándor Bende chief physician, titular associate professor, B-A-Z County Hospital and University Teaching Hospital
Dr. Tamás Sándor chief physician, (retired volunteer assistant), 2nd Department of Surgery
- 2016 Dr. Ferenc Ender chief physician, Joint Saint Emeric and Saint Ladislaus Metropolitan Hospital, Surgery Department
- 2017 Virág Katalin Bognár self-employed sociology instructor
Dr. Bertalan Meskó, Webicina Kft., manager
Dr. Gamal Eldin Mohamed Elmowag head physician, Budaörs Healthcare Centre
Dr. Miklós Szokoly director-general consultant, Péterfy Sándor street Hospital, Clinic and Casualty Centre
Dr. Tamás Iváncsy associate professor, Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics, Department of Electric Power Engineering
Dr. Judit Moldvay chief physician, National Korányi Pulmonology Institute, Tumor Biology Department
Dr. Géza Nagy college professor, Semmelweis Hospital, head physician, University of Miskolc, Faculty of Healthcare
- 2021 Prof. Dr. Ádány Róza egyetemi tanár, Népegészségtani Intézet
Prof. Dr. Fülöp Tamás egyetemi tanár, Népegészségtani Intézet

FOUNDATION FOR NATIONAL HEALTH CARE AND MEDICAL EDUCATION

Act IX of 2021 on „public trusts funds performing public function” and Act XX of 2021 on the “Foundation for National Health Care and Medical Education, the transfer of assets to the Foundation for National Health Care and Medical Education and Semmelweis University”
The executive body of the foundation is the Board of Trustees, which exercises all the powers that do not fall within the competence of the founder or other foundation organization or body, in particular the maintenance rights of the university specified in the act on higher education. The Board of Trustees consists of five (5) natural persons. The members of the Board of Trustees are the Chairman and the members of the Board of Trustees.

Members of the Board of Trustees

CHAIRMAN

Dr. Gábor Orbán
(Chief Executive Officer of Gedeon Richter Plc.)

MEMBERS

Dr. Jonathán Róbert Bedros
(Director General of Szent Imre University Training Hospital)
Dr. Péter Gloviczki
(Professor of Vascular Surgery at Mayo Clinic)
Dr. Béla Péter Merkely
(Rector of Semmelweis University, Director of the Heart and Vascular Centre)
Dr. Miklós Szócska
(Director of the Health Services Management Training Centre and the Institute of Digital Health Sciences, Dean of the Faculty of Health and Public Administration)

Supervisory Board

CHAIRWOMAN

Dr. Róza Nagy
(Chief Adviser to the President of Magyar Nemzeti Bank i.e. Hungarian National Bank)

MEMBERS

Dr. Zoltán Hankó
(President of the Hungarian Chamber of Pharmacists)
István Havas
(Executive Director)

Senate

The Senate is the supreme autonomous leading body endowed with rights of decisional authority, initiative, review and control. The chairman of the Senate is the rector of Semmelweis University.

The makeup of the Senate

The member of the Senate may be such a person – excluding representatives of the Student’s Union and other representative organisations – who is employed by Semmelweis University in an employment relationship or as a full-time working public servant, i.e. lecturer, researcher, teacher, or other scope of activity. The Senate consists of 45 members. This number is determined according to the seats available based on position, election and delegation as a result of election, defined in Section 13, part (4)-(5) of the Organisational and Operational Rules. The Rector and Chancellor are ex officio members of the Senate.

Members of the Senate

RECTOR	1. Dr. Béla Merkely
CHANCELLOR	2. Dr. Livia Pavlik
FACULTY OF MEDICINE	3. Dr. Miklós Kellermayer
	4. Dr. Edit Buzás
	5. Dr. Péter Ferdinandy
	6. Dr. Alán Alpár
FACULTY OF HEALTH SCIENCES	7. Dr. Zoltán Zsolt Nagy
	8. Dr. Gabriella Bednáríkné Dörnyei
	9. Dr. István Vingender
	10. Dr. Tímea Tóth
FACULTY OF DENTISTRY	11. Dr. Gábor Gerber
	12. Dr. Károly Bartha
	13. Dr. Csaba Dobó Nagy
FACULTY OF PHARMACEUTICAL SCIENCES	14. Dr. Romána Zelkó
	15. Dr. István Antal
	16. Dr. Szabolcs Béni
FACULTY OF HEALTH AND PUBLIC SERVICES	17. Dr. Miklós Szócska
	18. Dr. Eszter Zimányiné Sinkó
	19. Dr. Beáta Judit Pethesné Dávid
PETHŐ ANDRÁS FACULTY	20. Dr. Andrea Tenk Miklósné Zsebe
	21. Dr. Éva Szabó Dr. Feketené
	22. Dr. Ibolya Túri
KÁROLY RÁCZ SCHOOL OF PHD STUDIES	23. Dr. Zoltán Benyó
CLINICAL CENTRE	24. Dr. Attila Szabó
	25. Dr. Ferenc Bánhid

STUDENT'S UNION

**DOCTORANDUS STUDENT UNION
PUBLIC SERVICE COUNCIL**

SEMMELWEIS LABOUR ORGANISATION
(according to Section 13. Parts (2) and (3)
of the Organisational and Operational Rules)
INVITEES

26. Dr. Péter Hermann
27. Dr. Balázs Hankó
28. Dr. Péter Nyirády
29. Dr. Attila Szijártó
30. Tamás Hegedűs
31. Bence Gusztáv Stubnya
32. Bálint Mátyás Borsik
33. Bálint Tripolszky
34. Edina Vajda
35. Frida Méth
36. Hermann Daniel
37. Szilárd Szigeti
38. Cintia Szabó
39. Viktória Kiss
40. Bence Áron Benedikti
41. Dr. Szilárd Szanyi
42. Krisztina Tódorné Bognár
43. Kornélia Dr. Tóthné Kónya
44. Dr. Zoltán Berki
45. Dr. Katalin Antmann

Dr. Ágoston Szél
Irén Baumgartnerneé Holló
Dr. Zsolt Kovács
Dr. Levente Török
Dr. Andrea Kormos
Dr. Marcel Pop
Dr. Attila Mócsai
András Boros
Istvánné Riesz
Dr. Péter Reichert
Dr. Miklós Szathmári
András Balogh
Eszter Kovács
Emőke Márton
representatives of the supervising ministries

GOVERNMENT SEMMELWEIS UNIVERSITY



RECTOR: **Prof. Dr. Béla Merkely** M.D., Ph.D., D.Sc.



CHANCELLOR: **Dr. Livia Pavlik**

VICE RECTORS: **Prof. Dr. Ferenc Bánhid**y M.D., Ph.D., D.Sc.
General Affairs
Prof. Dr. Péter Hermann D.M.D., M.Sc., Ph.D.
Educational Affairs
Prof. Dr. Péter Ferdinandy M.D., Ph.D., D.Sc., MBA
Scientific Affairs
Prof. Dr. Attila Szabó M.D., Ph.D., D.Sc.
Clinical Affairs
Dr. Éva Feketéné Szabó
Strategical and Developmental Affairs
Prof. Dr. Alán Alpár M.D., Ph.D., D.Sc.
International Studies

DEANS: **Prof. Dr. Miklós Kellermayer** M.D., Ph.D., D.Sc.
Faculty of Medicine
Dr. Gábor Gerber D.M.D., Ph.D.
Faculty of Dentistry
Prof. Dr. István Antal dr. pharm., Ph.D.
Faculty of Pharmaceutical Sciences
College Prof. Dr. Gabriella Dörnyei Ph.D.
Faculty of Health Sciences
Dr. Miklós Szócska, Ph.D.
Faculty of Health and Public Administration
Dr. Andrea **Zsebe-Tenk**, Ph. D.
András Pető Faculty

PRESIDENT OF THE DOCTORAL COUNCIL:
Prof. Dr. Zoltán Benyó M.D., Ph.D., D.Sc.

HEAD OF THE CENTER FOR EDUCATION OF INTERNATIONAL STUDIES
Prof. Dr. Alán Alpár M.D., Ph.D., D.Sc.

DIRECTOR of the DIRECTORATE OF INTERNATIONAL STUDIES
and ACADEMIC PROGRAM DIRECTOR FOR MEDICINE,
DENTISTRY AND PHARMACEUTICAL SCIENCES IN ENGLISH:
Prof. Dr. Miklós Csala M.D., Ph.D., D.Sc.

Division of English Language Programs Office: Basic Medical Science Center
1094 Budapest IX., Tűzoltó u. 37-47, first floor 1604
Phone: (36-1) 266-0452
e-mail: english.secretariat@semmelweis-univ.hu
Website <http://semmelweis.hu/english/education/english-language-program/>

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english.secretariat@semmelweis-univ.hu)

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Ms. Nikolett Süveges

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Ms. Alexandra Noémi Szujó (459-1500 ext 60072; szujo.alexandra@semmelweis-univ.hu)

Office hours:	Monday:	1 p.m. – 3 p.m.	Tuesday:	1 p.m. – 3.30 p.m.
	Wednesday:	CLOSED	Thursday:	9.30 a.m. – 12 p.m.
	Friday:	10 a.m. – 12 p.m.		

SCHEDULE FOR THE 2021/2022 ACADEMIC YEAR (Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmaceutical Sciences)

The dates are subject to change!

Opening Ceremony	September 1, 2021
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First Semester

Date of registration	August 31, 2021
– 1 st year	
– the other years	August 30, September 1, 2, 3, 2021

First day of the semester

Faculty of Medicine (1 st – 5 th years)	September 6, 2021
Faculty of Dentistry	September 6, 2021
Faculty of Pharmaceutical Sciences (1 st – 4 th years)	September 6, 2021

Last day of the semester

Faculty of Medicine (1 st – 5 th years)	December 10, 2021
Faculty of Dentistry	December 10, 2021
Faculty of Pharmaceutical Sciences (1 st – 4 th years)	December 10, 2021

5th year Pharmaceutical Sciences:

Practical training July 19 – September 17, 2021

The semester lasts for 5th year Pharm. Sc. (12 weeks) September 20 – December 10, 2021

Examination period

Faculty of Medicine (1 st – 5 th years)	December 13, 2021–January 28, 2022
Faculty of Dentistry (1 st – 5 th years)	December 13, 2021–January 28, 2022
Faculty of Pharmaceutical Sciences (1 st –5 th years)	December 13, 2021–January 28, 2022

Second Semester

Date of registration	January 24 – 28, 2022
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First day of the semester	for 1 st – 5 th years
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Medicine and Dentistry	January 31, 2022
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Last day of the semester	for 1 st – 5 th years
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Medicine and 1 st – 4 th years Dentistry	May 13, 2022
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Last day of the semester	for 5 th year Dentistry
	April 29, 2022

Faculty of Pharmaceutical Sciences

First day of the semester	(1 st – 4 th years)
	January 31, 2022

Last day of the semester	(1 st – 4 th years)
	May 13, 2022

First day of the semester (practice)

for 5 th year	January 27, 2022
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Last day of the semester (practice)

for 5 th year	May 27, 2022
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Examination period for Faculty of Medicine, Faculty of Dentistry

1 st – 5 th year Medicine	May 16 – July 1, 2022
1 st – 4 th year Dentistry	May 16 – July 1, 2022
5 th year Dentistry	May 2 – June 17, 2022

Faculty of Pharmaceutical Sciences

1 st – 4 th year	May 16 – July 1, 2022
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Exam held outside the academic year – EOAY

August 23 – 31, 2022 (presumably)

EOAY for Pharm. Sc. 4th year

July 5–13, 2022 (presumably)

2021/2022 Schedule for 6th year Medicine

July 12, 2021 – April 27, 2022

2022/2023 Schedule for 6th year Medicine

July 11, 2022 – April 26, 2023

**General Board Examination Period
Faculty of Medicine**

November 17-24, 2021
 May 25 – June 10, 2022
 August 24 – September 1, 2022

Faculty of Dentistry

June 20 – 24, 2022
 August 22, 2022
 December 5, 2022 (repeat written exam)
 June 1 - 23, 2022

Faculty of Pharmaceutical Sciences

Graduation Ceremony for Dentistry
 Graduation Ceremony for Pharm. Sciences

July 9, 2022 planned (Saturday)
 July 2, 2022 planned (Saturday)

Holidays:**(Spring holidays)**

November 1, 2021 (Monday)
 March 15, 2022 (Tuesday)
 April 14 – 19, 2022
 Spring holidays include:
 April 15, 2021 (Good Friday)
 April 18, 2021 (Easter Monday)

Research Students' Conference:

February 9 – 10 – 11, 2022

No lectures or seminars for years 2–5/6:
 on February 9 – 10 at the Faculty of Medicine and at the Faculty
 of Pharm. Sc. (Wednesday – Thursday),
 on February 9 (Wednesday) at the Faculty
 of Dentistry, on February 10-11 solely for dental
 students whose participation at the conference is
 certified.

THE WORDS OF THE VOW AT REGISTRATION

I....., student of Semmelweis University promise under oath that I will respect the Hungarian laws and the Fundamental Law of Hungary. I promise that I shall abide by the regulations of Semmelweis University. I promise solemnly that I will respect the professors and teachers of the University, and that my conduct will be in keeping with the honor of my profession. I will keep the secrets of the patients that I learn about in the course of my studies. I will pursue my studies with full sense of responsibility to prepare myself to the best of my abilities for all my duties and obligations in my profession so as to be able to serve with my knowledge the progress of mankind. So help me God!

THE WORDS OF OATH AT GRADUATION

Faculties of Medicine and Dentistry

"I, swear that I will devote myself to the medical profession at all times. I will use the knowledge acquired in the field of medicine to prevent and cure diseases, and to benefit the physical and mental well-being of my patients. I will not betray the confidence of those who turn to me, nor will I take advantage of their defenselessness, nor will I disclose their secrets. I will treat every person with equal care and attention. I will maintain the high quality of my knowledge and skills by continuous education, but will also acknowledge the limits of my knowledge and abilities. I will submit myself to the ethical requirements of my medical practice. I will strive to enhance the reputation of the medical profession and SEMMELWEIS University."

"Én, esküszöm, hogy orvosi hivatásomhoz mindenkor méltó magatartást tanúsítok. Orvosi tudásomat a betegségek megelőzésére, a betegek testi-lelki javára, betegségük gyógyítására fordítom. A hozzám fordulók bizalmával, kiszolgáltatott helyzetével visszaélni nem fogok, titkaikat fel nem fedem. Egyenlő figyelemmel és gondossággal gyógyítok minden embert. Tudásomat és gyakorlati ismereteimet állandó képzéssel magas szinten tartom, de ismereteim és képességeim korlátait is tudomásul veszem. Az orvosi működéssel kapcsolatos etikai követelményeket tiszteletben tartom. Arra törekszem, hogy az orvostudomány, valamint a SEMMELWEIS Egyetem jó hírnevét öregbítsem és megbecsülését előmozdítsam."

Faculty of Pharmaceutical Sciences

I, swear that in virtue of my acquired knowledge of pharmaceutical sciences, I shall do my professional duty with the utmost diligence, and I shall always behave worthy of my profession. I shall place before all things the care for and the healing of my patients. I shall not reveal any data concerning the health status or the medication of my patients. I shall maintain my theoretical and practical knowledge at a high level. I shall never use my knowledge for activities that are contrary to the ethical code of pharmacists. As a participant in the activity of healing, I shall use my knowledge only for the defense and restitution of health to my fellow humans. I shall do my best to promote the science of pharmacy and keep the good name of the Semmelweis University.

Study and Examination Regulations

Faculties of Medicine, Dentistry and Pharmaceutical Sciences

1. Scope of the Regulations

Article 1 [Scope of the Regulations]

- (1) The scope of this part of the Organizational and Operational Regulations (hereinafter referred to as “Regulations” applies to the study and examination issues of Semmelweis University undergraduate, masters, postgraduate specialist training, higher education training students and also of visiting students. It applies especially to the student academic policy and the order of acquisition and examination of the knowledge, skills and abilities. The application of the Regulations is regardless of the location of the training, the language, work schedule, form of expenditure and nationality of the student.
- (2) A special part of the Regulations regulates the study and examination issues of the students participating in the doctoral program.
- (3) The knowledge of and the compliance with the Regulations is binding on all instructors, researchers, administrative staff and students involved in education, directly or indirectly.

2. Interpretative Provisions

Article 2 [Interpretative Provisions]

- (1) In the Application of These Regulations
 1. Pre-degree certificate (absolutorium): A document certifying without qualification and evaluation that the student has completed their traineeship required and has met the study and examination requirements of the curriculum without having done the closing examination (terminal board exam), the Thesis and the language examination, specified in the graduation requirements. The pre-degree certificate does not qualify as a certificate of qualification or as vocational qualification.
 2. Active semester: the semester in which the student’s status is not suspended.
 3. Transfer: the process in which a student with a student status at a higher education institution continues his or her studies at another institution; unless otherwise stipulated in these regulations, the student may apply for admission from another higher education institution – except from those institutions included in the 87/2015 Government Regulation (IV.9) – that provides a degree of the same level as that offered by Semmelweis University. This process is only possible if the termination of the student status is not in process. Transfer within Semmelweis University can be requested between specialties and faculties, and in line with legal restrictions, between training levels.
 4. Registration: the student’s statement in the NEPTUN Higher Education Administration System (hereafter: NEPTUN) that he/she will continue his/her studies in the semester; Recorded continuation of the student’s studies is based on the student’s registration in the NEPTUN, and on the course registration in the student information system according to prior information given by the faculties. Students taking part in a partial training abroad in the given semester are also subject to the obligation of registering for the continuation of their studies.
 5. Enrollment: the establishment of a student status between the eligible student and Semmelweis University through the authentication of the enrollment form. Those who have been admitted or transferred to Semmelweis University may establish a student status with the university. Student status is created through enrollment. Enrollment is accomplished by signing an enrollment form printed from the Student Information System (hereafter: NEPTUN) and by registering in the NEPTUN on the basis of a notice sent to the student in advance. Upon enrollment, the student is required to complete the course registration on the basis of the information given by the faculty.
 6. CV course (i.e. Exam Only Course): An opportunity for course completion that does not qualify as a course registration, during which a course to be concluded by a term grade or an exam, which course has been registered by the student in a previous semester and in which the student has obtained a signature but has not completed yet, can be completed in the given semester without the obligation to attend the contact lessons or to fulfill other term-time requirements by using any unused exam opportunities remaining from the semester of the last registration of the original course.
 7. Diploma work: an independent piece of work which substitutes the Thesis. It is required for the completion of the student’s studies. Its preparation can verify that the student has met certain output requirements of the training;

8. **Individual study schedule:** the total of subjects and courses taken by a student in a given semester, during which the student can choose individually from the offered study opportunities within the frames of the curriculum and regulations, i.e. under the conditions defined in the regulations and curricula so that they can deviate from what is suggested in the model curriculum;
9. **Concurrent prerequisite:** a course unit or a module of up to 15 credits, whose at least concurrent registration with a given subject is required by the curriculum;
10. **Prerequisite schedule:** the set of pre-requisites for the subjects included in the curriculum of the degree program;
11. **Prerequisite:** a course unit or a module of up to 15 credits that the curriculum requires to be completed beforehand for the registration to the given subject;
12. **Term grade:** a mark determined during the term-time based on the results of partial performance evaluations;
13. **FM course (i.e. "exempt from" course):** An opportunity for course completion that qualifies as a course re-registration, during which a course to be concluded by a term grade or an exam, which course has been registered by the student in a previous semester and in which the student has obtained a signature but has not completed yet, can be completed in the given semester without the obligation to attend the contact lessons or to fulfill other term-time requirements by using the exam opportunities of the given semester according to the general rules of assessment of study requirements.
14. **Exceptional study schedule:** completion of subjects included in the student's individual study schedule, in a way different from the general rules of order (including, in particular, the exemption from lessons or the possibility to make up for non-attendance at lessons, meeting study requirements in a different way or at a scheduled time);
15. **End-term examination:** assessment of study requirements concluding a single subject in the form of an exam. The material of the end-term exam of a multi-semester subject may include the material any course involved, which is not finished with a cumulative assessment of study requirements;
16. **Thesis advisor:** an expert supporting the student in the preparation of the thesis and guiding his/her work;
17. **Obligatory elective subject:** a subject defined in the curriculum, in which the student decides for himself/herself to register at the credit value defined in the model curriculum (for example: subjects of specialization or subjects of differentiated professional knowledge);
18. **Compulsory subject:** a subject which all students are required to complete;
19. **Credit recognition:** the acceptance of a subject of another faculty or institution, determining its credit value and determining whether the subject is substitutable with or different from other subject(s);
20. **Committee competent in credit recognition:** a committee defined in another part of the Regulations, which acts on students' credit recognition issues at first instance;
21. **Criterion requirement:** a mandatory requirement without credits that is specified in the training and output requirements (e.g. apprenticeship, language requirements);
22. **Course:** the completion of a subject in a given semester, a set of study sessions and performance assessment procedures with place(s), date(s), and instructor(s) specified;
23. **Justified exceptional case:** a circumstance beyond a student's control, including childbirth or various unexpected conditions, such as accident, serious illness, which prevents the student from fulfilling his/her obligations arising from his/her student relationship.
24. **Course record book:** a public document printed from NEPTUN in a format certified by the Educational Authority, indivisibly stapled and certified by the Dean of the faculty. The printed course record book must be created upon the termination of the student status. The numbered pages of the printed course record book should be stitched together with a national-colored cord and this part affixed with a circular label must be sealed, made indivisible and should be authenticated by the signature described above. The printed course record book contains all the data and records that are by law required to be included, in particular, but not exclusively, all the student's studies at the very level of education. The faculty maintains a record book if it does not meet the legal requirements for not needing to conduct record books.
25. **Model curriculum:** A subject registration order recommended on the basis of the prerequisite schedule, which includes the compulsory subjects prescribed in the curriculum; part of the credit value which is to be obtained from elective subjects, and description of these subjects assigned to the given semester.;
26. **Module:** a unit including several subjects from the curriculum of one program (e.g.: foundation module, professional core material module) or an equivalent, substitute unit (specialization module);
27. **Vice Dean for educational affairs:** a Vice Dean who assists the Dean's work in the educational and academic tasks of the graduate courses, or, in the absence thereof, a Vice Dean appointed by the Dean;
28. **Parallel training:** simultaneous participation in or eligibility for two or more training courses;

29. Passive semester: the semester
 - a) for which the student has not registered,
 - b) for which the student has stated that he/she does not wish to fulfill his/her student obligations,
 - c) for which the student has withdrawn his/her registration before the deadline,
 - d) in respect with which the student has been prohibited from continuing to study as a disciplinary measure; and
 - e) which is declared to be a passive semester after the deadline of de-registration, i.e. late de-registration, therefore, the student's status is suspended;
30. Partial training: self-financed training for the acquisition of partial expertise without a special admission procedure, which is designed primarily to meet the requirements of new specializations, to prepare for the master's degree, and to acquire the knowledge (credits) required by law for practicing a profession;
31. Independent specialization: the specializations of the medical diagnostic analysis higher education training, the conductive undergraduate education, the health care manager training and the medical diagnostic analysis bachelor training;
32. Thesis: a paper written as a completion of higher education studies, demanded by the training and output requirements. It verifies that the student has met certain output requirements of the training. It also helps the student through his/her own scientific work on any issue of a given scientific discipline to develop the ability to grasp the essence of a matter, to master the methods of library use and also of literature research. It enables the student to be able to formulate his/her opinion briefly and concisely. The term "thesis" also refers to "diploma work" unless otherwise stated;
33. Specialty supervisor: a lecturer appointed by the Senate, on the recommendation of the Dean, after the opinion of the Faculty Board; or failing this, the Dean, an authorized person who is responsible for the content and training processes of the specialty training leading to independent professional qualification within the degree course.
34. Degree course supervisor: a lecturer appointed by the Senate, on the recommendation of the Dean, after the opinion of the Faculty Board; or failing this, the Dean, who is responsible for the content and entire training process of the course. The term "degree course supervisor" also refers to "specialty supervisor" unless otherwise stated.
35. Final examination: an exam concluding a multi-semester subject or a combination of several courses. In the latter case, the final exam may be passed at the earliest after obtaining the credits of the subjects covered by the final examination;
36. Academic calendar: a document containing the schedule for a given academic year and the deadlines concerning the student and the organizational unit;
37. Subject registration: registration for a specific course in an announced subject. The registration is only possible if the prerequisites of the subject are met;
38. Subject requirements: a document containing the student's duties and the completion deadlines;
39. Establishment of a subject: the approval of the subject's syllabus for the first time;
40. Announcement of a subject: the announcement of courses enabling the completion of a subject. The course(s) required for the completion of the compulsory or obligatory elective subject must be announced within the semester of the model curriculum, by the educational unit which is responsible for the subject;
41. Course syllabus (course program): defines the knowledge and skills to be acquired in each subject;
42. Curriculum: defines the detailed educational and study requirements of a particular course and its detailed rules;
43. Registrar's Department: the organizational unit, regardless of its name, designated in the Organizational and Operational Regulations for the administration of students' general study affairs and for the management of study records;
44. Committee competent in educational and examinational affairs: a committee, regardless of its name, established by the Senate in each faculty, which acts at first instance in the study and examination affairs of students at the faculty;
45. Multi-semester subject: a set of courses, which are combined to form a thematic unit, and have names differing only in their serial number or in an extension to a common name. Furthermore, its subjects may differ in the requirements for their summative benchmarking;
46. Block education: a course scheduling method, applied for the compulsory subjects of year 4 and year 5 studies in the Model curriculum of the Faculty of Medicine. The student attends the theoretical and practical lessons of only one compulsory subject in each section of the semester (i.e. block), which are held in the timescale specified by the course supervisor. The student can take the examination of each subject at the end of its block;
47. Late de-registration from a semester, or a semester declared passive after the deadline of de-registration: the semester in which, upon the student's request submitted after the deadline of de-registration and until the last day of the term-time, suspension of the student's status is authorized by the competent body;
48. Visiting student status: the student may register to the subjects of his/her studies at another training program of the higher education institution with which he/she has an active student status or at another higher education institution as a visiting student. Recognition of the subject and the knowledge obtained shall be subject to the credit recognition procedure of the faculty responsible for the course. It shall be counted accordingly into the fulfillment of the student's study obligations;

49. Examination: a form of assessment of the acquisition of the specific knowledge, skill and experience assigned to a given subject or to certain subjects, which is combined with a summative assessment of performance;
 50. Examination course: CV course or FM course. The exam course is a non-scheduled course with no contact lessons;
 51. Closing examination (terminal board examination): the examination and assessment of the knowledge (and practical skills) required to obtain a higher education qualification, in which the candidate must demonstrate to the Examination Board of the Faculty that he/she acquired the knowledge required for the qualification and that he/she understands it and is capable of applying it, too. Gaining the pre-degree certificate (absolutorium) is a prerequisite for taking the closing exam.
- (2) When applying these regulations and if not stated otherwise
- a) "student" refers also to "visiting student",
 - b) "specialization" refers also to specializations leading to separate qualifications,
 - c) "self-funded student" refers also to students funding their own studies; "(partly) state-funded student" refers also to students whose studies are funded by the state.

3. Bodies Responsible for Educational Affairs

Article 3 [Persons and Bodies Competent in Teaching and Educational Matters]

- (1) The Senate
 - a) approves the training program of the university,
 - b) approves the syllabus in the case of an inter-faculty training.
- (2) The Rector
 - a) approves the academic calendar by 31 May each year, after seeking the opinion of the faculties and the Student Council,
 - b) may allow three days' study break per academic year, after consultation with the Deans.
- (3) The Faculty Board shall
 - a) determine the curriculum of the specialization,
 - b) determine the order of specialization choice if it is not within the frame of the admission procedure,
 - c) decide on the establishment, suspension and cancellation of subjects, and approve the subject syllabus and decide on the modification of the syllabus,
 - d) propose the content of the syllabus to the Senate in the case of inter-faculty trainings,
 - e) approve – at intervals of no less than three years – the list of persons who may be nominated as chairpersons and members of the Closing Examination Boards.
- (4) The Dean
 - a) may declare the requirement of a minimum number of students for the announcement of the subjects in a specialization module,
 - b) in agreement with the Rector, may allow three days' study break per academic year,
 - c) if the conditions laid down in these Regulations are fulfilled, may oblige the educational unit to announce a course,
 - d) makes recommendations to the Faculty Board regarding the Specialty Supervisor and the Degree Course Supervisor,
 - e) permits taking examinations outside the campus,
 - f) permits the participation of other teachers, researchers, lecturers, clinical chief physicians as examiners at final examinations,
 - g) is responsible for the organization of the closing examination, appointing the chair and the members of the Closing Examination Board among the persons selected by the Faculty Board,
 - h) specifies the exact date of each part of the closing examination within the closing examination period.
- (5) The Specialty Supervisor
 - a) may, in the case of a declaration of admission, permit the student to complete a traineeship at another domestic university, at their clinics or a foreign health institution,
 - b) allow the participation of an external consultant in the preparation of the thesis,
 - c) approve, in the courses of András Pető Faculty, the completion of professional traineeships at domestic professional services, travel conductor and health care institutions, or conductive education institutions in Hungary and conductive education institutions abroad, or at conductive education institutions that are adapted to the foreign system.

- (6) The Occupational Health Service
 - a) organizes, with the cooperation of the Registrar's Department, the obligatory pre-traineeship occupational medical examinations required by the Faculty. These examinations are the occupational, professional, personal hygiene and health examinations that are required by law (In the Regulations all of these or any of these will be referred to as an aptitude test.),
 - b) keeps an up-to-date record of the need for, and the participation at an aptitude test and of the presentation of the documents proving the aptitude (including Hepatitis vaccines), including registration of the validity of the compulsory aptitude test and Hepatitis vaccines in the NEPTUN,
 - c) ensures that the details of the aptitude test are published on the website of the relevant faculty in accordance with the law, for each training program until the beginning of the last examination period before each academic year.
- (7) The committee competent in educational and examinational affairs shall be responsible for
 - a) approval of exceptional study schedules,
 - b) late de-registration of a student from a semester (i.e., declaration of a student's semester to be passive after the deadline of de-registration),
 - c) approval of visiting student status,
 - d) approval of examinations and approval of examinations after the examination period in justified exceptional cases,
 - e) consideration of requests for special permissions,
 - f) approval of transfer among degree programs, faculties or institutions,
 - g) proceedings in other academic issues,
 - h) performing other tasks specified in other legal acts, university regulations, faculty regulations,
 - i) proposing the choice of specialization or study track,
 - j) conducting the choice of specialization or study track, and the classification of the students if they have not been classified during the admission procedure.
- (8) The committee competent in credit recognition is responsible for
 - a) decision-making on individual credit recognition issues,
 - b) performing preparatory tasks in matters of consultation, organization and regulation.
- (9) The student:
 - a) is responsible for: enrolling/registering for training, monitoring and adhering to applicable deadlines,
 - b) must make his/her payments on time if he/she is obliged to pay fees,
 - c) is responsible for the registration to the subjects announced for the training, within the time limit laid down in the calendar of the academic year, taking into account the prerequisite schedule,
 - d) should notify the Registrar's Department of changes to data by recording them to the NEPTUN,
 - e) must substantiate his/her request regarding educational and examinational issues (depending on the nature of the application) and has to duly justify and certify the content of such request.
- (10) If the student has an active training during the period of studies, he/she is entitled:
 - a) according to his/her progress, to register to the subjects specified in the curriculum and to take the examination of the subjects,
 - b) to visit the university facilities (library, cultural and sports facilities) accessible to students,
 - c) to use services for protection of students' interest,
 - d) to be a member of TDK (i.e. Scientific Students' Association),
 - e) to use a student card proving the active student status,
 - f) to apply for a university grant if he/she participates in a (partly) state-funded program.

4. Basic Concepts of the Credit System

Article 4 [Basic Concepts of the Credit System]

- (1) One credit equals the completion of 30 student study hours. Student hours include classroom (contact hours) and individual student study hours.
- (2) Credit may be given only to subjects which award a grade on a five-point or three-point scale. Only positive integer credits can be assigned to a subject.
- (3) Completion of a subject is achieved by at least a "satisfactory/pass" (2) grade in the rating scale of five grades or at least a "fair" (3) grade in the rating scale of three grades at the assessment within the subject requirements.
- (4) The student must complete the compulsory subjects prescribed in the curriculum in order to obtain a pre-degree certificate. In addition to the elective subjects, on the basis of the breakdown prescribed by the curriculum and by the training and output require-

ments, the students must complete the required number of credits. A student of a specialization or independent specialization is also required to complete the subjects specified as compulsory for the students of the independent specialization, as well as to collect the credit number(s) of the optional subjects specified in the curriculum regarding independent specializations.

- (5) The student may obtain the credits required for the pre-degree certificate in a shorter or longer period.

Article 5 [The Curriculum and the Model Curriculum]

- (1) The syllabus consists of compulsory, obligatory elective and elective subjects. Credits beyond the total number of credits required by the training and output requirements of the course cannot be required in the curriculum. This includes the minimum credit for the elective subjects specified in the training and output requirements.
- (2) The faculty ensures that the student may take elective subjects of at least 5% of the total number of credits required for the degree or may engage in voluntary activities in lieu of such subjects. The student can also choose from subjects with a credit value of at least twenty percent excess of all credits. In the case of an optional subject, the university does not restrict the student's choice of subjects announced by the higher education institutions. Any student may take on any elective subjects that were announced by any faculty of the university during the general subject admission procedure, this is subject to the prerequisite schedule.
- (3) Without paying any extra cost or fee, the student can complete subjects
 - a) for 10% credit value above the total required credits in the study schedule,
 - b) languages different from that of the training for up to 10% credit value above the total required credits in the study schedule.
- (4) The model curriculum within the curriculum includes, divided into educational periods,
 - a) all compulsory and elective subjects along with their credit value,
 - b) the number of subjects with their assigned credit values for a semester,
 - c) the types of assessments (signature, term grade or exam at the end of the semester),
 - d) the semester of announcing the subject,
 - e) the criteria of the subject and the deadline for their fulfillment,
 - f) the rules and requirements for the selection and completion of the specialization if it was not within the frames of the admission procedure,
 - g) the prerequisite schedule,
 - h) the requirements for the selection of the topic of the thesis and its completion if they are not included in these Regulations and the relevant course syllabus,
 - i) the detailed conditions for eligibility for the closing examination,
 - j) the potential subjects of the closing examination and the rules for their selection.
- (5) The Student Council has the right to comment on the curriculum before it is submitted.
- (6) Prerequisites can be determined if the knowledge obtainable in another subject, group of subjects, or in a subject module is required for the understanding of the given subject.
- (7) A subject can only be registered by those students who have fulfilled its prerequisite(s) before the semester and have fulfilled earlier or registered currently to its concurrent prerequisite(s).
- (8) The model curriculum includes the maximum of forty lessons per week (apart from the Language and Physical Education classes).
- (9) The length of lessons is 45 minutes. In the case of a combined lesson, a break of 15 minutes should be provided beyond 90 minutes.
- (10) In the case of inter-faculty training, the Senate defines the curriculum on the proposal of the Faculty Boards of the faculties participating in the training.
- (11) It is the right of the student of the degree program concerned to apply for specializations announced simultaneously in the given degree program if it is not done through the admission procedure. The number of students entering a specialization may be limited; the Dean may require a minimum number of students to apply for the specialization in advance. If the number of registered students is limited, the registration to the specialization is according to the order in which the specialization was selected by the students.
- (12) The curriculum includes, as a criterion requirement, a vow at the beginning of the studies, the content of which is defined depending on the nature of the training, and an oath as part of graduation at the end of the studies (hereinafter together: fundamentals of professional ethics). The oath at the end of the studies is followed by the graduation ceremony. The Rector decides on the order of the fundamentals of professional ethics and the text applied by each Faculty after its submission by the Faculty. If necessary for organizational reasons, the fulfillment of the fundamentals of professional ethics can take place before the start of studies, as well as after their completion; nevertheless, participation is obligatory. In this case, the condition of enrollment is to make the vow, while the condition of receiving a diploma is to take the oath. Making the vow is also mandatory for students admitted by transfer. The organization of fundamentals of professional ethics, including the possibility of making up, is the responsibility of the Faculty.

Article 6 [Course Syllabus (Course Program)]

- (1) The course syllabus is prepared by the subject supervisor based on the Student Evaluation of Teaching (“OMHV”) survey by taking the opinion of the Student Council into account. The course syllabus should be published in a study information brochure, accessible to all students in the faculty, and electronically at the beginning of the academic year. The educational unit in question should publish the information of the brochure on their website or otherwise in the usual way or in the NEPTUN at the basic information of the subject. The contents of the brochure cannot be changed or deviated from during the given academic period.
- (2) The Faculty Board is responsible for modifying the course syllabus at the initiation of the head of the given educational unit and with the support of the Dean.
- (3) The course syllabus includes:
 - a) the code of the subject, its full and any abbreviated name, its name in English and in German,
 - b) the number of lessons per week (per semester) (lecture + seminar + lab practice + clinical practice),
 - c) the frequency with which the subject is announced,
 - d) a list of courses in which the subject is compulsory or obligatory elective, the number of semesters for the subject, recommended by the curriculum,
 - e) the type of assessments (signature, term grade or examination mark),
 - f) the credit value of the subject,
 - g) the name of the educational unit responsible for the subject and the instructor, as well as the prerequisites for admission to the subject,
 - h) the purpose and the task of acquiring the professional content of the subject in order to achieve the aim of the training,
 - i) the description of the content of the subject and its syllabus in such a way as it enables decision-making on credit recognition at another institution, including the knowledge, the (partial) skills and (partial) competences to be acquired,
 - j) the grading method, the conditions for getting the signature, the number, topic(s) and date(s) of the mid-term tests (reports, oral, written tests), and the possibility of their retake,
 - k) if applicable, the type of examination and its requirements (list of topics, test pool),
 - l) the requirements regarding the participation at the lessons and the possibility of compensating for absences, the accepted means of certification in the event of absence,
 - m) written material, recommended literature, relevant technological and other material, study aids,
 - n) the number and type(s) of the student’s assignments to be completed by individual work, the deadline of their submission,
 - o) a list of the essential notes, textbooks, manuals and literature that may be used to acquire the educational material.

Article 7 [Optional Application of a Requirement Introduced in a Phasing-in System]

- (1) The new or modified curriculum, other study and examination requirements should also apply to students who have commenced their studies prior to the introduction of the requirement but who, at their will, request the application of the new or modified study and examination requirements.
- (2) A declaration of choosing to apply the new requirement should be submitted to the Registrar’s Department of the faculty in writing or, if the faculty allows, electronically, within a time limit specified by the Registrar’s Department of the faculty. The deadline for such declaration cannot be earlier than 15 days after the date of announcement of the change in the requirement, set out in paragraph (1), and the declaration cannot be withdrawn. The faculty notifies the students concerned of the change in the requirement and about the deadline for the declaration set out in this paragraph.
- (3) In the case of a curriculum change, the correspondence of the old and the new curricula may also be recorded in an equivalence table.

Article 8 [Periods of Training]

- (1) The training period comprises a term-time (term) and an examination period.
- (2) During the term, the student participates in the lessons of the subjects he/she has registered to and performs related tasks and may also complete the professional traineeship prescribed in the curriculum during the term. The term consists of at least fourteen teaching-weeks. The term-time of each semester is preceded by a registration period, which may overlap the examination period of the previous semester.
- (3) At the Faculty of General Medicine, the subjects within the model curriculum for the 4th and 5th year, including lectures and exercises, are taught in the form of training blocks, with no separate term-time and examination period for these subjects.
- (4) During the ninth semester of the Pharmaceutical Sciences training course, the term-time is twelve (12) weeks long, and it is supplemented with eight (8) weeks of compulsory professional practice before the closing examination.

- (5) During the tenth semester of the Dentistry training course, the term-time is twelve (12) weeks long.
- (6) Students can take their examinations in the exam period, which is seven (7) weeks long both in the fall semester and in the spring semester. At the Faculty of General Medicine, the exams of the subjects included in the 4th and 5th years of the model curriculum may be taken at the end of each block.
- (7) In the case of part-time trainings at the Faculty of Health and Public Services, the Faculty Board shall make a proposal to the Rector on the length of the term-time, the times of the lessons and on the duration of the examination period on the basis of the opinion of the head of the given educational unit. The Rector may deviate from the provisions of this paragraph in the academic calendar, but the examination period may not be shorter than four weeks, or in the case of master trainings, shorter than five weeks.
- (8) The Rector and the Dean may grant a three-day study break in each academic year, in agreement with the Student Council. The date of the study break should be determined before the beginning of the term, whenever it is possible. The Dean and the Rector shall consult before the study break is granted.
- (9) Missing from any lessons on official bank holidays or breaks/holidays ordered by the Rector or Dean may not be considered as absences. Extra opportunities for making up any missed lectures or practices may be organized in these days, in which participation may not be considered as obligatory.

Article 9 [Academic Calendar]

- (1) The first and last dates of the registration period, term-time, exam period, and closing exam period of the academic year are determined by the academic calendar.
- (2) The academic calendar includes deadlines for study, allowance and other student matters in accordance with the applicable regulations. Unless otherwise specified in the relevant regulations, the deadline in the calendar shall be deemed to be applicable.
- (3) The academic calendar may determine which weekday's schedule should apply to the lectures and practices to be held on Saturdays, which are rendered to be working days during the academic year.
- (4) The academic calendar is published on the webstie of the faculty.

Article 10 [General Rules Concerning Traineeship]

- (1) The hours to be worked, credits and exam type regarding the traineeship are determined by the curriculum.
- (2) Regarding the traineeship, the thematic collection, organization, the control of the external traineeship locations, in addition to the certificate of completion, and the methods of evaluation are determined by the relating course syllabus of which preparation is carried out by the responsible professional.
- (3) The institute of the traineeship is responsible for certifying the completion of the traineeships by filling out the course registration and evaluation form of the faculty.
- (4) Completion and the grade of the traineeship are recorded by the traineeship supervisor or the degree course supervisor the Registrar's Department in the NEPTUN.
- (5) The traineeship shall be assessed by a 5-grade qualification indicated on the form by the specialty supervisor of the traineeship or the degree course supervisor referred to in paragraph (3). In case the traineeship is evaluated as "fail", the supervisor determines whether and when the traineeships can be repeated during the training period.
- (6) Traineeships are completed in accordance with the work schedule of the institute of the traineeship.
- (7) Students are required to undergo an aptitude test of occupational health every year prior to their traineeship. Registration for the aptitude test in September of each academic year is compulsory.
- (8) In accordance with the current legislation, details and requirements of eligibility are published regarding to the certain program or specialization on the website of the faculty until the examination period of the semester prior to each academic year.
- (9) In the absence of registration, the student may not start the traineeship. The attendances on the compulsory aptitude tests must be checked by the educational unit responsible for the given traineeship or, in the absence thereof, by the Registrar's Department. In order to fulfill this obligation, the educational unit (e.g., department or institute) may access the NEPTUN database. The traineeship may be assigned to the student only after the aptitude test and the registration of the Hepatitis vaccine have been verified by the educational unit responsible for the organization of the given traineeship.
- (10) Registration under paragraph (7) is the student's responsibility and duty. If the student participates in the traineeship without registration, the traineeship is invalid and the student is liable for any damage caused.
- (11) The student completes the traineeship required by the curriculum in the educational units of the university or in other places of training, which have been accredited by the relevant faculty or by a faculty providing equivalent training in another domestic university.
- (12) The supervision of the traineeship is organized and managed by the head of the educational unit responsible for the subject. The head

of the educational unit shall send a written report to the Dean of the Faculty by the 1st of October each year, about the experiences of the traineeships completed by the 1st of September.

Article 11 [Special Regulation Concerning the Traineeship at the Faculty of Medicine, Faculty of Dentistry and Faculty of Pharmaceutical Sciences]

- (1) The duration of the traineeship at the Faculty of Medicine: the summer practice and the 6th year students' practice are of forty hours per week, during which the student can be assigned once bi-weekly to an on-call period of up to 12 hours, which should be undertaken on weekends or at nights depending on the student's choice.
- (2) The duration of the traineeship at the Faculty of Pharmaceutical Sciences is thirty-five hours per week for summer practice and forty hours per week before the closing examination.
- (3) At the Faculty of Pharmaceutical Sciences, summer internships can be conducted at an optional location (an accredited public pharmacy, an in-house pharmacy, a Galenian laboratory, a research institute, a university institute, a pharmaceutical technology plant). The 2-month period of compulsory traineeship prior to the closing examination must be completed in an accredited public pharmacy. One month of the 4-month-long compulsory traineeship before closing examination must be completed in a hospital or institutional pharmacy and the remaining 3 months in an accredited public pharmacy.
- (4) Signing of the evaluation of traineeship shall be denied if the absence has reached 25% of the duration of the traineeship.
- (5) In case of "fail" (1) qualification, the student may not continue his/her studies until the completion of the traineeship.
- (6) At the Faculty of Medicine, a final examination after the 6th year traineeship may be prescribed in the model curriculum. Once a final exam is requested, the traineeship does not have to be evaluated by an individual grade; in case the examination is failed, the practice does not have to be repeated.

Article 12 [Special Regulations Concerning the Traineeship at the Faculty of Health and Public Services]

- (1) The student is required to complete the traineeship required by the curriculum at any educational establishments or institutes, which are on the list approved by the degree course supervisor or have been individually approved.
- (2) Students are required to undergo an aptitude test every year prior to their traineeship. By contrast, the aptitude test is not obligatory if the student already has a valid occupational suitability certificate for the activity or for the performance of the job duties, or it is not required by the law for the tasks to be performed. In this case, the student is required to submit an aptitude statement or a form called "Student's Statement on Health Condition" at the Registrar's Department.
- (3) Students of the Faculty of Health and Public Services prepare a written report on their traineeship, the acceptance of which is a prerequisite for completing the course.
- (4) In the NEPTUN the completion of the traineeship is recorded by the head of the educational unit responsible for the training or by the instructor concerned.

Article 13 [Special Regulations Concerning the Traineeship at the Faculty of Health Sciences]

- (1) The faculty may organize traineeships in the form of summer practices for the students.
- (2) The summer practice corresponds to the practice to be completed in autumn in the model curriculum, the completion belongs to the fall semester, and the related assessment is included in the study indexes of the fall semester.
- (3) Even in case of completing the autumn traineeships in the form of summer practices, the subjects for which the traineeship is a prerequisite, cannot be registered for sooner than in the spring semester.
- (4) The student may re-register to the traineeship in term-time after a not completed summer practice, but this shall be considered as a re-registration to the subject (i.e. second or further course registration).

Article 14 [Special Regulations Concerning the Traineeships and Practical Training at the András Pető Faculty]

- (1) Practice is the form of education in which the gained theoretical knowledge is applied and implemented in practice, in an organized method, following the principles of conductive education. In some subjects, lectures and practice can complement each other.
- (2) The complex final session is a practical report required to complete a Bachelor of Science degree in Conducting. Complex final session is considered as a closing examination and hence must be taken before a committee/board. The committee is chaired by a conductor educator. The minimum number of members of the committee shall be 2. Minutes should be taken of the complex final session. In the case of a complex final work, a course syllabus should be prepared and published before the semester begins. The complex final session fails if any of the minutes in the protocol are insufficient. An unsuccessful final session can be repeated once. In the case of a successful complex final session, the student has no opportunity to request an improvement exam.

- (3) The coordinator of conductive pedagogical exercises (basic individual, individual methodological and group conductive education) is provided by the instructor responsible for continuous professional practice.
- (4) The task of coordinating pedagogical and pedagogical rehabilitation practices (group education, group methodological, teaching, rehabilitation) is the responsibility of the advisor of specialization.
- (5) The completion of the traineeship, the grade of the evaluation, is recorded in the NEPTUN by the Traineeship Teacher or the Traineeship Trainer, the Course Director or the Registrar's Department.
- (6) Participation in conductive pedagogical exercises (basic individual, individual methodological and group conductive education) is compulsory. The student may miss up to 20% of their practice hours, which must be made up for. Absence of basic individual and individual methodological practice should be remedied by the end of the exam period. The weekly schedule of the individual and individual methodological exercises is prepared by the chief conductor, taking into account the characteristics of the group, the agenda and the students' requirements. Repeating the missed group conductive education practice is possible until the end of the semester. To repeat is the student's responsibility.
- (7) The student can miss the pedagogical exercises (school group teaching practice, kindergarten group methodological practice, group education, pedagogical rehabilitation) up to three times. Students who have not successfully met the methodological requirements of the given semester cannot take part in the group teaching/methodological/teaching practice at school and kindergarten.
- (8) The student may be absent from 20% of the practice relating to theoretical study.
- (9) In conductive pedagogical practice, the grade/qualification of the individual and the individual methodological practice of the foundation consists of grades and signatures that vary from year to year. All signatures and shares are a prerequisite for an aggregate rating. If the required semester signatures or digits are missing, the semester end signatures will be denied. If the continuous practice grade is "fail" and the total grade is "fail", the semester shall be repeated. If the grade of the practical report is "fail", the report may be repeated once before the end of the examination period with the presence of an instructor. If the grade of the practical report is also fail, then the sum of the grades is also fail. In case of basic individual, individual methodological practice, if the total mark is insufficient, there is no possibility of correction, the subject can be completed by re-registration. In case of a successful report, there is no possibility to repeat it for gaining a better grade.
- (10) The qualification of kindergarten, school and pedagogical rehabilitation education and methodology (individual and group, external, internal, integrated) consists of different grades for each part. For the sum of grades and closing a semester each part is required. If the required grades to complete the semester are missing, the end of semester qualification will be denied. If the grade on the practice report is insufficient, the report may be repeated once until the end of the exam period. If the grade of the practical report is also fail, the sum of the grades is also fail. In case of a successful report, there is no possibility of a corrective report.
- (11) If the sum of the grades of the kindergarten and school (educational, methodological, external, internal, integrated) practice is insufficient, the subject can be completed by re-registration.
- (12) In years III. and IV, the professional practice (conductive pedagogical, pedagogical, and pedagogical rehabilitation) can be organized in the exam period.

5. Provisions Concerning Student Status

Article 15 [Student Status, Enrollment Obligations, Course Registration]

- (1) Those who have been enrolled or transferred to Semmelweis University may establish a student status at the university no later than the semester following the decision. Student status is created through enrollment. Only one legal relationship may be established with one student at one training, considering the nature of the training, its way of funding and its language.
- (2) Prior to starting their studies, students take a solemn oath according to the nature of the training.
- (3) By enrolling, the student declares that he/she is familiar with and adheres to the university's rules applicable to him/her.
- (4) Enrollment, as well as the submission of declarations or applications regarding the continuation or suspension of studies shall be accomplished within the periods specified in the academic calendar.
- (5) The student may withdraw his/her registration within one month after the beginning of the training period but not later than 14 October or 14 March. If the student does not request to discontinue his/her studies by this date, the semester is considered to be an active semester even if the student does not attend the lectures and practices, and does not fulfill his/her study duties. If the student requests such discontinuation of his/her studies by the above deadlines, the given semester shall be considered as a passive semester.
- (6) In justified exceptional cases, on the basis of the student's application and supporting documents submitted at the latest by the last day of the term-time, the committee competent in educational and examinational affairs may, on one occasion during the whole training, authorize the ongoing active semester to be declared passive after the deadline specified in paragraph (5). A justification of the reason(s) shall be attached to the application. The issuing of the approval, which changes the status of an active semester to passive, is followed immediately by the cancelling of the study results of that semester, and the rules governing the suspension of student

status apply to that semester. If an active semester is declared passive (late declaration of a passive semester), 75% of the tuition fee can be refunded upon a duly substantiated request by a student participating in fee-paying training.

- (7) For student obliged to pay for their training (self-funded training), the fulfillment of this obligation is a condition of registration. Students who have not fulfilled their payment obligations by the due date(s) may not be enrolled.
- (8) The student is required to report any changes in their data recorded in NEPTUN immediately. There is no legal redress for any disadvantage resulting from failing to do so. The student may be requested to pay a special procedure fee for failure to report changes in data.
- (9) Assessment of student performance is entered into the NEPTUN by an authorized instructor.
- (10) Registration to at least one subject by the student in the NEPTUN for a given semester qualifies as announcement of continuation of studies.

Article 16 [Suspension and Termination of Student Status]

- (1) Student status is suspended
 - a) if the student declares that he/she does not wish to fulfill his/her student obligation in the next training period, or if the student does not register for the following training period,
 - b) if the student has withdrawn his/her relevant registration until the deadline,
 - c) if the semester is declared passive after the deadline upon the student's request,
 - d) if the student is prohibited from continuing to study as a disciplinary punishment,
 - e) for the duration of the actual military service of the volunteer reserve, during which the student is exempt from the obligations laid down in these Regulations.
- (2) In the case referred to in point a) of paragraph (1), the continuous interruption of student status shall not exceed two semesters, except on the basis of the authorization specified in paragraph (3). The student may suspend his/her student status more than once according to these regulations.
- (3) The committee competent in educational and examinational affairs may, at the request of the student, authorize the suspension of the student relationship:
 - a) for a continuous period longer than that specified in paragraph (2),
 - b) prior to completion of the first semester, or
 - c) until the end of the training period which has already began, for that training period (late declaration of a passive semester) provided that the student is not able to fulfill his/her obligations arising from the student status due to childbirth, accident, illness or any other unexpected condition beyond his/her control.
- (4) When the student status is suspended,
 - a) the student may not receive any normative allowance,
 - b) the student card cannot be validated,
 - c) NEPTUN can be used by the student.
- (5) The student status terminates:
 - a) if the student is admitted and enrolled by another higher education institution, on the day of admission,
 - b) if the student announces the termination of his/her student status, on the day of application/announcement,
 - c) if the student is not able to continue his/her studies at the Hungarian (partly) state-funded training program and does not want to continue his/her studies at the self-funded (fee-paying) training,
 - d) on the last day of the semester in which the student obtained the pre-degree certificate (absolutorium),
 - e) if the student's status is terminated by the Rector due to payment arrears after unsuccessful demand note and due consideration of the student's social situation, on the day of the decision becoming final,
 - f) on the day when the students' expulsion as a disciplinary punishment becomes final,
 - g) on the day when the decision that terminates the student's status becomes final, if the condition that is specified in the Act on National Higher Education as a prerequisite for establishing the student status does no longer apply,
 - h) if the student who participated in a Hungarian (partly) state-founded training withdraws the declaration that is required under the relevant provision of the Act on National Higher Education and does not undertake to participate in a self-funded (fee-paying) training.
- (6) Unilateral declaration of dismissal terminates the student status:
 - a) if the student fails to fulfill his/her obligations described in the regulation regarding the progress of studies,
 - b) if the student fails to register for the next semester third time in a row,
 - c) if the student does not commence studies after the suspension of the student status,
 - d) if the student could not complete a subject at its third registration, provided that the student has been notified in writing in advance to fulfill his obligation within the time limit specified and has been informed of the legal consequences of the omission.

- (7) The university terminates, by a unilateral statement, the student status of a student whose total number of unsuccessful retake and repeated retake examinations in the same subject unit reaches five. This provision applies only to those who have commenced their studies in the relevant program in the fall semester of 2012/2013 or thereafter.
- (8) Those students whose student status has been terminated shall be removed from the list of students.

Article 17 [Transfer]

- (1) Deadline of the application is June 15th of each year, for whom the conditions for dismissal are not met.
- (2) The student applying for admission is required to send it by July 15th
 - a) a certified copy of a sealed course book or an equivalent certificate,
 - b) certificate of student status
 - c) detailed curriculum of the training and the certified subject program of the completed subjects. Completion of documents upon request is possible.
- (3) At the András Pető Faculty, the application shall be accompanied by the decision on the successful aptitude test.
- (4) Decision about the transfer is made by the committee competent in educational and examinational affairs in the light of the student's academic achievement and other circumstances, taking into account the available capacity.
- (5) Students who have participated in (partly) state-funded training at the transferring institution may also be admitted to a (partly) state-funded training.
- (6) In the event of a transfer, the university will require information from the Information System for Higher Education (FIR):
 - a) whether the student has attended a (partly) state-funded or self-financed training,
 - b) in case of (partly) state-funded studies, how many (partly) state-funded active semesters have been used by the student during the studies,
 - c) if the student's student status is terminated or terminated due to transfer. If the required information cannot be gained from the FIR system, a statement is requested in this regard from the donor institution.
- (7) If admission is refused, the student may commence studies at the institution only after successful admission.
- (8) In case of the student applying for the admission of the subjects completed in another specialty, faculty or institute, the committee competent in credit recognition shall make a preliminary credit transfer decision taking into account the opinion of the course supervisor. when making a takeover decision. During the pre-credit transfer procedure, the committee competent in credit recognition decides on the credit requirements (subject to fulfillment conditions) expected to be fulfilled by the end of the semester in which the application is submitted. In the case of student admission, credits recognized in a prior credit recognition decision shall be deemed to be recognized at the time of the actual commencement of studies without further application.
- (9) Transfer to Semmelweis University training can only be requested between courses of the same level, except for transfer
 - a) from undivided training to bachelor training,
 - b) from bachelor training or undivided training to higher vocational training.
- (9a) In the cases of basic and undivided master training programs, transfer may be requested only between trainings resulting in the same level of graduation provided that the student has acquired at least 30 credits in the former (transferring) institution.
- (10) The transfer decision must stipulate
 - a) the academic year,
 - b) the faculty, specialty, work schedule, financial form,
 - c) and, on the basis of the prerequisite schedule, the year (grade), in which the transferred student can begin or continue his/her studies.
- (11) In the case of transfer to the András Pető Faculty, the applicant can gain admission to the first year of the self-financed training. The prerequisite for admission to the specialization is the fulfillment of the conditions specified for the specialization. Transfer from full-time to part-time training may be subject to the conditions set out in the admission bulletin, in addition to the above.
- (12) If the transfer student does not have a continuous legal relationship until enrollment, then the decision on the transfer will be withdrawn by the committee competent in educational and examinational affairs in accordance with Article 57 (6) of the Act on National Higher Education.

Article 18 [Simultaneous Training]

- (1) The student participating in parallel training programs will be awarded a separate diploma upon successful completion of each training.
- (2) Students can gain eligibility to pursue parallel training by means of admission or transfer.
- (3) Once a student of the university gains eligibility to a parallel training at the university, he/she may not establish a separate student relationship, so he/she does not enroll again, and the date of the beginning of the new training is the date of the decision under paragraph (2).

- (4) The student may not obtain multiple rights for studying in the same program if he or she has been allowed to study in parallel training even if the student is studying in different places of study, different languages of instruction, different work schedules, or by different financing modes. If the student has applied for admission to a degree program (or if the student has applied for admission for an advanced training) that the student is already studying at the university, then the student's request shall be treated as a request for conversion or reclassification that is based on place, language or work schedule. If a student enrolled in a particular program and is re-admitted to the same program for Bachelor, Master, or in the case of vocational training in higher education, then the Dean will ask the student to select the appropriate training location, training language, work schedule and mode of finance at the same time when the Dean announces his or her decision on the admittance of the student then the student's right (to continue his or her studies on a different training from the one that he or she has already selected) shall be removed from the register. This provision does not preclude the student from pursuing parallel studies in several specialties leading to a separate qualification.
- (5) If a student participates in parallel training within the university then he or she may suspend his or her studies in one of his or her training programs, in which case the student shall fulfill the obligations that arise from the studies that he or she has not suspended.
- (6) If a student of the Faculty of Health Sciences establishes a student status at a different institution, then the enabling of the exceptional study order of the student may come into existence after the student has been admitted to another institution.
- (7) If a student studies at the András Pető Faculty, he or she may not request for an exceptional study order even if the student wants to study in simultaneous trainings. The student of András Pető Faculty may undertake a parallel training at another higher education institution if the student has fulfilled his or her prior notice requirement at the relevant faculty. The documentary evidence, which proves that the student has enrolled in another institution must be presented to the Registrar's Department in order to keep the records.

Article 19 [Partial Training]

- (1) If the student wishes to study in the framework of partial training, the student may establish a student status for a semester and re-initiate to establish a student status without restriction of times but may only complete courses up to a total of sixty credits. The student participating in the part-time training shall pay a fee corresponding to the cost of the given training. The Registrar's Department issues a course completion sheet and a certificate of the student status and issues a certificate of the subjects that the student registered for within the given student status.
- (2) If a student wishes to establish student status in order to study in part-time training, the student must submit a request to the Registrar's Department and the student must specify the subjects he or she wishes to complete in this request.
- (3) The student must attach the following documents to his or her request:
 - a) the following information necessary for the establishment of a student status: the applicant's name, gender, name of birth, mother's name, place and date of birth, nationality, permanent address and telephone number of the student's apartment or other place of stay. If the student is not a Hungarian citizen, he or she must attach the document, which proves that he or she has the right to stay in Hungary. If the student is a citizen of a country that falls under special requirements, then the student must present the official title and the number of the permit of residence that guarantees the free movement and the right of residence in Hungary
 - b) a certificate of student status,
 - c) a certified copy of the student's mark book or the certified copy of the master sheet.
- (4) The application may be submitted no later than 30 days before the beginning of the study period.
- (5) The committee competent in educational and examinational affairs makes a decision on the submitted request within fifteen days. The Registrar's Department shall notify the student who submitted a request on the decision no later than fifteen days before the beginning of the semester.
- (6) If the student wishes to take part in part time training, he or she will have a student status. By this student status, the student is not eligible to pursue further professional qualifications or to apply for a transfer or to establish additional guest student status. The student is not entitled to suspend his student status (except for a specific reason defined in Article 16(3)), the student is not eligible for studying in a training that is partially or fully sponsored by the Hungarian state, the student is not eligible to apply for support time.
- (7) If the student has obtained a student status in order to study in a part time training then the student status must be accounted into the duration of the student's statutory benefits, or any services that the student may be entitled to.
- (8) After the student completed a part time training the Registrar's Department issues a certificate of the completed subjects and of their credit value. The subjects that were acquired by the student can be included in the student's tertiary education.

Article 20 [Guest Student Status]

- (1) The university shall contribute to the student pursuing a degree as a guest student at another higher education institution, either in Hungary or abroad if the host institution allows the student to do so. If the student studies in a training of a Hungarian higher education institution that is partially or fully sponsored by the Hungarian state then the student may establish a guest student status in accordance with the regulations applicable to students who study in a training that is partially or fully sponsored by the Hungarian state and if the student takes part in a self-financed training program, then the student may establish a student status in accordance with the regulations applicable to students who study in a self-financed training program.
- (2) The procedure for applications for partial trainings, which are organized by the university are ruled by the regulation regarding the university partial trainings.
- (3) A student may participate in partial training courses at a foreign university if he or she signs a study contract both with the university and the host institution abroad. This study contract must be submitted by the student to the department of the university responsible for the applications within 15 working days after the end of the enrollment period in the host institution.
- (4) If a student of the university organizes it individually to attend partial training, then it has to be allowed by a decision of the committee competent in educational and examinational affairs, and this committee takes the preliminary credit transfer decision of the committee competent in credit recognition into consideration (if such a preliminary decision is available). The student is obliged to submit the permit of admittance issued by the host institution to the Registrar's Department within 8 days of receiving and the Registrar's Department submits the permit to the committee competent in educational and examinational affairs.
- (5) The university may recognize the student's credits that the student has obtained in another higher education institution (while he or she had a guest student status) under the credit recognition rules. The student must show a credit certificate or an equivalent certificate (e.g. transcript) issued by the host institution to prove that he or she has obtained the credits.
- (6) If the student (who has concluded a cooperation agreement with the foreign higher education institution in order to study in that institution according to the Learning Agreement) concluded a study contract, which includes the credits that the student wants to obtain with the university before departure requires the university to accept his or her credits then the university will carry out a prior credit transfer procedure. In such a case, the credit recognition procedure shall be done before the beginning of the student's studying in a part time training abroad and it is not revocable.
- (7) If a university student has obtained a guest student status and thus obtained exams, then these examinations are treated by the university as if they had been taken by the student at the university. The university then has to do a prior or regular credit recognition process in order to make sure that the student meets the curriculum requirement. When a student has passed an examination in another institution, this subject is recorded by the Registrar's Department of the university in NEPTUN as an accredited subject. The student has to submit the certificate of the subjects that he or she has obtained in the part time training courses to the Registrar's Department by the 14th of March (if he or she completed the subjects in the fall semester) or by the 14th of September (if he or she completed the subjects in the spring semester). If the student fails to meet the deadline given above, then he or she can have the results of the subjects – that he or she completed in the framework of the student status – accepted by the university in the following spring semester (if the student completed the subjects in the fall semester), or in the next fall semester (if the student completed the subjects in the spring semester).
- (8) If the student wants to establish a guest student status then he or she must submit an application. The application must be submitted at the same time as the student enrolls for the semester either in NEPTUN or on paper at the faculty of the university of which courses the applicant wishes to take. This period may be extended up to the end of the third week of the semester for international students.
- (9) The acceptance of the application is decided by the committee competent in educational and examinational affairs within eight days of receiving the application. The decision shall include information about the following: the form of financing of the studies of the guest student, the amount of any cost to be paid by the student and the method and deadline of the payment.
- (10) The Registrar's Department registers the guest student for those courses in NEPTUN, based on which courses are enabled by the permission of the guest student based on his or her student status.
- (11) The Registrar's Department issues a certificate of the student's academic achievement of the given semester in the framework of the guest student status, accompanied by a credit certificate per completed course.
- (12) The issued certificate shall include the following:
 - a) the student identification data (name, name of birth, place and date of birth, student ID number),
 - b) the title, description, work schedule, identifying number, credit value and earned grade of the completed course,
 - c) the school year and the semester of the course,
 - d) the duration of studies (first and last days of the student status) and the time for which the student received support,
 - e) the number and the date of the certificate;
 - f) the signature, the stamp of the certifying body.

6. Course Registration

Article 21 [Announcement of Subjects and Courses]

- (1) A The announcement of the subject means the announcement of the courses of the subjects, the announcement process is supervised and directed by the Vice Dean for Education of the faculty.
- (2) In case of obligatory elective and elective subjects, the faculty responsible for the training ensures that an appropriate selection of these subjects of at least 1.20-fold credit value is announced.
- (3) The educational unit responsible for teaching the subject decides on the announcement of the subject and it must announce a compulsory subject in accordance with the curriculum. The Dean of the educational unit may require the announcement of a subject on the proposal of the committee competent in educational and examinational affairs of the faculty.
- (4) The subjects and the courses related to the subjects must be announced in a way that each student can complete the requirements of the model curriculum in each semester.
- (5) Compulsory subjects that end with an exam must be announced with a sufficient number of courses for a sufficient number of students – in every semester, which contains the subject course in the model curriculum (“current semesters”), and in cross semesters, these courses must be announced at least in the form of CV and FM courses. CV and FM courses need to be announced only upon students’ request if these courses do not seem to be required on the basis of the number of eligible students, or in cases of part-time trainings and trainings for few students, i.e. maximum 60 students per year.
- (6) Low and high limits for the registered students may be defined by the educational unit responsible for the course. This fact and the parameters should be published in NEPTUN.
- (7) The number of students per teacher in clinical practice and laboratory practice courses corresponds with the number of students per group that has been established by the given faculty.
- (8) Compulsory subjects have to be announced by the educational unit in every semester, which contains the subject course in the model curriculum (“current semesters”) with a capacity at least 5% higher than the number of students eligible for registration, so that all eligible students can register these courses. This condition must be met according to the expected number of students at the time of the announcement of the course. The high limit of registered students for the subject or the course may be increased later, particularly for this purpose.
- (9) The number of students to register to a course may be limited on the basis of the work capacity of the instructors, the availability of teaching tools, the capacity of the seminar rooms and teaching laboratories, and – with the agreement of the Student Council – for other objective reasons.
- (10) The head of the educational unit responsible for announcing the subject ensures that the subjects and courses (including examination courses) are recorded in NEPTUN until the last day of the preceding term-time. The courses are recorded by entering the data described in paragraph (15) into NEPTUN.
- (11) The faculty responsible for teaching the program (or the training) ensures that the courses are scheduled in the timetable and the scheduling is recorded in NEPTUN before the end of the third week of the exam period of the previous semester. In the case of courses having only one teaching session per semester, the scheduling is indicated in the comment box.
- (12) The educational unit assigns the instructor of the subject/course before the beginning of the course registration period of the current semester if the instructor is already known. Subject/course instructor assignment may be modified under appropriate circumstances.
- (13) A classroom must be assigned to each scheduled course (with the exception of criterion requirements). The registrar responsible for course scheduling at the faculty assigns the classroom by taking the recommendation of the educational unit into consideration.
- (14) The courses in compulsory and obligatory elective subjects, which are announced for the same semester according to the model curriculum, and have no parallel courses on different weekdays, must be scheduled to different times.
- (15) The subject is announced through NEPTUN by the deadlines specified in this section, with the following information:
 - a) the course code,
 - b) the type of course,
 - c) the nature of the course,
 - d) the instructors of the course and their participation in the education of the course,
 - e) the course registration requirement,
 - f) the subject program,
 - g) the minimum number of students and the maximum number of students who may be registered to the course,
 - h) the size of an optional waiting list,
 - i) in the event of over-application to the course, the ranking criteria where this is not the order of application to the course,
 - j) the language of instruction of the course,
 - k) the classroom assigned to the course,
 - l) the timetable details of the course.

- (16) The person who is responsible for the curriculum of the faculty determines the timetable data of the courses by taking the recommendation of the educational unit responsible for the teaching of the subject into consideration.
- (17) The educational units responsible for teaching the subjects may also publish the course announcement in addition to the central announcement.
- (18) If the Registrar's Department finds an error in the range of subjects or of the courses, then it will report it to the Vice Dean of education (and also to the leader of the educational unit responsible for the training in the Faculty of Public Health) or it can directly initiate the rectification of deficiencies while it is delegated to do so by the vice Dean for education.
- (19) The faculty Vice Dean of education will take the recommendation of changes of the designated lesson administrators (or department administrators) into consideration (at the Faculty of Public Health, the Vice Dean of the faculty also takes the opinion of the head of the educational unit responsible for training into consideration) and makes sure that the preliminary subject and course offers are published in NEPTUN (except for the assigned classroom of the course, the timetable and the course instructor) until the end of the last week of the term-time in the preceding semester.
- (20) The head of the educational unit responsible for the announcement of the courses may request the faculty coordinator to modify, add or delete courses until the end of the last working day before the subject registration period. The person (department administrator) who is designated to manage the timetable may modify the offer of courses and he or she can coordinate with the Vice Dean of education when he or she makes his or her decision (at the Faculty of Public Health, he/she may coordinate with the head of the educational unit responsible for the training) with respect to a decrease in the number of students and to a decrease in the number of courses but he/she may not cancel any examination course.
- (21) The final offer of courses and subjects cannot be modified (with the exceptions defined in paragraph (20))

Article 22 [Rules and Limitations of Subject Registration]

- (1) Subject registration consists of
 - a) an optional preferential subject registration period and
 - b) the regular subject registration period including
 - ba) the period of registration to compulsory subjects, and
 - bb) the period of registration to obligatory elective and elective subjects.
- (2) Subject and course registration periods should be organized in several stages over time while the load bearing capacity of NEPTUN should be taken into account.
- (3) The students may register to compulsory, obligatory elective and elective courses until midnight of the last workday before the beginning of the term-time in respect to the prerequisite system of the subjects.
- (4) The preferential subject registration period begins not sooner than 12 hours before the beginning of the regular subject registration period to compulsory subjects.
- (5) The timing, the circle of eligible students and appropriate reasons for a preferential subject registration period are determined by the Vice Rector for educational affairs. The Vice Rector notifies the Registrar's Department at least eight days before the beginning of the period, and the Registrar's Department enforces the terms in NEPTUN. A preferential subject registration period cannot be installed in the lack of such notification.
- (6) Students register to the subject assuming that their registration to the courses required to complete the given subject will be accepted. Registration to all types of courses required to complete a subject occurs simultaneously. The students' registration is accepted if the student has fulfilled his/her prerequisite obligations and the course has not reached its registration limit. The student may withdraw his/her registration for a course and may register for another course by the end of the subject registration period.
- (7) The student receives an automatic notification of the fact that he/she has registered to a subject in NEPTUN. The Registrar's Department closes the registration for addition or modification in NEPTUN on the first weekday after the subject registration period and thus the timetable for the student's current semester becomes final. The student receives a notification via NEPTUN within one workday after the closing of the subject registration urging them to check their subject registrations.
- (8) Students may object to their subject registrations within five days after the end of the subject registration period. The application may be submitted in person at the Registrar's Department or by email. The Registrar's Department modifies the student's registration to a subject in case of a well-founded and properly substantiated complaint. The head of the Registrar's Department processes the objection request in a way that if the request is accepted, the registrar's Department may make the change within 8 days after the end of the subject registration period. The student may have his/her course registrations without any consequences by the third week of the time-term.
- (9) In case of sequential multi-semester subjects, if the student has obtained the signature of the subject in the previous semester but was unable to meet the examination requirements, his/her registration to the subject in the following semester may be permitted by the committee competent in educational and examinational affairs by the end of the subject registration period, on the basis of the

approval of the educational unit that is responsible for the course. However, the student may only obtain the grade of the examination of the subject in the current semester after obtaining the credits of the given subject for the previous semester.

- (10) If the student was unable to register to a course due to a reason that is attributable to the university, the educational unit or to the instructor, the student shall be allowed to register to the course according to his/her original decision or to a course that can be fit to his/her timetable.
- (11) The students have the right to choose between parallel lessons, or between parallel groups of the same year up to the announced registration limits, provided that the curriculum requirements and the restrictions defined in this section are met.
- (12) Those students who are foreseeably undertaking a part of their studies abroad and for whom only certain turns are suitable, may receive preference in the subject registration period if they attach the appropriate certificates (learning agreement, letter of intent from the host institution, certificate from the organization having an agreement of cooperation with the university).
- (13) The condition for the students' registration to the subject(s) related to their activities in Scientific Students' Association (TDK) is the students' inclusion in the TDK Register, and this information must be indicated in the appropriate field in NEPTUN. Registrations of those students who are not recorded in the TDK Register must be deleted. Registrations of those TDK students whose performance meets the requirements defined in the TDK Code of Conduct are modified to a subject of higher credit value by the Registrar's Department.

Article 23 [Subject Re-registration]

- (1) The missing credits of an unaccomplished compulsory course can be obtained no later than in the semester when the subject is re-announced at the second time, except if the student's status has been suspended.
- (2) If the student was unable to obtain credits for a registered subject at first registration, he/she may re-register to the subject in two of the subsequent semesters provided that restrictions of the prerequisite schedule and the regulations in paragraph (1) are met.
- (3) If the student was unable to obtain the credits of a subject in the way described in paragraph (2), a special permission can be requested only once in the whole training, and regarding only one subject to re-register to the subject one more time. If the student has already obtained the signature, he/she only needs to take the exam for the subject in the next semester. The student may also request another opportunity to obtain the signature.
- (4) Re-announcement of a subject, in this section, means the soonest announcement of the course in a spring semester if the subject was first registered to by the student in a spring semester; and it means the soonest announcement of the course in a fall semester if the subject was first registered to by the student in a fall semester.

Article 24 [Repeating a Subject, Examination Course]

- (1) The examination course may be:
 - a) a CV course,
 - b) or an FM course.
- (2) Compulsory courses must be announced in every semester at least in the form of an examination course.

7. Assessment of Meeting the Study Requirements

Article 25 [Assessment of Study Requirements and of Student Performance]

- (1) Completion of a subject, and acquiring the credits for a subject:
 - a) Via fulfillment of the course, the study activities and other requirements assigned to the subject and obtaining the learning achievements ("completion"), or
 - b) Via recognition of the student's previously acquired knowledge, which has been learnt in either formal, informal or non-formal ways, in accordance with the provisions of Article 43 ("credit recognition").
- (2) Student performance may be assessed by:
 - a) a rating scale of five grades, such as: excellent (5), good (4), average/fair (3), satisfactory/pass (2), unsatisfactory/fail (1)
 - b) or a rating scale of three grades, such as: excellent (5), fair (3), fail (1).
- (3) The funding of education (e.g. self-financing, state-funding, scholarships) must not influence the evaluation of the students' performance.
- (4) The student's knowledge can be assessed in the following ways:
 - a) through oral or written test(s) during term-time in the lessons or at separate occasions (classroom test), or through evaluation of the student's assignment completed as an extracurricular work, or

- b) through an examination, which can be:
 - ba) a practical examination (practical mark), which may be prescribed if the training goals allow and necessitate the practical application of the subject and the evaluation of the students' skills for such practical application;
 - bb) end-term examination (examination),
 - bc) final examination,
 - bd) closing examination (terminal board examination).
- (5) A grade can be given to the student at the end of the semester:
 - a) as a term grade, in either theoretical or practical subjects based on assessments during the term,
 - b) as an examination grade.
- (6) The grade that the student receives at the examination can be based only on the student's performance at the exam, and the results of mid-term assessments cannot be taken into consideration.

Article 26 [Offering a Grade]

- (1) In cases of subjects concluded by end-term examinations and of those consisting of seminars and practical sessions only, the head of the educational unit (the lecturer of the subject) can offer the student an excellent or a good grade based on the student's performance during the study period. The terms of offering practical grades must be announced at the beginning of the semester.
- (2) The relevant students must be informed about their offered grades on the last session of the subject at the latest through the appropriate platform of NEPTUN. The student is not obliged to accept the offered grade, he/she may apply for taking an examination instead. If the student does not register for any examination of the subject, then the offered grade that has been recorded in NEPTUN shall be deemed accepted.
- (3) Maximum 5% of the students registered to the course may be offered a grade in the case of compulsory subjects.

Article 27 [Methods of Assessment and Measurement of Student Performance]

- (1) The aim of assessment and measurement of student performance may be:
 - a) confirmation of the possession of prior competences, which are required in order to accomplish a study activity, may be carried out by diagnostic assessments (such as a placement test),
 - b) recording the students' mid-term progress with continuous feedback, which requires a supportive (formal) partial performance assessment, or
 - c) evaluation of the competences acquired during a given study period by using a summative assessment.
- (2) The types of the assessments under paragraph (1) may be applied in combination within the same subject in a manner that is appropriate to the nature and purpose of the subject.
- (3) Any type of measurement and evaluation may be used for examining the existence of competences, such as knowledge or ability.
- (4) The existence of competencies, such as attitude, independence or responsibility should be measured primarily by partial performance assessment, and secondarily by summative assessment.
- (5) Partial performance assessment may take place in the following ways:
 - a) Continuous assessment, which means that the teacher may evaluate the student's performance and activity in the sessions of the course. This can include: (active participation, raising ideas, participating in organized group work or debate, reports (made by the students) in the previous lesson, etc.),
 - b) One-off action(s) (the students make an oral report, a laboratory measurement, or they prepare reports of laboratory measurements or they make regular, self-help tasks, which help the students to learn the study material, etc.),
 - c) Students create work(s) supported by the instructor on a continuous basis, with guidance or consultation. It can be homework, home written essay, project assignment, presentation, plan, artwork and documentation), or
 - d) the students undertake a practical task (or tasks).
- (6) Results of the obligatory partial performance assessment, with the exception of criterion requirements, must be taken into consideration at granting the signature and forming the grade with a weight determined in the course syllabus.
- (7) The student completes the summative assessment through one-off action(s) as defined in the course syllabus, i.e. written test, written, practical or oral end-term exam or final exam, etc.

Article 28 [Performance Assessment System]

- (1) The system of evaluating the performance of the students should be done in such a way that it should facilitate and encourage continuous learning and it should not lead to the undue overload of the students. The method of evaluation of the subjects of the subsequent academic year, i.e. practical grade or examination, shall be recorded in the model curriculum.

- (2) The number of term-time performance assessments, which belong to a subject and which are necessary for the student to complete the subject should be determined in the following way:
 - a) although the number of evaluations that aim to assess prior competences of the students is not limited, such assessments may only be applied in subjects including practical course(s) or laboratory practice course(s),
 - b) the number of activities for the summative assessment of competences acquired during the semester (e.g., mid-term test)
 - ba) cannot be more than three, in the case of a course concluded by a term grade or more than two, in the case of a course concluded by an examination.
 - bb) In the case of a course concluded by a term grade: the duration of the evaluation activity can be 60 minutes per credit value; in the case of a course concluded by an examination the evaluation activity of the course can be 45 minutes per credit value.
- (3) Diploma work writing course and certain courses, which are not concluded by an examination, such as professional practice, planning exercise or project task, should be evaluated by partial performance assessment.
- (4) Performance assessments described in points b) and c) of Article 27(1) of these regulations can be qualified as optional in the course syllabus. Benefits can be assigned to successful completion of such non-compulsory performance assessments and the result of such non-compulsory assessments can be taken into consideration when granting the signature or forming the term grade or examination grade.
- (5) Performance assessment activities should be scheduled dominantly in the term-time; their retake or improvement can take place until the end of the first week of the examination period.
- (6) Compulsory performance assessment activities in the term-time can take place on workdays between 8 a.m. and 8 p.m. in the time of the course sessions or in different time(s) set in the performance assessment plan in advance. Any other scheduling requires the agreement of the Student Council.
- (7) Performance assessment activities, such as written or oral mid-term tests must not be scheduled to overlap with a session of another subject course of the same semester in the model curriculum.
- (8) The performance assessment plan should be made in the following way: The weekly number of summative performance assessment activities, such as written or oral mid-term tests of the subject courses of the same semester in the model curriculum cannot exceed two in general and four in the last two weeks of the term, and the assessments of the same week must be held on different workdays.
- (9) The performance assessment plan described in paragraph (8) has to be made for each training program regarding the compulsory and obligatory elective courses in the model curriculum.
- (10) The performance assessment plan, which includes the performance assessment activities and the possibilities for their retake and improvement, has to be published at the homepage of the faculty until the end of the first week of the term-time.
- (11) Deviation from the performance assessment plan requires the approval of the committee competent in educational and examination affairs. In such a case, the students involved must be informed by the subject tutor via NEPTUN one week before the time of the affected performance assessment activity.
- (12) If the student fails to be present on some of the practical sessions, but if these events do not exceed 25% of sessions, the teacher does not have the right to withhold his or her signature to the student. If the student exceeds his or her absence over 25% of all of the practical sessions, then the head of the educational unit defines the conditions of how the teacher gives his or her signature and the possibility of the order of the student's substitution of his or her absence.
- (13) The performance assessment should be evaluated by the summation of the students' accomplishments, and the grade should be formed according to the principles below:
 - a) the performance level (score) required for a satisfactory/pass (2) grade cannot be higher than 50% of the level (score) that can be gained by the complete and excellent performance of all of the compulsory performance assessment activities,
 - b) the student's performance can be marked as: "unfulfilled" if the student did not participate in any of the performance assessment activities or the student's absence exceeded the amount that is determined in the course syllabus.
- (14) If at least 50% of the assessed students were unable to complete the compulsory subject announced in the appropriate semester according to the model curriculum in the given examination period then an investigation may be requested by the Student Council, and conducted by the Vice Rector for educational affairs, and in case the complaint is justified, the Vice Rector initiates an investigation on the possible remedy to the failures. The outcome of the investigation has implications in the following academic year. If the investigation gives rise to a reasonable suspicion of an ethical misconduct, the Vice Rector initiates the proceedings of the committee competent in disciplinary affairs and informs the educational unit concerned.
- (15) The Vice Rector for educational affairs may request a statistical analysis from the educational units concerning the indicator(s) of the teachers' educational and examination activities.

Article 29 [Signature]

- (1) The condition for allowing the student to take the examination of a subject concluded with an examination is that the “signature” acknowledging the completion of the term is recorded by the end of the time-term but no later than by the end of the first week of the examination period.
- (2) The prerequisite for obtaining the signature is that:
 - a) the student attends at least 75% of the practical sessions and seminars of the course, and
 - b) the student attends all the performance assessment activities or their retake opportunities, maximum twice during the term according to the general rules of such assessments.
- (3) Notwithstanding the general rules defined in point a) of paragraph (2), in the case of subjects that are taught in a block system in the 4th and 5th years at the Faculty of General Medicine, the student’s absences from lectures and practical sessions are summed up within each block. In these cases the student is obliged to make up for all of those sessions that he/she was absent from, and to this end, the clinic is obliged to give sufficient opportunity for making up even in on-call times overnight or on weekends.
- (4) Attendance requirements lower than those defined in point a) of paragraph (2), and, in the case of divided training programs, the attendance at up to 75% of the lectures may be prescribed in the course syllabus.
- (5) Obligatory attendance cannot be prescribed if the maximum number of registered students set for a course exceeds the capacity of the classroom assigned to the course.
- (6) The students who did not fulfill the requirements to obtain the signature according to the regulations in paragraph (2) are reported to the Dean of the faculty by the head of the educational unit or by the lecturer of the subject in the first week of the exam period. It is the duty of the teacher of the course or the educational administrator of the educational unit to record the refusal of giving the signature to the student in NEPTUN until the second day of the second week of the exam period.
- (7) The student is not allowed to take an examination of a subject, in which he/she has not obtained the signature.
- (8) The signature in the subjects taught in a block system in the 4th and 5th years at the Faculty of General Medicine must be recorded until the first workday following the end of the given completed block.

Article 30 [Rules of Examinations and Final Examinations]

- (1) An examination may consists of the following parts:
 - a) oral assessment of performance,
 - b) written assessment of performance,
 - c) accomplishment of practical tasks,
 - d) consideration of all or some of the student’s contributions in performance assessment activities during the term-time,
 - e) or various combinations of points a) to d).
- (2) The examination can be a simple exam or a combined exam. A simple exam consists of one part defined in paragraph (1), whereas a combined exam consists of at least two parts defined in paragraph (1).
- (3) It is the course syllabus that determines which parts defined in paragraph (1) are included by the combined exam; however, the exam shall not be composed of more than three parts.
- (4) It shall be defined in the course syllabus:
 - a) what is the accomplishment level at each part of the exam required for passing the exam,
 - b) which mid-term performance assessments and how can be taken into account at the evaluation in a combined exam,
 - c) whether the individual parts of a combined exam can be retaken or improved by the student.
- (5) All of the parts of a combined exam have to be accomplished by the student in the same semester and the parts of the exam have to be taken in the same day, except when the educational unit allows the students not to retake a successful part of a failed exam, in accordance with point c) of paragraph (4).
- (6) Failing an examination, including the failure at a part of an examination except at the one described in point d) of paragraph (1), reduces the number of exam opportunities for the student by one.
- (7) In case of partial inclusion of mid-term results, the result(s) of the the part(s) of the exam that are taken in the exam period should be taken into account as at least 50% of the exam when figuring the grade. The mid-term results included in the exam shall be taken into account for each semester in which the signature entry is valid, unless otherwise stated in the subject program.
- (8) In case of full consideration of the mid-term results, the examination grade is established solely on the basis of mid-term performance. In this case, an opportunity to modify the grade thus obtained must be offered to the student during the exam period, and the way to modify the grade must be described in the subject program.
- (9) An examination sheet must be recorded at the exam, including the partial exams of a complex examination, and it should include:
 - a) indication of the semester of the given academic year,
 - b) the name and code of the subject, or of the curriculum unit,

- c) the date of the examination,
 - d) the name of the examiner,
 - e) the identification number and signature of the examiner,
 - f) the name and the student identification number of the student who registered for the exam, and
 - g) the evaluation (grade), and the date of the examination.
- (10) An evaluation sheet must also be issued for the parts, which were not accomplished at the examination.
 - (11) The examiner instructor records the evaluation of the examination and signs the examination sheet and validates the document by signing it immediately after the examination.
 - (12) The examination sheet shall be kept for a period specified by law, but for at least 10 years by the educational unit responsible for the subject. The head of the unit is responsible for safekeeping of the examination sheets.
 - (13) A final examination is evaluated by a single grade, on a five-point scale.
 - (14) In case of a failed combined final examination, only the failed parts of the examination need to be retaken if so provided in the course syllabus.
 - (15) If so provided in the course syllabus, the result(s) of successful part(s) of a combined examination, including those taken outside of the academic year (i.e., so called EOAY examination) remain valid until the end of the semester,
 - (16) Requirements for a final examination (the type, the topics and the competency items to be evaluated) must be published along with the announcement of the subject and cannot be changed during the given training period.
 - (17) The examiners of final examinations are senior instructors, such as professors, associate professors. However, in justified cases and on demand of the head of the educational unit, the Dean may permit the participation of other instructors, researchers, teachers, senior physicians involved in the training. The final examination must be taken before a two-member examination committee if more than one subject is included in the final examination and in case of a retake final examination. The head of the examination committee must be a senior instructor.
 - (18) A written (partial) examination is considered to be taken before an examination committee if the test is evaluated by at least two different examiners independently from each other. The result of the (partial) examination is determined by the examination committee.
 - (19) If the examination is to be passed before an examination committee, the examination may be held only if both members of the examination committee are present at the examination and at each part of the examination.

Article 31 [Organization of Examinations and Final Examinations]

- (1) Examinations are primarily held during the examination period, except in a block system.
- (2) Examination after the exam period and in the first week of the subsequent semester can be authorized by the committee competent in educational and examinational affairs. The examination thus completed shall be considered to have been taken during the examination period.
- (3) The examinations (final examinations) shall be organized in such a way that every student eligible to take the examination (final examination) shall be able to register to and take the examination (final examination). The students shall be enabled to retake the failed examinations in the same training period.
- (4) Examinations must be held on working days. The (partial) examination shall not begin earlier than 8:00 a.m. and shall end by 8:00 p.m. The duration of the (partial) exam must be held in accordance with the value recorded and published in NEPTUN. It is the responsibility of the relevant educational unit to ensure that the examination is held within the time interval that has been specified in NEPTUN and that the duration of the examination should stay within reasonable limits (up to 5 hours). The organizers of the examination may only deviate from this regulation with the permission of the committee competent in educational and examinational affairs.
- (5) Educational units must provide at least two exam days per week for the oral exam and one exam day per week for the written exam in each course and in each year in every exam period. The exam, final exam can be retaken no sooner than on the first calendar day after the failed exam. A maximum number of students can be set for each examination. The sum of the maximum numbers of students per exam – or per a partial examination in the case of a complex exam – may not be less than twice the number of students who have registered to the course. The overall maximum number of students of all examinations shall be divided so that at least 10% of the places are offered in every week of the examination period.
- (6) The committee competent in educational and examinational affairs may also allow the announcement of a smaller overall number of places for the examinations than defined in paragraph (5) until the deadline of the announcement of the examinations, if the educational unit so requests. The Vice Dean for Education can approve a smaller number of examinations than defined in paragraph (5) but not less than 4 examination days throughout the entire exam period on the basis of the students' demand in the case of divided training, and simultaneously informing the Student Council. In both cases, care must be taken to avoid conflicts between the exam days of the compulsory subjects included in the model curriculum of the same semester, and to allow every eligible student to register

for and take the examination, as well as to ensure that failed exams can be retaken during the same exam period as many times as is allowed by these regulations.

- (7) The rules and schedule of the examinations must be published two weeks before the beginning of the exam registration period. The announcement must include the dates of the examinations, the names of the contributors, the date(s) of revealing the examination results, and information about the opportunity to retake the exam. The dates of the examinations must be determined in advance for the entire exam period. The head of the educational unit and the Dean of the faculty are mutually responsible for announcing the examinations and perform the announced examinations.
- (8) After announcement, the dates of the examinations may be modified only with the prior consent of the committee competent in educational and examinational affairs.
- (9) Extra examinations may be announced by the educational unit, and the Dean may also demand it, if necessary.
- (10) The student may not attend and is not allowed to register for the seventh examination (the sixth retake examination) of the given subject after having failed the exam six times during his/her student status.

Article 32 [Rules Applicable at Examinations and Final Examinations]

- (1) An examination (or a partial examination) may be considered to have begun when the examination task (such as a question or a topic) has been given to the student. The examination or a partial examination that has begun can only be ended by an evaluation.
- (2) The student must be given a preparation time (before answering or starting the practical task) adjusted to the nature of the exam in the course of the oral or practical examination. This can only be waived at the request of the student.
- (3) Examinations, final examinations can be held primarily in the university's buildings and sites of the practical trainings, and elsewhere once authorized by the Dean of the faculty that is responsible for education.
- (4) It is the responsibility of the examiner or the chair of the examination committee to ensure that the (partial) examinations are conducted properly in an undisturbed and relaxed atmosphere.
- (5) If the examination is taken before an examination committee, any member of the committee may pose a question to the student however, the student's performance is evaluated by the chair of the committee while taking the opinion of the committee members into account.
- (6) The announced (partial) examination, final examination must be held if it has been registered for by any eligible student.
- (7) The time of the (partial) examination within the announced oral (partial) examination can be determined by the educational unit or the examiner either for individual students or for groups of students. The examinees must be informed about the time assigned to their examinations in NEPTUN at least 8 hours before the beginning of the examination. In the lack of published appointments, the examination begins at the original time of the examination for all examinees.
- (8) In case of the absence of the appointed examiner, the head of the educational unit must assign a competent substitute examiner or organize a replacement examination without causing any detrimental consequences to the students.
- (9) It is the responsibility of the head of the educational unit to hold those (partial) examinations that have been announced and to provide replacement examination in case the exam is cancelled due to the absence of the examiner. The students may file a complaint regarding any cancelled (final) examination to the committee competent in educational and examinational affairs.
- (10) Certain (partial) examinations may be reserved only for retake exams by the organizing educational unit. These examinations cannot be taken into consideration when calculating the maximum number of examinations and the maximum number of students in accordance with Article 31(6).

Article 33 [Participation in Examinations and Final Examinations]

- (1) A student may only participate in an examination of a subject that he/she has obtained a signature for.
- (2) A student may only take a final examination if he/she has fulfilled the prerequisites and obtained the credits of the subjects linked to the final examination as determined in the model curriculum.
- (3) Students may register to an examination until 6.00 a.m. and they may cancel their registration for an examination until 0:00 a.m. on the day of the given examination via NEPTUN.
- (4) A unique registration period, which must not be closed sooner than 72 hours before the exam, can be set by the educational unit for the oral part of the final examination in NEPTUN system.
- (5) Students willing to retake a failed (partial) exam or to improve the result of a successful (partial) exam of the same examination period should be privileged at the registration to (partial) examinations, which have been formerly announced as retake exams.
- (6) Students are obliged to attend the (partial) examination which they have registered to via NEPTUN. If the student fails to do so, his/her performance cannot be evaluated, and – unless the absence is excused – a "did not appear" note has to be recorded to the given (partial) exam in NEPTUN. Unexcused absences have to be counted in the maximum number of exam opportunities of the semester,

and the student is obliged to pay a missed exam fee and an exam administration fee, which are specified in the Regulations of Refunds and Allowances.

- (7) Students are not allowed to take an examination without identifying themselves. Student may identify themselves at the examination by any suitable document, which contains both a signature and a picture. If the student is unable to verify his/her identity, a "did not appear" note has to be recorded on the examination sheet and in NEPTUN, which does not reduce the number of exam opportunities, yet the student is obliged to pay an exam administration fee, which is specified in the Regulations of Refunds and Allowances.
- (8) The fees referred to in paragraphs (6) and (7) are prescribed by the Registrar's Department within three days from the student's default.
- (9) The student is obliged to excuse his/her absence from the (partial) examination at the educational unit within 3 workdays personally, in writing, electronically or by proxy. The acceptance of the student's justification is decided upon by the educational unit and, in case of a debate between the student and the educational unit by the committee competent in educational and examinational affairs. If the student excuses his/her absence properly, the examination is considered as though it had not been registered for, and the "did not appear" note is deleted by the educational unit.
- (10) The student who fails an examination, can attempt to complete the exam two more times, i.e. at two retake exams in the same examination period. The student is allowed to have a third retake examination only in one subject per academic year. The student is not allowed to have a fourth retake examination in any subject in the same semester even with special permission.
- (11) The student has the opportunity to improve the result of a successful exam until the end of the exam period. The student must be informed that the result of the examination may be impaired. Additional credit(s) cannot be earned by retaking a successful exam. In case of limited places at the examination, a student registered to retake a failed exam has an advantage over the ones registered to retake a successful exam.

Article 34 [Examination Outside the Academic Year]

- (1) Students of the undivided medical trainings or master's degree trainings in health sciences, who are unable to fulfill the examination requirements arising from their student status during the spring semester's examination period of the academic year may take an examination organized outside the academic year (hereinafter referred to as EOAY). The result of an EOAY shall be considered as that of an examination taken during the spring semester of the academic year. If the institution of higher education has a vacant Hungarian state-funded position, the reclassification decision made by 31 July at the latest shall be reviewed and, if necessary, adjusted in the light of the results of the EOAY. EOAY can be completed during the spring semester of the given academic year in the period specified in paragraph (6).
- (2) In cases of the undivided medical trainings and master's degree trainings in health sciences, the students may take the EOAY described in paragraph (1) in any subject registered for but not completed in the given spring semester, according to the available exam dates, if he/she notifies the Registrar's Department, listing the subjects to be finished with EOAY, until the end of the working day following the last day of the exam period; this, provided that the student has not been dismissed by the end of the spring semester's exam period, including the scenario that the student is exempt from dismissal under the special permission decision of the committee competent in educational and examinational affairs. If the student's dismissal is pending, and the student is eligible for and signed up for EOAY it in due time, the committee competent in educational and examinational affairs shall suspend the proceedings until the results of the EOAY are announced, and then, the light of the results of the EOAY, decides either to cancel the proceedings or to proceed with the dismissal in.
- (3) Taking the examination referred to in paragraph (2) shall not be considered as a course registration.
- (4) In the case of EOAY, during the period specified in paragraph (6), the student may take examinations in any subject as many times as many exam opportunities he/she has left in the given semester.
- (5) If the student passes the exam by EOAY, failure to complete the unit or units affected by the EOAY in the semester shall not be considered as a subject omission.
- (6) The exam date of the EOAY shall be determined in such a way that during the seven working days from the Tuesday of the week preceding the registration week to the Wednesday of the registration week, the student is able to pass the examinations according to Article 33(9), with regard to the general rules on organizing examinations stated in Article 31(6). The exams must be organized in such a way that all the students concerned can register to and take the exam.
- (7) In the case of EOAY, it is not necessary to fulfill the conditions of the subject announcement. If the student does not complete the subject within the EOAY, he/she may take the opportunity of the CV course offered during the semester, provided he/she has remaining exam opportunities, taking into account the difference of all exam opportunities according to Article 33(9) and the failed exams in the framework of EOAY.
- (8) The student may retake the exam failed in the EOAY in the semester of the next announcement of the subject, taking into account the difference between the number of failed examinations in the given subject and the unsuccessful examinations within the EOAY and

the number of examinations specified in Article 33(9). The number of retake examinations for the same unit of study shall not exceed the maximum number of failed exams specified in the Act on National Higher Education.

- (9) If a student takes an active semester, taking into account the cases specified in points a) and b) of Article 24(1) (FM and CV courses), he/she may register to elective and obligatory elective subjects of up to 15 credits per semester in the given semester and the following semester.

Article 35 [General Rules for Exam Retake and Replacement Exam]

- (1) The university shall ensure that each student is able to report on his/her knowledge and to retake the successful or unsuccessful academic performance assessment in such a way as to ensure the impartial conduct and assessment of the repeated performance assessment.
- (2) The student may not make use of the possibility of retake or replacement if he/she has not fulfilled the attendance requirements stipulated in this regulation or the course syllabus.
- (3) Unless otherwise provided in this regulation, the use of the first occasion announced by the educational unit for retake and replacement of the assessment of academic performance shall be free of charge for the student.
- (4) In the case of a retake performance evaluation, the results achieved there shall be taken into account unless otherwise specified in the course syllabus or in this regulation.
- (5) The opportunities for retake and replacement of the mid-term performance assessments shall be organized in such a way that the student, while exercising and successfully fulfilling the possibilities specified in Article 36(1)-(2) can
 - a) improve the term grade to a mark different from unsatisfactory (fail), or
 - b) obtain a "signature" entry from the subject to be concluded by an exam.

Article 36 [Retake and Replacement of Mid-term Performance Assessments]

- (1) At least two retake and replacement opportunities must be offered for the mid-term performance assessments in case the term grade is determined on the basis of mid-term tests, or the completion of another mid-term assessment (oral test, presentation, practical performance evaluated with a grade) is a prerequisite for obtaining the practical course mark or for exam eligibility. If the student was unable to meet the course requirements during the retake and replacement opportunities, the student cannot be given a signature for the term.
- (2) If at least "satisfactory/pass" performance at the last assessment or at least "satisfactory/pass" grade at each assessments is prescribed in the requirements of the subject as a condition for getting the signature, then at least two retake / replacement opportunities shall be provided for each performance assessment individually or in combination.
- (3) If the subject concludes with a practical course mark according to the model curriculum, at least one retake opportunity shall be offered if it is feasible by the end of the term-time.
- (4) The knowledge and other competencies required for a retake examination are the same as those marked in the course syllabus for the exam to be retaken. The retake exam shall be evaluated on the same scale as the exam subject to retake.
- (5) If, according to the provision of the course syllabus, a group of performance assessments cannot be retaken or replaced, the (partial) result of this group of academic assessments shall be determined on the basis of the most favorable two-thirds – rounded off.

Article 37 [Retake and Replacement of Examinations and Final Examinations]

- (1) The student may modify the result of a previously passed examination by having a retake examination.
- (2) The student can sit the retake examination before a different examiner or examination committee if so authorized by the head of the educational unit on the basis of the student's duly reasoned written or electronic request addressed and submitted to the head of the educational unit no later than three working days before the commencement of the examination. If the head of the educational unit is involved in the examination, the appointment of a different examiner can be requested from the Dean of the faculty responsible for teaching the subject.
- (3) During a given examination period, a second retake examination (i.e. the retake after a retake) shall be taken before an examination committee of at least three members, upon the student's written or electronic request submitted no later than three working days before the commencement of the examination. No more than one member of the examination committee may be an examiner who has graded a former examination of the student as unsatisfactory/fail during a given exam period.
- (4) A written (partial) examination is considered to be taken before an examination committee if the test is evaluated by at least two different examiners independently from each other. The result of the (partial) examination is determined by the examination committee.

8. Recording of Study Assessment and Grades

Article 38 [Recording of Study Assessments and Grades]

- (1) The course teacher, the tutor or the study administrator of the educational unit shall record the term grade in NEPTUN no later than the end of the first week of the examination period of the specific semester. The date of recording the term grade is the date of acquisition.
- (2) In a given semester, the student may only have one grade recorded for a subject assessed with a term grade at the end of the specific semester, and any grade obtained by retake or replacement assessments overrides the previous mark.
- (3) The signatures for subjects concluded with examinations must be record in NEPTUN no later than the end of the first week of the exam period by the course teacher, the tutor or the study administrator of the educational unit. The date of the signature entry is the date of acquisition.
- (4) A student may only have one signature entry in a given semester for each subject ending with examination. Any signature entry obtained or modified following a make up, repteake or correction will override the previous entry.
- (5) After establishing the result of an examination (end-term exam or final exam), but no later than the end of the next working day, the examiner shall record the mark in NEPTUN at the given examination, based on the examination sheet or final examination report. In the case of a combined examination (final exam), the entry shall be made for the examination session at which the grade was established.
- (6) No grade for examination can be recorded in NEPTUN if the student has not taken any examination of the subject in the given semester.
- (7) Any grade, score or result obtained at a midterm or at any examination, including the results of any assessment other than a “diagnostic study assessment/test”, offered grades, partial examination grades, as well as the evaluation of any partial written examination or examination session yielding no specific grade on their own, can be communicated to the student confidentially in person or in any other way, so that it cannot be learnt by a third party.

Article 39 [Study Assessment Records]

- (1) Any documents produced by the students during their study as well as any assessments of students' work shall be managed by the educational unit responsible for teaching the given subject. However, the Dean may decide to have these records managed at the faculty level.
- (2) Paper-based documents (classroom tests, homework, written reports, etc.) of the study assessments carried out during the term-time and make up periods can be returned to the student after the assessment or shall be archived by the course leader.
- (3) Documents (grading sheets, study result summaries and records) of study assessments carried out during the term-time and make up periods shall be kept in accordance with the requirements of the Document Management Policy.
- (4) After evaluation, any documents produced during the examination period (e.g. term papers/coursework) and related to the examinations (including final examinations) shall be kept by the course leader.
- (5) Documents related to the evaluation of examinations (e.g. grading sheets, examination reports and final examination reports) and produced during the examination period shall be kept in accordance with the requirements of the Document Management Policy.
- (6) Any documents specified in paragraphs (2) and (4) not returned to the student after the assessment shall be destroyed within one month from the commencement of the next term-time, unless there is a procedure under way regarding the given examination, which may affect the outcome of the examination. In the latter case, the documents specified in paragraphs (2) and (4) shall be destroyed within one month after the final decision regarding the specific case has been issued. The expiry date specified herein does not apply to examination sheets. In any event, the process of records keeping and destroying shall be carried out in a way that prevents the identification of the author of the sorted out document.

Article 40 [Publicity of Assessments]

- (1) Written and practical study assessments (classroom tests, exams, final exams, etc.) are not public, they are attended only by the students and the teaching staff involved.
- (2) Oral study assessments are public within the frame imposed by the venue of the study assessment for the citizens of the university, as defined in paragraph (4). However, at the explicit and justified request of the student, the teacher conducting the study assessment, or, in the case of final examinations or closing exams, the chair of the Examination Board may restrict public access.
- (3) In the case of oral assessments, there must be a third party present in addition to the student and the teacher performing the assessment. This third party may be any of the citizens of the university as defined in paragraph (4).

- (4) In the case of oral study assessments, any of the following persons are allowed to be present during the examination in addition to the student and the teacher performing the assessment:
 - a) university students, PhD course attendants, PhD candidates,
 - b) university teaching staff, retired teaching staff,
 - c) other persons involved in university education (e.g. non-teaching doctors), or
 - d) university citizens not listed above, who attend the examination at the request of the examinee.
- (5) The persons referred to in points a) to c) of paragraph (4), may attend only those examinations at which they, as students, also are assessed or they, as other university citizens, are in charge of any specific exam-related task, provided that their presence does not interfere with the appropriate and professional conduct of the examination, the decision of which is the privilege of the examiner who takes into account all aspects and circumstances of the case.
- (6) University citizens referred to in point d) of paragraph (4) may attend the examination of the student who has requested that, provided that this participation does not interfere with the appropriate and professional conduct of the examination, which is decided by the examiner by taking into account all aspects and circumstances of the case.

Article 41 [Publicity of Study Assessment Results]

- (1) During the term-time,
 - a) if possible, proficiency test results shall be communicated prior to the study activity for which the assessment was made;
 - b) the results of partial study assessments carried out pursuant to points a) or d) of Article 27(5) shall be communicated immediately after the activity was assessed; if the assessment was carried out in accordance with points b) or c) of Article 27(5), the result of the partial study assessment shall be communicated within seven days after the rated activity was performed or the student work to be evaluated was submitted;
 - c) summary assessment results shall be communicated within eight days after completion (submission). Study assessment results shall be directly communicated to the assessed student or recorded and published in NEPTUN in a way as to avoid access by third parties.
- (2) The results of written (partial) examinations and written parts of final examinations shall be communicated directly to the assessed student or recorded in NEPTUN until the end of the second working day following the examination, in a way as to avoid access by any third party.
- (3) Results of oral or practical (partial) examinations, and the results of oral or practical parts of final examinations taken in the exam period shall be communicated to the student immediately after assessment. Oral or practical partial examination results may also be recorded in NEPTUN after the immediate notification.
- (4) There must be at least 48 hours between the publication of study assessment results and the commencement of any associated retake or replacement.
- (5) Revised, checked and evaluated written study assessments shall be kept accessible until the end of the examination period. Students may submit their complaints/objections to the teacher, examiner, course leader or, in exceptional cases, to the head of the educational unit until the last day of the examination period. In the event of a miscalculation or misevaluation, the teacher shall correct the objected mark of the study assessment.
- (6) The teacher or examiner shall provide the access stipulated under paragraph (5) at occasions announced in advance. The date of access shall be determined so as to have at least 24 hours before the beginning of the retake or replacement of the relevant study assessment.
- (7) If the teacher missed to act in accordance with paragraphs (4) and (6) of this Article, the Dean may oblige him/her to announce another opportunity for retake or replacement.
- (8) During the access provided under paragraph (5):
 - a) the student shall be allowed, without any specific request, to view the correction and evaluation guide for the given study assessment, compare it with the contents of his/her written work and the evaluation given by the teacher, and make notes about his/her coursework/term paper.
 - b) the teacher shall provide detailed answers to the questions asked by the student on professional, correctional, and evaluational issues related to his/her study assessment.
- (9) In order to enforce the provisions of Paragraph (8), the student may request the intervention of the head of the educational unit or Vice Dean in charge of education, or, in the case of the Faculty of Health and Public Services, that of the head of the educational unit responsible for education.
- (10) After the study assessment was finished, the educational unit may publish the Correction and Evaluation Guide on its website.

- (11) Study assessment results, including the term grades, end-term examination and final examination grades, as well as the signature entries are confidential personal data. Such data shall only be transmitted in special cases and to specific persons specified in these Regulations and in cases and to persons defined in the relevant laws. For any reasons or to any persons not covered by these Regulations or by law, these data must not be transmitted or disclosed.

Article 42 [Recording and Indicators of Study Assessment Results]

- (1) The student's study results shall be recorded in NEPTUN. Once the examinations have been completed, the results of both the oral and non-oral examinations will appear in the electronic record system on the "Performance Sheet", and NEPTUN will automatically send notifications about these results.
- (2) The teacher shall record the grade in the NEPTUN using the pre-printed grading sheet and make a copy of this sheet for the student who requested to have his/her own copy and authenticate these documents with a signature. If the student has his/her own copy of the grading sheet printed by him/her and signed by the teacher, he/she can verify whether the grade recorded in NEPTUN is the same as the grade specified on the pre-printed grading sheet. If the student does not have the Performance Sheet, in case of discrepancy he/she may verify the grade by comparing the grading sheet (pre-printed, completed and signed by the examiner) with the automatic notification received from NEPTUN.
- (3) Any subsequent verification of the written examination results can be done based on the term paper/coursework, which shall contain the evaluation and the signature of the examiner.
- (4) If the result of the examination was incorrectly recorded in NEPTUN, the student concerned may ask the course teacher or the head of the educational unit to make the necessary corrections by the end of the examination period. The teacher shall verify the student's complaint within 5 working days and make any necessary corrections. Any such requests received after the examination period shall be submitted by the teacher, with his/her correction proposals, to the Dean's Department Manager via the electronic mail system. The student may object in writing, against his/her assessment results recorded in NEPTUN within 14 days after the end of the study period. The objection must be submitted to the Registrar's Department. The objection shall be investigated by the Registrar's Department under the supervision of the Vice Dean in charge of education or, in the case of the Faculty of Health and Public Services by the Dean who shall decide on any possible correction within 5 working days of objection receipt. The student shall be notified on the result of the investigation within the same time limit via the student information system. The student may appeal the examination results within 15 days after notification, by submitting his/her complaint/objection to the Evaluation Review Board with the intermediation of the Registrar's Department.
- (5) Results of the previous semester shall be finalized and closed in NEPTUN by the end of the second week of each term-time.
- (6) One free of charge transcript (i.e. an exact copy of the student's complete, permanent academic record printed from NEPTUN) can be requested by the student in each semester.

9. Credit Recognition

Article 43 [Credit Recognition]

- (1) During credit recognition, for any passed subject if the correspondence (match) is at least 75%, the substitution shall be accepted. If the same indicator is less than 75%, the committee competent in credit recognition may approve the substitution after considering the circumstances, in particular the role of the subject played in the achieving of training objectives, and may also request the opinion of the course leader. In accordance with the nature of credit recognition, the educational unit shall recommend the same decision for students being in the same situation.
- (2) If the match is less than 75%, instead of credit recognition it is possible to recognize as achieved and waive certain requirements of the subject. In such a case the student will be required to take a special examination (i.e. a difference examination that does not include the above-mentioned requirements) before the examination period (during the final three weeks of the study period) or during the examination period. Such subjects shall be registered to by the Registrar's Department for the specific student, but the latter is also required to report to the teacher responsible for the subject of the difference examination within 10 working days of decision receipt.
- (3) A subject identical to an already completed subject cannot be registered to again (except for credit recognition). A subject is different from another subject if the thematic and the knowledge to be acquired are more than 25% different.
- (4) As for the passing of the teaching plan-related requirements, it is allowed to consider only the subjects that are different from all the subjects already taken into consideration for passing.
- (5) Prior to registration/enrollment for a given semester, the student may request credit recognition for the subjects already completed and passed at another faculty or higher education institution in accordance with the credit recognition procedure of the given faculty.

The credit recognition decision shall be taken by the committee competent in credit recognition in accordance with Paragraphs (1) to (4), also taking into account the proposals of the Program Leader (coordinator) or course leader. During the credit recognition process, it is required to consider that the student must complete at least one third of the credit value of the course at the university, including the credits for subjects completed in other courses and accepted during credit recognition, in order to obtain a university degree.

- (6) Any credit recognition based on the specified output requirements of the subject (module) is done solely by comparing the knowledge on which the credit is based. The credit must be recognized if the comparative knowledge gives a match of at least 75%.
- (7) A student who has lost his/her student status and has been re-admitted in a new admission procedure may have his/her credits accepted for the subjects successfully passed in the past by the decision of the committee competent in credit recognition.
- (8) The committee competent in credit recognition will decide on the applications received within the specified deadline so that the student applying for recognition may draw up an individual curriculum for the following semester based on the decision.
- (9) The rules, options and typical modalities of credit recognition, as well as the list of documents required for the procedure, are set out in the credit recognition procedure of the specific faculty. Only applications duly completed and submitted by the deadline set out in this document will be accepted.
- (10) If the substitute subject requested by the student was not completed within the frame of a credit-based education, the credit shall be given for the number of hours indicated in the previous registration course book, taking into account the current ratio of contact and individual lessons in the current course. If neither the credit value nor the number of lessons of the substitute subject are known, the application for credit recognition cannot be effectively judged.
- (11) The faculties of Semmelweis University mutually allow the registration of publicly announced specific subjects with the credit value granted by the announcing faculty, and any subject announced at the Semmelweis University may be registered to and recognized as an elective subject based on the provisions of paragraph (4).
- (12) If a substituting subject can be assigned a credit value appropriate to the faculty curriculum, then the grade associated with the substituting subject must be accepted. If it has multiple grades, its rounded average should be considered and validated.
- (13) The maximum number of credits that can be counted based on work experience is 30.
- (14) The rules governing the credit recognition procedure are set out in the rules of procedure of the committee competent in credit recognition.
- (15) The rules of the credit recognition procedure shall apply *mutatis mutandis* where the student requests the recognition of achievements from non-formal or informal learning or work experiences.
- (16) The faculty may maintain an equivalence record for credit recognition regarding the particular course(s) it provides, in which the higher education institution, subject name, date of publication, or other relevant information may provide students with prior information on subjects already recognized in previous procedures and subject eligibility. For subjects registered to on the basis of a previous decision, if the subject programs concerned remain unchanged, the committee competent in credit recognition may proceed with a simplified procedure, which may or may not require the opinion of the course director, but shall not be required to do so. These previous decisions do not bind the committee.
- (17) A simplified procedure may also be used where credit recognition is between the old and the new curricula of the same course and an equivalence table is created with or after the curriculum change.

10. Pre-degree Certificate, Diploma work, Closing Examination

Article 44 [Pre-degree Certificate (Absolutorium)]

- (1) Until gaining the pre-degree certificate – in case of (partly) state-funded training – in bachelor or master training, in addition to the training period, a state-funded student may have a maximum of 2 active semesters, or a further 4 active semesters in a case of undivided training. Until gaining the pre-degree certificate – in case of (partly) state-funded training – the possible number of passive semesters are 2-2 in bachelor and master training, and 4 semesters in undivided master training. In justified cases, alongside the previous consent of the head of faculty, for a student undergoing further training may allow to suspend their student status for a different time period applying for the 2011 CCIV. acting in accordance with the provisions of Article 45(1)-(2) of Act I of 1992.
- (2) In order to obtain a pre-degree certificate, the student is required to complete at least one-third of credit value of the degree – even in a case of acceptance of the completed credits and previous studies from other higher education institutions, in addition to earlier acquired knowledge recognized as credits – in the given institute, including the acquired and accepted credit value of subjects from other training of the university
- (3) The Registrar's Department issues the pre-degree certificate if the relevant conditions are met, with recording the acquisition in the NEPTUN, and with drawing up that it is signed by the Dean of the faculty according to the student's request.

Article 45 [Thesis]

- (1) In order to obtain their diploma, students are required to write a thesis in bachelor and master training. The aim of the thesis is to promote via independent scientific processing of any problem in a certain disciplinary area, the student's ability of highlighting the essence, to learn using the library and the methods of literature research and to be able to summarize their opinion briefly and clearly, in addition, it may aim to systematically process the possible solutions of the practical problems regarding the specificities of the training, to demonstrate innovative concepts and results.
- (2) The topic supervisor, or in certain cases the consultant leads the writing of the thesis. The topic supervisor is a professor or a researcher of the faculty; or with the Dean's permission, an external professional can be the topic supervisor. An external supervisor may only be functioned with an insider consultant. If the topic supervisor is an external professional, the subject is signed and evaluated by the faculty lecturer and research supervisor at the end of the semester.
- (3) The educational unit of the relevant faculty creates a list of topics related to the thesis, including the names of the consultants. The list of topics has to be announced electronically and on the news table of the educational unit and – in a case of bachelor, master or undivided training, at least four semesters prior to the last year of studies, but in a case of a minimum seven-semester-long training at least 2 semesters prior to the last semester of the training, and in a case of a maximum four-semester-long training one semester before the final semester – until the last day of the examination period in the fall semester in every academic year. The student may choose from any announced topic depending on a certain topic supervisor's capacity. The chosen topic can be different from the announced topics with the consent of the head of the educational unit responsible for the topic. The student has to choose a topic and notify the head of the certain educational unit at least a year prior of the completion of their studies – in a case of minimum four-semester-long studies one semester prior to the final semester. If the head of the educational unit authorizes the topic, he is responsible of recording it and providing a consultant.
- (4) Preparation for writing the thesis is aided by – in the semesters specified in the recommended curriculum, with defined individual and contact lessons – an obligatory elective course ending with an exam grade.
- (5) While writing the thesis, the student must consult with his or her topic consultant in each semester, as many contact hours as is defined in the model curriculum.
- (6) The content of the thesis may be at least 50,000 characters, the maximum content is 100,000 characters without spaces. The font to be used is Times New Roman in font size 12. The content includes the tables as well as the references; however, it does not include the figures, footnotes and bibliography. The thesis should be bound in file or book format in 2 copies; and submitted alongside an electronic copy to the educational unit responsible for the training. A certificate of submission is given to the student. The cover of the thesis should include the title of the thesis; the name, the year and the group of the student; in addition to the year of submission and the name and workplace of the consultant. In accordance with the permission of the head of educational unit, the student can write the thesis in any of the languages in which the university provides a program.
- (7) The submission deadline of the thesis may differ for each faculty, and it must be announced on the webpage of the faculty.
- (8) The thesis has to be submitted for review. The reviewer is invited by the head of the educational unit which announced the topic. The reviewer should be a lecturer with a degree in higher education, researcher or external professional. In bachelor training, the topic supervisor may be asked for review, in duly justified cases. The number of the reviewers is one or two in bachelor training, and at least two in a case of master training. If the topic was not announced by an educational unit of the faculty, the faculty or the faculty's specialist in charge must appoint a professional reviewer, who may be an external specialist or a member of the faculty. The topic supervisor creates an individual review as well. Reviews should be sent to the student/candidate at least 5 days prior to the thesis defence. A grade recommendation for the thesis is given by the reviewer as well as the topic supervisor.
- (9) Evaluation of the thesis is given on a 5-point scale. When rating/grading the thesis, the rate of independent research/work has to be taken into consideration. Defense of the thesis is conducted in front of a 3-member committee of the educational unit, or – if the thesis defence is part of the closing exam – the Closing Examination Board, the chair of which is the head of the educational unit or a university or college professor, or associate professor appointed by the head of the educational unit. The members of the committee are the consultant and a lecturer of the department. The committee may appoint a third member, who may be an external lecturer, chosen from the private lecturers of the university.
- (10) The review should be written on a special form – form of thesis registration and evaluation – in two copies. The evaluation includes the review as well as the recommended grade. The student should be informed about the evaluation by sending the second copy of the form of the thesis registration and evaluation form prior to the closing examination, at least 10 workdays before the thesis defence.
- (11) The reviewer poses 2-5 questions on the form of thesis registration and evaluation pertaining to the content of the thesis; The oral description of the thesis of a length prescribed by the committee, the answering of the previously posed and possible further questions denote the defence of the thesis.
- (12) A thesis which is not authorised for defence is marked as "fail". Evaluation of theses which are authorised for defence are assessed by the committee regarding the reviewers' recommendation and the student's performance during the defence according to paragraph (9).

- (13) In a case of one reviewer, the head of the educational unit either authorizes the “fail” evaluation, or appoints a new reviewer. In the case of two reviewers, if only one reviewer gives a “fail” evaluation, the head of the educational unit appoints a new reviewer.
- (14) In a case of a “fail” evaluation, the head of the educational unit notifies the student and informs him/her about the conditions of revision/supplementation. The thesis evaluated as “fail” may only be revised/supplemented once.
- (15) The closing exam after the revision/supplementation of the thesis can be taken only in the subsequent closing exam period by the student
 - a) who did not submit his/her thesis until the deadline;
 - b) whose thesis was evaluated by the reviewer as “fail” with the approval of the head of the educational unit,
 - c) whose thesis was evaluated as “fail” by the newly appointed reviewer according to paragraph (12).
- (16) The conditions for the revision/supplementation of the failed thesis are determined by the head of the relevant educational unit, and it may include a request for further consultations if necessary.
- (17) After the defence, the head of the educational unit gives one copy of the thesis to the student, the other copy and a copy of the report of the defence certifying the evaluations remains at the educational unit. The thesis has to be kept by the educational unit in accordance with the prevailing Document Management Policy.
- (18) An award winning work for the “Rectorial Competition” may be accepted by the Dean as a thesis evaluated with an “excellenet” grade according to the recommendation of the head of the educational unit in case the student requests so in an application previously submitted to the Registrar’s Department.
- (19) For students participating in undivided master training, a praised work for the “Rectorial Competition” may be accepted by the Dean as a thesis evaluated with an “excellent” grade according to the recommendation of the head of the educational unit in case the student requests so in an application previously submitted to the Registrar’s Department.
- (20) A scientific paper, which has been produced by the student in relation with his/her studies, and has been published as the student’s first-authored article in a peer-reviewed journal, may be accepted by the Dean as a thesis in which case, review and evaluation shall be provided according to the general rules.
- (21) Requests regarding the thesis defined in paragraphs (18)-(20) must be submitted to the Registrar’s Department by the student until the end of the academic year before the completion of the studies. Exemption from writing the thesis does not mean the exemption from the defence of the thesis.

Article 45/A [Special provisions regarding the thesis at András Pető Faculty]

- (1) During the preparation of the thesis, the supervisor should provide 3-5 consultation opportunities. The student is required to attend at least 3 consultations by the end of the term of the 7th semester.
- (2) Participation in the consultation can be confirmed on the form of thesis topic announcement, which must be completed and attached when submitting the thesis.
- (3) If the student does not fulfill this obligation, his/her thesis cannot be assessed and he/she receives a “fail” evaluation.

Article 46 [Closing Examination (Terminal Board Examination)]

- (1) If the thesis is not accepted, the student/candidate is not eligible for taking the closing exam. The conditions and the earliest deadline of the supplementation are determined by the head of the educational unit in accordance with the opinion of the department.
- (2) The student who has failed to meet his/her payment obligation to the higher educational institution is not eligible for taking the closing exam.
- (3) The student is obliged to register for the closing exam 40 days prior to the first day of the closing exam period determined in the academic calendar, according to the procedure determined for each faculty, in NEPTUN, and in case of the Faculty of Health Sciences and the Faculty of Health and Public Services, at the Registrar’s Department. The faculty can prescribe a shorter deadline.
- (4) The closing exam can have several parts according to the curriculum, particularly oral, written and practical parts. The thesis defense is part of the closing exam – if the curriculum so determines; however, it is evaluated separately from other parts of the closing exam.
- (5) Differing from paragraph (4), in the Faculty of Health Sciences, the closing exam has
 - a) in case of bachelor training,
 - aa) practical,
 - ab) written (theoretical),
 - ac) oral (theoretical) parts,
 - b) in the case of Nutrition Science master training,
 - ba) professional oral exam from the core subjects,
 - bb) professional oral exam from the differentiated professional subjects,
 - bc) degree thesis defense,

- c) in the case of the Nursing master training,
 - ca) written theoretical part,
 - cb) written practical part,
 - cc) oral theoretical part,
 - cd) thesis defense.
- (6) At least two closing exam periods per academic year are appointed according to the academic calendar at the Faculty of Medicine and the Faculty of Pharmaceutical Sciences regarding the specifics defined by the National Closing Examination Committees for Medicine and for Pharmaceutical Sciences. Closing exams may only be taken in the appointed closing exam periods.
- (7) Organizing the closing exam is the responsibility of the Dean of the faculty. The number of closing examination boards is determined according to the number of registered students in such way that no more than 10 students may be sorted for one occasion at one Closing Examination Board. This number is 12 at the Faculty of Pharmaceutical Sciences.
- (8) Sorting of the students is based on their registration for the closing exam dates or it is done by the Registrar's Department, in the latter case, when it is justified, a possibility for modifying the date should be provided. In case of multiple Closing Examination Boards on the same closing exam day, the sorting of students to individual boards is done according to previously stated professional criteria, or failing that, by a lot drawing. The sorting for the committees should be published at latest on the day of the exam in a way customary at the faculty. Students should be electronically informed about the location of the examination on the preceding day.
- (9) The closing exam should be taken before the Closing Examination Board consisting of a chair and at least two other members. The chair and the members of the committee are appointed by the Dean from the candidates determined by the Faculty Board for up to one academic year. The Closing Examination Board should have at least one member who is a university or college professor, or associate professor, and one member who is not the employee of the university, or who is the lecturer of a different faculty or training program of the university. The mandate of a Closing Examination Board member – not including the chair of the board – may be valid for the assessment of only a single part of the closing exam.
- (10) Students who miss to take their closing exam, and certify that it was through no fault of their own can be provided a date for a replacement closing exam by the faculty within the specific closing exam period.
- (11) An examination report shall be kept on the practical and theoretical closing examinations. The grade of the written part of the exam shall be recorded in the report of the theoretical exam.
- (12) The members of the committee evaluate the performance of the student with a grade, then in a closed session – in case of a debate, with voting – they determine the grade of the oral closing exam. In case of a tied vote, the vote of the chair is definitive. In addition, the committee confirms the grade of the practical part of the closing exam and the grade of the thesis.
- (13) The closing exam is successful if the grade of each part of the closing exam defined in paragraph (4) and the grade of the thesis are at least "satisfactory/pass" (2). A successful closing exam cannot be re-taken.
- (14) The final grade of the closing exam is the arithmetic mean of the grades of all parts of the closing exam. The final grade of the closing exam is announced by the chair of the Closing Examination Board.
- (15) The grades/evaluation of the closing exam:
 - 2.00 – 2.90: satisfactory,
 - 2.91 – 3.50: average,
 - 3.51 – 4.50: good,
 - 4.51 – 4.99: excellent,
 - if the grade of each part is excellent: distinguished.
- (16) If the evaluation of any part is "fail", the student has to retake the part of the exam which was unsuccessful. At the Faculty of Medicine, if the written or the oral part of the closing exam is evaluated as "fail", the student has to retake both parts of the closing exam. This closing exam may be retaken twice only. Retaken closing exams may only be retaken in the following closing exam period. Credit value cannot be attributed to the closing exam. If the student/candidate has used the possibilities to retake any part of the closing exam as defined in this paragraph, and the partial exam remains unsuccessful, the whole closing exam has to be retaken.
- (17) In case of unsuccessful written closing exam, the student cannot take the oral part, although, he/she may take the practical part of the closing exam; if the practical part is successful, this part of the final exam does not have to be retaken. If it is unsuccessful, the student cannot take the oral theoretical closing exam.
- (18) If the student has not taken a successful closing exam until the termination of his/her legal relation (student status), he/she may attempt to retake the closing exam in any closing exam period after the termination of his/her legal relation. If the closing exam is taken later, the student cannot be obliged to take any complementary tests; however, the closing exam has to be taken according to the rules regarding the closing examination prescribed in the training and output requirements applicable at the time of the exam. Students who started their studies after September 1st 2012 may not take the closing exam after the end of the fifth year from the termination of their student status.

11. The Diploma/Degree

Article 47 [General Regulations Regarding the Diploma/Degree]

- (1) The degree/diploma is an authentic/legal document with the crest of Hungary which contains the name and the identification number of the issuing higher educational institute, the number of the diploma, the name, maiden name, in addition to the place and date of birth of the diploma's owner, the level of education, the given grade and faculty, the name of the qualification, the grade of the degree, the place, month and day of the issue, the classification of the professional qualification according to the Hungarian Qualification Framework, European Qualification Framework, in addition to the period of the training regarding the requirements of training and graduation. Additionally, It has to contain the original signature of the head of the institution – the head of the institution is determined in accordance with the Organizational and Operational Regulation – and the imprint of the seal of the higher education institute.
- (2) The prerequisite of issuing the diploma, which certifies the end of the higher educational studies is a successful closing exam, in addition to the successful language exam in accordance with the requirements of training and graduation. In order to issue the diploma, the student is obliged to present legal documentation which certifies, that
 - a) a successful general language exam was taken at at least intermediate "C" level, or complex high intermediate "B2" level in bachelor training,
 - b) a successful state-approved or equal language exam was taken in accordance with the requirements of training and graduation.
- (3) At the Faculty of Pharmaceutical Sciences, a further condition of issuing the diploma is a successful terminological final language exam in English or German language.
- (4) The diploma must be issued and handed out within 30 days after the legal document of language exam certification defined in paragraph (2) was presented. If the student already presented the certification defined in paragraph (2) at the time of the closing exam, the diploma must be issued within 30 days after the successful closing exam was taken.
- (5) If the diploma is not issued because the language certificate wasn't presented, the higher educational institute provides a certificate. This document does not certify qualification or possession of professional knowledge and only certifies a successful closing exam. The Registrar's Department is responsible for issuing and registering this certificate.
- (6) The diploma must be issued in Hungarian and English, or in Hungarian and Latin, in Hungarian and Nationality language in case of a Nationality language course, Hungarian and the language of the training if the training is not in Hungarian.
- (7) The diploma supplement must be issued, as defined by the European Commission and the European Council, in Hungarian and in English, and in the case of nationality training at the request of the student, in the language of the nationality concerned in bachelor-, master and higher vocational training. The diploma supplement is a legal document. Issuing the supplements and master sheet is the responsibility of the Registrar's Department.
- (8) A diploma issued in bachelor, master, undivided and vocational training entitles the owner to hold a job or pursue an activity as defined by law.
- (9) In a higher-level vocational training, the condition of issuing the diploma is a language exam certification if made compulsory by the requirements of training and graduation.
- (10) The degree levels certified by the university diplomas in English and Latin:
 - a) bachelor level "Bachelor" or "baccalaureus" (abbreviated: BA, BSc),
 - b) master level "Master" or "magister" (abbreviated: MA, MSc).
- (11) Students holding the "master" title use the phrase of "licensed" before the qualification certified by the diploma.
- (12) Persons who completed their studies at the Faculties of Medicine, Dentistry or Pharmaceutical Sciences are entitled to use the title of doctor. Their abbreviations: dr. med., dr. med. dent., dr. pharm.
- (13) At the student's request, after payment of expenses, the university shall issue an ornate diploma, which shall be signed by the Rector of the university, the Dean of the relevant faculty and the chair of the Closing Examination Board.
- (14) The certificate is signed by the Rector or the Dean and the chair of the Closing Examination Board.
- (15) If the student does not possess the language certificate at the time of the closing exam, and thus the diploma is issued after the closing exam period, and the chair of the Closing Examination Board is not employed by the university at the time of issuing, then, instead of the chair of the Closing Examination Board, the diploma may be signed
 - a) by the Vice Dean at the Faculty of Medicine, the Faculty of Health and Public Services, the Faculty of Dentistry, the Faculty of Pharmaceutical Sciences and the Faculty of Health Sciences,
 - b) by another member of the Closing Examination Board at the András Pető Faculty.
- (16) In case of successful closing exam, the diploma is handed out during a solemn graduation ceremony. The time of the graduation ceremony is determined by the Dean.

Article 48 [Special Regulations Regarding the Diploma and the Qualifications of the Diploma at the Faculty of Medicine, the Faculty of Dentistry and the Faculty of Pharmaceutical Sciences]

- (1) The qualification of the degree (diploma) should be based on the value calculated as described in paragraph (3) and rounded to the nearest hundredth.
 - a) The evaluation of the diploma at all trainings except the undivided master trainings:
 - aa) 4.51 – 5.00: excellent,
 - ab) 3.51 – 4.50: good,
 - ac) 2.51 – 3.50: average,
 - ad) 2.00 – 2.50: satisfactory;
 - b) at the undivided master trainings:
 - ba) 4.51 – 5.00: summa cum laude,
 - bb) 3.51 – 4.00: cum laude,
 - bc) 2.00 – 3.50: rite.
- (2) The subjects taken into consideration while evaluating the diploma, but which do not end with a final exam are determined by the curriculum.
- (3) Formula for calculating the evaluation of the diploma:

$$XD = \frac{\sum_n (X_i) + T + W + O + P}{n + 4}$$

XD : the number which is the basis of the evaluation of the diploma;
 $\Sigma_n(X_i)$: the sum of the required final exams and the subjects defined in paragraph (2);
 n : the number of the required subjects defined in paragraph (2);
 T : the grade (5-point-scale) of the thesis;
 W : the grade of the written part of the closing exam;
 O : the grade of the oral part of the closing exam;
 P : the grade of the practical part of the closing exam.

- (4) The evaluation of the diploma is calculated by the Registrar's Department.

Article 49 [Special Regulations Regarding the Diploma, and Evaluations of the Diploma at the Faculty of Health Sciences]

- (1) The evaluation of the diploma is based on the arithmetic mean of the following:
 - a) the grades of the individual parts of the closing exam,
 - b) the grade of the thesis,
 - c) the simple arithmetical mean of the grades of the possible final exams,
 - d) the credit weighted average for the whole period of study.
- (2) The 5-point-scale qualification of the diploma is based on the arithmetic mean value rounded to the nearest hundredth. The qualifications:
 - a) 4.51 – 5.00: excellent,
 - b) 3.51 – 4.50: good,
 - c) 2.51 – 3.50: average,
 - d) 2.00 – 2.50: satisfactory.
- (3) A degree with honors is awarded to a student if he/she has achieved "excellent" grades in all parts of the closing examination, has an "excellent" grade for his/her thesis and all of the final exams, has a credit weighted average of at least 4.00 for the entire study period and has not got any grade below "average".

Article 50 [Special Regulations Regarding the Diploma, and the Evaluation of the Diploma at the Faculty of Health Sciences and Public Services]

- (1) The evaluation of the diploma is calculated by the teaching administrator of the educational unit and it is verified by the Dean's Office.
- (2) The method of calculating the evaluation of the diploma is the following:
 - a) **At the program of Science in Health Services Management (BSc)**, the evaluation is the rounded arithmetic mean of the grades of the synthesizing exams, of the thesis defense and of the two parts of the closing exam.

$$XD = \frac{\sum_n (X_i) + T + B + H}{n + 3}$$

- aa) XD : the number which is the basis of the evaluation of the diploma,
- ab) $\sum_n (X_i)$: the sum of the grades of the subjects in the model curriculum, which lead to the complex, synthesizing, problem-oriented assessment of the knowledge of several subjects (Introduction to Information Technology III: Computer-networks; Medicine (4)-Clinical Basics, Health Science (7) – Health Management, Digital Healthcare (7) - Integrated Health Systems)
- ac) n : the number of complex exams indicated in the point above,
- ad) T : the grade (5-point-scale) of the thesis,
- ae) B : the grade of the oral exam of the basic subject (part of the closing exam),
- af) H : the grade of the oral exam of Health Informatics (part of the closing exam).

Five-point scale qualification:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- b) **At the Executive Health Services Management Postgraduate Specialization Program**, the evaluation of the diploma is based on the weighted mean of these two values: the arithmetic mean of all grades obtained during the entire course of studies (at 60% weight), and the grade of the closing exam (at 40% weight).

Three-point scale qualification:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.00 – 3.50: satisfactory.

- c) **At the Quality and Patient Safety Management Postgraduate Specialization Program**, the grade of the diploma is the rounded arithmetic mean of the grades of the thesis defense and of the closing exam.

Evaluation:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- d) **At the Master Course in Mental Health-Oriented Family Studies**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis, of the grade of the defense, and of the oral exam) and of the credit-weighted mean of all the grades.

Evaluation:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- e) **At the Master of Arts in Social Works (MA)**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis, of the grade of the defense, and of the oral exam) and of the credit-weighted mean of all the grades.

Evaluation:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- f) **At the Specialist Training Course in Integrated Parent-Infant Consultation**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis and of the grade of the defense) and of the credit-weighted mean of all the grades.

Evaluation:

4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- g) **At the Specialist Training Course in School Social Work**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis and of the grade of the defense) and of the credit-weighted mean of all the grades.
Evaluation:
4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.
- h) **At the Specialist Training Course in Communal and Family Meditation (Balassagyarmat)**, the simple arithmetic mean of the grade of the closing exam (mean of the grades of the examinations, of the grade given by the opponent of the thesis and of the grade of the defense) and of the credit-weighted mean of all the grades.
Evaluation:
4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.
- i) **At the Specialized Training Program for Preparation for the Lactation Consultant**, the simple arithmetic mean of the grade of the closing exam (the grade of the defense) and of the mean of all the grades.
Evaluation:
4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.
- j) **At the Special Qualification Program in Mental Health**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis and of the grade of the defense) and of the simple arithmetic mean of the grades of subjects concluded with an exam.
Qualification:
4.51 – 5.00: summa cum laude,
3.51 – 4.50: cum laude,
2.00 – 3.50: rite.
- k) **At the Special Qualification Program in Mental and Spiritual Counseling**, the simple arithmetic mean of the grade of the closing exam (mean of the grade given by the opponent of the thesis and of the grade of the defense) and of the credit-weighted mean of all the grades.
Evaluation:
4.51 – 5.00: excellent,
3.51 – 4.50: good,
2.51 – 3.50: average,
2.00 – 2.50: satisfactory.

- (3) The methods for calculation of the evaluation of the diploma are also described in the previous curricula, and in case of discontinued programs, they must be published on the website of the educational unit responsible for teaching.

Article 51 [Special Regulations Regarding the Diploma, and the Evaluation of the Diploma at the András Pető Faculty]

- (1) The evaluation of the diploma is given by the grades of the closing exam, of the final exams and the credit weighted average of complex closing work and the school teaching practice/kindergarten methodological practice (OPGY 303, 304, 305, 306, 307, 308 TPGY 3031, 3041, 3050, 3061, 307, 308).
- (2) According to the mean value calculated as shown above, the evaluations of the diploma are the following: honored: 5.00; excellent: 4.51 – 4.99; good 3.51 – 4.50; average: 2.51 – 3.50; satisfactory 2.00 – 2.50.
- (3) Diploma with honors is awarded to the student who has “excellent” grades for the closing exam, the result of the complex closing work, the final essay and the school teaching practice and the grades for all final exams are “excellent”, and the grades of the other exams are at least average.
- (4) Graduate students may get a diploma with honours if the student has a high school closing exam, a complex closing work and final exam of “excellent” grade, and a mean of grades of at least 4.51 without any grade below “average”, as shown in their teacher training book.

12. Deviation from the Provisions of the Regulation

Article 52 [Exercises of Special Permission]

- (1) During the course of training, the committee competent in educational and examinational affairs may grant a derogation from a provision of these Regulations which does not impose an academic or financial obligation. Special permission can be exercised in relation to the order of study, without affecting the content of the study requirement.
- (2) The special permission defined in paragraph (1) may be provided
 - a) once for subjects in the model curriculum of the 1-4 semesters and once for subjects in the model curriculum of semester 5 and beyond, in the case of undivided training;
 - b) once in the whole training in the cases of basic and divided master courses.
- (3) The special permission not used in the theoretical training, described in point a) of paragraph (1) shall not be transferable to the second half of the training. Special permission not used in the bachelor training is not transferable to the master training.
- (4) The decision on a special permission shall stipulate the terms of the approval and shall state that no further benefits may be granted as special permission during that period.

Article 53 [Vis Maior]

- (1) In cases involving a wide range of students, where special permission could be provided if it was applied for, and also upon ex officio proceedings in cases of vis major, specific derogations from the rules of these Regulations are possible.
- (2) The ex officio proceedings described under paragraph (1) are initiated by the Vice Rector for educational affairs with the consent of the Student Council.
- (3) Where the authority competent for the derogation cannot be determined, the Vice Rector for educational affairs shall act with the consent of the Student Council.

13. Provisions for Students with Disabilities

Article 54 [Provisions Applicable to Students with Disabilities]

- (1) One person may pursue studies in higher education in Hungarian (partly) state-funded training, for a period totaling twelve semesters in undivided, bachelor and master training. Support is limited to a maximum of fourteen semesters if the student is enrolled in full-time training and the training requirements exceed ten semesters.
- (2) The support period as defined in paragraph (1) may be extended for a student with a disability by up to four semesters by the higher education institution. This preference may be exploited for the achievement of more than one degrees but the period of allowance on this basis may not exceed four semesters.
- (3) Further provisions for students with disabilities are included in the university's Equal Opportunities Regulations.

14. Remedies in Educational Matters and the Obligations of the Institution to Provide Information

Article 55 [Right for Remedy in Educational Affairs]

- (1) The provisions relating to the appeals procedure are set out in Chapter III of the Organizational and Operational Rules of Semmelweis University. Part 7 (Remedies Regulations).
- (2) According to the Act on National Higher Education, all proceedings in the educational affairs of the students, in particular those which fall within the competence of the committee competent in educational and examinational affairs under these Regulations, are considered as first order decisions. In case of doubt, the committee competent in educational and examinational affairs may act if it is necessary to make a decision in a matter of a procedural nature related to the continuation of the student's studies, the progress of his or her studies and the acquisition of knowledge/qualifications, if there are no legal provisions or other bodies responsible for the matter.

Article 56 [The Obligations of the Institution to Provide Information and Consultation]

- (1) The Dean of the faculty ensures that the students starting their studies at the university are given access to the rules of study and examinations as well as the training information before enrollment. The provisions on the content and publication of the study guide are set out in the Act CCIV/2011 on National Higher Education, on the implementation of certain provisions of Act No. (IV.9.) (Hereinafter: NHE Act provisions) and can be found in the homepage of the faculty.
- (2) The rules of study and examination shall be published in English and German as well.
- (3) The university publishes a single study leaflet per academic year in Hungarian, English and German, containing relevant information for the academic year. The faculty may also publish certain information related to the institutional brochure on its own website in addition to the textbook.

15. Final Provisions**Article 57 [Final and Transitional Provisions]**

- (1) For matters not covered by these Regulations, the provisions of the Act on National Higher Education and 87/2015. (IV. 09.) Government Decree (NHE Act provisions) and the provisions of other legal acts shall prevail.
- (2) These Regulations shall enter into force on the date of their adoption by the Senate, and shall at the same time be subject to Part III of the Organizational and Operational Rules of the Semmelweis University. Part III/I, III/II, III/III and III/IV. Chapters 1 to 2 are repealed. The Code shall apply for the first time for the fall semester of the 2019/2020 academic year, including the time between the adoption of the Code and, if later, the date of agreement by the Student Council. At the discretion of the Rector or the Vice Rector for educational affairs, or if it is more favorable to the student, the provisions of the Code may be applied to pending matters.
- (3) For the academic year 2019/2020, the specific provisions of these Regulations concerning the organization of exams in the field of blended education shall not apply to the subjects included in the standard curriculum of general medical practitioners for the fifth year.
- (4) Article 18(4) applies to existing multiple entitlements, the invitation must be made within a reasonable time after the entry into force of the bylaws, and may be announced by the university in the form of a notice.
- (5) Where the content of the study obligations are defined in these Regulations, students who commenced their studies prior to the date of entry into force of the Regulations shall continue to be subject to the obligation set out in the Regulations in force at the time of commencement, but the faculty may apply the new study requirements.
- (6) The deadlines passed or nearly passed at the time of entry into force of these regulations, can be replaced individually by new reasonable deadlines by the Rector or the Dean.
- (7) The new obligation sets forth in these regulations for a university body or student shall be fulfilled to the extent expected in the fall semester of the 2019/2020 academic year, with a view to its full implementation.
- (8) When examining the existence of the conditions necessary for granting a special permission, previous special permission should be disregarded if, under these Regulations, the decision could have been taken without exercising a special permission – a case which may fall within the scope of Article 51 only if the Vice Rector for educational affairs or the committee competent in educational and examination affairs decides individually.
- (9) Curricula and subject programs shall be subject to review, by 30 June 2020, to ensure that they comply with the provisions of these Regulations. Provisions of previously adopted subject programs, subject requirements systems that are contrary to the provisions of these Regulations shall not be applied or shall be applied to such an extent and in such a manner as to comply with these Regulations.

PLAGIARISM DECLARATION

at the Faculty of Medicine

(Declaration on compliance with regulations on preparing thesis work)

I, the undersigned, name:

(Neptun code:) hereby declare by signing this declaration that this thesis work, entitled:

..... "

.....

..... "

is my own work, and I adhered to the provisions of Act LXXVI of 1999 on Copyright in the preparation of the thesis work and respected the rules laid down by the University.

I acknowledge by signing this declaration that Semmelweis University refuses accepting the thesis provided it can be proved that this thesis work was not carried out by me or violation of copyright law arises with regard to the thesis.

I am also aware, that the authorization holders may take action against me because of violation of copyright law, which may result in legal consequences, including consequences of civil law, infringements act and criminal law.

Budapest,, 20.....

.....

student's signature

Rectorial Circular

on the independent work of students and on certain questions concerning lecture and practice policies

In order to meet the requirement for independent student work and to ensure the smooth functioning of lectures and practices, I hereby draw the attention of the students of Semmelweis University to the following:

- I. In the course of testing one's knowledge and practical skills, it is prohibited, under disciplinary liability, to use any unauthorised material, or to secure any illicit advantage. For the purpose of this provision, advantages ensured to disabled students in accordance with legal provisions or university regulations and allowances based upon individual decisions made in accordance with Chapter III Part III of The Rules of Operation and Organisation of Semmelweis University qualify as allowed advantages.
- II. The independent creation of original work, as well as the true and accurate citation, and the precise and complete indication of the sources used are not only scientific requirements, but also obligations arising from legal regulation.

Intellectual property is protected by the laws of Hungary. The content of this protection is defined particularly by the Copyright Act, the acts on inventions and patents, and on trademarks and the Civil Code of Hungary. The intellectual property of another person is only allowed to be used in accordance with these regulations.

All creations of literature, science and art shall fall under copyright protection as defined by Act No LXXVI of 1999 on copyright. According to this act, from a work disclosed to the public any part may be cited by indication of the source and naming the author indicated therein. Such citation shall be true to the original and its scope shall be justified by the nature and purpose of the borrowing work. The free use is permitted only so far as it does not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interests of the author, and it is in compliance with the requirements of fairness and is not designed for a purpose incompatible with the intention of free use.

The consequences of the abuse of rights relating to intellectual property are provided by law, thus the abuse of these rights may also fall under disciplinary liability.

- III. In the absence of previous authorization, it is prohibited, under disciplinary liability, to take photos or make video or sound recordings at lectures and practices. In addition, any misuse of the likeness or recorded voice of another person shall be deemed as a violation of inherent rights and may result in other consequences. The disclosure of likeness or recorded voice of another person shall be authorized by that person.

I request all students to take notice of the above.

Attention to Students of Foreign Language Programs at Semmelweis University

In recent years, Semmelweis University has built a valuable student community by maintaining high academic standards and placing much emphasis on the ethical integrity of our education. The overwhelming majority of our students appreciate our efforts. Unfortunately, a small minority does not want to accept our ethical guidelines, and tries to take undue advantage at exams by using unacceptable techniques.

We therefore do implement the following sanctions:

Against students who are found at exams possessing forbidden items, including electrical devices, such as mobile phones, ipods, etc. a disciplinary action will be initiated that can end with immediate discharge with disgrace from Semmelweis University. By implementing this rule, we wish to preserve the academic and material value of the Semmelweis Diploma.

NEPTUN.NET Unified Education System

Summary for Students

At Semmelweis University, the education system NEPTUN.Net is used for performing administrative tasks related to education. The users of the system – registry clerks, faculty secretaries, instructors and students – have different authorities to access the information stored in the system.

For the students of the institution, the system provides the following functions:

- To check their personal data and information related to their studies,
- To register for subjects,
- To register for exams,
- To check grades entered into the system,
- To monitor the grants transferred,
- To get information on their payment obligations,
- To manage their finances,
- To receive messages within the system from registry clerks, secretaries of institutions and instructors.

You get your user ID and password to the NEPTUN.Net system from the Dean's Office or the Registry of the Faculty where you have been admitted. Users with students' rights may only manage their own data. In order to prevent unauthorized access, it is very important that you change your password from time to time. It is recommended that you change the password immediately upon entering the system for the first time. The password should be minimum 6 characters long, consisting of letters, numbers or a mixture of both.

Students can access the NEPTUN.Net system on any computer located in students' terminal rooms (in the Student Centre /NET/ and in the Central Library) or any other computer with Internet access using a browser (Internet Explorer 7 or Mozilla Firefox version 2) from the official university Neptun Portal (<http://net.neptun.sote.hu>).

(For a detailed description of the Students' WEB please check the Neptun Portal – Support / Neptun usage / Aids by role / Aids for students).

Entering the system

On the Neptun Portal, click on the Student icon to enter. Then choose the server you wish to use. Enter the Neptun code (ID) and the password on the window which appears.

Once you enter you can choose from the following data groups at the top of the page:

Personal data, Studies, Subjects, Exams, Finances, Information, Administration

Upon entering the Neptun.Net system, students have to perform the following operations during a term:

- Registration
- Subject registration
- Exam registration

Registration

You can access the registration function in the Administration menu. Here you can register for the next term by clicking on the link "Registration". On the page "Registration requests", when clicking on "New" in the status column of the current semester, a window is displayed where you have to declare whether you choose to register with an "Active" or a "Passive" status. After you have chosen the appropriate option, click on the button "I declare". (Such registration is only available if Registration period is displayed under "Periods" in the "Information" menu! If you have not chosen any course for the semester yet, but you intend to register with an "Active" status, the programme will ask you to make sure whether you really want to continue the registration process. If you choose the option "no" at this stage, this means that registration will not be completed, and before you do so, you can take up your courses. If you choose "OK", you can continue registration. Naturally, you are free to take up courses afterwards.)

Subject registration (choosing subjects, choosing courses)

Choose the link "Subject registration" in the "Subjects" menu.

- 1. Displaying the list of subjects:** Select the appropriate semester (e.g. 2021/22/1) and the curriculum, then select "Subject list of the chosen curriculum" under „Subject type" to display obligatory and elective subjects. The option "Other elective subjects" may be used if the institution concerned manages its elective subjects separated from the curricula. If you do not find any subject in this list, this only means that at your institution these elective subjects are also integrated into the curricula. In this case, you should choose the option "Subject list of the chosen curriculum" at this question. By ticking "Show only those subjects that will be launched" you can make sure that only those subjects appear in the displayed subject list which will be launched in the semester selected. You can display the subject list filtered according to the conditions set by clicking on the "List subjects" button.
- 2. Display, search and ordering options in the subject list:** On the top of the list you can set the number of subjects to be displayed on one page. If the list is longer than one page, you can use the two-way arrows on the top of the list or the drop-down menu to turn pages. By clicking on the printer icon, you can print the page displayed. When you find the subject required, click on any detail and all details of the selected subject will be displayed in a pop-up window.
- 3. Subject details / Current courses tab:** Here you can see the courses launched in the given semester for the selected subject. You can now choose the subject and its course or courses. You can choose the courses by marking the checkbox on the right of the course list, then confirm your choice by clicking on "Save" at the bottom of the page. You have to choose more than one course for the same subject if more than one course type (e.g. theoretical and practical) are announced. In this case, you need to choose one course for each course type. This is not true for exam courses which must be chosen independently in all cases, which means that you cannot choose an exam course and another course type for the same subject at the same time. Course registration will only be successful if:
 - you have fulfilled the requirements for subject and course registration,
 - none of the courses selected is booked out (in the students/limit column the number of students is under the limit),
 - **you have selected one course for each course type (e.g. theoretical, practical),**
 - **it is preliminary or final subject and course registration period,**
 - you have not completed the subject so far.
 For more information on a given course, click on any detail of the given course in the list to display the course information in a new pop-up window.
- 4. Deregistering subjects:** If for any reason you would like to drop a chosen subject, you can do so under "Registered subjects" in the "Subjects" menu. On this page you can see the subjects you have chosen in the current registration period; you can change courses or deregister subjects here. If in any subject line you click on "Deregister subject", the system will first ask whether you really want to drop the given subject and if you answer yes, the subject will be dropped and deleted from the list of registered subjects. Naturally, this means that your registration for the courses of the deregistered subjects is also deleted and you will be informed of this. (Subject deregistration is possible during the preliminary or final subject or course registration period.)
- 5. Changing courses:** If you want to change the course(s) you have chosen in a given subject, you can do this by clicking on any detail of the given subject to display the pop-up window "Subject details". Here on the "Current courses" tab in the last column of the list you have to select the course(s) required and unmark the course(s) to be dropped, then confirm the change by clicking on the „Save" button. The system will report on the change or the reasons for potential errors.

Exam registration

You can find “Exam registration” in the “Exams” menu. On this page you can register for exams or cancel your registration. In the exam list, exams which you have already registered for will appear in blue. To cancel an exam registration, go to the „Selected exams” menu.

1. **List exams:** On entering the page for the first time all future exam dates announced in the current semester will appear, but you can filter the list. If you only want to see the exam dates of a given subject, select the subject from the “Subjects” roll-down menu, then click on the button “List exams”.
2. **Exam registration:** To register for an exam, click on “Register” in the line of the given date. The programme will report on the success or failure of exam registration.
3. **Canceling exam registration:** If you register for an exam by mistake or you simply change your mind and want to cancel your registration, click on „Cancel” next to the given exam. (Normally this can be done prior to the exam within the cancellation deadline.)
4. **Payment of retake exam fee:** By clicking on “Payment” under “Finances”, you will be taken to the page where the list of settled and payable items is displayed. Here you can also fulfill your financial obligations. On the “Payment” tab, click on the “Transcribe item” button and on the appearing “Transcribe item” window, enter the payment title (retake exam), then select the subject for which you would like to transcribe the exam fee from the roll-down list. Finally, click on the „Create item” button. You can take over the invoice of the item created in the Dean’s Office. To list current items, select the current semester using the “Semester” roll-down menu under “Filters” on the 1.) “List items” tab. (Items you have displayed are marked as “Own item” in the “Status” column.) To view the details of a given item, click on “Details” in the line of the item concerned.

Message management

During term time, students may receive messages on various topics. This menu can be found on the left-hand side of the page. Here you can see the messages sent to the student by the Dean’s Office clerk in charge of his/her year or the instructor of a chosen course. You can view the text of the message on a new window by clicking on the required topic in the list of messages.

The NEPTUN system assists students and university employees in the accurate and effective performance of administrative tasks related to their studies. **In order to ensure faultless operation, it is indispensable that authority rules are complied with and that accurate data is provided. Therefore, please note that data changes or wrong data must be corrected within 8 days using „Modify data”.**

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Prof. Dr. Károly Lapis, Prof. Dr. Béla Szende, Prof. Dr. András Jeney,

Prof. Dr. László Kopper

Dr. Attila Zalutnai, Dr. Judit Pápay, Dr. Lilla Reiniger, Dr. Gergely Rácz (tutor)

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Professor Emeritus:

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Background The Department of Neurosurgery was established in 1977 and is operated by the National Institute of Neurosurgery, which is a stand-alone neurosurgical hospital. It has 156 beds in its wards, which includes the only paediatric neurosurgical department in Hungary. The National Institute is the third largest neurosurgical service-provider in Europe.

Profil The Department of Neurosurgery is involved in virtually the entire spectrum of neurosurgical practice. All other specialities needed for modern neurosurgery (e.g. neuroradiology, neuroophthalmology, neurootology, electrophysiology, neuropathology and neurology) are also present, and are organised in a multidisciplinary structure. The biggest neuro-intensive care department, with separate units for paediatric cases, is maintained and operated by the Department.

Education Lectures are given on neurosurgery to medical undergraduates in Hungarian and English. Postgraduate resident training is also provided, in addition to further training courses.

Health Care Annually, around 3500 major operations are performed in five theatres, including endovascular interventions, stereotactic surgery, endoscopic and laser surgery, neuro-implantation, in addition to the so-called classical micro-neurosurgical operations. The outpatient turnover is 50,000. The Department has the highest case mix index in Hungary, indicating the most complicated cases, which makes a unique background for both undergraduate and postgraduate teaching.

Research Multidisciplinary organisations with a high patient turnover are ideal for basic and clinical research. Cerebral vascular malformations, tumours of the base of the skull, pituitary adenomas, functional neurosurgery and interventions, neurooncology, spine surgery as well as intra- and post-operative patient monitoring are the major fields of interest for the Department's 98 staff members (of which 23 are neurosurgeons, including residents).

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Associate professor:

Dr. Antal Hamvas, Dr. József Pánovics,

Dr. Attila Keszthelyi

Assistant professor:

Dr. Sándor Lovász, Dr. Miklós Szűcs, Dr. Krisztina Szabó, Dr. Lajos Joós

Assistant lecturer:

Dr. Stelios Mavrogenis, Dr. András Ruzs, Dr. Attila Majoros, Dr. Péter Riesz,

Dr. Erzsébet Péntes, Dr. Gergely Bánfi

Clinical doctor:

Dr. András Horváth (tutor)

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Head of the Department:

Prof. Dr. Barna Vásárhelyi M.D., Ph.D., D.Sc.

Tutor:

Prof. Dr. Antal Szabó Ph.D., D.Sc.

Department of Military-, Disaster- and Order Enforcement Medicine

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Head of the Department:	Prof. Dr. János Gál
Deputy head of Department:	Dr. György Orgován associate professor
Academic advisor:	Prof. Dr. Péter Sótónyi rector emeritus, Dr. László Svéd
Executive of educational affairs:	Dr. László Liptay
Clinical specialist:	Dr. Attila Faggyas, Dr. Gábor Orosz
International affairs:	Balázs Marczin
Head lecturer:	Mrs. Klára Szalay Nagy

The department was founded on July 1st, 1970 (EüM 43/1969) – first under the name of Department of Military Medicine (as part of the Institution of Medical Training), then as the Institution of Military Medicine, and later as the Institution of Military and Disaster-Medicine. From 2001 it was named ÁOK (Faculty of Medicine) Department of Military and Disaster Medicine, Semmelweis University. The name has undergone further changes since July 1st, 2004 as university reorganization affected and integrated a number of sub-divisions (the former Department of Oxyology and the Department Group of Emergency Care Training) into this department. Since March 27th, 2014, by legislation of the senate (40/2014), the present name of the institution is the **Department of Military-, Disaster- and Order Enforcement Medicine**. It is currently located at the Medical Centre, Hungarian Defence Forces complex, where the functionality of the institution is provided by a series of separate contracts of cooperation.


PROFESSIONAL PROFILE

- Coordination, education and science-related questions regarding military and disaster medicine
- Maintaining an established and widely expanding network of local and international cooperation in the fields of military, disaster, and order enforcement medicine
- Continuing the long-running collaboration between the NATO Centre of Excellence for Military Medicine and Semmelweis University
- Contract-governed scientific collaboration between departments of the National University of Public Services and Semmelweis University
- The observing and analysing of disasters either occurring in the present or that are historically documented throughout the World - and application of the findings under Hungarian circumstances
- Establishing training programmes related to the department's field and organising such courses for the doctors and professionals, both civilian and military-employed.
- Providing the graduate education course "The Medical Fundamentals of Disaster Resolution" in Hungarian, English and German languages
- The education of trainee specialists at both theoretical and technical levels, coordination of these projects
- Preparation of candidates for the Military-, Disaster and Order Enforcement exam
- Hosting Qualification Examinations and organising the related preparation course

Faculty of Dentistry

Department of Prosthodontics


1088 Budapest, VIII. Szentkirályi u. 47.

: 318-0011

Head of the Department:	Prof. Dr. Péter Hermann D.M.D., M.Sc., Ph.D.
Associate professor:	Dr. Péter Kivovics, Dr. András Kóbor, Dr. Melinda Madléná, Dr. Tibor Károly Fábíán, Dr. Zsuzsa Szántó, Dr. Judit Borbély (tutor 1 st year)
Assistant professor:	Dr. János Gerle, Dr. László Kádár, Dr. Endre Somogyi, Dr. Katalin Károlyházy (tutor 5 th year)
Assistant lecturer:	Dr. Péter Faluhelyi, Dr. Marianna Jáhn, Dr. Katalin Kalocsai, Dr. Mercédesz Linninger, Dr. Krisztina Mikulás, Dr. Zsuzsanna Tóth, Dr. Pál Sajgó, Dr. Katalin Nemes, Dr. Dénes Palaszko (tutor 2 nd year, 3 rd year 2 nd semester), Dr. Ildikó Bercze (tutor), Dr. Alexandra Czigola
Clinical specialist:	Dr. Péter Schmidt, Dr. János König (tutor)

Independent Section of Radiology


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: 459-1500 ext 59128

Head of the Department:	Prof. Dr. Csaba Dobó Nagy D. M. D.
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Department of Pedodontics and Orthodontics

1088 Budapest, VIII. Szentkirályi u. 47.

: 318-0011

Head (assigned) of the Department:	Dr. Noémi Katinka Rózsa D.M.D., Ph.D., M.Sc.
Professor Emerita:	Prof. Dr. Ildikó Tarján
Associate professor:	Dr. Katalin Gábris, Dr. Gergely Balaton
Assistant professor:	Dr. Miklós Kaán, Dr. Ibolya Kéri
Assistant lecturer:	Dr. Mária Budai, Dr. Beáta Szádeczky, Dr. Adrienn Barta, Dr. Attila Soós, Dr. Kinga Deseő

Department of Conservative Dentistry

1088 Budapest, VIII. Szentkirályi u. 47.

☎: 318-0011

Head of the Department:

Professor Emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

Dr. János Vág D.M.D., Ph.D.

Prof. Dr. Árpád Fazekas

Dr. Zsuzsanna Tóth, Dr. Károly Bartha, Dr. Zsolt Lohinai (tutor),

Dr. med. habil. Melinda Madléna

Dr. Júlia Nemes, Dr. János Vág, Dr. Milán Gyurkovics, Dr. Enikő Szabó

Dr. Anna Herczegh, Dr. Krisztina Árendás, Dr. Réka Fazekas, Dr. Sándor Mikó,

Dr. Andrea Demeter, Dr. Zsolt Nagy, Dr. Sarolta Pozsgay, Dr. Györgyi Szekeres,

Dr. Gergely Pataky, Dr. Edit Tóbiás, Dr. Izabella Nagy, Dr. Eszter Szalay

Department of Oral Biology

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☎: 210-4415

Head of the Department:

Full professor:

Professor Emeritus:

Associate professor:

Assistant professor:

Dr. Ákos Zsemeri Ph.D.

Prof. Dr. Gábor Varga, Prof. Dr. György Simon

Prof. Dr. Tivadar Zelles

Dr. József Blazsek, Dr. Beáta Kerémi (tutor – 2nd semester)

Dr. Kristóf Kádár (tutor – 1st semester)

Department of Oral Diagnostics

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Head of the Department:

Prof. Dr. Csaba Dobó Nagy D.M.D.

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Head of the Department:	Dr. Zsolt Németh D.M.D., Ph.D., med. habil.
Tutor:	Dr. Attila Szűcs associate professor, Ph.D.
Full professor:	Prof. Dr. Zsuzsanna Suba, Prof. Dr. József Lajos Barabás
Professor Emeritus:	Prof. Dr. György Szabó, Prof. Dr. Tamás Divinyi
Associate professor:	Dr. Árpád Joób-Fancsaly, Dr. Márta Ujpál
Assistant professor:	Dr. Sándor Bogdán, Dr. Tamás Huszár
Associate lecturer:	Dr. Ferenc Koppány, Dr. Kinga Körmöczi, Dr. Mihály Vaszilkó
Clinical doctors:	Dr. József Béla Barabás, Dr. Péter Barabás, Dr. Kinga Bérczy, Dr. Gergely Csókay, Dr. Katalin Csurgay, Dr. Iván Decker, Dr. Fanni Sára Kálmán, Dr. György Komlós, Dr. Zsófia Rónaszegi-Somogyi, Dr. Tatjana Skolnyik, Dr. Ilona Szmirnova, Dr. Szonja Vingeder

Department of Periodontology

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Head of the Department:	Prof. Dr. Péter Windisch D.M.D., D.Sc.
Professor Emeritus:	Prof. Dr. István Gera
Full professor:	Dr. Ferenc Dóri
Associate professor:	Dr. Bálint Molnár
Assistant professor:	Dr. Attila Horváth
Assistant lecturer:	Dr. Pál György Nagy (tutor)

Department of General Dental Preclinical Practice

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Head and tutor of the Department:	Prof. Dr. Krisztina Márton D.M.D., Ph.D.
Assistant lecturer:	Dr. Anna Dézsi
Clinical specialist:	Dr. Zoltán Kovács, Dr. Tamás Demeter (tutor)
Resident:	Dr. Alexandra Kovács

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☎: 317-6600, 317-2222; 60749

Head of the Department:	Dr. Orsolya Németh D.M.D., MDSc., Ph.D.
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Faculty of Pharmaceutical Sciences

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☎: 476-3600

Head of the Department:

Full professor:

Associate professor:

Assistant professor:

Assistant lecturer:

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Prof. Dr. Zoltán Vincze Ph.D.

Dr. Lajos Gergő, Dr. Balázs Hankó, Dr. Ágnes Mészáros (tutor)

Dr. Mária Nikolics, Dr. Andrea Meskő (tutor), Dr. Judit Balogh

Dr. Mónika Hantos

Institute of Pharmacognosy

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☎: 266-0120, 317-2979

Head of the Department:

Full professor:

Professor Emerita:

Professor honorary:

Associate professor:

Assistant professor:

Assistant lecturer:

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Prof. Dr. Anna Blázovics

Prof. Dr. Éva Szőke

Prof. Dr. Ágnes Kéry

Dr. László Kursinszki

Dr. Andrea Böszörményi

Dr. Anna Bucsy-Sólyomváry (English coordinator), Dr. András Darcsi

Dr. Eszter Riethmüller

Department of Pharmaceutics

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Head of the Department:

Professor Emeritus:

Associate professor:

Assistant professor:

Senior research scientist:

Assistant lecturer:

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Dr. Imre Klebovich

Dr. Krisztina Ludányi

Dr. Emese Bertalan-Balogh (tutor of the 3rd, 4th and 5th years),

Dr. Livia Budai, Dr. Marianna Budai, Dr. Nikolett Kállai-Szabó, Dr. Mária Hajdú

Dr. Borbála Dalmadi-Kiss

Dr. Viktor Fülöp, Dr. Miléna Lengyel, Dr. Nóra Mike-Kaszás,

Dr. Noémi Niczinger, Dr. Zsófia Edit Pápay

Department of Pharmaceutical Chemistry

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Emeritus Professor:

Associate professor:

Assistant lecturer:

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Prof. Dr. Béla Noszál

Dr. Károly Mazák, Dr. Márta Mazák-Kraszni, Dr. László Örfi,

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	Dr. György Bagdy	☎ E-mail: szoko.eva@pharma.semmelweis-univ.hu
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Professor Emerita	Dr. Kornélia Tekes	☎ torok.tamas@pharma.semmelweis-univ.hu
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	Dr. Gabriella Juhász	☎ tothfalusi.laszlo@pharma.semmelweis-univ.hu
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The Department of Pharmacodynamics at the Faculty of Pharmaceutical Sciences was founded in 1979. The Department is responsible for the teaching of three obligatory subjects; the Pharmacology and Toxicology, the Basic Medical Pathophysiology, and the Drug Therapy in the undergraduate pharmacy program. We also teach elective subject and take part in the postgraduate education of pharmacists.

The Department is located on the 8th floor of the Nagyvárad Tér building (NET) of the University, but some of our offices and laboratories can be found on the groundfloor, on the 3rd floor and on the 11th floor.

Pharmacology and toxicology

This page contains informations for 7th and 8th semester pharmacy students of the English Program about *pharmacology and toxicology*. The thought in 112 lessons of lectures and 56 lessons of practice over two semesters on the basis of internationally recognized textbooks. The mechanism of action and pharmacokinetic properties of drugs as well as their clinical indications and adverse effects are emphasized. In the toxicology part in addition to the toxic effect of various drugs, environmental toxicology and the most common acute and chronic poisonings are discussed.

Requirements: Weekly 4 lessons of lectures and 2 lessons of practice in both semesters (7th and 8th). Exams: Practical mark (2 credit points) based on 2 midterm written exams in both semesters. Oral semifinal exam (4 credit points) at the end of 7th semester. Oral final exam (4 credit points) at the end of 8th semester.

Education materials published on the MOODLE site!

Basic medical pathophysiology

This page contains informations for 7th and 8th semester pharmacy students of the English Program about Basic medical pathophysiology. The taught in 56 lessons of lectures over 2 semesters. The program is based on the special demands of pharmacy students. Pathophysiologic basis of the common disorders is discussed to help the understanding the principals of (pharmaco)therapy.

Teacher and tutor: Prof. Kornélia Tekes

Requirements: Weekly 2 lessons of lectures in both semesters (7th and 8th).

Exams: Written semifinal exam (2 credit points) at the end of 7th semester. Oral final exam (2 credit points) at the end of 8th semester.

Drug therapy

This page contains informations for 9th semester pharmacy students of the English Program about Drug therapy. The subject is taught in 24 lessons and 24 lectures of practices. Evidence based pharmacotherapy of the most common disorders and the adverse effects and interactions of the used drugs are discussed. Information about the over-the-counter medications and treatment of chronic disorders are specially emphasized.

Requirements: Weekly 2 lessons of lectures and 2 lessons of practices in the 9th semester.

Exam: semifinal exam (4 credit points) at the end of 9th semester.

MTA-SE Neuropsychopharmacology and Neurochemistry Research Group

Duration of the project: 07.01.2013-06.30.2018

Link: <http://semmelweis.hu/gyogyszerhatastan/mta-se-research-group/>

The MTA-SE Neuropsychopharmacology and Neurochemistry Research Group supported by the Hungarian Academy of Sciences examines the different interactions of genetic and environmental factors involved in the development of depression using genomic and imaging methods.

NAP-2-SE New Antidepressant Target Research Group

Duration of the project: 2017.12.01.-2021.11.30.

Link: <http://semmelweis.hu/gyogyszerhatastan/nap-2-research-groups/nap-2-se-new-antidepressant-target-research-group/>

Supported by the National Research, Development and Innovation Office and as a part of the Hungarian Brain Research Program 2.0 the research group tries to identify new drug targets for the treatment of depression using genome-wide gene-environment interaction analysis (GEWIs).

The project based on the results of the previous *NAP-A-SE New Antidepressant Target Research Group*.

SE-NAP 2 Genetic Brain Imaging Migraine Research Group

Duration of the project: 12.01.2017. – 11.30.2021.

Link: <http://semmelweis.hu/gyogyszerhatastan/nap-2-research-groups/se-nap-2-genetic-brain-imaging-migraine-research-group/>

Supported by the National Research, Development and Innovation Office and as a part of the Hungarian Brain Research Program 2.0. the research group is investigating the neural response (brain activity) and genetics of people with migraine, tension headache and in healthy control subjects to identify biomarkers of migraine and new drug targets.

The project based on the results of the previous *MTA-SE-NAP B Genetic Brain Imaging Migraine Research Group*.

Department of Organic Chemistry

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Associate Professor

Dr. Gábor Krajsovszky, Ph.D. (extension 53021, 53055)

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Scientific Coworker

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The Department of Organic Chemistry was founded in 1957 and its first head was Prof. Ottó Clauder. The infrastructure of the Department (the students' and tutors' laboratories, the equipment for preparative work and the library) was gradually built up and finally a spectroscopic unit was established. In 1977, Prof. László Szabó took over as head of the Department and after it, in 1997 Dr. Ákos Kocsis was appointed as acting director. After that from 1997 Prof. Péter Mátyus was the head of the Department. Since 2016 to June 2017 Dr. Gábor Krajsovszky was the acting director. The present head of the Department is Dr. István Mándity.

In the following post the aim and structure of the teaching and research activities are summarized.

The aim of the education in organic chemistry is to create an organic chemical basis for subsequent subjects in the curriculum of students at the Faculty of Pharmaceutical Sciences. To attain this goal, besides the main lectures (112 hours in the 3rd and 4th semesters) and parallel laboratory practicals (110 hours) in organic chemistry, the Department offers a choice of a special course to its students (*Drug Syntheses*, and *Named Reaction in Organic Chemistry*), and meanwhile, continuous enlargement

of number of special courses is planned. The available methods based on Computational Chemistry and Molecular Modeling have been involved in the official education material since 1998. The teaching activities at the Department also include the introduction of selected students into research in organic and medicinal chemistry, the direction of diploma work and participation in the postgraduate (Ph.D.) education. The Department takes part in several international research and educational cooperation programmes (such as ERASMUS).

The Department additionally plays an important role in the postgraduate education of pharmacists, as organizer of the Medicinal Chemistry Programme, and offers a two-year post-graduate programme in Drug Research and Development.

The main research fields at the Department were the synthesis and chemical properties of heterocycles, including some natural products. In the last few years, important results have been achieved in the fields of synthesis strategies, including palladium-catalysed cross-coupling reactions of pyridazines and uracils, and mechanistic studies and the synthetic development of certain thermal rearrangement reactions. Another research field was at the Department involves medicinal chemistry with the design and synthesis of antiarrhythmic compounds, ligands of α -adrenoceptors and inhibitors of semicarbazide-sensitive amine-oxidase.

The Department cooperated in both research and education with several academic (e.g. the Semmelweis University Department of Pharmacodynamics, Department of Pharmacology and Pharmacotherapy, Department of Ophthalmology, and II. Department of Internal Medicine; Peter Pazmany Catholic University Faculty of Information Technology, the University of Debrecen, Pécs, and Szeged; the Hungarian Academy of Sciences Chemical Research Centre; the University of Vienna, Palermo, Cagliari, Universidad de CEU San Pablo (Madrid), National University Singapore); and industrial (Richter Gedeon, EGIS, Pannonpharma) organizations.

The main research profiles in the Department are involving primarily – preserving the departmental traditions at least partially – heterocyclic syntheses, preparation of compounds with chloride ion transporter effect, peptide chemistry, chemistry of bifunctional compounds, introduction of processes of „green chemistry” (such as use of solvents carbon dioxide neutral, elaboration of organic chemical reactions taking place in water, application of continuous-flow chemical technologies). The research work is facilitated by separation, spectroscopic and computational methods.

Institute of Clinical Experimental Research – Teaches at the Faculty of Pharmaceutical Sciences

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☎: 210-0306

Head of the Department:

Prof. Dr. Zoltán Benyó M.D, Ph.D., D.Sc.

Full professor:

Prof. Dr. Péter Sándor,

Associate professor:

Dr. Tamás Ivanics, Dr. Zsuzsanna Miklós (tutor)

Institute of Digital Health Sciences

1094 Budapest, Ferenc tér 15. floor II.

Head of Department:

Dr. Miklós Szócska Ph.D.

Professor Emeritus:

Dr. habil Elek Dinya Ph.D.

Associate professor:

Dr. Zoltán Ádám Tamus Ph.D.

Assistant professor lecturer:

Péter Dombai, Dr. Tamás Iváncsy Ph.D., Zoltán Sándor,

Tamás Tóth, Dr. Gergely Zajzon

Tutor:

Mr. Gergely Marosi

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Kornélia Várszegi

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Dr. László Gorove (tutor), Dr. Judit Schönborn (tutor),

Dr. István Hornyák (tutor), Dr. Imre Engelbrecht (tutor)

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Science secretary:

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Directorate for Safety Technology - Department for Disaster Management and Civil Protection

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Director:

István Mészáros

Supervisor:

Pál Kocsik M.Sc.

Registrar:

Girusné Erzsébet Lovász

FACULTY OF MEDICINE

BASIC MODULE



Faculty of Medicine
1st year

STUDY PROGRAMME

First year in the 2021/2022 academic year

1st Semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practice (h/week)			
Medical Chemistry	1,5	3	5	–	semi-final
Cell Science	1	2	3	–	semi-final
Macroscopic Anatomy and Embriology I.	1	6	7	–	semi-final
Medical Biophysics I.	1,5	2,5	4	–	semi-final
Medical Sociology – Health Care (for the 1st half of the class)	1	1	2	–	semi-final
Medical Communication	1	1	2	–	semi-final
Medical Terminology (Latin)	0	2	2	–	pract. mark
First Aid	0,5	1	1	–	pract. mark
Medical Hungarian I	0	4	2	–	pract. mark
Physical Education (PE) I.	0	1	0	–	signature
Mathematical and Physical Basis of Medical Biophysics (obligatory elective subject)	3,5	0	1	–	pract. mark

2nd Semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practice (h/week)			
Medical Biochemistry I.	3	2	5	Medical Chemistry	semi-final
Macroscopic Anatomy and Embriology II.	3	6	9	Macroscopic Anatomy I.	final
Microscopic Anatomy and Embryology I.	1	4	5	Cell Science	semi-final
Medical Biophysics II.	1,5	2,5	4	Medical Biophysics I.	final
Medical Sociology – Health Care (for the 2nd half of the class)*	1	1	2	–	semi-final
Introduction to Patient Care	2	3	2	Medical Sociology – Health Care*, Medical Communication	semi-final
Medical Hungarian II.	0	4	2	Medical Hungarian I.	pract. mark
PE II.	0	1	0	PE I.	signature
Introduction to Medical Informatics (obligatory elective subject)	0	1	1	–	pract. mark
Summer Practice - Nursing	1 month		1	Medical Communication	pract. mark

*Simultaneous taking of the courses.

LIST OF TEXTBOOKS (The list may change!)

- 1 McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 Publication Date: 22/03/2013
- 2 Sobotta Atlas of Human Anatomy (Package), 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 Publication Date: 25/06/2013
- 3 Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel Elsevier; 03/04/2014; ISBN 9780702051319
- 4 C.Rosse-P.Gaddum-Rosse: Hollinshead's Textbook of Anatomy. Lippincott-Raven. 4th ed. 1997. ISBN 0-397-51256-2
- 5 Stevens & Lowe's Human Histology , Elsevier, 4th ed. 2015 ISBN 978-0-723435020
- 6 Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
- 7 Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
- 8 Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer 2014, ISBN 9781469897806
- 9 Ebbing,D.D-Grammon,S.D: General Chemistry. 9th ed. 2009. Houghton Mifflin Co. Boston. ISBN 10:0-618-85478-6 / 13:978-0-618-85478-7
- 10 Harper's Illustrated Biochemistry, 30th edition, Lange, ISBN-10: 0071825347
- 11 Seminar manuals: published on homepage: semmelweis.hu/biokemia/
- 12 Tóth: Concise Inorganic Chemistry for Medical Students. Bp. Semmelweis Kiadó
- 13 Laboratory Manual; Medical Chemistry and Biochemistry. Bp. Semmelweis Kiadó
- 14 Bauer-Csemely-Hrabák: Principles of Organic Chemistry (ed. A. Hrabák) Bp. Semmelweis Kiadó
- 15 Hrabák: Selected Collection of Chemical Calculations and Biochemical Exercises. Bp. Semmelweis Kiadó
- 16 Garzó-Müllner-Sasvári: Bioorganic compounds. Bp. Semmelweis Kiadó
- 17 Damjanovich – Fidy – Szöllösi (eds) Medical Biophysics, Medicine, Budapest, 2009. ISBN 978-963-226-127-0
- 18 Miklós Kellermayer: Medical Biophysics Practices. Semmelweis Publishers, Budapest, 2015. ISBN 978-963-331-349-7.
- 19 1st semester: Gyöngyösi L. & Hetesy B., 2012. Jó reggelt! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 20 2nd-3rd semesters: Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 21 Alberts et al.: Essential Cell Biology. Garland Science/Taylor & Francis Group Publ. 2013. (4th edition, ISBN: 9780815344544)
- 22 Anne-Marie Barry, Chris Yuill: Understanding the Sociology of Health: An Introduction. Sage, London, 2016.

Recommended textbooks:

- 1 Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S.Standing: 2015 ISBN : 9780702052309
- 2 RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
- 3 A.L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology 3rd Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885 Copyright: 2012
- 4 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 9780071780339
- 5 W.Kahle-H.Leonhardt-W.Platzer: Color Atlas and Textbook of Human Anatomy (in 3 volumes) 3rd revised ed. Thieme Inc. New York, 1986.
- 6 Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; Elsevier, 2016 , ISBN 9780723438274
- 7 Stryer: Biochemistry. 4th ed. 1995. ISBN 0-7167-2009-4
- 8 Zumdahl: Chemical Principles. 3rd ed. 1998. Houghton-Mifflin Co. Boston. ISBN 0-395-83995-5
- 9 First Aid Manual: The Authorised Manual of St. John Ambulance, St. Andrew's Ambulance Association and the British Red Cross by the British Red Cross Society published on 21/03/2011 by Dorling Kindersley Publishers Ltd ISBN 9781405362146
- 10 Cooper-Hausman: The Cell: A Molecular Approach, 5th Edition, Sinauer Associates, 2006, ISBN 0-87893-300-X
- 11 Graham Scambler: Sociology as Applied to Medicine. 6th edition. 2008, Saunders Elsevier, London
- 12 Belák E. Medical Terminology for Beginners (earlier title: Medical Latin), Bp. Semmelweis Kiadó

MACROSCOPIC ANATOMY AND EMBRYOLOGY I.

Department of Anatomy, Histology & Embryology

Head of Department: *Dr. Alpár Alán*

Course Director: *Dr. Andrea D. Székely*
Dr. Sándor Katz

Credit value : 7

Number of lessons per week: 7 **lectures:** 1 **practical course:** 6 **seminars:** 0

Subject type: compulsory course

Subject code: AOKANT667_1A

Name of the course leader: Dr. Szél Ágoston (full professor)

Objectives of the subject, its place in the medical curriculum:

Demonstration of the macroscopical composition of the human body specifically to provide the future clinicians/medical doctors with a valid body of information with relevance to clinically significant morphological structures. General Embryology describes the intrauterine development of a human embryo/fetus and introduces the development of the locomotor system. Teaching is done in the form of lectures and dissection classes.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Semmelweis University, Department of Anatomy, Histology and Embryology
Budapest 1094, Tűzoltó utca 58.

Successful completion of the subject results in the acquisition of the following competencies:

Understanding the macroscopical composition of the human body together with the position and topographical relation of organs. Clear understanding of structure and function. Ability to perform basic preparatory tasks during dissection. Identification of general directions/landmarks on the cadaver together with the recognition of significant organs/body parts. Acquiring knowledge of surface features and/or sectional anatomy forming basis for clinical diagnostics (palpation, auscultation, etc.) and the use of radiological imaging methods. Clear understanding of the beginning of human development (general embryology) together with the development of the musculoskeletal system.

Course prerequisites:

None (subject is offered in the 1st semester)

Number of students required for the course (minimum, maximum) and method of selecting students):

obligatory for all registered students, on the basis of registration via the NEPTUN system

How to apply for the course:

Via the NEPTUN system.

Detailed curriculum:

List of lectures

1. week:	General introduction, terminology
2. week:	Joints and movements of the shoulder and shoulder girdle,
3. week:	Joints and movements of the elbow and the hand
4. week:	Joints and movements of the hip
5. week:	Pelvis. Joints and movements of the knee
6. week:	Joints and movements of the foot
7. week :	Composition of thorax, diaphragm
8. week:	Composition of the abdominal wall. Inguinal and femoral canals
9. week:	Composition and movements of the vertebral column. Muscles of the nape and back.
10. week:	Gametes, fertilization, cleavage
11. week:	Implantation, structure of the placenta, placental circulation. Fetal membranes
12. week:	Gastrulation, formation and derivatives of germinal layers
13. week:	Folding of the embryo, neurulation. Body axes, cranio-caudal and dorsoventral differentiation.
14. week:	Development of the skull, vertebral column and limbs

Topics for the dissection classes

1-6 weeks:	Bones, joints and muscles of the limbs. Dissection of the limbs.
7-9. weeks:	Cadaver dissection. Dissection of the superficial layers of the trunk, inspection of the structure of the body wall on prosected specimens (torso).
8-12. weeks:	Inspection of the bony skull together with head and neck prosections
13-14. weeks:	Embryology consultations, revision

Other subjects concerning the border issues of the given subject (both compulsory and optional courses). Possible overlaps of themes: Microscopic Anatomy and Embryology I - II.

Special study work required to successfully complete the course:

All students are required to *demonstrate their knowledge and motivated practical work* by the completion and demonstration of a dissected specimen or region once during the two semesters of the Academic year.

Requirements for participation in classes and the possibility to make up for absences:

Active participation in practical lessons is obligatory. Students should attend at least 75% of the scheduled hours, absences therefore are limited in **25%**. Attendance will be recorded in the dissection room classes.

Methods to assess knowledge acquisition during term time:

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance is obligatory at the two mid-term tests (held approximately on weeks 7 and 12). Anatomy mid-terms may be oral or written (computer based) exams. Students absent from the mid-term test should reattend at one of the two further occasions or their semester will not be accepted. The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Requirements for signature:

Active participation in at least 75% of dissection room sessions, including the midterm tests (irrespective of the result) is obligatory for every student.

Type of examination:

Semifinal (written and oral) examination, topics: subject matter of the semester.

Semifinal examinations consist of written (theoretical) and oral (practical) parts. Examiners are delegated by the Course Director with the consent of the Head of Department.

Requirements of the examination:

During the semifinal examination the knowledge of students will be tested. The examination starts with a written pretest (e-learning module "Moodle") to be followed by an oral test in Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions from the subject matter of the semester.

Topic list for the semifinal examination:

Macroscopic Anatomy I.

Musculoskeletal Anatomy

- General osteology, classification of bones
- Continuous connections of bones. Classification of joints; components, movements and mechanisms
- General myology
- Structure of the vertebral column, the gross anatomy of the muscles acting upon it
- Movements and muscles of the head&neck (atlantooccipital and atlantoaxial joints)
- Joints of the shoulder girdle, the gross anatomy of the muscles acting upon them
- Shoulder joint, the gross anatomy of the muscles acting upon it
- Axillary fossa, quadrangular and triangular spaces
- Muscle compartments and cross section of the arm
- Elbow joint, the gross anatomy of the muscles acting upon it. Cubital fossa
- Muscles and cross section of the forearm
- Structure and movements of the radiocarpal joint, gross anatomy of the muscles acting upon it
- Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths
- Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb and fingers, the gross anatomy of the muscles concerned with the movements
- Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)
- Thoracic muscles
- Diaphragm
- Muscles and spaces of the abdominal wall, rectus sheath
- Composition of the pelvis (bones, ligaments and membranes)
- Muscles of the buttock, the posterior abdominal wall and the pelvis (external and internal muscles of the hip)
- Inguinal canal, femoral canal
- Subinguinal hiatus, vascular and muscular compartments; adductor canal, femoral canal
- Hip joint and the gross anatomy of the muscles concerned with the movements
- Osteofibrous compartments, muscles and cross section of the thigh
- Knee joint and the gross anatomy of the muscles concerned with the movements. Popliteal fossa
- Osteofibrous compartments, muscles and the cross section of the leg
- Ankle joint together with the gross anatomy of the muscles acting upon it
- Subtalar and talocalcaneonavicular joints, the muscles acting upon them
- Osteofibrous compartments and structure of the foot, arches of the foot
- Bones, spaces and connections of the skull, external and internal skull bases
- Neurocranium, components and cavities (anterior, middle and posterior cranial fossae)
- Viscerocranium, components and cavities (walls and connections of the nasal cavity, orbit, oral cavity, pterygopalatine and infratemporal fossae)
- Temporomandibular joint and the gross anatomy of the muscles of mastication
- Superficial muscles of the neck, muscle triangles
- Deep muscles of the neck and the laminae of the cervical fascia
- Muscles of facial expression

Further topics with relevance to the musculoskeletal system

- Lymphatic drainage of the thoracic wall including the mamma
- Dorsal branches of the spinal nerves, intercostal nerves
- Cervical plexus, brachial plexus, lumbar plexus, sacral plexus.
- Innervation of limbs
- Innervation of the trunk
- Cutaneous innervation
- Axillary artery and branches. Arteries and veins of the arm, forearm, and hand
- Arteries and veins of the lower limb
- Lymph nodes and lymphatic drainage of the upper and lower limbs

General Embryology and development of the musculoskeletal system

- Spermatogenesis, spermiogenesis
- Oogenesis
- Fertilization, cleavage of the zygote
- Blastocyst formation; the bilaminar embryonic disc
- Implantation
- Formation of body axes, parts of the early embryo (yolk sac, amnion, chorion, body stalk)
- Gastrulation
- Formation of the intraembryonic mesoderm; the notochord
- Neurulation (neural tube and neural crest)
- Derivatives of ectoderm, endoderm and mesoderm
- Folding of the embryo
- The structure and function of the placenta
- Development of the fetal membranes (chorion and amnion), umbilical cord
- Twin formation
- Membranous and cartilaginous neurocranium and viscerocranium
- Development of the limbs and vertebral column
- Development of the muscular system

Method and type of evaluation:

Semifinal examinations are composed of written theoretical and oral practical parts.

Students are given separate marks for each part of the examination. Unsuccessful partial examinations result in the failure of the semifinal examination. When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5 only. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

How to register for the examination?

Via the NEPTUN system.

Possibilities for exam retake:

According the Study and Examination Policy

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Recommended textbooks

1. Sobotta Atlas of Human Anatomy, 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
2. Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319
3. THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System, 2014 by Schuenke, ISBN: 9781604069228
4. THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy, 2016 by Schuenke, ISBN: 9781626231207
5. THIEME Atlas of Anatomy, Internal Organs, 2016 by Schuenke, ISBN: 9781626231665
6. McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013
7. Netter: Atlas of Human Anatomy, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.
8. Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.
9. Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.
10. Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S. Standring; 2015 ISBN : 9780702052309
11. Netter's Clinical Anatomy with Online Access, 3rd Edition, by J. Hansen, 2014, eBook ISBN: 9781455770632 eBook ISBN: 9780323312899 014
12. Anatomy, A Photographic Atlas, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2
13. Bräuer: Sobotta Flashcards (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
14. RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
15. Regional Anatomy, by T Tömböl, Medicina 2008, ISBN 963 242 186 8
16. Sectional Anatomy – Workbook, by A. Nemeskéri; István Apáthy's Foundation, 2001.
17. Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864
18. *The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384*

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<http://semmelweis.hu/anatomia>) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).

MACROSCOPIC ANATOMY AND EMBRYOLOGY II.

Credit value: 9
Number of lessons per week: 9 lecture: 3 practical course: 6 seminar: 0
Type of the course: compulsory course
Subject code: AOKANT667_2A
Name of the course leader: Dr. Szél Ágoston

Objectives of the subject, its place in the medical curriculum:
Demonstration of the macroscopical composition of the human body specifically to provide the future clinicians/medical doctors with a valid body of information with relevance to clinically significant morphological structures. Development of internal organs – this part describes the intrauterine differentiation and growth of internal organs with relevance to the general medical curriculum. Teaching is done in the form of lectures and dissection classes.

Place where the subject is taught (address of the auditorium, seminar room, etc.):
Semmelweis University, Department of Anatomy, Histology and Embryology
Budapest 1094, Tűzoltó utca 58.

Successful completion of the subject results in the acquisition of the following competencies:
Understanding the macroscopical composition of the human body together with the position and topographical relation of organs. Clear understanding of structure and function. Ability to perform basic preparatory tasks during dissection. Identification of general directions/landmarks on the cadaver together with the recognition of significant organs/body parts. Acquiring knowledge of surface features and/or sectional anatomy forming basis for clinical diagnostics (palpation, auscultation, etc.) and the use of radiological imaging methods. Understanding of human development in order to draw parallels with macroscopical anatomy.

Course prerequisites:
Macroscopic Anatomy and Embryology I.
Number of students required for the course (minimum, maximum) and method of selecting students:
Obligatory for all registered students, on the basis of registration via the NEPTUN system

How to apply for the course:
Via the NEPTUN system.

Detailed curriculum:
List of lectures

1. week:	Nasal cavity, paranasal sinuses Oral cavity, tongue, palate, faucial isthmus Salivary glands
2. week:	Morphology and development of teeth Pharynx, esophagus Larynx
3. week:	Development of the face, malformations Development of the pharyngeal arches, development of the foregutThoracic cavity, mediastinum. Chambers of the heart, external features. Structure of heart wall, valves, fibrous skeleton. Pericardium
4. week:	Cardiac vessels and nerves, conducting system. Surface projection. Auscultation points. Development of the heart Development of arteries and veins
5. week:	Morphology of trachea and the lung. Pleura. Development of the respiratory system. Postpartum adaptation of the circulatory system Stomach and small intestines (duodenum, jejunum, ileum)

6. week:	Liver, gall bladder, pancreas, spleen. Large intestine, rectum
7. week:	Peritoneal relations of abdominal organs. Development of the peritoneum, separation of body cavities Morphology of the kidney, capsules of the kidney, ureter, urinary bladder. Morphology and coats of the testicle
8. week:	Morphology of the epididymis, spermatic cord, seminal vesicle and prostate Morphology of penis and male urethra. Male perineum Ovary, Fallopian tube and uterus
9. week:	Vagina, female perineum, external genital organs Development of the urinary system Development of genital organs
10. week:	Topographical divisions of the central nervous system, developmental units Meninges, epidural and subarachnoidal spaces, ventricles, choroidal plexus, CSF Lobes of the cerebral cortex, topographical subdivisions, structure and function of the medial, lateral and basal cortical fields
11. week:	Topography and components of the basal ganglia and the diencephalon (thalamus, hypothalamus), the 3 rd ventricle. Topography and components of the brainstem (midbrain, pons and medulla oblongata), the 4 th ventricle. Arterious, venous and lymphatic circulation of the brain
12. week:	The autonomic nervous system. Sympathetic and parasympathetic nervous system. Cranial nerve nuclei Trigeminal nerve (CN 5), facial nerve (CN 7)
13. week:	Glossopharyngeal nerve (CN 9), vagus nerve (CN 10) Spinal cord, spinal ganglia, spinal segment. Spinal nerves, nerve plexuses Lymphatic system. Regional lymphatic drainage of organ, lymph nodes.
14. week:	Intracranial topography, orbit Topographical relations of the thoracic cavity Topographical relations of the abdominal cavity

Topics of dissection classes

1-2. weeks:	Dissection of the head and neck organs.
3-6. weeks:	Opening of the thoracic and abdominal cavities, dissection of thoracic and abdominal organs
7-9. weeks:	Dissection of the retroperitoneal region and perineum together with organs of the lesser pelvis.
10-12. weeks:	Dissection/ inspection of the brain and spinal cord. Intracranial topography.
13-14. weeks:	Cranial nerve branches. Cross sections of the trunk. Revision

Other subjects concerning the border issues of the given subject (both compulsory and optional courses). Possible overlaps of themes:

Microscopic Anatomy and Embryology I - II..

Special study work required to successfully complete the course:

All students are required to *demonstrate their knowledge and motivated practical work* by the completion and demonstration of a dissected specimen or region once during the two semesters of the Academic year.

Requirements for participation in classes and the possibility to make up for absences:

Active participation in practical lessons is obligatory. Students should attend at least 75% of the scheduled hours, absences therefore are limited in **25%**. Attendance will be recorded in the dissection room classes.

Methods to assess knowledge acquisition during term time:

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance is obligatory at the two mid-term tests (held approximately on weeks 7 and 12). Anatomy mid-terms may be oral or written (computer based) exams. Students absent from the mid-term test should reattend at one of the two further occasions or their semester will not be accepted. The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Requirements for signature:

Active participation in at least 75% of dissection room sessions, including the midterm tests (irrespective of the result) is obligatory for every student. Missed practical classes cannot be made up for.

Type of examination:

Final (written and oral) examination, topics: subject matter of the subjects Macroscopic Anatomy and Embryology I-II. Final examinations consist of written (theoretical) and oral (practical) parts

Examiners are delegated by the Course Director with the consent of the Head of Department.

Requirements of the examination:

During the final examination the knowledge of students will be tested. The examination starts with a written pretest (e-learning module “Moodle”) to be followed by an oral test in Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions from the subject matter of the semester.

Topic list for the semifinal examination:

Macroscopic Anatomy I.

(see there)

Macroscopic Anatomy II.***Internal organs of the head & neck region (morphology and development)***

- Oral cavity (divisions, boundaries)
- Floor of mouth, sulcus lateralis linguae
- Macroscopy of the tongue
- Types and morphology of teeth, blood supply and innervation
- Tooth development
- Salivary glands together with topography
- Faucial isthmus, palate. Tonsils
- Pharynx and parapharyngeal spaces
- Blood supply and innervation of pharynx
- Pharyngeal muscles
- Nose, nasal cavity (boundaries, nasal meatus, vessels)
- Paranasal sinuses (connections, vessels)
- Larynx (shape, position, muscles, vessels, nerves)
- Skeleton and joints of larynx together with the fibroelastic membranes, mucous membrane
- Common and external carotid arteries and their branches. Maxillary artery and its branches
- Venous drainage of face and neck
- Lymph nodes and lymphatic vessels of the head&neck
- Development of the face, including the developemnt of the oral and nasal cavities
- Development and differentiation of the foregut
- Derivatives of the branchial arches
- Derivatives of the branchial pouches and grooves
- Development of the teeth and tongue

Circulatory system (morphology and development)

- Shape, external features of heart
- Chambers of heart
- Endocardium, ostia, valves of heart
- Skeleton of heart, anuli fibrosi
- Structure of heart wall
- Pulse generating and conducting system of heart
- Pericardium
- Position and surface projections of heart
- Percussion and auscultation (area of cardiac dullness, heart sounds)
- Radiology of heart
- Early circulation (formation of vessels, basis vascular systems of the embryo/fetus)
- Heart development
- Pulmonary circulation
- Ascending aorta, arch of aorta and its branches
- Subclavian artery and its branches
- Thoracic aorta and its branches
- Abdominal aorta and its branches
- Development of arteries (aorta, branchial arterious arches, umbilical arteries)
- Celiac trunk and its branches
- Superior mesenteric artery and its branches
- Inferior mesenteric artery and its branches
- External and internal iliac arteries and their branches
- Internal pudendal artery and its branches
- Superior vena cava and its tributaries
- Inferior vena cava and its tributaries
- Azygos and hemiazygos veins and their tributaries
- Portal vein and its tributaries, portocaval anastomoses
- Development of veins (inferior v. cava, portal v., superior v. cava, azygos and hemiazygos veins)
- Fetal circulations
- Lymphatic drainage of the abdominal and pelvic organs
- Thoracic duct, right lymphatic trunk

Morphology and development of the thoracic, abdominal and pelvic organs

- Trachea and bronchial tree
- Lung (shape, parts, surfaces, hilum)
- Lung (position, topography, vessels, nerves)
- Surface projection of pleura and lung
- Pleura, pleural cavity
- Mediastinum (divisions and content)
- Development of the lower airways including the lung
- Description and topography of the esophagus
- Stomach (shape, position, parts, blood supply and innervation). Peritoneal relations
- Duodenum (shape, position, divisions, vessels)
- Jejunum-ileum (shape, position, vessels)
- Large intestine (shape, position, vessels)
- Rectum, anal canal (shape, position, vessels)
- Liver (shape, position, peritoneal relations, vessels)
- Gall bladder and biliary passages (anatomy)
- Pancreas (shape, position, vessels)
- Peritoneum, greater and lesser omentum, mesentery, omental bursa
- Formation and differentiation of the midgut
- Formation and differentiation of the hindgut

- Development of liver and pancreas
- Development of the peritoneum
- Formation of body cavities, development of the diaphragm
- Kidney (shape, position, hilum, sinus, capsules, vascular architecture)
- Renal pelvis and calyces. Ureter
- Urinary bladder (shape, position, muscles, vessels)
- Female urethra
- Male urethra, bulbourethral gland
- Development of kidneys
- Development of urinary passages
- Testis (shape, position, vessels). Scrotum, coats of testis
- Epididymis, vas (ductus) deferens, spermatic cord
- Seminal vesicle, prostate
- Penis (shape, position, mechanism of erection, vessels, nerves)
- Pelvic floor, male perineum (connective tissue spaces)
- Hernia canals (inguinal and femoral)
- Ovary (shape, position, vessels)
- Uterine tube (shape, position, vessels)
- Uterus (shape, parts, position, supporting structures, vessels) Broad ligament
- Vagina, female perineum (connective tissue spaces)
- External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)
- Development of gonads, formation and migration of primordial germ cells
- Development of male genital system
- Development of female genital system
- Development of the external genital organs

Macroscopy of the nervous system

- Intracranial topography Dura mater, dural sinuses
- Arachnoid mater, pia mater, cisterns, CSF circulation
- Description and meninges of the spinal cord
- Brain stem (medulla oblongata, pons, midbrain)
- Cerebellum
- Diencephalon (parts, blood supply). Thalamus, hypothalamus
- Lateral ventricles, III. ventricle, IV. ventricle
- Hemispheres
- Internal carotid artery (course, parts and branches)
- Vertebral artery (course and branches)
- Circle of Willis
- Veins of the brain
- Cranial nerve nuclei, macroscopy of cranial nerves together with the brain, dural and skull exits
- Branches of cranial nerves (CN 3, CN 4, CN 5, CN 6, CN 7, CN 9, CN 10, CN 11, CN 12)
- General composition of the autonomic nervous system
- Sympathetic nervous system (cranial, cervical, thoracic and lumbar parts)
- Sympathetic trunk
- Parasympathetic system (cranial and sacral parts)
- Topography of the orbit. Extraocular muscles. Eye movements.
- Eyelids, conjunctiva, fasciae of the orbit, lacrimal apparatus

Method and type of evaluation:

Final examinations are composed of written theoretical and oral practical parts. The written theoretical examination is done using an e-learning module while the practical examination is conducted in the dissection room on real prosected cadaver specimen.

Examiners are delegated by the Course Director with the consent of the Head of Department.

Students are given separate marks for each part of the examination. Unsuccessful partial examinations result in the failure of the final examination. When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5 only. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

How to register for the examination?

Via the NEPTUN system.

Possibilities for exam retake:

According the Study and Examination Policy

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Recommended textbooks

1. Sobotta Atlas of Human Anatomy, 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
2. Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319
3. THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System, 2014 by Schuenke, ISBN: 9781604069228
4. THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy, 2016 by Schuenke, ISBN: 9781626231207
5. THIEME Atlas of Anatomy, Internal Organs, 2016 by Schuenke, ISBN: 9781626231665
6. McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013
7. Netter: Atlas of Human Anatomy, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.
8. Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.
9. Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.
10. Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
11. Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S. Standring; 2015 ISBN : 9780702052309
12. Netter's Clinical Anatomy with Online Access, 3rd Edition, by J. Hansen, 2014, eBook ISBN: 9781455770632 eBook ISBN: 9780323312899 014
13. Anatomy, A Photographic Atlas, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2
14. Bräuer: Sobotta Flashcards (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
15. RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
16. Regional Anatomy, by T Tömböl, Medicina 2008, ISBN 963 242 186 8
17. Sectional Anatomy – Workbook, by A. Nemeskéri; István Apáthy's Foundation, 2001.
18. Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 97807020308
19. The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<http://semmelweis.hu/anatomia>) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).

MICROSCOPIC ANATOMY AND EMBRYOLOGY I.

Department of Anatomy, Histology & Embryology

Head of Department: *Dr. Alán Alpár*

Course Director: *Dr. Andrea D. Székely*
Dr. Sándor Katz

Credit value: 5

Number of lessons per week: 5 **lectures:** 1 **practical course:** 4 **seminars:** 0

Type of the course: compulsory course

Subject code: AOKANT674_1A

Name of the course leader: Dr. Szél Ágoston (full professor)

Objectives of the subject, its place in the medical curriculum:

Demonstration of the fine structure of cells and tissues composing the organs of the human body specifically to provide the future clinicians/ medical doctors with a valid body of information describing the microscopical elements of clinically significant morphological structures (including cell biology, general histology and the histology of organs).

Teaching is done in the form of lectures and histology laboratory classes

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Semmelweis University, Department of Anatomy, Histology and Embryology
Budapest 1094, Tűzoltó utca 58.

Successful completion of the subject results in the acquisition of the following competencies:

Understanding the microscopical composition of the human body together with the understanding of human development in order to draw parallels with macroscopical anatomy. Clear understanding of histological structure and function. Ability to identify basic structural elements within the tissue specimen. Identification of general directions/landmarks within digitized tissue slides.

Course prerequisites:

Cell science

Number of students required for the course (minimum, maximum) and method of selecting students):

Obligatory for all registered students, on the basis of registration via the NEPTUN system

How to apply for the course:

Via the NEPTUN system.

Detailed curriculum:*List of lectures*

1. week:	Epithelial tissues, cell contacts, intercellular connections Glandular epithelium
2. week:	Connective tissue cells and fibres. Extracellular matrix
3. week:	Supporting tissues (cartilage, bone)
4. week:	Ossification, bone remodelling. Blood, erythropoiesis, leukopoiesis
5. week:	Muscle tissues
6. week:	Histology of vessels
7. week:	Histology of the tongue and teeth. Histology of the esophagus
8. week:	Histology of the stomach. Microscopical anatomy of the small and large intestines
9. week:	Histology of the liver and pancreas
10. week:	Histology of the airways
11. week:	Microscopical anatomy of urinary organs
12. week:	Histology of the male genital systems
13. week:	Histology of the female genital system I.
14. week:	Histology of the female genital system II. Placenta, mammary gland

Histology laboratories

1. week:	Introduction, epithelial tissues
2. week:	Connective tissue cells and fibres
3. week:	Blood, Cartilage, bone
4. week:	Bone formation. Nerve tissue
5. week:	Smooth, skeletal and cardiac muscle types
6. week:	Histology of vessels. Tooth bud
7. week:	Lip, tongue, lingual papillae
8. week:	Esophagus, stomach. Duodenum, jejunum, ileum, colon
9. week:	Liver, gall bladder, pancreas
10. week:	Larynx, trachea, lung
11. week:	Urinary system
12. week:	Male genital system
13. week:	Female genital system
14. week:	Placenta, revision

Other subjects concerning the border issues of the given subject (both compulsory and optional courses). Possible overlaps of themes:

Macroscopic Anatomy and Embriology I - II.

Cell sciences, cell biology

Certain chapters of Biochemistry and/or Physiology

Special study work required to successfully complete the course:

none

Requirements for participation in classes and the possibility to make up for absences:

Active participation in histology laboratory classes is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the histology laboratory classes.

Methods to assess knowledge acquisition during term time:

The knowledge of students will be checked in midterm tests (held prospectively in weeks 5 and 11). written (electronic) test. Attendance is obligatory at the two midterm tests. Students absent from the tests should reattend at one of the offered retakes. Histology and Embryology midterms are written (Moodle) examinations organised as e-learning type examination where a valid SeKa account (including user name&-password) is required.

The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Requirements for signature:

Active participation in at least 75% of dissection room sessions, including the midterm tests (irrespective of the result) is obligatory for every student.

Type of examination:

Semifinal (written and oral) examination, topics: subject matter of the semester (Microscopic Anatomy and Embryology I.). Semifinal examinations consist of written theoretical and oral practical parts.

1. Written pretest (e-learning module)
2. Microscopic Anatomy - identification of structures on digitized tissue slides - including relevant theoretical questions from the subject matter of the semester

Requirements of the examination:

During the semifinal examination the knowledge of students will be tested. Semifinal examinations are composed of written (theoretical) and oral (practical) parts with the latter being conducted with the use of digitized histological tissue slides.

Topic list for the semifinal examination:

Microscopic Anatomy and Embryology I.

General Histology

- Concept of basic tissues
- Definition and classification of epithelial tissue
- Simple epithelia
- Stratified epithelia
- Membrane specializations of epithelia
- Glandular epithelia

- Pigment epithelium, sensory neuroepithelium
- Cells of connective tissue
- Ground substance and fibres of connective tissue
- Types of connective tissue
- Blood and the corpuscular elements of blood
- Histology of the bone marrow, maturation of erythrocytes and platelets
- Differentiation of granulocytes, lymphocytes and monocytes
- Histology of cartilage
- Histology of the bone tissue
- Intramembranous ossification
- Endochondral ossification
- Growth and remodeling of bone
- Smooth muscle and myoepithelial cells
- Skeletal muscle tissue
- Cardiac muscle tissue
- Nervous tissue

Histology of organs

- Histological structure of arteries and arterioles
- Composition of capillaries and veins
- Wall structure of hollow organs
- Histology of the lip, tongue and teeth
- Structure of the esophagus
- Histology of the airways (epiglottis, larynx, trachea, lung)
- Histology of the stomach
- Structure of the small and large intestines
- Histology of the liver and biliary passages including the gall bladder
- Histology of the pancreas
- Histology of the kidney and the urinary passages (ureter, urinary bladder)
- Histology of the testicles together with the epididymis
- Histology of the prostate, seminal vesicle, spermatic cord
- Histology of the penis
- Histology of the ovary, uterine tube; corpus luteum
- Histology of the uterus
- Histology of the vagina
- Placenta, umbilical cord

Method and type of evaluation:

Semifinal examinations are composed of written theoretical and oral practical parts. The written theoretical examination is done using an e-learning module while the practical examination is conducted with the help of digitized histological tissue slides.

Students are given separate marks for each part of the examination. Unsuccessful partial examinations result in the failure of the semifinal examination. When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5 only. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

How to register for the examination?

Via the NEPTUN system

Possibilities for exam retake:

According the Study and Examination Policy

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

List of textbooks

1. Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
2. Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
3. Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
4. Stevens & Lowe's Human Histology , Elsevier, 4th ed ISBN 978-0-723435020, 2015.
5. Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.
6. The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
7. Histology Manual 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2019.
8. A. L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology, 4th Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885; 2015
9. Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<http://semmelweis.hu/anatomia>) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).

ANATOMIC DISSECTION IN THE PRACTICE – optional course

Department of Anatomy, Histology and Embryology

Credit: 2

1 x 90 min practical course

Course prerequisites: Macroscopic Anatomy I.

Held in both semesters.

Objectives of the subject, its place in the medical curriculum:

The technique of anatomical dissection dates back many centuries. Dissecting of fixed specimens gives students the opportunity to acquire practical knowledge that is essential, especially for those who are planning to choose manual field. Fine dissection of small structures requires extra time and appropriate infrastructural conditions. Our practical course creates this unique opportunity under the guidance of expert instructors. The specimens will get into the high quality demonstration specimen pool to be used in the education.

Successful completion of the subject results in the acquisition of the following competencies:

By completing the course, students will master the technique of fine anatomical dissection. Working with fine quality instrumental tools gives the opportunity to get to know better anatomical layers and structures in more details. This type of work gives a good base of knowledge what can be developed further in manual fields.

Detailed curriculum:

Practices:

1. Introduction. Handout of specimens. Removal of the skin.
2. Dissection of cutaneous nerves and superficial veins I. (demonstration and practice)
3. Dissection of cutaneous nerves and superficial veins II. (demonstration and practice)
4. Dissection of muscles I. (demonstration and practice)
5. Dissection of muscles II. (demonstration and practice)
6. Dissection of arteries and nerves I. (demonstration and practice)
7. Dissection of arteries and nerves II. (demonstration and practice)
8. Dissection of the viscera I. (demonstration and practice)
9. Dissection of the viscera II. (demonstration and practice)
10. Working with bone I. (demonstration and practice)
11. Working with bone II. (demonstration and practice)
12. Dissection of the brain I. (demonstration and practice)
13. Dissection of the brain II. (demonstration and practice)
14. Exam and demonstration of the dissected specimens.

Teachers (depending on the number of the registered students):

Dr. Alán Alpár professor – professional tutor

Dr. Tamás Ruttkay senior lecturer – lecturer, practice leader

Dr. Emese Pálfi senior lecturer – practice leader

Special study work required to successfully complete the course:

Anatomical dissection on the practices.

Requirements for participation in classes and the possibility to make up for absences:

Participation in the practices is verified by signing an attendance sheet. Absence up to 25% of the classes is allowed within a semester. Due to the nature of the course, it is not possible to make up for absences.

Methods to assess knowledge acquisition during term time:

There is no mid-term check. Requirements for signature: Attendance at least 75% of the classes.

Type of examination:

The semester ends with a practical exam, during which the student presents and hands over the specimen dissected by him/her to the practice leader.

Requirements of the examination:

During the last practice of the semester, the student summarizes the topic of the dissected specimen and displays it. The practice leader evaluates the semester preparatory work based on the criteria detailed below.

Method and type of evaluation:

The finished specimen is evaluated according to the following criteria: 1. The degree of preparation of the topic recorded at the beginning of the course. 2. Quality of the prepared anatomical structures. 3. Presentation of the specimen in a practical exam (theoretical, regional anatomical presentation).

The student's knowledge will be evaluated using a scale of 1 to 5 mark.

Possibilities for exam retake:

It is not possible to replace an unfinished specimen. In case of justified absence from the practical exam, the presentation of the dissected specimen and the formation of the grade will take place at an additional time.

**Printed, electronic and online notes, textbooks, guides and literature (URL address for online material)
to aid the acquisition of the material:**

T. Tömböl: Regional Anatomy. Medicina, Budapest, 2008.

CELL SCIENCE

Department of Genetics, Cell- and Immunobiology

Address: NET Building, H-1089 Budapest, Nagyvárad tér 4.

Course director: *Edit Buzás MD, DSc*

Course coordinator: *Orsolya Láng MD, PhD*

Office hours are given on the Department website (<http://gsi.semmelweis.hu/index.php/en/education/information>)

Credit: 3

Aim of the course:

Course Cell Science is developed for medical students as a part of the Basic Module. The Course presents the most important aspects of cell-morphology and cell function. Cell Science Course provides a detailed discussion of compartmentalization in the eukaryotic cell as well as describes the most significant characteristics of the basic cellular functions (migration, endocytosis, cell-cell communication, division, stem cell differentiation, ageing and cell death). The practices introduce the students to the microscopic techniques used for cell morphological studies. The purpose of the course is to demonstrate the complexity of cell structure and function relationships as well as to present basic methods of in vitro cell culturing and their potential medical applications.

Location of the course:

Selye János Lecture Hall and Lab rooms L13-L16 are located on the first floor of the NET building (1089 Budapest, Nagyvárad tér 4.)

Lecturers: Prof Edit Buzás, Dr. András Kristóf Fülöp, Dr László Kóhidai

Lectures (1 hours per week):

1. Cell theory. Model cells in Medicine
2. Cell membrane
3. Structure and function of nucleus
4. Endoplasmic reticulum
5. Golgi complex, vesicular transport and secretion
6. Endocytosis. Autophagy
7. Cell adhesion and cell junctions
8. Cytoskeleton
9. Cellular movement
10. Structure and function of mitochondria and peroxisomes
11. Cell communication. Extracellular vesicles.
12. Cell cycle and mitosis
13. Stem cells and differentiation
14. Cellular aging and cell death

Practices (2 hours per week):

1. The light microscope
2. The general cell structure. Light microscopic microtechnique
3. The electron microscope. Cell membrane
4. The interphase nucleus. Cyto(histo)chemistry
5. Immunohistochemistry. Super-resolution microscopy
6. Cell and tissue culture
7. Endoplasmic reticulum
8. Golgi complex and secretion
9. Endocytosis and lysosomes
10. Cell surface differentiation, enzyme-histochemistry
11. Store and supply of energy. Mitochondria. Peroxisome.
12. Mitosis
13. Meiosis
14. Cell death (necrosis and apoptosis)

The order of topics may vary

Course requirements: Students must participate at least 75% of the classes. More than three absences from the practice or more than three absences from the lecture invalidate the semester, no signature is given. There are no extra practices.

Midterms: During the semester two Moodle exam will be organized at week 6th and 12th. Based on the total performance maximum 3 bonus points can be obtained. These extra scores will be added to the exams scores as bonus scores. No opportunity to improve the bonus scores.

Exam: The course ends with a written exam. It contains multiple choice, essays, drawings, etc. covering both theoretical and practical part of the subject. The written exam score should achieve 50% of the total scores for passing. At 13th week of the semester, a competition will be organized. Those who achieve the good or excellent level get the exam grade. Further details will be announced at the website of the department (<http://gsi.semmelweis.hu>) and in the Moodle.

Core text: Alberts et al. Essential Cell Biology (4th edition) Garland Science ISBN-13: 978-0815344544 ISBN-10: 0815344546
Lecture and practice presentations and additional texts are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

MEDICAL BIOPHYSICS I.

Tutor: **Dr. István Voszka**

First Semester

Week Lecture (1.5 hours per week)

- 1 Radiations (basic concepts)
- 2 Properties of electromagnetic radiations;
wave and corpuscular nature
- 3 Attenuation of radiation
- 4 Luminescence and its applications
- 5 Lasers and their medical applications
- 6 Thermal radiation, thermography.
Biological effects of light
- 7 Production and spectrum of X-radiation
Cyclotron; Linear accelerator;
- 8 Attenuation of X-radiation, interactions
- 9 Atomic structure; Radioactive decay law
Gamma-radiation and its detection
- 10 Radiotherapy, radiosurgery;
Isotope diagnostics
- 11 SPECT, PET
Beta-radiation, beta-decay
- 12 Alpha-radiation, alpha-decay
Interaction with matter
- 13 Dosimetry
- 14 Radiation protection; estimation of risk

Laboratory (2,5 hours per week)

- Laboratory safety rules
- Resonance
- Emission spectroscopy. Light sources
- Spectrophotometry
- Optical lenses; light microscope
- Detection of nuclear radiations
- Oscilloscope
- Special light microscopes
- X-ray diagnostics
- Optics of the eye
- Polarimeter
- Coulter counter
- Determination of skin-impedance
- Concentration determination with refractometer
- Repetition

MEDICAL BIOPHYSICS II.

Second Semester

Week	Lecture (1,5 hours per week)	Laboratory (2,5 hours per week)
1	Bonds and their significance in macromolecular structure; Boltzmann distribution, examples	The attenuation of gamma-radiation
2	Liquid crystals, membranes	Dosimetry
3	Electronic properties of condensed materials (solids, macromolecules)	Amplifier
4	Ultrasound properties, generation of ultrasound	Gamma energy determination
5	Ultrasonography, Doppler methods	Pulse generators (e.g. pacemaker, defibrillator)
6	Methods for structure examination	Sine wave oscillators (high frequency heat therapy, ultrasound)
7	Basic concepts of Thermodynamics, First law	Audiometry
8	General description of transport phenomena, Onsager's equation, examples	Isotope diagnostics
9	Diffusion; transport across membrane	Densitography (CT)
10	Resting potential and its local changes	Flow of fluids. Electric model of vascular circulation
11	Action potential, properties, interpretation	Electrocardiography
12	General characteristics of sensory function, hearing, vision	Diffusion
13	Biophysics of muscle function	Sensory function
14	Motor proteins	Repetition

MATHEMATICAL AND PHYSICAL BASES OF MEDICAL BIOPHYSICS

First Semester

Tutor: *Dr. István Voszka*

Altogether 14 hours lecture during the first four weeks of the semester

Credit 1

Topics of lectures:

1. Mathematics, necessary for the understanding of biophysical laws
2. Physical quantities and units
3. Kinematics – motions
4. Statics – changes of shape, forces, mechanical stress, pressure
5. Dynamics – work, energy
6. Oscillations, waves
7. Fluid mechanics
8. Thermodynamics
9. Electricity – charges in rest and in motion
10. Magnetism, magnetic induction

MEDICAL CHEMISTRY

Department of Molecular Biology

Lectures and practical lessons

Two lectures are held every week; practical lab lessons (duration: 180 min) and seminars (90 min) are held in alternating weeks. For detailed schedules see the Moodle website of the subject.

Prerequisites for acknowledging the semester

(1) Participation in the laboratory practicals is compulsory; students are obliged to sign the attendance sheets at the end of each lab lesson. Students not attending (i) more than 2 labs or (ii) more than 5 seminars or (iii) more than 1 lab and 3 seminars are not going to be allowed to sit for the semifinal exam. Missed practicals and seminars can only be completed in the same week with another group; certificate of participation issued by the host teacher needs to be presented by the student to his/her own teacher.

(2) It is compulsory to sit for the first midterm examination.

Midterm examinations

Two written midterm examinations will be held in weeks 6 and 13 of the semester, respectively, during ordinary lab lessons. Midterm tests consist of two theoretical questions and four problems (calculations).

The midterm topic list will be published on the Moodle platform. Students achieving a good (4) or excellent (5) mark are exempted from solving a problem (chemical calculation) in the semifinal exam.

The **second midterm** is optional. It can be taken in the first part of the last chemistry practical lesson. One of the experiments conducted during the semester is to be summarized. Scores (1 – 5) of this test will be doubled and added to the points collected for the lab work during the semester (at most 6). Students getting at least 11 points (from the maximal $6 + 2 \cdot 5 = 16$) get a bonus: they do not have to pick a practical topic in the semifinal exam.

Bonuses can be combined, so in the best-case scenario one picks only two topics on the semifinal exam. Bonuses are also valid for retakes and CV exams but not for FM exams.

Midterm tests will be marked by your own lab teacher.

Failed midterms can not be retaken.

Semifinal examination

Only those students who have fulfilled both acknowledgement criteria, thus obtained an official electronic Neptun signature, are entitled to sit for the semifinal exam.

The semifinal is an oral exam conducted by a two-member examination committee.

Students take one topic from each of the following groups of topics:

I. Problems (calculations)

II. General chemistry

III. Organic chemistry

IV. Labs

Rules pertaining to students having achieved bonus(es) can be found in the previous paragraph.

Exemption from attending the course

Students who learned general, and organic chemistry at university levels prior to the commencement of their studies at Semmelweis University might be exempted from attending the Medical Chemistry course. Students are kindly asked to present their official documents (academical transcripts and a detailed syllabus on the courses they have completed) to the tutor (Gergely Keszler).

Registration and modification of examination dates

Electronically, via the Semmelweis University Neptune System.

All our examination rules comply with the official examination regulations of the Semmelweis University.

Recommended textbooks

1. General chemistry:
2. Ebbing-Gammon: General Chemistry, latest edition
3. Organic chemistry:
4. Hrabák-Csermely-Bauer: Principles of Organic Chemistry (2nd edition, 2007, editor: A. Hrabák)
5. Sasvári: Bioorganic compounds
6. Lab lessons:
7. Hrabák: Laboratory Manual – Medical Chemistry, Biochemistry and Molecular Biology (fourth edition, 2015)
8. Hrabák: Selected Collection of Chemical Calculations and Biochemical Exercises (latest edition)

Description of the curriculum

The principal aim of the course is to prepare students for the understanding of the Biochemistry and Molecular Biology subjects. This requires a firm knowledge of the foundations of general and organic chemistry.

The Medical Chemistry course encompasses the following chapters of Chemistry:

I. General Chemistry*Structure of atoms, ions and molecules. Chemical bonds*

Relation of atomic radius, ionization energy, electron affinity and electronegativity to the periodic table. Ionic bond, ion radius, ions. Covalent bonding, s and p bonds, hybrid orbitals, hybridization of carbon. Electron pair repulsion, geometry of molecules, bond angle. Molecular orbital theory.

Polar covalent bonds. Molecules composed of more than two atoms. Coordinative bond. Structure and geometry of ions. Metallic bonding. Interactions between molecules: electrostatic interactions, van der Waals and hydrogen bonds. Structure of water, its properties.

Physical states. Types of crystals, characteristic crystal lattices.

Solutions, laws of aqueous solutions, their biological and medical aspects

Solute, solvent, solution. The solution process. Solubility of ions in water, dissociation. Enthalpy of hydration. Concentration, % and molar concentration, normality, molality, molar fraction. Saturated solutions. Solubility, partition, solubility product. Demonstration on calculation problems. Laws of dilute solutions. Vapor pressure, freezing point, boiling point of pure solvents. Vapor pressure of solutions, Raoult's law. Freezing point depression and boiling point elevation of aqueous solutions. Osmotic pressure, dependence on temperature, solute concentration and ionic dissociation. Biological and medical importance of osmosis.

Electrolytes

Electrolytes, degree of dissociation and the ionization constant, their correlation. Conductance of electrolytes, specific and equivalent conductance of strong and weak electrolytes. Acid-base theories. The Arrhenius theory. Classification of acids and bases, their anhydrides. The Bronsted-Lowry concept. The Lewis concept (e.g. coordination compounds). Acidic strength and the molecular structure. The ionization of water. Water product, definition of pH and pOH. The pH scale. Calculation of pH for strong electrolytes. The effect of strong acids and bases on the ionization of weak acids and bases, respectively. The effect of strong acids and bases on the salts of weak acids and bases. Buffers, calculation of pH of buffers. Buffers of polyprotic acids. Buffers of physiological importance. The carbonic acid/hydrogencarbonate buffer. Buffer capacity. Acid-base indicators. Titration curves of strong and weak electrolytes. The selection of indicator for titrations. The amphoteric character. Basic and acidic salts. Double salts, complexes. Geometry of complexes, chelates. Reaction of salts with water (hydrolysis).

Electrochemistry

Redox processes. Oxidation number, its definition. redox equations. The electrode potential, its explanation. Normal and standard potentials. Galvanic cells, Nernst equation. Concentration cells, the principle of electrometric pH measurement. Non-polarizable electrodes, their utilization in practice. Biological redox potential, redox electrodes. The application of redox potential for biological processes, the principle of mitochondrial energy production. Electrolysis.

Thermodynamics

Chemical thermodynamics. Internal energy and enthalpy, reaction heat, standard enthalpy. Hess' law. Combustion heat, atomic and molecular enthalpy of formation. Bonding energy. The I. and II. laws of thermodynamics, entropy, free energy and free enthalpy. Relation between electromotive force and free enthalpy change. Exergonic and endergonic processes. The equilibrium constant. The direction of the processes and its relation to free energy change.

Chemical kinetics

Reaction kinetics, rate of reaction, order and molecularity. Half-time of reactions. The van't Hoff rule. Activated complex, transition state, activation energy. The Arrhenius equation. Catalysis, catalysts. Reversible processes, the law of mass action, equilibrium constant and its relation to free energy change. Consecutive reactions, the importance of rate-limiting steps in metabolic processes.

II. Organic chemistry

General properties of organic compounds

Introduction, definition of organic compounds, their composition. Homologous series, constitution, constitution isomerism. Classification according to carbon skeletons and functional groups. Characterization of bondings in organic compounds, bonding energy, distance of atoms, dipole moment. Apolar and polar character, inductive and inductomeric, mezomeric and electromeric effects. The vectorial character of dipole moment. Optical isomerism: structural principles of rotation. Chirality, chiral carbon atoms, configuration, enantiomers. Principle of relative and absolute configuration. Projected formulas. Compounds with more than one chiral center: diastereomerism, mezo-forms. Separation of optical isomers.

Classification of hydrocarbons based on their carbon backbone

Alkanes, cycloalkanes, their homologous series. Steric forms, conformations, conformational isomerism. Physicochemical properties of paraffines. Steric structure of cycloalkanes. Alkenes, their homologous series. Constitutional and configurational isomerism. Chemical properties of alkenes, possible mechanisms of addition reactions. Hydrocarbones containing more double bonds, delocalization of p-electrons in compounds containing conjugated double bonds. Acetylene: physicochemical properties. Aromatic hydrocarbons: homologous series, isomerism. The explanation of the aromatic character by the electronic structure. Chemical behavior of benzene and its homologues. Substitution, oxidation, reduction, direction rules in repeated substitutions. General characterization of heteroaromatic compounds, important heteroaromatic compounds.

Functional groups. Classification and chemical characterization of compounds containing various functional groups

Classification of organic compounds according to their functional groups.

1. **Halogenated hydrocarbons, their physicochemical properties.**
2. **Organic compounds containing hydroxyl groups. Classification. Alcohols, physical properties, chemical reactions. Enols and phenols, their chemical reactions. Synthesis of ethers, their reactions.**
3. **Oxo compounds: classification, nomenclature, physical properties. Chemical reactions of aldehydes and ketones, nucleophilic addition reactions. Condensation reactions of oxo-compounds, oxidation reduction, substitution on the carbon chain.**
4. **Carboxylic acids and their derivatives. Classification, nomenclature, their synthesis, physical properties. The explanation of the acidic character of carboxylic group, the effects of substituents on the acidic character. Chemical reactions of monoprotic carboxylic acids, formation of esters, haloids, amides and anhydrides. Substitution of the carbon chain: synthesis of halogenated, hydroxy-, keto- and amino acids. Acidic character of dicarboxylic acids, important reactions. Chemical reactions of hydroxy- and ketoacids. Important representatives of dicarboxylic, hydroxy- and ketoacids.**
5. **Organic compounds containing sulfur: thiols, thiophenols and thioethers, their synthesis and physicochemical properties.**
6. **Organic compounds containing nitrogen: classification, physicochemical properties of nitro compounds. Amines, classification, synthesis, basicity. Important chemical reactions of amines (e.g. Schiff base formations). Amides of carbonic acids.**

MEDICAL BIOCHEMISTRY I.

Department of Medical Biochemistry

Credits: 5

Total number of hours: 70; **lectures (hours):** 42; **practices (hours):** 28

Type of the course: obligatory

Academic year: 2021/2022

Code of the course

Name of Head of the Department: Professor László Csanády M.D. Ph.D. D.Sc.

Contact details: H-1094 Budapest, Tűzoltó u. 37-47. **tel:** +36-1-459-1500#60010 **e-mail:** csanady.laszlo@med.semmelweis-univ.hu

Position: Temporary Head of Department

Date of Habilitation: 2013 **Its number:** 341

Objectives of the subject, its place in the medical curriculum:

The aim of this course is to examine biologically important molecules - namely amino acids, carbohydrates, lipids and nucleotides - identify their contributions to metabolic processes emphasized from a medical point of view, examine the structure and function of proteins, and address mechanisms of catalysis performed by enzymes. Furthermore, three basic biochemistry modules are outlined: The enzymology module, encompassing general principles of enzyme kinetics and how enzymes influence efficiency and controllability of chemical processes in biological systems, as well as how they affect structure and regulation of metabolic pathways; the bioenergetics module, addressing the relationships between mass-energy conversions in the human body emphasizing nutritional aspects, also elaborating on thermodynamic aspects of metabolism; and the 'first' intermediary metabolism module, presenting the salient features of carbohydrate and lipid metabolism which are essential for understanding physiological and pathological processes of the human body. During practices, students apply the theoretical knowledge acquired at lectures as part of case-oriented discussions in an effort to interpret - from a molecular point of view - medically relevant conditions.

Location of the course (lecture hall, practice room, etc.):

Premises located in the Basic Medical Sciences building (laboratory rooms located on the first floor and lecture halls located on the ground floor).

Successful completion of the subject results in the acquisition of the following competencies:

The knowledge of the structure, interactions and reactions of biological molecules and the interactions between organs of the higher integrated regulatory functions of the human body, is of paramount importance from a medical point of view and is essential for understanding physiological and pathological processes and, as a consequence, for making informed medical decisions.

Prerequisite (s) for admission to the course: Medical Chemistry

Number of students required for the course (minimum, maximum) and method of selecting students: Not applicable for compulsory subjects

How to apply for the course: Application is through the Neptun online system

Detailed curriculum:

Lectures: weekly 2x70 min (3 hours)

Lecturers: Prof. Csanády László (CSL), Prof. Kolev Kraszimir (KK), Dr. Christos Chinopoulos (CC), *Dr. Komorowicz Erzsébet* (KE), Dr. Kardon Tamás (KT), Dr. Törőcsik Beáta (TB), Prof. Tretter László (TL)

Practices (P): 2 hours every week

Week	Lectures	Practices (P): 2 hours every week
1	The chemical structure of the amino acids that make up proteins. Formation of peptide bonds and their spatial structure. Primary structure of proteins. (CSL) Hierarchical structure of proteins, secondary and tertiary structure. Process of unfolding of proteins, protein denaturation. (CSL)	Structural and chemical characteristics of amino acids from the point of view of physiological functions (pH and temperature dependent properties).
2	Quaternary structure and posttranslational modifications of proteins. Structure of collagen. Structural basis of protein-nucleic acid interactions. (CSL) Structure-function relationships of haemoglobin and myoglobin. (CSL)	Current protein diagnostic and structural analysis methods and their medical applications.
3	A description of the general properties of enzymes. The chemical nature of enzymes. Thermodynamics of catalysis. The role of activation energy. Isoenzymes. The role of coenzymes and vitamins. Mechanism of action of serine proteases. (KK) Kinetic models of enzyme function. Michaelis-Menten kinetics. Initial reaction rate criteria. Michaelis constant (Km) and its significance. Inhibition of enzyme reactions, kinetics of inhibition. The importance of inhibition types in drug design. (KK)	Interpreting protein structure-related pathological conditions in light of atomic resolution protein structures
4	Allostery and cooperativity. Levels of regulation of enzyme reactions: regulation by compartmentalization, regulation of gene expression, regulation by reversible modification of catalytic activity of enzymes. Regulation by proteolytic activity. (KK) Structure and kinetics of metabolic pathways. Principles of metabolic control. Strategies for identifying drug target enzymes. (KK)	Determination of enzyme kinetic parameters, regulation of enzyme activity
5	Thermodynamics of biochemical processes. Reversible and irreversible reactions. Compounds with high group transfer potential. The central role of ATP in cellular energy metabolism. Reducing equivalents. (TL) Substrate level phosphorylation as a possible mechanism for ATP synthesis. Reactions and regulation of the citrate cycle. Acetyl-CoA sources of the citrate cycle. Pyruvate dehydrogenase complex. (TL)	Identification of metabolic pathways.
6	Mechanism of ATP synthesis in mitochondria: oxidative phosphorylation. The so-called terminal oxidation, also known as respiratory chain redox reactions, and the enzyme complexes that catalyse these reactions. (CC) Transfer of energy released during exergonic redox reactions to the synthesis of ATP. Function of ATP synthase, reversibility. Respiratory control, P/O ratio. Mechanisms inhibiting oxidative phosphorylation. Physiological role of uncoupling. (CC)	The structure of carbohydrates. Carbohydrate components in the diet. Dietary fibers and additives.
7	Carbohydrates in food, their digestion, absorption of carbohydrates in the intestinal tract. Membrane transporters in general. Glucose transporters, their tissue localization, regulation. (TB) The process and regulation of glycolysis. (TB)	Experimental determination of P/O ratio (practice)
8	Metabolism and molecular pathology of fructose, galactose and lactose. Glycogen degradation and synthesis. (TB) Gluconeogenesis. Anaplerotic reactions. Energetics of gluconeogenesis, its significance in starvation. Cori cycle. Regulation of gluconeogenesis. Effect of glucagon. (TB)	Lactic acidosis
9	Regulation of blood glucose I. Glycogen mobilisation in liver and muscle. Phosphorylation cascade. Enzymes regulated by glucagon. Lactose synthesis (TB) Regulation of blood glucose II. Hyperglycaemia. Insulin secretion, its receptor and its effects on the organs (TB)	Structures and bioenergetic functions of the main lipids in the body and in foodstuffs
10	The biochemistry of diabetes. Type 1 and type 2 diabetes (TB) Dietary lipids, their digestion, absorption, metabolism of kilomicros. Essential fatty acids (TL)	Measurement of blood glucose levels according to the oral glucose tolerance test. Non-enzymatic glycation of haemoglobin.
11	Mobilisation of fatty acids in adipose tissue and its regulation. Transport in the circulation. Free fatty acids, VLDL, IDL (TL) Oxidation of fatty acids and its regulation. Production and utilisation of ketone bodies (TL)	Role of insulin in metabolism and signal transduction
12	Synthesis and regulation of fatty acids. Saturated and unsaturated fatty acids. Synthesis and regulation of triglycerides and phospholipids (TL) Characterisation and grouping of biotransformation reactions: phase I reactions - microsomal cytochrome P450 isoenzymes, phase II reactions - glucuronidation, conjugation with glutathione. Regulation of biotransformation processes (KT)	The role of lipoprotein lipase in determining the metabolic profile of organs. Lipoprotein lipase deficiency.

Week	Lectures	Practices (P): 2 hours every week
13	Cholesterol metabolism, cholesterol transport in the circulation (KK) Synthesis, metabolism and role of bile acids in the digestion of fats. Cholesterol deposition and uptake in cells (KK)	Determination of cholesterol and triglycerides (medical implications of plasma cholesterol levels)
14	Steroid hormone synthesis in the adrenal cortex. Biochemical background of adrenocortical stratification. Synthesis of mineralocorticoids, prereceptor specificity. Types of steroid receptors and signal transduction, classical and non-genomic mechanisms of action. (KE) Synthesis of glucocorticoids, cortisol effects, regulation of cortisol synthesis. Synthesis of sex hormones. Progesterone and estradiol synthesis in the placenta. Testosterone synthesis in the testis, formation and significance of dihydrotestosterone. KE)	Membrane-forming lipids; precursors of signalling molecules.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes: none

Special study work required to successfully complete the course: None.

Requirements for participation in classes and the possibility to make up for absences:

Practices and seminars are mandatory. It is not possible to make up for missed practices/seminars. In case of absences amounting to more than 3 occasions, the semester is not acknowledged. Arriving to a practice /seminar with a delay of more than 10 minutes is considered an absence.

Methods to assess knowledge acquisition during term time:

Practice/seminar participation performance will be evaluated by the tutor: as such, maximum 10 points per semester can be obtained that may count towards the semi-final grade, see under “Grading system”.

Midterms: A midterm will take place in the 6th and another in the 11th week, during the practice/seminar (allocated time per midterm: 20 minutes). Each midterm will consist of multiple choice questions (MCQs) from which max 20 points can be obtained (10 points per midterm).

It is not obligatory to pass a midterm in order to be allowed to sit for the semi-final exam. However, the midterm points will be added as “points” to the result of the semi-final exam, as detailed in “Grading system”.

Lectures: At the end of each lecture, there will be a Kahoot on the topic of the lecture, consisting of 5 questions. Maximum 1 point can be earned per lecture, as outlined by the lecturer. Through the Kahoots, students may obtain points that will be added to the points earned at the semi-final exam, as detailed in “Grading system”.

Competition: The competition is held on the last week and consists of 70 multiple choice questions (MCQs). Only students who amass 14 or more points from the midterms may participate in the competition. Points obtained from midterms, Kahoot quizzes, or practice/seminar performance (see below), do not count in the competition. Winners may be exempted from the semi-final exam.

Requirements for signature: No credit will be given for absences exceeding 6 hours (3 occasions).

Type of examination: Semi-final; Form: written and oral test based on material of the official textbooks, lectures and practices/seminars published at the department’s Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>). See under “Grading system” for further details.

Requirements of the examination:

The material covered in the exam is the material of the lectures and practices/seminars in the topic, with the corresponding textbook chapters.

Method and type of evaluation:

Grading system: The grade of the semi-final exam is based on the points obtained i) in Kahoot quizzes at the lectures, ii) during the seminars/practices, iii) at the two midterms, iv) at the written MCQ semifinal exam, and v) in an oral exam following the written MCQ exam. The written MCQ exam and the oral exam will take place on the same day of the examination period.

The grading system is as follows:

(i) Kahoot: maximum 1 point per lecture.

(ii) Seminar/practice points: maximum 10 points.

Total points from (i) and (ii) cannot exceed 20 points.

(iii) Two midterms: maximum 20 points.

(iv) Written MCQ exam: This test consists of multiple choice questions (MCQs) from which max 100 points can be obtained (allocated time: 100 minutes).

If the score of the MCQ exam is 49 or below, then the grade of the semi-final exam is 'fail'.

If students reach 50 points on the MCQ exam, the midterm points, practice/seminar performance points and lecture Kahoot points (total max. 40 points) will be added to the MCQ score.

Grade calculation of the written part of the semi-final exam from the total points (MCQ+semester):

95–140: grade 5 (excellent)

85–94: grade 4 (good)

70–84: grade 3 (satisfactory)

55–69: grade 2 (pass)

Only those students who obtained at least 50 points at the semifinal MCQ test will be invited for an oral exam. During the oral exam, the examiner will pick three questions from those MCQs that were correctly answered by the student. The student will have to elaborate properly on these questions. The final grade will be given based on the written and the oral part of the exam.

How to register for the examination?: The exam dates are announced on the 12th week of the semester. We provide at least one exam date each week. Applications are made in the Neptun system in accordance with the University Study and Exam Rules.

Possibilities for exam retake: an exam can be re-taken only after two calendar days.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Harper's Biochemistry (30th edition, or latest)

Online material published in the department's website (<http://semmelweis.hu/biokemia/en/>)

MEDICAL SOCIOLOGY – Health Care

Semester: half class in the first semester and half class in the second semester

Institute of Behavioural Sciences

Type of the course: compulsory

code: AOKMAG425_1A

credit: 2

Course leader: Dr. György Purebl

Groups 1-8 in the first semester, groups 9-16 in the second semester

Course objectives:

By the mid to late 20th century, the biomedical model in medicine was replaced by the biopsychosocial model. There are biological, psychological and social factors in the background of illness. This is the approach we take in this course in looking at various aspects of health, illness and medical work. Our aim is to introduce future medical doctors to the social factors they must be familiar with in working with patients. Topics include social stratification and health inequalities, the principles of health care systems, medicalisation and the changing medical profession, illness behaviour, intercultural issues in health care as well as the challenges of digital health.

Course Syllabus:

1. Introduction to medical sociology, basic concepts and principles. (lecture)
2. Health and illness in society, a historical transformation of mortality and morbidity patterns. (lecture)
3. Social stratification, social inequalities and health (lecture)
4. Intercultural healthcare (lecture)
5. The challenges of digital health (lecture)
6. Globalisation and therapy choice (Lecture)
7. Health care systems (Lecture)
8. Preparation for project work and for health care system workshop (practical)
9. Health care systems workshop (practical)
10. Global poverty and inequalities, Inequalities and health- social class (practical)
11. Inequalities and health: age, ethnicity and gender (practical)
12. The doctor- patient relationship in the 21st century (practical)
13. Illness behaviour (practical)
14. The challenges of health care professionals- coping with stress (practical)

Participation and making up for absences:

No less than 75% of all practices must be attended. One practical absence can be made up by undertaking an extra task set by the practical leader or by participating in the practical with another group.

Justification of the absence in the lectures and examinations:

Medical certificate

Checks during the semester (reports, written checks):

Students will be given topic related tasks during the practicals which they will have to complete in groups in order to get the signature.

The tasks will involve finding topic related data in class, interpreting it and presenting it to the group, relating the topics discussed in class to the students' own countries and experiences and sharing it with others, reading articles and summarising them and participating in games and activities. More information will be provided separately. The project work is not graded, but it is a requirement for the signature.

Requirements for the signature at the end of the semester:

Participating in 75% of the practices.

Doing the project work

Method of the calculation of marks:

The written semi-final is 100% of the final grade

Grades:

0-50 points – 1

51- 60 points -2

61-74 points -3

75-84 points -4

85 points and over 5

Type of the exam:

Written final exam to be held during the examination period consisting of multiple choice questions, true or false questions and an essay type case analysis based on lecture materials and the textbook. This is 100% of the final grade.

Requirements for the exam:

The material needed to study will be made available on Moodle.

Application for the exam: Neptun

Changing the application for the exam:

Neptun

Justification of the absence from the exam:

Medical certificate

Course and recommended text books:

Graham Scrambler (ed) Sociology as Applied to Health and Medicine, Palgrave Macmillan 2018- selected chapters only.

MEDICAL COMMUNICATION

Institute of Behavioural Sciences

Name of the course leader: *Prof. Dr. József Kovács*

Credit value: 2 credits

Total number of hours: 28 **lectures:** 14 **practices:** 14 **seminars:** 0

Subject type: compulsory course

Subject code: AOKMAG670_1A

Objectives of the subject, its place in the medical curriculum:

Proper communication is an essential element of effective healing. Good communication helps to form a trusting relationship between the physician and the patient, it allows the doctor to gather effectively the information that underpins the diagnosis, and it improves the patient's cooperation and adherence with treatments. The aim of education is partly to teach communication techniques that can make the daily tasks of doctors more effective: listening to, interviewing, informing and promoting cooperation of the patients. The subjects of education are also elements of the everyday doctor-patient relationship, which have recently come to the fore, such as e.g. shared decision making, suggestive effects of medical communication, communication aspects of patient safety.

In addition to describing the general regularities of medical communication, the course also presents the specialities of communication in various areas of the health care. Thus, we deal with the peculiarities of communication with children or the elderly, discussion about sexual topics and the cultural competence of the doctor. In our education, we place great emphasis on the difficult issues of the doctor-patient relationship, so we deal with the communication of bad news and the prevention and management of aggression.

The main goal of the course is to teach special communication knowledge to medical students that can help them create proper doctor-patient relationship and improve their effectiveness in medical practice.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

SU NET and EOK buildings

Successful completion of the subject results in the acquisition of the following competencies:

Upon successful completion of the subject, the students will be able to

- effectively gather information to make a diagnosis by using appropriate questioning techniques;
- use communication techniques that facilitate the understanding and remembering during patient information;
- know and apply specific communication techniques to express their attention and empathy;
- use several communication techniques to improve the patient's therapeutic cooperation;
- inform the patient about the possible risks of the treatments in accordance with the legal regulation, in an objective, yet non-alarming way;
- can activate the patient in order to become a partner in his own treatment as much as possible, and empower the patient himself to contribute as much as possible to his own recovery or improvement of his condition;
- have effective methods to facilitate lifestyle change;
- be aware of the suggestive effects that doctor's communication can have; be able to use communication methods that put the positive effects of the doctor's words at the service of cooperation and healing;
- be able to communicate in a way that suits the individual characteristics of the patient (age, different social and cultural backgrounds, different levels of health understanding, possible mental disorders or disabilities);
- be able to communicate on intimate issues without embarrassment;
- know and be able to use communication methods to manage tensions and conflicts;
- breaking bad news in a compassionate way (eg news of incurable disease, news of death, news of congenital malformation);
- can effectively use modern technology for the purposes of medical communication;
- know and be able to use communication tools that increase patient safety.

Course prerequisites:

There are no prerequisites.

Number of students required for the course (minimum, maximum) and method of selecting students:

The completion of the course is compulsory for all students. Course is taught only in the first semester of the academic year, all students can register for the course. The recommended maximum number of students for practice is 15 students per group.

How to apply for the course:

Through the Neptun system.

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks). Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments!

Always attach a CV for guest lecturers!)

LECTURES: Week 1-7

Week 1:	Introduction. Communication difficulties and possible solutions in the everyday medical practice.
Week 2.	Promoting behavior change. The development of the patient-physician collaboration.
Week 3.	Communication about functional complaints.
Week 4.	The specialties of age in medical communication.
Week 5.	Suggestive communication in medical practice.
Week 6.	Breaking bad news. Disclosing medical errors.
Week 7.	E-health: use of technological tools in health communication.

Practice: Week 8-14 (see times, venues and teachers to be announced)

Week 8.	Seminar. Communication in everyday life and in the medical practice.
Week 9.	Seminar. The active listening. Communication aspects in empathy.
Week 10.	Patient information, patient education.
Week 11.	Seminar. Promoting lifestyle change. suggestive communication techniques, motivational interview, shared decision-making.
Week 12.	Seminar. Communicating bad news (practice). Communicating with depressed patients. Recognizing the risk of suicide.
Week 13.	Seminar. Communication with tense, hostile patients, strategies to prevent violence. Communicating about intimate issues.
Week 14.	Seminar. The cultural competence of the doctor. Communicating about complementary and alternative therapies.

Lecturers: Dr. Stauder Adrienne, Dr. Kollár János, Dr. Tóth Mónika Ditta, who are employees of Semmelweis University

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

- The Sociology of Healthcare and Medicine (possible overlap: the impact of modern technology on medical communication)
- Medical Psychology, Psychiatry (possible overlap: relationship and communication with people with mental disorders.)
- Bioethics (possible overlap: medical communication deals with the implementation in everyday practice of principles described in bioethics.)

Special study work required to successfully complete the course:

(E.g. field exercises, medical case analysis, test preparation, etc.)

no special study work required

Requirements for participation in classes and the possibility to make up for absences:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

It is possible to make up for ONE absence by participating in another seminar group the same week (only once in a semester, upon agreement with both teachers!)

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

There is no assessment during the term time.

Requirements for signature:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

Type of examination: semi-final

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

Exam topics list A:

1. The significance of medical communication. Misconceptions and facts about medical communication.
2. Doctor-patient consultation.
3. Promoting lifestyle change: the 5A and 5R methods; the transtheoretical model of behavior change.
4. Promoting lifestyle change: motivational interviewing.
5. Communication options for developing health literacy.
6. Communicating risks of treatments.
7. Shared decision making.
8. Suggestive communication in medical practice.
9. Communication with children.
10. Communication with older people. Communication with elderly having age-related mental disorders.
11. Cultural competence of the physician.

Exam topics list „B”

12. Communication about functional symptoms
13. Communication with patients using complementary and alternative treatments.
14. Communicating about intimate issues.
15. Communication with tense, hostile people.
16. Communication with depressed patients. Recognizing the risk of suicide.
17. Communication with patients having anxiety symptoms or addictions.
18. Breaking bad news.
19. Communication aspects of patient safety.
20. Communication with people living with disabilities.
21. Communication with the victims of abuse.
22. E-health: use of technological tools in health communication.

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

Final mark is based on an oral exam. Two topics – one from A list and one from B list should be reported on, at least at satisfactory (2) level. The average of the marks given for each topic gives the final mark.

How to register for the examination?:

Through the Neptun system.

Possibilities for exam retake:

Through the Neptun system

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

The oral exam is based on the course text book and the lecture handouts posted on the website.

Course text book:

Pilling, János: Medical Communication in practice. Medicina, Budapest, 2020.

Recommended text books:

Washer, P. (2009): Clinical Communication Skills. (Oxford Core texts). Oxford University Press.

McCorry, L.K. & Mason, J. (2011): Communication skills for the healthcare professionals. Lippincott Williams & Wilkins, Baltimore

Tamparo, C.D & Lindh, W.Q (2017): Therapeutic communication for health care professionals. Cengage Learning, Boston

Hugman,. B. (2009): Healthcare communication. Pharmaceutical Press, London

INTRODUCTION TO MEDICAL INFORMATICS

Name of the educational organizational unit: SE EKK

Type of the subject: 1 practice / week

code: AOVINF244_1A

credit value: 1

Name of the lecturer of the subject:

Dr. Miklós Szócska

Teachers:

Dr. Tamás Iváncsy (PhD, lecturer)

Dr. Ádám Zoltán Tamus (PhD, associate professor)

Tamás Tóth (assistant lecturer)

Zoltán Sándor (assistant lecturer)

Administrator: Ms Petra Rácz

Term: spring

The exercise of the subject in the in the realization of the aim of the education:

To introduce the students to the medical application of informatics, the characteristics of modern, integrated information systems with respect to quantitative aspects and to decision demands of the modern sciences. The medical informatics leans on methods of mathematics, statistics and computer sciences and it also includes from the different engineering, management and informatics procedures.

Select the desired course in Neptun when registering to the subject! Changing topics/groups is possible only according to the rules of the registration in Neptun! You must attend the course you have selected in Neptun!

OPTIONAL courses:

I. SCIENTIFIC COMMUNICATION COURSE

The course gives an introduction to the paper based and oral publications and presentations. The students have to find a medical problem (a topic) to work out during the course.

1. **Creation and retrieval of medical knowledge. Finding and studying scientific publications via the electronic library of the university.**
2. **Structure of a scientific publication. The importance and meaning of the sections of the paper. Structure of an oral presentation.**
3. **Scientific publication in practice: finding and evaluating information and creating paper and presentation on the selected topic.**

II. DATABASES COURSE

The course gives an introduction to structuring and retrieving data using databases. The students perform practical examples of data management and query using a current software solution.

1. **Introduction to database theory and data modelling principles (the application, logical and physical models, basic concepts and objects).**
2. **Data handling in practice: planning a relational database, managing tables and fields**
3. **Information retrieval from databases: the role and structure of queries, performing basic queries**
4. **Data management via user interfaces – basic concepts and principles**

III. BIOMEDICAL SIGNAL PROCESSING COURSE

The students learn about the basics of biomedical signals, their acquisition, digital storage and processing. They perform practical analysis of selected signal examples.

1. Introduction to biomedical signal processing, objectives of signal analysis, Components of human-instrument system
2. Examples of biomedical signals (electrical and mechanical signals), and transducers.
3. The basics of signal processing, the digitalizing (sampling, Shannon-theory, quantization).
4. Analysis of a phonocardiogram (heart sound, calculation of the pulse, murmurs). Spectral analysis.
5. Analysis of ECG signal. Basics of removing noise and artefacts.

IV. PRESENTATION TOOLS

The course provides an overview of visual representation of medical information for various audience. The students learn the use of several related tools, and work up a selected topic.

1. Introduction to presentation techniques: How to make a good presentation? – technical and non-technical skills, best practices
2. Types of medical information, online information sources
3. Visual representation of information: word cloud, infographic etc.
4. Online tools for creating and sharing presentations

Requirements of participation of the lessons and the possibility of substitution of the absence:

According to rules of the Studies and Exam Code. Attendance on at least 3 of the 4 practices is mandatory.

The mode of the certificate in case of absence from the lessons:

According to rules of the Studies and Exam Code. No certificate accepted.

The requirements of signature at the end of the term (including also the number and the type of the students' exercises which are solved individual by them)

Attendance on at least 3 of the 4 practices is mandatory

The mode of acquisition of the mark:

Practical exercise

List of lecture notes, course books, study-aids and literature which can be used to acquisition of the syllabus:

The educational materials are available at <http://dei-cloud.semmelweis.hu>

Username and password is announced at the first practice.

INTRODUCTION TO PATIENT CARE

Institute: Department of Family Medicine
Lecturer: *Dr. Péter Torzsa MD PhD*
Tutor: *Dr. Krisztián Vörös*

lectures: 6x2 hours, practices: 6x3 hours/semester

Credit: 2

Examination: semi-final

Second Semester

Thematic:

- An overview of medical profession.
- Formation of the consciousness of profession, personal careers.
- The attitude of the medical doctor. Communication with colleagues and the members of the medical staff.
- An overview of different levels of health care.
- The organization, function activity of the clinical department and general medicine praxis.
- Characteristics of the clinical work.
- Overview of the scientific activity of the clinical department. Raising interest on joining to it.

FIRST AID

Tutor: ***Dr. István Hornyák***

Topics

- Principles of first aid. Recognition of an emergency. Assessment of the scene. Dangerous scene. Safety measurements on the scene. Call for an ambulance. Emotional viewpoints of managing emergencies.
- Assessment of the patient. Responsiveness – unresponsiveness. Assessment of the responsive patient: complaints, signs for the severe condition. Positioning of the patient in specific conditions.
- The unconscious patient. Airway management. Assessment of the vital signs. Recovery position.
- Heart attack. Sudden death. Chain of survival. Assessment of vital signs.
- BLS (Basic Life Support)
- BLS
- AED (Automated External Defibrillator). PAD (Public Access Defibrillation)
- BLS + AED (management of situations)
- BLS + AED (Management of situations)
- Chocking. Drowning. Electrocutation.
- Injuries. Extrication of the patient: Rautek maneuvers. Helmet removal. Mobilization and immobilization of injured patients.
- Bleeding control. Bandages. Burns. Shock.
- Fractures, dislocation, sprain. Slings.
- Stroke. Convulsions. Diabetes mellitus: Hypoglycaemia. Shortness of breath. BLS
- Poisoning. Drugs. Drunkenness.
- BLS

Note: Participation at 75% of practices is necessary. Compensation of absences is possible in subsequent practices.

Development in learning skills will be controlled all the time during the practices in the semester.

Mode of certifying absences: oral – referring to practices.

Requirements: The student should be able to recognize emergencies, and call for help start with BLS + AED provide airway management in unconscious patients provide first aid for patients complaining for chest-pain, shortness of breath, signs for hypoglycaemia and having suffered from fainting, shock condition, convulsion, injuries.

The performance of the above mentioned requirements at the last practice will be evaluated with “accepted” or “not accepted”.

MEDICAL TERMINOLOGY (Latin)

Responsible organisational unit:

Department of Languages for Specific Purposes

Programme director:

Dr. Katalin Fogarasi-Nuber, associate professor, Director

90 minutes/week

Assessment: 3 written tests

Role of subject in fulfilling the aim of training:

Students get familiarized with the Latin and Greek terminology of medicine in order to facilitate the acquisition of other subjects. Special focus is dedicated to anatomy, physiology, pathology and pharmaceuticals. Furthermore, the course provides an introduction into general scientific terminology.

Brief description of subject:

The main aim of the subject is:

1. to acquire a knowledge of about 500-600 Latin words and phrases as a minimum vocabulary (basic vocabulary of medical and scientific language),
2. the correct application of
 - a) anatomical names,
 - b) names of diseases
 - c) names of drugs,
3. to understand diagnoses and prescriptions;
4. to learn about abbreviations used in prescriptions.
5. to be able to make a clear distinction between medical terms of English and Latin/Greek.

Course content of practical lessons:

1. Grammar:

Nouns: the 5 Declensions

Adjectives - construction of the most important attributive structures with the vocabulary of anatomy, clinical subjects and of pharmaceuticals.

Prepositions (in anatomical, clinical and pharmaceutical phrases)

Numerals: Usage on prescriptions.

2. Texts containing:
 - a) anatomical names;
 - b) clinical and patho-anatomical diagnoses;
 - c) prescriptions
3. Vocabulary

Latin and bilingual (Greek-Latin) nouns, adjectives, numerals and prepositions used in anatomy, the clinical subjects and pharmaceuticals;

Course material, recommended text book(s), professional literature and supplementary reading(s)

Belák E. *Medical Terminology for Beginners* (earlier title: *Medical Latin*), Budapest: Semmelweis Kiadó.

Bakó A. *Medical Terminology*. Course material provided by the Institute in pdf.

MEDICAL HUNGARIAN I.

Responsible organisational unit:
Department of Languages for Specific Purposes

Programme director:
Dr. Katalin Fogarasi-Nuber, associate professor, Director

4 lessons per week, 2 credits,
Assessment: 2 oral tests (on weeks 7 and 14)

The aim of the subject:
The role of this subject is to help students acquire the Hungarian language skills that enable them to take anamnesis, ask the patient about medical history and present complaints and to develop strategies that help understanding Hungarian patients in their clinical practice. Students learn how to communicate with the patient during the examination of the thoracic organs, circulation, abdomen, locomotor and nervous systems. Furthermore, they get familiarised with basic medical documentation (e.g., patient’s chart). They develop the vocabulary necessary in their clinical practice, such as the names of symptoms and conditions.

Course content of practical lessons:

weeks	curriculum
1	Introduce yourself in Hungarian
2	What can I do for you? What languages do you speak? Where are you from? (Conjugation of verbs I.)
3	What do you do in Budapest? (Conjugation of verbs II)
4	Where do you live? (numbers, conjugation of verbs with „-ik”)
5	Roleplay exercises I
6	Roleplay exercises II
7	Oral interview (first midterm)
8	The human body, bodyparts
9	At the pharmacy
10	What is your complaint?
11	Talking about pain (location, duration)
12	At the clinics: patient’s data
13	Basics of history taking in Hungarian
14	Oral interview

Course material provided by the Department of Languages for Specific Purposes

MEDICAL HUNGARIAN II.

Responsible organisational unit:

Department of Languages for Specific Purposes

Programme director:

Dr. Katalin Fogarasi-Nuber, associate professor, Director

4 lessons per week, 2 credits,

Assessment: 2 oral tests (on weeks 8 and 14)

The aim of the subject:

The role of this subject is to help students acquire the Hungarian language skills that enable them to take anamnesis, ask the patient about medical history and present complaints and to develop strategies that help understanding Hungarian patients in their clinical practice.

Students learn how to communicate with the patient during the examination of the thoracic organs, circulation, abdomen, locomotor and nervous systems. Furthermore, they get familiarised with basic medical documentation (e.g., patient’s chart). They develop the vocabulary necessary in their clinical practice, such as the names of symptoms and conditions.

Course content of practical lessons:

weeks	curriculum Hungarian language competences related to the following topics
1	Revision – At the clinics: patient’s data
2	Family history; lifestyle, habits
3	Medical history – previous illnesses and surgeries
4	Medications, allergies, transfusion
5	Pain and fever
6	Present complaints I (heart, lungs)
7	Present complaints II (gastrointestinal)
8	Revision, oral interview (first midterm)
9	Present complaints III (faeces, urine)
10	Present complaints IV (swollen legs)
11	Present complaints V (dizziness, headaches)
12	Present complaints VI (neurological symptoms)
13	Revision, roleplay exercises
14	Oral interview

Course material provided by the Department of Languages for Specific Purposes

PHYSICAL EDUCATION I.

Department of Physical Education

Type of Subject: Compulsory
Code of Subject: AOKTSI009_1A
Credit: 0

Name of the Lecturer: Várszegi Kornélia

His/her workplace, phone number: 1107 Budapest, Zágrábi utca 14. +36-1/264-1408
Position: director

Objectives of the subject, its place in the medical curriculum:

The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Testnevelési és Sportközpont (Gymnasium) 1107 Budapest Zágrábi utca 14.

Successful completion of the subject results in the acquisition of the following competencies:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Number of students required for the course (minimum, maximum) and method of selecting students:

According to the Neptun admission system (20 – 60 students)

How to apply for the course:

via Neptun system
Detailed curriculum:

1st Week:	General information	Health and Safety, Fire and Environmental protection. The mid-year adoption requirements, the construction of the classes and the presentation of the university recreational and sports opportunities for extra – curricular activities. Heart rate measurements, Ruffier test and evaluation of the results.
2nd Week:	Athletic	Exercises to improve stamina..Preferably outdoors, on grass ground running, with the aim of developing good running and breathing techniques.
3rd Week:	Flying disc	Introduction the basic of frisbee rules and practicing the basic technical elements in pairs and game situation.
4th Week:	Tennis	Introducing the basis technical elements of tennis (forehand and backhand shot), improving hand-eye coordination.
5th Week:	Agility ladder	Introducing different running, skipping techniques using agility ladder.
6th Week:	Football	Introducing the basic technical elements of football. Single exercises and exercises in pairs to improve the ball skill development.
7th Week:	Badminton	Introducing the basic technical and tactical elements of badminton. Introducing the basic rules and game.

8th Week:	Circuit training	Bodyweight exercises and exercises with basic equipment to learn the correct functional movement pattern.
9th Week:	Ruffier test and ball skill developing exercises	Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention.
10th Week:	Meta	Introducing the game and the basic rules. Aim to improve the ball skill development, improve reaction time, speed and explosiveness.
11th Week:	Obstacle course	To complete a built up obstacle course using different creeping- climbing, hovering, pulling, skipping, throwing techniques for general skill development.
12th Week:	Core training	Postural correction exercises using the own bodyweight especially to strengthen the core muscles to prevent the health of the vertebrae.
13th Week:	Skipping rope	Endurance and coordination developing exercises at different levels using skipping rope.
14th Week:	Dumbbell exercises	Strengthening exercises with dumbbells.

P.E. Teachers:

Doharné Buczkó Anikó, Farkas Dominika, Kalmus Dániel, Lehel Zsolt, Sótonyiné Hrehuss Nóra, Várszegi Kornélia, Weisz Miklós

Requirements for participation in classes and the possibility to make up for absences:

The number of active participations for physical education classes is 10, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Methods to assess knowledge acquisition during term time:

There is no mandatory control during the term.

Requirements for signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

PHYSICAL EDUCATION II.

Type of Subject: Compulsory
Code of Subject: AOKTSI009_2A
Credit: 0
Name of the Lecturer: Várszegi Kornélia

His/her workplace, phone number: 1107 Budapest, Zágrábi utca 14. +36-1/264-1408
Position: director

Objectives of the subject, its place in the medical curriculum:
The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behaviour

Place where the subject is taught (address of the auditorium, seminar room, etc.):
Testnevelési és Sportközpont (Gymnasium) 1107 Budapest Zágrábi utca 14.
Successful completion of the subject results in the acquisition of the following competencies:
One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Number of students required for the course (minimum, maximum) and method of selecting students:
According to the Neptun admission system (20 – 60 students)

How to apply for the course:
via Neptun system
Detailed curriculum:

1st Week:	General information	Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra-curricular activities.
2nd Week:	Basketball	Dribbling, passing and shooting drills in order to improve fine motor skills.
3rd Week:	Bench exercises	Using the dimensions of the sport bench by running, skipping, jumping, lifting etc. exercises.
4th Week:	Rubber band exercises	Strength and coordination training by taking advantage of the elastic features of the object.
5th Week:	Floorball	Introducing the sport to the Students by exposing the major rules, proper technique of stick handling. Passing and shooting drills.
6th Week:	„Double-trouble”	Strength and stretch training in pairs by applying different starting positions. Functional movements executed in pairs.
7th Week:	Volleyball	Introducing the fundamental elements of the game (serves, hits, digs etc.) Exposing the major rules and techniques.
8th Week:	Frisbee	Taking the next step into the game by applying tactical elements in match situations. Passing and catching drills in different moving forms.
9th Week:	Ruffier test and ball skill developing exercises	Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention. Sport games on the side (Dodge-ball, King of the court etc.)

10th Week:	Circuit training	General strengthening drills at each stations. Applying different intensity level, regarding the various conditions of the Students.
11th Week:	Tennis	Involving the new strokes into the learning process: form of serves, the volleys, the smash etc.
12th Week:	Badminton	Introducing the new technical and tactical elements of the game (drop shots, lobs, smash etc.) Exposing the rules of doubles.
13th Week:	Core exercises	Relative (own body) weight exercises applying different equipment (hand weights, rubber band etc.) with the aim of postural correction, by strengthening the core muscles in order to avoid spinal deformations.
14th Week:	Box exercises	Applying the sport box by jumping, lifting, slaloming, carrying (etc) it.By this enhance the level of strength and stamina.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men's football, handball, basketball, volleyball)

P.E. Teachers:

Doharné Buczkó Anikó, Farkas Dominika, Kalmus Dániel, Lehel Zsolt, Sótonyiné Hrehuss Nóra, Várszegi Kornélia, Weisz Miklós

Requirements for participation in classes and the possibility to make up for absences:

The number of active participations for physical education classes is 10 (for trainings 15 times!), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Methods to assess knowledge acquisition during term time:

There is no mandatory control during the term.

Requirements for signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption! of both the Hungarian and foreign students.

COMPULSORY SUMMER PRACTICE

SUMMER (NURSING) PRACTICE

Credit point: 1

Total hours: 160 practice

Type of course: compulsory

Course code: AOKNSG676_1M

Aim of the course, its position in the medical curriculum:

Introduction of the structure of the clinic/hospital and the operating of the given ward. Learning the process of patient care and nursing through practical training. Learning basic skills of everyday nursing tasks, which will be used during further medical practice and after completion of the medical training.

Acquired competences after successfully completing the course:

- Ability to assess basic nursing needs of the patient.
- Ability to detect, observe, and document patient's vital signs (pulse, blood pressure, respiration, temperature).
- Ability to administer subcutaneous and intramuscular injection, collect blood, place venous cannula under supervision, recognise minor complications.
- Knowledge of basic skills of resuscitation.

Student enrolment requirements (minimum, maximum), method of student selection:

Number of attending students as given by the practical site. Valid Occupational Medical Examination certificate, certificate of occupational, fire, and environment protection training.

How to apply for course:

After applying on the NEPTUN site, contact clinical head nurse of the practical site/in case of a hospital contact hospital nursing board, regarding the beginning of the practice.

Detailed syllabus:

- 1st week: Introduction to the operating of the ward. Observing nursing activities, assessment and documentation of nursing needs, and patient's environment. Actively taking part in everyday nursing care of patients with the support of nurses. Observing and acquiring communication skills with patients. Observing laboratory and other examination procedures, as well as preparation of patient for surgery/examination. Learning the use of personal protective equipment, as well as hygienic and antiseptic hand washing. Learning basic skills, protocol, and ward devices for resuscitation.
- 2nd week: Independent nursing care patient admission, measurement of weight, height, blood pressure, pulse, temperature, respiration, blood glucose, assessment of needs, documentation. Development of patient's environment. Assistance with performance of ECG. Observe administration of medication, blood collection, administration of injection, placement of venous cannula, infusion and transfusion therapy, assistance in preparation, recognition of minor local complications. Administration of subcutaneous and intramuscular injection under supervision of nurse.
- 3rd week: Blood collection, administering injection, placement of venous cannula under supervision of nurse. Continuous practice of knowledge acquired during the first two weeks.
- 4th week: Continuous practice of knowledge acquired during the first three weeks.

Requirements for participation in classes and opportunities to make up for absences:

Two classes may be missed, further absences cannot be made up.

The criteria for end-of-term signatures:

Regular attendance of the practical. According to the Studies and Exams Code, the criteria for obtaining signature is at least 75% participation in the practical.

Type of exam:

practical

Exam requirements:

Student chooses one task from the list of given tasks, and performs the given task in practice. In connection with the task the student assesses the patient's nursing care needs, and detects, observes, and documents vital signs (pulse, blood pressure, temperature, respiration).

Method and type of class marks:

Criteria for obtaining a signature is regular attendance of the practical, for the performance of the chosen item a mark is given: passed with excellence (5) - passed (3) - not passed (1) .

How to apply for the exam:

The practical exam takes place on the last day of the practice.

Opportunity to repeat the exam:

The practical exam can be repeated two times.

The list of printed, electronic and online notes, textbooks, study aids and literature to be used to learn the curriculum (in case of online sources, html address):

Recommended literature:

Bokor, Nándor: Általános ápolástan és gondozástan (Medicina 2013.)

Oláh, András (ed). Az ápolástudomány tankönyve http://eta.bibl.uszeged.hu/906/1/0061_apolastudomany_magyar.pdf

EXAMINATION ITEMS

1. Describe and demonstrate the process of hygienic hand disinfection.
2. Describe the daily routine of the ward, and the content of the nursing documentation.
3. After the patient left, tidy up the bed and its environment.
4. Describe possibilities of positioning patient in bed. Perform positioning taking patient's comfort and safety needs into consideration.
5. Prepare for and perform tidying up patient's bed, and bathe patient. Describe patient's hygiene, comfort and safety needs, and inform patient about the nursing procedure.
6. Prepare for a non-independent patient's need to defecate, and perform the necessary nursing procedure. Describe aspects of observation regarding the quality and quantity of the exudates.
7. Describe possible nutrition and fluid intake needs of the patient. Describe nursing tasks of enteral nutrition and sufficient hydration of the patient. Demonstrate leading a fluid chart.
8. Describe disinfection methods of the instruments and devices of the ward; explain asepsis and antisepsis.
9. A new patient is admitted to the ward. Assign patient to a hospital room, take nursing history, and fill out patient admission chart.
10. Measure weight, height, temperature, and respiratory rate of newly admitted patient, and indicate these values on patient's chart and nursing documentation.
11. Prepare for and perform blood pressure measurement. Take the pulse. Indicate these values on patient's chart and nursing documentation.
12. Describe nursing tasks for monitoring of bodily discharges. Indicate quality and quantity of discharges on patient's chart and nursing documentation.

13. Prepare subcutaneous injection for administration. Describe procedure and possible complications of administration. Perform administration under supervision of nurse, fill out necessary documentation.
14. Prepare intramuscular injection for administration. Describe procedure and possible complications of administration. Perform administration under supervision of nurse, fill out necessary documentation.
15. Prepare blood pressure measurement and perform procedure under supervision of nurse. Describe possible complications of taking blood pressure.
16. Prepare for placing permanent venous cannula. Describe means of fixing venous cannula, observation points, and possible complications. Perform placement of cannula under supervision of nurse, fill out necessary documentation.
17. Prepare for placing and intravenous drip administered for patient. Set up the infusion. Perform documentation regarding the infusion therapy.
18. Prepare for blood group determination and transfusion. Describe nursing tasks.
19. Prepare for and perform bedside blood glucose measurement. Explain what the device indicates in case of high or low blood glucose levels. Indicate these values on patient's chart and nursing documentation.
20. Prepare for placement of permanent catheter. Describe procedure and possible complications of placement. Document procedure.
21. Prepare 12 channel ECG with standard and chest leads for patient. Describe procedure of placement of ECG electrodes.
22. Describe options and methods of decubitus risk assessment. Perform and document decubitus risk assessment. Describe prevention methods.
23. Prepare for changing protective dressing and wound treatment. Describe procedure of changing dressing and wound treatment. Examine condition of the wound. Document procedure.
24. During medical rounds an elastic bandage was ordered for the patient's lower limb. Apply elastic bandage and document procedure.
25. Describe nursing tasks regarding medication (distributing and administering medication). Perform identification of patient, administration of medication, and necessary documentation.
26. Describe possibilities and procedures of special medication administration forms (drip, inhalant, rectal, vaginal).
27. Describe personal protective equipment used at ward, and their application. Possible methods for prevention of nosocomial infections.
28. Describe general and specialist diagnostic methods of the ward, and the preparations necessary for the examinations.
29. A patient in shock is admitted to the ward during night shift. Describe symptoms of circulatory and respiratory failure, and their recognition. Prepare for initiation of basic resuscitation, and describe procedure.

BASIC MODULE



Faculty of Medicine
2nd year

STUDY PROGRAMME

Second year in the 2021/2022 academic year

3rd Semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practive (h/week)			
Microscopic Anatomy and Embryology II.	2	2	4	Microscopic Anatomy and Embryology I., Macroscopic Anatomy and Embryology II., Cell Science	semi-final
Medical Physiology I.	5,5	5	10	Macroscopic Anatomy II. Medical Biophysics II., Medical Biochemistry I.	semi-final
Medical Biochemistry II.	3	2	5	Medical Biochemistry I.	final
Molecular Cell Biology I.	2	2	4	Medical Chemistry Medical Biochemistry I.	semi-final
Hungarian Medical Terminology III.	0	4	2	Hungarian Medical Terminology II.	pract. mark
PE III.	0	1	0	PE II.	signature

4th Semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practive (h/week)			
Medical Microbiology I.	2	2	4	Medical Biochemistry I., Cell Science	semi-final
Medical Physiology II.	5,5	4,5	10	Medical Physiology I. Microscopic Anatomy and Embryology II.	final
Molecular Cell Biology II.	3	2	5	Molecular Cell Biology I.	final
Immunology	2	1,5	3	Molecular Cell Biology I., Medical Biochemistry II.	semi-final
Genetics and Genomics	2	1,5	3	Molecular Cell Biology I., Medical Biochemistry II.	semi-final
Medical Psychology	1	2,5	4	Medical Sociology – Health Care, Medical Communication	semi-final
Hungarian Medical Terminology IV.	0	4	2	Hungarian Medical Terminology III.	pract. mark
Introduction to Clinical Medicine	0	12×2,5	2	Introduction to Patient Care	pract. mark
	change expected				
PE IV.	0	1	0	PE III.	signature

LIST OF TEXTBOOKS (The list may change!)

- 1 Harper's Illustrated Biochemistry, 30th edition, Lange, ISBN-10: 0071825347
- 2 Berne-Levy-Koeppen-Stanton: Physiology, 6th updated edition, Mosby. ISBN-10: 032307362X
- 3 Lodish: Molecular Cell Biology, 8th edition (2016); ISBN-13: 978-1-4641-8339-3
- 4 Cockerham, William C.: Medical Sociology. Prentice Hall, Upper Saddle River, 2006.
- 5 Marthy A. & Végh Á. Egészségére! Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.
- 6 Immunology seminars (e-book): <http://gsi.semmelweis.hu>
- 7 Abbas, Lichtmann, Pillai, Basic Immunology 5th Edition, Elsevier, 2015
- 8 Medical Genetics and Genomics (e-book)

Recommended textbooks:

- 1 Murray, Robert K-Granner, Daryl K-Mayes, Peter A-Rodwell, Victor W: Harper's Illustrated Biochemistry. 26th ed. McGraw-Hill. ISBN 0-07-138901-6 (online version: www.lib.sote.hu)
- 2 Biochemistry Laboratory Manual. Ed. Gy. Szabados. Bp. Semmelweis Univ.

MICROSCOPIC ANATOMY AND EMBRYOLOGY II.

Department of Anatomy, Histology & Embryology

Credit value: 4

Number of lessons per week: 4 lectures: 2 practical course: 2 seminar: 0

Type of the course: compulsory course

Subject code: AOKANT674_2A

Name of the course leader: ***Dr. Alán Alpár, Professor, Head of Department***

Contact details: : Semmelweis University, Department of Anatomy, Histology and Embryology, +36 1 459 1500 / 53609

Objectives of the subject, its place in the medical curriculum:

Demonstration of the fine structure of cells and tissues composing the organs of the human body specifically to provide the future clinicians/ medical doctors with a valid body of information describing the microscopical elements of clinically significant morphological structures (including cell biology, general histology and the histology of organs).

The part covering the microscopy of the CNS provides the students with a basic knowledge concerning the major roles of the brain together with the spinal cord with special reference to function and structure. The development of the nervous systems together with the detailed morphological/histological/developmental description of organs of special senses as well as the endocrine system will also be discussed. Teaching is done in the form of lectures and histology laboratory classes

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Semmelweis University, Department of Anatomy, Histology and Embryology
Budapest 1094, Tűzoltó utca 58.

Successful completion of the subject results in the acquisition of the following competencies:

Understanding the microscopical composition of the human body together with the understanding of human development in order to draw parallels with macroscopical anatomy. Clear understanding of histological structure and function. Ability to identify basic structural elements within the tissue specimen. Identification of general directions/landmarks within digitized tissue slides.

Course prerequisites:

Cell science,

Microscopic anatomy and embryology I,

Macroscopic Anatomy and Embryology II.

Number of students required for the course (minimum, maximum) and method of selecting students):

Obligatory for all registered students, on the basis of registration via the NEPTUN system.

How to apply for the course:

Via the NEPTUN system.

Detailed curriculum:

List of lectures

1. week:	Cellular components of lymphatic tissue. Thymus, tonsils, MALT Structure and circulation of lymph nodes and spleen
2. week:	Nerve tissue Development of the neural tube, craniocaudal and dorsoventral differentiation. Divisions of the central nervous system
3. week:	Formation and derivatives of the neural crest and placode ectoderm Fine structure of the spinal cord (spinal reflexes, receptors, effectors)
4. week:	Brain tracts, neurotransmitters, neuronal circuits, <i>“connectomics”</i> Central autonomic nervous system. Monoaminergic and cholinergic neurones and pathways. <i>„Ascending Reticular Activating System”</i> (ARAS)
5. week:	Somatosensory system. Spinal and trigeminal sensory pathways. Thalamus, cortical areas. Viscerosensory system. Role of the reticular formation, thalamus, insula and the prefrontal cortices in visceral sensory activities
6. week:	Neuroanatomy of pain. Referred pain. Cerebral inhibition of pain sensation. Neuroanatomy of movements/locomotion I. Motor cortical areas, planning and programming of movements. Motor pathways
7. week:	Neuroanatomy of movements/locomotion II. The role of cerebellum and basal ganglia in eliciting movements. Gait control mechanism. Visceromotor system. Control of micturition. Spinal motor reflexes.
8. week:	External ear. Middle ear Inner ear. Bony and membranous labyrinth. Development of the organ of hearing.
9. week:	Spiral organ of Corti. Auditory pathway. Neuroanatomy of hearing, understanding and control of speech. Fine structure of the labyrinth, tracts of the vestibular system. Control of balancing and posture together with the movements of the eye and head. Awareness of spatial position.
10. week:	Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation. Lacrimal gland, lacrimal apparatus. Inner coat of the eyeball, retina. Development of the eye.
11. week:	Neuroanatomy of vision. Visual pathway, visual recognition, neuroanatomy of reading and understanding of written/text. Endocrine system I. Hypothalamus, the hypothalamo-hypophyseal system, epiphysis
12. week:	Endocrine system II. Thyroid, parathyroid, adrenal glands. Energy metabolism, neuroanatomy of food intake, taste sensation and olfaction. Structure and functional significance of the reward system.
13. week:	Limbic system. Amygdala, hippocampus. Circadian rhythm, sleep/wake cycle; neuroanatomy of resting state and activation.
14. week:	Behaviour and motivation. Neuroanatomy of emotions, empathy, well-being, aggression, fear, anxiety and depression. Cognitive functions. Neuroanatomy of determination, planning, alertness together with learning&memory, personality, consciousness and creativity.

Histology laboratories

1. week:	Lymphatic system I.
2. week:	Lymphatic system II.
3. week:	Histology of the peripheral nervous system
4. week:	Microscopy of the CNS – consultation 1.
5. week:	Histology of the central nervous system
6. week:	Microscopy of the CNS – consultation 2.
7. week:	Microscopy of the CNS – consultation 3.
8. week:	Midterm test
9. week:	Histology of the organ of hearing
10. week:	Histology of the organ of vision I.
11. week:	Histology of the organ of vision II.
12. week:	Skin. Endocrine system 1.
13. week:	Midterm
14. week:	Endocrine system 2.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses).

Possible overlaps of themes:

Macroscopic Anatomy I - II.

Cell sciences, cell biology

Certain chapters of Biochemistry. The endocrine and central nervous systems are also discussed in Physiology

Special study work required to successfully complete the course:

none

Requirements for participation in classes and the possibility to make up for absences:

Active participation in histology laboratory classes is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the histology laboratory classes

Methods to assess knowledge acquisition during term time:

The knowledge of students will be checked in written (Moodle) midterm tests (held prospectively in weeks 8 and 13). Attendance is obligatory at the two midterm tests. Students absent from the tests should reattend at one of the offered retakes. The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Requirements for signature:

Active participation in at least 75% of dissection room sessions, including the midterm tests (irrespective of the result) is obligatory for every student.

Type of examination:

Final (written and oral) examination, topics: subject matter of the two semesters (Microscopic Anatomy and Embryology I-II.). Examiners are delegated by the Course Director with the consent of the Head of Department.

Final examinations consist of written theoretical and oral practical parts.

Requirements of the examination:

During the final examination the knowledge of students will be tested. Final examinations are composed of written (theoretical) and oral (practical) parts with the latter being conducted with the use of digitized histological tissue slides.

1. Written pretest (e-learning module)
2. Microscopic Anatomy - identification of structures on digitized tissue slides - including relevant theoretical questions from the subject matter of the semester

Topic list for the semifinal examination:

Microscopic Anatomy and Embryology I.

(see there)

Microscopic Anatomy and Embryology II.***Lymphatic organs***

- Lymphatic tissues in general, cellular components
- Histological structure of lymph nodes
- Spleen (fine structure and circulation)
- Thymus
- Tonsils, MALT

Development of the nervous system and organs of special senses

- Development and primary differentiation of the neural tube
- Development of brain vesicles
- Development of the peripheral nervous system (neural crest, placodes)
- Development of the organ of vision
- Development of the organ of hearing&equilibrium

Neurohistology

- Histology of the neurons developing from the neural tube
- Glial cells
- Histology of the neurons and supporting cells developing from the neural crest
- Fine structure of peripheral nerves
- Receptors and effectors
- Interneuronal synapses

Microscopy of the central nervous system

- Fine structure (microscopy) of the spinal cord
- Proprioceptive reflexes
- Nociceptive reflexes
- Autonomic reflexes
- Brain tracts, neurotransmitters, neuronal circuits, "connectomics"
- Central autonomic nervous system. Monoaminergic and cholinergic neurones and pathways.
- „Ascending Reticular Activating System“ (ARAS)
- Somatosensory system. Spinal and trigeminal sensory pathways. Thalamus, sensory cortical areas.
- Viscerosensory system. Role of the reticular formation, thalamus, insula and the prefrontal cortices in visceral sensory activities.
- Neuroanatomy of pain. Referred pain. Cerebral inhibition of pain sensation.
- Motor cortical areas, planning and programming of movements. Motor pathways.
- The role of cerebellum and basal ganglia in eliciting movements. Gait control mechanism.

- Visceromotor system. Control of micturition. Spinal motor reflexes.
- Energy metabolism, neuroanatomy of food intake, taste sensation and olfaction. Structure and functional significance of the reward system.
- Limbic system. Amygdala, hippocampus.
- Circadian rhythm, sleep/wake cycle; neuroanatomy of resting state and activation.
- Behaviour and motivation. Neuroanatomy of emotions, empathy, well-being, aggression, fear, anxiety and depression.
- Cognitive functions. Neuroanatomy of determination, planning, alertness together with learning&memory, personality, consciousness and creativity.

Endocrine organs

- Microscopical anatomy and development of the pituitary gland. Portal circulation
- Microscopical anatomy of the pineal gland
- Microscopical anatomy and the development of the thyroid gland
- Microscopical anatomy and the development of the parathyroid gland
- Microscopical anatomy and the development of the suprarenal gland
- Histology of the islands of Langerhans

Organs of special senses

- Microscopical structure of the skin and skin appendages
- Coats of the eyeball
- Chambers of the eye, vitreous body
- Lens, accommodation
- Neuroanatomy of vision. Visual pathway, visual recognition, neuroanatomy of reading and understanding of written/text.
- External ear, tympanic membrane. Middle ear, auditory tube, hearing ossicles.
- Spiral organ of Corti. Auditory pathway. Neuroanatomy of hearing, understanding and control of speech.
- Fine structure of the labyrinth, tracts of the vestibular system. Control of balancing and posture together with the movements of the eye and head. Awareness of spatial position.
- Organs of taste and olfaction.

Method and type of evaluation:

Final examinations are composed of written theoretical and oral practical parts. The written theoretical examination is done using an e-learning module while the practical examination is conducted with the help of digitized histological tissue slides.

Students are given separate marks for each part of the examination. Unsuccessful partial examinations result in the failure of the semifinal examination. When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5 only. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

How to register for the examination? Via the NEPTUN system

Possibilities for exam retake:

According the Study and Examination Policy

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

List of textbooks

1. Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
2. Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
3. Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
4. Stevens & Lowe's Human Histology , Elsevier, 4th ed ISBN 978-0-723435020, 2015.
5. Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.
- 6.
7. *The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384*
8. *Histology Manual 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2019.*
9. A. L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology, 4th Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885; 2015
10. Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<http://semmelweis.hu/anatomia>) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).

Introduction to Clinical Medicine

Credit Points: 2 (change expected)

Total number of hours: 30

lectures: – practices: 12×2,5 seminars:-

Type of the course (mandatory/elective): mandatory

Academic year: 2021/2022

Code of the course: AOKCSA249_1A

Name of the Department: ***Dr. Péter Torzsa M.D. Ph.D.***

Contact details: H- 1085 Budapest, Stáhly u. 7-9. Phone: +36-1-355-8530

Position: Head of Department

Tutor: ***Dr. Krisztián Vörös***

Aim of the subject and its place in the curriculum:

- Preventive approach, screening procedures
- Presenting patients
- Holistic patient care
- Managing complex bio-psycho-social-health problems
- Care of frequent chronic illnesses
- Differential diagnostics
- Using basic diagnostic means and tools on their own and assessing test results
- Development of professional consciousness.
- Most frequent diseases in the clinical department and the general practitioner's office. Case reports.
- Referral of patients. The medical consultation.
- Communication with the patient and his/her relatives. The role of the family in the treatment of and care for acute and chronic diseases.
- Effective cooperation with patients. Means to improve compliance.
- The importance of disease prevention.
- Team work in medicine.
- Overview of the research activity at the clinical department. Raising interest in participating.

Location of the course (lecture hall, practice room, etc.):

Family practices, clinics

Prerequisite(s) for admission to the subject:

Only for students in the 2nd year, following completion of the Introduction to Patient Care program

Minimum and maximum number of students registering for the course:

Student selection method in case of oversubscription:

15 students/group

How to register for the course:

Registration for the course in the 'Neptun' system

Detailed thematic of the course:**Detailed topic of the subject:**

1st week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
2nd week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
3rd week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
4th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
5th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
6th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
7th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
8th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
9th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
10th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
11th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
12th week:	internal medicine, surgery, paediatrics, psychiatry, obstetrics and gynecology, family medicine, orthopaedics, traumatology, cardiology, dermatology, urology, pulmonology, neurology, according to the attendance sheet
13th week:	Homework: Essay
14th: week:	Exam: Essay

Special training activities required: –
Completed attendance sheet

Policy regarding the attendance and making up absences:

It's compulsory for the student to attend 75 percent of the training sessions, but if needed the student can join another training group to be able to meet this requirement if they missed some of the training sessions in the original group.

Requirement for acknowledging the semester (signature):

It's compulsory for the student to attend at least 75 percent of the training sessions.

Type of the examination:

Essay

Exam requirements:

Case study (essay, typed, 1,400 characters as the minimum length, Times New Roman font, font size 12, single spacing) of a specific patient chosen on the basis of the following topics: internal medicine, surgery, paediatrics, psychiatry, dermatology, orthopaedics, family medicine, nephrology, transplantation, neurology.

Deadline for handing in the essay is the 14th week

Type and method of grading:

Grading is based on the essay according to the following criteria:

Grade 1: failing to hand in the essay on the deadline, the number of characters is under 1,400, the case study is not original, but plagiarism

Grade 2: absence of a case study, but the other requirements are met

Grade 3: there is a case study, but too general drafting, without any personal experience

Grade 4: there is a case study, one not too significant professional/technical mistake

Grade 5: precise and accurate wording in the medical jargon, personal opinion about the patient's case

MEDICAL PHYSIOLOGY I.

Department of Physiology

Name of subject: Medical Physiology I.

Type of subject: Compulsory subject

Subject code: AOKELT792_1A

Credit Points: 10

Head of the Department: **Dr. László Hunyady, Full Professor**

Course Director: **Dr. Péter Várnai, Full Professor**

Tutor: **Dr. András Balla**

Aim of Medical Physiology course:

The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.

Schedule of the subject:

Lectures:

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.
2. Signal transduction: receptors, G proteins, second messengers. Cellular calcium metabolism, receptors of growth factors and cytokines. Membrane trafficking and vesicular transport.
3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.
4. Neuromuscular junction and physiology of skeletal muscle. Autonomic neurotransmitters and physiology of smooth muscle.
5. Physiology of the blood.
6. Physiology of the heart I.: origin and spread of cardiac excitation Cardiac cycle. Regulation of cardiac output.
7. Electrocardiography (ECG). Physiology of blood circulation: introduction.
8. Hemodynamics, systemic circulation. Microcirculation.
9. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.
10. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.
11. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.
12. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.
13. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.
14. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. Acid-base balance: role of lungs and kidneys.

Practices:

- Blood cell counting, determination of hemoglobin concentration and hematocrit, measurement of erythrocyte sedimentation rate
- Leukocyte differential count on peripheral blood smear
- Typing of Blood Groups, Blood Coagulation Test
- Measurement of transport rate on red blood cells. Hemolysis
- Investigation of cardiac functions *in situ*
- Blood pressure measurement in humans
- Echocardiography
- Computer simulation: Neuromuscular junction
- Electromyography (EMG), nerve conduction velocity
- Recording and analyzing the human ECG

- Computer simulation: Skeletal and smooth muscle
- Effects of vagal nerve stimulation on cardiac functions
- Respiratory physiology calculations
- Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Attendance at classes: The lecture hours per week are 5.5; the practice hours per week are 5. The attendance of a minimum of 75% of practices is necessary for the end-term signature.

Absences:

No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. Missed sessions must be reported to the teacher the week after. There are no extra practices. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Requirements for signature:

The attendance in minimum 75% of practices (including seminars) is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.

Requirements of the examination:

Requirements of the semi-final exam: material of the Medical Physiology I.

The semi-final exam is oral exam. The students need to bring ID card and the laboratory report book to participate in the exam. The oral exam consists of two theoretical questions (I-II). The overall result of the oral exam is based on the two theoretical grades; a failed (1) theoretical question results in an overall failed (1) exam.

Lists of the theoretical questions can be found in the webpage of the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and coats should be placed next to the wall of the exam place; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Registration for the exam:

Registration for the exam must be recorded through the NEPTUN system.

Modification in the registration must be recorded through the NEPTUN system.

Absences from the exams:

Failing to certify absence or denying it cause registering "absence" = "nem jelent meg" in the lecture book and/or in the NEPTUN system.

List of textbooks:

Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition). 2017. ISBN: 9780323393942

Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss). 2017. ISBN: 9789633314159.

MEDICAL PHYSIOLOGY II.

Type of subject: Compulsory subject

Subject code: AOKELT792_2A

Credit Points: 10

Head of the Department: **Dr. László Hunyady, Full Professor**

Course Director: **Dr. Péter Várnai, Full Professor**

Tutor: **Dr. András Balla**

Prerequisite: Medical Physiology I. (subject to change by introducing the new curriculum), Microscopic Anatomy and Embryology II.

Aim of Medical Physiology course:

The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course

Schedule of the subject:

Lectures:

1. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
2. Secretory functions of the gastrointestinal tract. Digestion and absorption of food.
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
4. Function of the adrenal cortex. Function of the thyroid gland. Energy balance, quality and quantity requirement of food.
5. Hormonal regulation of intermediary metabolism.
6. Calcium metabolism, bone tissue, growth. Function of the reproductive system: endocrinology of the sexual differentiation and development.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioural mechanisms, motivation; emotion.

Practices:

- Studies on circulatory reactions of a virtual rat
- Circulatory and respiratory reflexes in rabbit (Demonstration, Practice)
- Smooth muscle of rabbit small intestine
- Human pulmonary function tests – Spirometry
- Measurement of cardiac output in rat
- Pulse wave in human
- Oral glucose tolerance test (OGTT)
- Human pulmonary function tests – Body plethysmography
- Electrooculography (EOG) and investigation of the vestibular system
- Spiroergometry
- Human visual physiology
- Investigation of reflexes
- Practice for lab exam. Lab exam

Attendance at classes:

The lecture hours per week are 5.5; the practice hours per week are 4.5. The attendance of a minimum of 75% of practices is necessary for the end-term signature.

Absences:

No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. Missed sessions must be reported to the teacher the week after. There are no extra practices. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Methods to assess knowledge acquisition during term time:

The knowledge of the students is tested in a written form on a weekly base. The written short tests cover the material of lectures of the previous week.

Requirements for signature:

The attendance in minimum 75% of practices (including seminars) is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.

Final exams

In the examination period the students have to give final exam in the second semester. Participation in the final exam requires the completed "Anatomy, Cell, Histology and Embryology III" course with a successful exam.

Requirements of the examination:

Requirements of the final exam: material of the Medical Physiology I. and Medical Physiology II.

The final exam consists of practical, written and oral parts. The students need to bring student identity card and the laboratory report book to participate in the exam. The practical part (lab exam) takes place in the last week of the second semester. Passing the lab exam is not a prerequisite to participate on the other parts of the final exam. A failed or missed lab exam is taken into account in grading the final exam as fail (1) partial grade (a successful lab exam does not result in any grade). The written and oral part of the final exam is held on the same day. The topics of the final exam can be found in the webpage of the Department of Physiology (<http://semmelweis.hu/elettan/teaching/sec-ond-semester>). The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the exam rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately

Registration for the exam:

Registration for the exam must be recorded through the NEPTUN system.

Modification in the registration must be recorded through the NEPTUN system.

Absences from the exams:

Failing to certify absence or denying it cause registering "absence" = "nem jelent meg" in the lecture book and/or in the NEPTUN system.

List of textbooks:

Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition). 2017. ISBN: 9780323393942

Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss). 2017. ISBN: 9789633314159

MEDICAL MICROBIOLOGY I.

Institute of Medical Microbiology

Program Director: *Prof. Dr. Dóra Szabó*

Tutor: *Dr. Ágoston Ghidán*

Second Semester

Week	Lectures (2 hours per week)
1.	Introduction. General information about the tuition. The place of Medical Microbiology among natural sciences, its significance, sub-fields and short history. Fundamentals of the morphology, physiology and genetics of bacteria.
2.	Pathogenic nature and virulence of bacteria. Pathomechanism, molecular pathogenesis, virulence factors. Infection and disease.
3.	Defence mechanisms of the host against infections. Active and passive immunisation. Vaccines.
4.	Antibacterial drugs: Modes of action and interactions of antibacterial drugs. Principles and practice of the antibacterial chemotherapy. Origin, mechanisms, induction, transfer, spreading, elimination and control of resistance of bacteria against antibacterial drugs
5.	Introduction to the classification of medically important bacteria: fundamentals of taxonomic, epidemiological, nosological, as well as pathogenetical classification. Gram-positive non-spore forming rods: <i>Corynebacterium</i> , <i>Listeria</i> , <i>Erysipelothrix</i> , <i>Lactobacillus</i> Normal flora of the vagina.
6.	Gram-positive aerobic cocci: <i>Streptococcus</i> and <i>Staphylococcus</i> genus. Normal flora of the skin.
7.	Gram-negative aerobic and microaerophilic cocci and coccobacilli: <i>Neisseriaceae</i> , <i>Pasteurellaceae</i> , <i>Haemophilus</i> genus Normal flora of the upper respiratory tract.
8.	Gram-negative aerobic rods and coccobacilli: <i>Pseudomonas</i> , <i>Legionella</i> , <i>Brucella</i> , <i>Bordetella</i> , <i>Francisella</i> genus.
9.	Gram-negative facultative anaerobic rods Normal flora of the gastrointestinal tract. Extraintestinal diseases caused by Gram-negative enteral bacteria. Pathogens of the gastrointestinal tract I: <i>Vibrio</i> , pathogenic <i>Escherichia coli</i> , <i>Campylobacter</i> , <i>Helicobacter</i> .
10.	Pathogens of the gastrointestinal tract II: <i>Yersinia</i> (yersiniosis), <i>Shigella</i> (shigellosis), <i>Salmonella</i> (salmonellosis). The enteric fever (<i>Salmonella typhi</i> and <i>paratyphi</i>), as well as <i>Yersinia pestis</i> .
11.	Gram positive aerobic and anaerobic spore-forming bacteria: <i>Bacillus</i> and <i>Clostridium</i> genus Obligate anaerobic bacteria and associated infections: Gram-positive: <i>Peptostreptococcus</i> , <i>Propionibacterium</i> , <i>Eubacterium</i> , <i>Bifidobacterium</i> , <i>Arachnia</i> , Gram-negative: <i>Veillonella</i> , <i>Bacteroides</i> , <i>Fusobacterium</i>
12.	Acid-fast bacteria: <i>Mycobacterium</i> , <i>Nocardia</i> . <i>Actinomyces</i>
13.	Spirochaetales: <i>Treponema</i> , <i>Borrelia</i> . <i>Leptospira</i> .
14.	Rickettsiales, Chlamydiales, Mycoplasmatales

Second Semester

Week	Bacteriology Practicals (2 hours per week)
1.	Introduction. Rules and instrumentation of the safe handling of microbes. Safety in the laboratory. Basic microbiological methods I: Microscopic examinations.
2.	Basic microbiological methods II: Cultivation of bacteria and biochemical activity of bacteria
3.	Basic microbiological methods III: Sterilisation. Disinfection
4.	Basic microbiological methods IV: Susceptibility of bacteria to antimicrobial drugs
5.	Basic microbiological methods V: In vitro immunological reactions
6.	Midterm examination I. and Systematic bacteriology I: Identification of Gram-positive aerobic rods
7.	Systematic bacteriology II: Identification of Gram-positive cocci: Staphylococcus
8.	Systematic bacteriology III: Identification of Gram-positive cocci: Streptococcus
9.	Systematic bacteriology IV: Identification of Gram-negative cocci and coccobacilli, and Gram negative aerobic rods
10.	Systematic bacteriology V: Identification of Gram-negative facultative anaerobic rods
11.	Systematic bacteriology VI: Identification of the aerobic and anaerobic spore-forming bacteria, as well as the obligate anaerobic and microaerophilic bacteria
12.	Midterm examination II. and Systematic bacteriology VII: Identification of irregular Gram-positive rods
13.	Systematic bacteriology VIII: Spirochaetes
14.	Systematic bacteriology IX: Rickettsiae, Chlamydiales and Mycoplasmatales

MEDICAL BIOCHEMISTRY II.

Department of Medical Biochemistry Molecular Biology

Credits: 5

Number of lessons per week 70; lectures 42; practical course/seminar: 28

Type of the course: obligatory

Academic year: 2021/2022

Code of the course AOKBMT794_2A

Name of Head of the Department: Professor László Csanády M.D. Ph.D. D.Sc.

Contact details: H-1094 Budapest, Tűzoltó u. 37-47. Phone: +36-1-459-1500#60010 e-mail: csanady.laszlo@med.semmelweis-univ.hu

Position: Temporary Head of Department

Date of Habilitation: 2013 **Its number:** 341

Objectives of the subject, its place in the medical curriculum:

The aim of this course is to provide a comprehensive description of the metabolic processes in the human body, with particular emphasis on the medical aspects of these processes. The main focus of the semester is on intermediate metabolism, i.e. the amino acid and nucleotide metabolism following carbohydrate and lipid metabolism as described in Medical Biochemistry I and the integration of these processes in the individual organs and the human body as a whole. Furthermore, the course aims to develop the skills of medical students to understand the complex physiological processes in the human body at the molecular level. Medical students will learn clinical biochemical methods in case-oriented studies, and in addition, particularly promising and rapidly developing areas („medicine of tomorrow”) will be addressed. The medical biochemistry orientation of the course is the molecular basis of diseases that are of major public health concern (cardiovascular, neurodegenerative, cancer), with particular emphasis on potential molecular targets for therapy.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Premises located in the Basic Medical Sciences building (laboratory rooms located on the first floor and lecture halls located on the ground floor).

Successful completion of the subject results in the acquisition of the following competencies:

The knowledge of the structure, interactions and reactions of biological molecules and the interactions between organs of the higher integrated regulatory functions of the human body, is of paramount importance from a medical point of view and is essential for understanding physiological and pathological processes and, as a consequence, for making informed medical decisions.

Prerequisite (s) for admission to the course: Medical Biochemistry I.

Number of students required for the course (minimum, maximum) and method of selecting students:

Not applicable to compulsory subjects

How to apply for the course: Application is through the Neptun online system.

Detailed curriculum:

Lectures: 2x70 minutes per week (3 hours)

Lecturers: Prof. Csanády László (CSL), Prof. Kolev Kraszimir (KK), Dr. Komorowicz Erzsébet (KE), Dr. Törőcsik Beáta (TB), Prof. Tretter László (TL)

Practices (P): 2 hours each week

Week	Lectures	Practices: 2 hours every week
1	Nitrogen balance. Protein digestion. Function and regulation of proteases. Amino acid absorption, amino acid transporters. (KK) Amino acid degradation. Ammonia removal. Reactions and regulation of the ornithine cycle.	Determination of transaminase and creatine kinase activity, medical implications
2	Amino acid degradation: the fate of the carbon skeleton. The role of vitamins in amino acid metabolism. Biosynthesis and degradation of heme. Iron homeostasis (KK)	Elimination of ammonia in the human body.
3	Nucleotide structure/functions. Fate of nucleotides of nutrient origin. Formation and elimination of uric acid, its biological role in the human body. Molecular background of gout (KK). Synthesis and degradation of purine and pyrimidine nucleotides. Effects of cytostatic drugs on nucleotide metabolism. (KK)	Metabolic role and medical significance of vitamin B12 and tetrahydrofolic acid
4	Organ biochemistry. Red blood cell metabolism and enzymopathies. Intermediate metabolism of the kidney. Metabolic properties of the renal cortex and marrow. Renal metabolism in starvation and acidosis. Comparison of gluconeogenesis in kidney and liver. The metabolism of striated muscle and myocardium. Metabolic adaptation to exercise. (TL)	Biochemical-bioenergetic aspects of muscle work.
5	Metabolic characteristics of brain and adipose tissue. Metabolism of intestinal epithelial cells and lymphocytes. (TL) Starvation-fatigue cycle and its regulation, processes in the liver. Inter-organ communication during satiety and starvation. Regulation of biochemical processes in the satiated liver. (TL)	The role of the liver in metabolism. Metabolic rearrangements in liver diseases.
6	Membrane transporters. Na,K-ATPase isoforms. Secondary active transporters. Na ⁺ /H ⁺ exchange transporter (TB) Molecular basis of nerve transmission. Acetylcholine synthesis, receptors, acetylcholinesterase. Properties of synaptic vesicles; key proteins involved in exocytosis of synaptic vesicles (TB)	Metabolic characteristics of rapidly dividing cells and tumours.
7	Synthesis and metabolism of adrenaline and noradrenaline. Transporters in neurons (TB) Adrenergic receptors. Adrenaline and molecular mechanisms of the action of adrenaline and noradrenaline in different organs (TB)	Extracellular matrix: transformations in physiological and pathological states.
8	The synthesis and production of dopamine and serotonin and their metabolism. Molecular properties of transporters and receptors. Biochemical basis of Parkinson's disease. (TB) Synthesis, metabolism, transporters and molecular properties of glutamate and GABA. (TB)	The relationship between metabolism and nervous system function I
9	General characteristics of ion channels. Methods for the study of ion channels. Molecular mechanisms of gating and permeation. Spatial structure of the K ⁺ channel. (CSL) Ion channel families. Voltage dependent, Ca ²⁺ activated, and ATP-sensitive K ⁺ channels. Voltage-dependent Cl ⁻ channels. CFTR Cl ⁻ channel. Nicotinic Ach receptor. (CSL)	The relationship between metabolism and nervous system function II
10	General overview of blood clot formation and dissolution. Fibrinogen and fibrin. Regulation of thrombin. Activation of prothrombin. Initiation of coagulation and amplification of the initiation signal. (KK) The coagulation inhibitor system and negative feedback mechanisms. (KK)	Molecular background of congenital thrombophilia. APTI, PTI tests
11	Fibrinolysis. Activation of plasminogen. The plasmin inhibitor system. (KK) Cellular factors in coagulum formation and dissolution. Platelets and von Willebrand factor. (KK)	Molecular background of acquired thrombophilia. Fibrin stabilization and the study of soluble fibrin monomers
12	The role of neutrophil leukocytes and endothelial cells in hemostasis. Hemodynamic and biochemical interactions in hemostasis. (KK) Function and role of pattern recognition receptors (TLR, scavenger receptors) in the vascular wall. Cholesterol-induced pyroptosis and its molecular basis. (KK)	Risk factors associated with cholesterol homeostasis in atherosclerosis (diabetes, hypertriglyceridemia). Biochemical basis of atherosclerosis prevention.

Week	Lectures	Practices: 2 hours every week
13	The role of gene expression level regulation by dietary components in the regulation of metabolism. (TL). Regulatory, adaptive signals driven by the current metabolic state of the cell and their mechanism of action. Biochemical effects of thyroid hormone and its role in complex metabolic regulation, thermogenesis. (TL).	Molecular basis of weight regulation in physiological and pathological states.
14	Central molecules and drug targets of proliferation, differentiation, survival, angiogenesis, metastasis I (TB) Focal molecules and drug targets of proliferation, differentiation, survival, angiogenesis, metastasis II (TB)	Molecular basis of energy expenditure and its dysregulation in metabolic syndrome

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:
None.

Special study work required to successfully complete the course: None.

Requirements for participation in classes and the possibility to make up for absences:

Practices and seminars are mandatory. It is not possible to make up for missed practices/seminars. In case of absences amounting to more than 3 occasions, the semester is not acknowledged. Arriving to a practice /seminar with a delay of more than 10 minutes is considered an absence

Methods to assess knowledge acquisition during term time:

Practice/seminar participation performance will be evaluated by the tutor: as such, maximum 10 points per semester can be obtained that may count towards the final grade, see under “Grading system”.

Midterms: A midterm will take place in the 6th and another in the 11th week, during the practice/seminar (allocated time per midterm: 20 minutes). Each midterm will consist of multiple choice questions (MCQs) from which max 20 points can be obtained (10 points per midterm).

It is not obligatory to pass a midterm in order to be allowed to sit for the final exam. However, the midterm points will be added as “points” to the result of the final exam, as detailed in “Grading system”.

Lectures: At the end of each lecture, there will be a Kahoot on the topic of the lecture, consisting of 5 questions. Maximum 1 point can be earned per lecture, as outlined by the lecturer. Through the Kahoots, students may obtain points that will be added to the points earned at the final exam, as detailed in “Grading system”.

Competition: The competition is held on the last week and consists of 70 multiple choice questions (MCQs). Only students who amass 14 or more points from the midterms may participate in the competition. Points obtained from midterms, Kahoot quizzes, or practice/seminar performance (see below), do not count in the competition. Winners will be exempted from the final exam.

Requirements for signature: No credit will be given for absences exceeding 6 hours (3 occasions).

Type of examination: final; Form: written and oral test based on material of the official textbooks, lectures and practices/seminars published at the department’s Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>). See under “Grading system” for further details.

Requirements of the examination:

The material covered in the exam is the material of the lectures and practices/seminars in the topic, with the corresponding textbook chapters.

Method and type of evaluation:

Grading system: The grade of the final exam is based on the points obtained i) in Kahoot quizzes at the lectures, ii) during the seminars/practices, iii) at the two midterms, iv) at the written MCQ semifinal exam, and v) in an oral exam following the written MCQ exam. The written MCQ exam and the oral exam will take place on the same day of the examination period.

The grading system is as follows:

- (i) Kahoot: maximum 1 point per lecture.
- (ii) Seminar/practice points: maximum 10 points.

Total points from (i) and (ii) cannot exceed 20 points.

(iii) Two midterms: maximum 20 points.

(iv) Written MCQ exam: This test consists of multiple choice questions (MCQs) from which max 100 points can be obtained (allocated time: 100 minutes).

If the score of the MCQ exam is 49 or below, then the grade of the final exam is 'fail'.

If students reach 50 points on the MCQ exam, the midterm points, practice/seminar performance points and lecture Kahoot points (total max. 40 points) will be added to the MCQ score.

Grade calculation of the written part of the final exam from the total points (MCQ+semester):

95- 140: grade 5 (excellent)

85- 94: grade 4 (good)

70- 84: grade 3 (satisfactory)

55- 69: grade 2 (pass)

Only those students who obtained at least 50 points at the semifinal MCQ test will be invited for an oral exam. During the oral exam, the examiner will pick three questions from those MCQs that were correctly answered by the student. The student will have to elaborate properly on these questions. The final grade will be given based on the written and oral part of the exam.

How to register for the examination?: The exam dates are announced on the 12th week of the semester. At least one exam date per week will be provided. Applications are made in the Neptun system in accordance with the University Study and Exam Rules.

Possibilities for exam retake: An exam can be retaken after two calendar days.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material: Harper's Biochemistry (30th edition, or latest)

Online material published at the department's Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

MOLECULAR CELL BIOLOGY I

Department of Molecular Biology

Mandatory course; Credit: 4

Description of the curriculum

The principal aim of the course is to provide an insight into the storage and expression of genetic information throughout replication, transcription and translation. Our current understanding of the multilevel regulation of gene expression will also be discussed, followed by an up-to-date summary of the principles of proteostasis, autophagy and the molecular biology of DNA and RNA viruses.

Students having completed this course will be familiar with the principles of molecular biology, which will help them to understand and apply different fields of molecular medicine which is fundamental in the 21st century.

Prerequisites for admission to the subject:

Successful exams in Medical Chemistry as well as in Medical Biochemistry I.

Key topics

Nucleic acids – structure and function. Bases, nucleosides, nucleotides, DNA structure, DNA denaturation, hybridization. DNA replication. Replication in prokaryotes, leading and lagging strand. Okazaki fragments. DNA-dependent DNA polymerases. DNA ligase. Telomerase. topoisomerases. Replication in eukaryotes. Structure of eukaryotic chromosomes. Mitochondrial DNA. Nucleosome structure. DNA repair. Types of DNA damage; mutations, frameshift, missense/nonsense/samesense mutations, mismatch repair. Coordination of repair and replication. Transcription in prokaryotes. Structure of RNA; t-RNA, r-RNA, m-RNA, differences between the prokaryotic and eukaryotic genomes. Transcription complexes, initiation, elongation, termination in prokaryotes. Transcription in eukaryotes, RNA polymerases, promoters, enhancers, silencers. Transcription factors. Processing of mRNA, mechanism of splicing. Alternative splicing, mRNA editing. The genetic code. Activation of tRNA. Mechanism of translation initiation, elongation, termination. Antibiotics. Posttranslational modification of proteins. Protein folding, sorting, quality control and transport into intracellular compartments. Ubiquitination and intracellular proteolysis. Epigenetic regulation of gene expression: DNA methylation, histone modifications, miRNA. Mobile genetic elements, genome evolution and the molecular biology of DNA and RNA viruses.

Regulation of gene expression in prokaryotes. The operon model. Positive and negative regulation in the lac operon. Regulation of gene expression in eukaryotes at the transcriptional level. Role of chromatin structure; covalent and non-covalent chromatin modifying activities and DNA methylation (epigenetics). Post-transcriptional regulation in eukaryotes. Regulation of mRNA stability. Translational regulation.

Module II. Methods in molecular biology and gene technology

Requirements for acknowledgement of the semester

Participation in the laboratory lessons is obligatory; students have to sign the attendance sheets at the end of each lesson. In case of more than two missed labs the semester cannot be acknowledged and the student is not going to be allowed to sit for the terminal exam. Missed practicals can be made up only in the same week with another group; certificate of participation issued by the host teacher has to be presented by the student to his/her own teacher. The schedule of practical lessons can be downloaded from the official Moodle website of the subject. Students properly conducting their experiments are entitled to get a lab score on each practical. These scores will help you get exemption from the lab topics on the final exams (see Molecular Cell Biology II).

Midterm tests and exam bonus

A short written test including 10 formulas from the list of compulsory structures can be taken at the beginning of the 2nd laboratory lesson. Students having scored at least 70% on this test are eligible to participate in the optional oral midterm in week 11. The topic list for the oral midterm will be published in due course on Moodle. Students having obtained excellent (5) or good (4) marks will be exempted from taking a topic from the corresponding topic list (I: DNA structure, replication and repair). This test cannot be retaken.

Semifinal exam

The course is finished with an oral exam. Students will be examined by a two-member examination committee. 4 topics taken from the topic list have to be answered.

Students are not allowed to leave the examination room between taking exam topics and getting their grades. Importantly, you fail the whole exam if you fail even on just one of your topics.

Recommended textbooks

1. Lodish: Molecular Cell Biology (8th edition)
2. Hrabák: Laboratory Manual - Medical Chemistry and Biochemistry

MOLECULAR CELL BIOLOGY II.

Department of Biology

Head of department: Prof. Miklós Csala Molecular

Teaching secretary: Dr. Gergely Keszler

Mandatory course; credit: 5

Lectures and laboratory lessons

Two lectures are held a week and laboratory lessons are held every second week.

Description of the curriculum

The subject Molecular Cell Biology summarizes the molecular mechanisms of molecular biology and cell biology for medical and dentistry students. It provides the essential knowledge for the understanding of further subjects of molecular medicine including molecular pathology, molecular diagnostics, pharmacology, gene therapy and medical biotechnology.

Students having completed this course will be familiar with the principles of molecular biology which will help them understand and apply different fields of modern molecular medicine.

Prerequisites for admission to the subject:

Successful exam in Molecular Cell Biology I.

Key topics

Principles of recombinant DNA technology: molecular cloning, restriction endonucleases. Genomic and cDNA libraries. Blotting techniques (Southern, Northern, Western) and their utilization. DNA microarrays. PCR, real-time PCR and its application in molecular biology. Recombinant vectors (reporter and expression vectors); synthesis of recombinant proteins. Transgenic, knock-out and knock-in animals in medical research. Human gene therapy (ex vivo vs in vivo; genome editing by the CRISPR/Cas9 technology). The Human Genome Project and its results: organization and polymorphic nature of the human genome; implications for human traits and diseases. Genotyping methods (PCR-RFLP, PCR-ASA, primer extension, (next generation) sequencing). Online databases.

Maintenance of cellular homeostasis: coordination of cell division, differentiation and cell death; eogenous mitogenic and survival stimuli. Basic concepts of the cell cycle; control points and molecular mechanisms. Active and passive cell death, variants of programmed cell death, apoptotic pathways. Non-apoptotic programmed cell death: pyroptosis, necroptosis, ferroptosis and parthanatos. Integrity of the genome as a major determinant of cell proliferation and survival. Coordination of protooncogene and tumor suppressor pathways under physiological and pathological conditions. Components of the cytoskeleton. Molecular motor proteins. Vesicular transport; the role of the rab cycle. Molecular mechanisms of exo- and endocytosis. Formation of the metabolome of cellular compartments. Signalling in organelle stress. Molecular mechanisms underlying the process of ageing. Extracellular matrix, tissue architecture, adhesion molecules. Methods in cell biology (cell cultures, cell fractionation, *in vivo* microscopy)

Requirements for acknowledgement of the semester

Participation in the laboratory lessons is obligatory; students have to sign the attendance sheets at the end of each lesson. In case of more than two missed labs the semester cannot be acknowledged and the student is not going to be allowed to sit for the terminal exam. Missed practicals can be made up only in the same week with another group; certificate of participation issued by the host teacher has to be presented by the student to his/her own teacher. The schedule of practical lessons can be downloaded from the official Moodle website of the subject. Students properly conducting their experiments are entitled to get a lab score on each practical.

Midterm tests and exam bonus

An optional oral midterm is held in week 11. Participants are expected to take and present a single topic from the midterm topic list. Students obtaining a grade of four (good) or five (excellent) will be exempt from taking a topic from group III of the exam topics (Signal transduction and cell cycle) on the final exam.

Participation in the practical midterm is also optional. Students can take this written test during the last practical class of the semester (week 13 or 14, depending on the lab schedule. You are expected to provide short answers (a word or a short sentence) to 20 questions covering the experiments performed in the 1st and 2nd semesters; each correct answer is worth a point. Your scores obtained here will be added to your lab scores (a total of at most 12 collected during the labs of both semesters). Students having obtained 25 or more scores (from a total of 20 + 12 = 32), will be exempt from taking a lab topic on the final exam.

Final examination

Examinees have to take 5 topics on the oral final exam. Please note that failing a single topic will result in failing the entire exam. Students having obtained a grade of **4 (good) or 5 (excellent) on the first (theoretical) midterm** will be exempt from the corresponding group of topics (**III: Signal transduction and cell cycle**). Moreover, those having collected a sum of at least **25 scores on the labs** (max. 12 points) AND on the **second (practical) midterm** (max. 20), will be exempt from taking a lab topics (group V) on the final exam. These exam bonuses are independent from each other and one can attain both or just one of them. Bonuses are valid throughout the exam period, even for retakes of failed or passed exams. They are also valid for CV but not for FM exams.

Recommended textbooks

Lodish: Molecular Cell Biology (8th edition)

Hrabák: Laboratory Manual - Medical Chemistry and Biochemistry

IMMUNOLOGY

Deaprtment of Genetics, Cell- and Immunobiology
Course Director: **Prof. Edit Buzás**

Credit: 3

Aim of the subject and its place in the curriculum:

A pre-clinical course for medical students that introduces the essentials of the immune system, natural and adaptive immune responses. It discusses the structure of the human immune system: organs, cellular and molecular components involved in the immune response; the development of genetic diversity of antigen receptors, and the role of diversity in an efficient immune response. It introduces to the students the processes of immunological regulation in healthy organism, including the immunology of pregnancy. It also discusses the course and alteration of immunological processes in certain pathological conditions, such as infections, tumors, hypersensitivity reactions, autoimmunity, immunodeficiency and transplantation, therefor provides a basis for other subjects. In related practices, students will be introduced to the basic methods required to test the functionality of the immune system, to the immunological assays and immunologically relevant procedures used in current diagnostics and therapy.

Competencies gained upon the successful completion of the subject: Understanding the relationships between immunological processes and the role of the immune system in the prevention, development and course of diseases. Theoretical knowledge of basic immunological diagnostic and therapeutic techniques.

Prerequisite(s) for admission to the subject:

Cell Science, Medical Biochemistry II.

Detailed thematic of the course:

	Lectures	Practices
1.	The role, processes, organs and cells of the immune system	Basic terms
2	Principles of natural immunity	The role of the immune system in the lab
3.	The complement system; inflammation and acute phase reaction	Methods based on antigen-antibody interactions I. Immunoserology
4.	Antigen, antigen presentation and MHCs	Methods based on antigen-antibody interactions II:immuno-assays
5.	Antigen receptors and their formation	Methods based on antigen-antibody interactions III Flow cytometry
6.	T lymphocytes and cell-mediated immune response	Complement assays
7.	B lymphocytes and humoral immune response	Biological therapies I
8.	Immune response in infections	Biological therapies II
9.	Immunodeficiencies	Immunization and vaccination I
10.	Hypersensitivity reactions	Immunization and vaccination II
11.	Mucosal immunity	Hypersensitivity I.
12.	Immunological tolerance; natural and pathological autoimmunity	Hypersensitivity II-IV.
13.	Immunology of transplantation	Screening methods for autoantibodies
14.	Antitumor - and pregnancy immunity	HLA-typing

Policy regarding the attendance and making up absences:

Attendance of a minimum of 75% of the practices is necessary for the end-term signature. The presence at the seminars (practices) are registered weekly, more than three absences from the seminars invalidate the semester as well. The sessions can be attended in an appropriate mental and health condition.

Means of assessing the students' progress during the semester4: Discussing the topics of the lecture under the guidance of the practice teacher to establish diagnostic and therapeutic methods.

Requirement for acknowledging the semester (signature): Attendance of a minimum of 75% of the practices.

Type of the examination: written test

Exam requirements5:

The topics are based on the textbooks, the e-book, the lectures' and practices' presentations. At the exam, it is not sufficient to repeat memorized topics from the textbook and presentations, but you have to be able to synthesize and integrate your knowledge from different parts of the subject.

Topic list of lectures:

1. The concept of immunity, Principles of the immune response: antigen specificity, sensitivity, memory, clonal selection based operation.
2. Components (primary, secondary immune organs, cells, molecules) of the immune system.
3. Features of innate and adaptive, cell-mediated and humoral, primary and secondary response.
4. The immune homeostasis.
5. Migration of immune cells and adhesion molecules;
6. Cytokines and cytokine receptors.
7. Chemokines and chemokine receptors.
8. Fc-receptors; PAMP, DAMP, Pattern recognition receptors.
9. Phagocytes and phagocytosis.
10. Role of neutrophils, eosinophils and basophils/mast cells.
11. Types and role of dendritic cells.
12. Inflammasome/ inflammasomopathies.
13. Innate lymphoid cells.
14. The activation pathways and the regulation of the complement system;
15. Complement receptors;
16. Complement genetics;
17. The biological role of complement activation
18. The inflammation and the acute phase response, the provoking factors and mechanisms, periods;
19. The acute phase plasma proteins.
20. The major histocompatibility complex;
21. The ways of antigen processing and presentation.
22. Types and structures of antigen receptors;
23. The immunoglobulin and TCR genes, the sources of antigen receptor diversity;
24. Expression and production of antigen receptors.
25. Differentiation and activation of T cells
26. Types of the T cells
27. The cell mediated immunity.
28. The activation and differentiation of B cells
29. Types of the B-cells
30. The humoral immunity.
31. Antimicrobial immune response.
32. Mucosal Immunity

33. Hypersensitivity reactions: Type I-II-III-IV reactions
34. Immunological background of transplantation and GVH disease
35. The natural autoimmunity.
36. Idiotypic regulation and network.
37. Pathological autoimmunity.
38. Mechanisms of immune tolerance.
39. Primary and acquired immune deficiencies.
40. Tumor antigens.
41. Anti-tumor immunity.
42. Escape strategies of tumor cells.
43. Possibilities of anti-tumor immune-therapy.
44. The immunology of pregnancy

Topic list of practices:

1. The cells and organs of immune system.
2. Communication between the immune cells.
3. Antigen and hapten.
4. Features of diagnostic antibodies.
5. Immunoserological techniques: Detection of antibodies in body fluids, or detection of antigens based on the antibody-antigen reaction.
6. Serum electrophoresis and densitograms,
7. Immune complex and immune precipitates.
8. Turbidimetry and nephelometry.
9. Methods based on immune precipitation: radial immunodiffusion, immunofixation.
10. Clinical application of immunoserology methods.
11. Direct, indirect and passive agglutination, methods based by agglutination, fields of use.
12. Features of diagnostic antibodies.
13. The labeling of diagnostic antibodies,
14. ELISA, Western blot. Immunocyto (histo)chemistry, fields of use.
15. Lateral flow test, fields of use.
16. Principles of flow cytometer and cytometry.
17. Identification of cell populations by size and granularity, scatter plot.
18. Immune phenotyping, histogram, dot plot.
19. Role of flow cytometry in clinical practice.
20. The ways of activation of complement system.
21. In vitro complement activation.
22. Measuring the complement activation (CH50).
23. Diseases of complement system. HAE disease.
24. HLA nomenclature.
25. HLA typing methods: Microcytotoxicity test and mixed lymphocyte culture test.
26. HLA associated diseases.
27. Definition of targeted molecular therapy and immune modulation.
28. Monoclonal antibodies in the therapy: Types of the monoclonal antibodies.
29. Monoclonal antibodies in the tumor therapy: checkpoint blockade, induction of ADCC, bispecific antibodies.
30. Antibody therapy in transplantation.
31. Antibody therapy in chronic inflammatory diseases.
32. TNF alpha, T- and B cells as therapeutic targets in RA.
33. IVIG
34. Cytokine therapy
35. Dendritic cell-therapy.
36. The aims and practical implementation of immunization.
37. Adjuvants.
38. Immunodominant epitope.
39. Oral tolerance.

40. The aim of immune stimulation, active immunization.
41. Passive immunization
42. The features of effective vaccines.
43. Types of vaccines, cell-based vaccination
44. Hypersensitivity reactions I.: Penetration of antigens, types of IgE mediated responses.
45. Release of histamine and its effects.
46. Allergy tests.
47. Anaphylaxis vs. anaphylactoid reaction; urticaria vs. angioedema.
48. Food intolerance vs. food allergy.
49. Basics of allergy pharmacotherapy; Desensitization and prevention.
50. Clinical examples for Hypersensitivity reactions II-III-IV.
51. Diagnostic tests used in Hypersensitivity reactions II-III-IV.
52. Types of systemic and organ specific autoantibodies
53. Screening methods of autoantibodies,
54. Detection of autoantibodies.

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):

1. Abbas, Lichtmann, Pillai, Basic Immunology 5th Edition, Elsevier, 2015
2. Practice and lecture ppt-s): <http://gsi.semmelweis.hu>
3. Immunology seminars (e-book): <http://gsi.semmelweis.hu>

GENETICS AND GENOMICS

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. F. Ágnes Semsei**

Credit: 3

Number of lessons per week: 3.5 **lecture:** 2 **practical course:** 1.5

Academic year: 2021/2022 II. semester

Subject code: AOKGEN738_1A

Name of the course leader: Prof. Edit Buzás

Department of Genetics, Cell- and Immunobiology, +36-1-210-2929 / 56241

Position: Professor and Chairman

Objectives of the subject, its place in the medical curriculum:

Introductory course in classical and molecular genetics and functional genomics, as well as basic course for the clinical module. It addresses the types, general laws of human inheritance, characteristics, organization and structure of the human genome, and the most important methods and / or their application in theoretical and clinical medicine, according to the needs of medical students, and evaluates the results (in practice). It presents the forms of genetic and epigenetic variability, their mechanisms and their consequences for human health. Through selected examples, the pathway from gene to disease is analyzed using a systems biology approach.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Semmelweis University, Department of Genetics, Cell- and Immunobiology, H-1089 Budapest, Nagyvárad tér 4. Hungary, NET building lecture rooms, L13-L16

Successful completion of the subject results in the acquisition of the following competencies:

Basics of cytogenetics. Setting up and interpreting pedigrees. Basic knowledge of human genetics and human genomics. Background of monogenic and multifactorial diseases. Basics of prenatal diagnosis, detection of monogenic diseases by molecular genetic methods. Basic knowledge of oncogenetics, epigenetics, population genetics, nutrigenetics, evolutionary genetics, pharmacogenetics with biomedical approach. Role of gene-gene and gene-environment interactions in various diseases. Basic knowledge of bioinformatics and systems biology related to medical genetics and genomics. Basics of gene therapy.

Course prerequisites:

Molecular Cell Biology I.,
Medical Biochemistry II.

Number of students required for the course (minimum, maximum) and method of selecting students:

According to Study and Exam Policy

How to apply for the course:

in Neptun system

Detailed curriculum:

Lectures (2 hours per week)*:

1. Introduction to human genetics (E. Buzás)
2. Genetic variations (Cs. Szalai)
3. Chromosomal aberrations (E. Lajkó)
4. Autosomal inheritance I. (C. Szalai)
5. Role of sex in inheritance (M. Holub)
6. Epigenetics (O. Láng)
7. Introduction to genomics (Cs. Szalai)
8. Methods in genomics, systems biology (Cs. Szalai)
9. Genetherapy (Cs. Szalai)
10. Genomic approach of complex inheritance (H. Hegyesi)
11. Pharmac- and nutrigenomics (Á. F. Semsei)
12. Genetics of biological processes, oncogenetics (Wiener Z.)
13. Populationgenetics; Evolutiongenetics (H. Hegyesi)
14. Genome and environment (O. Láng)

Practices (1.5 hours per week)*:

1. Genetic aspects of cell cycle and cell division disruptions (Atypical mitosis / meiosis)
2. Cytogenetics I.
3. Cytogenetics II.
4. Introduction to pedigree analysis
5. Autosomal dominant inheritance I.
6. Autosomal dominant inheritance II.
7. Autosomal recessive inheritance I.
8. Autosomal recessive inheritance II.
9. Sex-linked inheritance
10. Complex inheritance I.
11. Complex inheritance II.
12. Gametogenesis, prenatal genetic testing
13. Genetherapy
14. From genes to bedside

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

Understanding of Genetics and Genomics is based on the knowledge of molecular biology and molecular genetic techniques studied at Medical Biochemistry I-II. Elective subjects taught by our institute (Sex Genetics, Epigenetics, Genomics) elaborate on some of the subchapters of "Genetics and Genomics", with overlaps needed for understanding, focusing on topics not covered in the main subject. Understanding the subject of Clinical Genetics is based on the knowledge of Genetics and Genomics.

Requirements for participation in classes and the possibility to make up for absences:

Completion of prerequisite subject.

Practices can only be attended to in an appropriate mental and health condition. Practical absence can be remedied during the current training week, in parallel courses, after prior consultation with the practice instructors.

* The order of the lectures may vary (depending on holidays and workday transfers). Colleagues with senior teaching status may also act as lecturers, if the lecturer on schedule is prevented.

Methods to assess knowledge acquisition during term time:

Written homework from the topics of taught lectures and practices after prior consultation with the practice instructors. Bonus lecture scores can be collected at lectures. Written midterm from the topics of taught lectures and practices. We provide an opportunity to retake the midterm, only for students who have proven absence.

Requirements for signature:

According to the Study and Exam Policy the students must visit at least 75% of the lectures and practices.

Type of examination: written (lectures and practices)

Requirements of the examination:

1.) Introduction to human genetics and genomics.

MGGe: Chapter 1, pages 9-21; Lecture: Introduction to human genetics

Basic genetic terms, e.g.: genome, genetics, genomics, **homologous chromosomes**, gene, locus, allele, wild type allele, genotype, phenotype, homozygote, heterozygote, hemizygote, dominant, recessive, cytogenetics; Mendel's laws, Model organisms in genetics; DNA: structure, function, amount, organization (chromatin, chromosome). Replication, transcription, mRNA maturation (splicing, alternative splicing), types of RNA-s, features of genetic code. Translation and posttranslational modifications. Human genome: nuclear and mitochondrial. Structure of eukaryotic gene. Intergenic DNA; Specific sequences of nuclear genome. Repetitive sequences. Human Genome Project, ENCODE Project

2.) Transmission of genetic information from cell to cell in an organism.

MGGe: Chapter 2, pages 22- 41, Practice presentation: Atypical mitosis

Features of mitotic phases. Functional parts of chromosomes (telomere, centromere, kinetochore, sister chromatids. Cytokinesis. Changes of DNA amount and chromosome number during cell cycle. Types, causes and consequences of atypical mitosis.

3.) Transmission of genetic information from generation to generation.

MGGe: Chapter 2, pages 41-51; Practice presentation: Typical and atypical meiosis

Significance and source of genetic variability. Significance of meiosis. Stages of meiosis: meiosis I. and II. Features of phases of first prophase (leptotene, zygotene, pachytene, diplotene, diakinesis; synapsis, crossing over, chiazma). Random alignment and assortment of homologous chromosomes in meiosis I anaphase. Atypical meiotic process: non-disjunction. Change of DNA amount and chromosome number during meiotic process.

4.) Pedigree analysis

Practice: Introduction to pedigree analysis

Mendelian or monogenic inheritance, Construction of pedigree: main symbols that are used in pedigrees. Pedigree analysis (characteristics pedigree patterns of monogenic inheritances: AD, AR, XD, XR, Y-linked, mitochondrial). Disease examples for monogenic inheritances (AD, AR, XD, XR, mitochondrial); **Important terms:** gene, genome, locus, allele, multiple allelism, wild type (normal) allele, genotype: homozygote, heterozygote, complex heterozygote, hemizygote, phenotype: dominant, codominant, recessive.

5.) Mendelian Inheritance: autosomal inheritance

MGGe: Chapter 6, pages 102 -121; Lecture: Monogenic inheritance (Autosomal inheritance); Practice: Autosomal dominant inheritance

Properties and disease examples of autosomal inheritance: AD (osteogenesis imperfecta, acondroplasia, Marphan syndrome, familial hypercholesterolemia, Huntington disease, Polycystic kidney disease). Ecogenetic diseases (porphyria, malignant hyperthermia). AR (albinism, phenylketonuria, xeroderma pigmentosum, deafness, cystic fibrosis, sickle cell anemia, thalassemias). **Important terms:** gene, genome, locus, allele, multiple allelism, wild type (normal) allele, genotype: homozygote, heterozygote, complex heterozygote, hemizygote, phenotype: dominant, codominant, recessive. Genetic heterogeneity (locus heterogeneity, allele heterogeneity), Factors

affecting pedigree patterns: reduced penetrance, variable expressivity, pleiotropy, heterogeneity (locus and allele), phenocopy, anticipation, „de novo“, new mutation, Influence of the age, Lethal/sublethal genes, „Modifier genes“, Epistasis; Heterozygote advantage, The influence of the environment,

6.) Role of sex in inheritance

MGGe: Chapter 7, pages 122-131; Lecture: Role of sex in inheritance

Properties and disease examples of Sex-linked inheritance: XR (hemophilia A and B; Duchenne and Becker muscular dystrophy), XD (hypophosphatemia, incontinentia pigmenti, Fragile X). Y-linked inheritance; Sex influenced inheritance (e.g. boldness). Sex limited inheritance (e.g. precocious puberty). Genomic imprinting, X-chromosome inactivation. Mitochondrial inheritance (homoplasmy, heteroplasmy)

7.) Cytogenetics

Practice: Cytogenetics I

Structure and types of eukaryotic chromosome. Karyotyping (chromosome preparation, principle, significance and types of banding techniques, principle and significance of multicolor-FISH, and M-banding); kariogram, idiogram; X inactivation. Study of sex chromosomes in interphase. Characteristics of human karyotype. Mutagenicity tests: micronucleus and sister chromatid exchange. Chromosome territories.

Light microscopic slides: 54, 60, 64

8.) Structural chromosome mutations

MGGe: Chapter 4, pages 69-80; Lecture: Chromosomal aberrations; Practice: Cytogenetics II

Structural chromosome aberrations. Types of structural aberrations: deletion (terminal, interstitial), duplication, translocation (reciprocal, Robertsonian), inversion (paracentric, pericentric), ring chromosome, isochromosome. Balanced and unbalanced mutations. Chromosomal translocations in leukemia. Consequence of structural aberrations.

9.) Numerical chromosome mutations

MGGe: Chapter 4, pages 80-90; Lecture: Chromosomal aberrations; Practices: Cytogenetics

Numerical chromosome aberrations: euploidy, polyploidy, aneuploidy, mixoploidy (mosaicism, chimerism). Possible cause of aneuploidy (non-disjunction in meiosis I and II). Autosomal (Patau, Edwards and Down syndromes) trisomies. Numerical aberrations of sex chromosomes (Klinefelter, XYY, triplo X, Turner syndromes). Uniparental disomy (UDP). Cause and consequence of polyploidy and mixoploidy (mosaicism and chimerism).

10.) Mutations and polymorphisms

MGGe: Chapter 3, pages 52-68; Lecture: Genetic variations

Different meanings of mutation and polymorphism. Significance of mutation. Classification of mutations: by cause (spontaneous, induced, different DNA repair mechanisms, consequence of their failure), by site (in the organism: somatic, germline, in the gene), by function (loss-of-function, gain-of-function, dominant negative, lethal, back), by fitness (neutral, beneficial, harmful), by size (genome, chromosome, gene: insertions, deletions, substitutions). Repetitive insertions, triplet repeat: polyglutamine and polyalanine disorders. inDel mutations: frame shift and in frame mutations. Nucleotide substitutions: transition, transversion, sense (synonymous) missense and nonsense (non-synonymous) mutations. Types, size and significance of genetic polymorphism.

11.) Epigenetics

MGGe: Chapter 5, pages 91-101; Lecture: Epigenetics

Meaning of epigenetics. Relationship of genome, epigenome and phenotype. Epigenetic mechanisms: transcriptional (DNA methylation, histone modifications), posttranscriptional (RNAi, miR). X chromosome inactivation, role of XIST. Autoimmunity and X inactivation. Genomic imprinting, evidences of nonequivalence of parental genome. Mechanism of genomic imprinting. Causes of Prader Willi and Angelman syndromes. Possible role of genomic imprinting. Relationship between genomic imprinting and cancer. Position effect. Epigenetic changes caused by aging and by in vitro fertilization. Transgenerational effects.

12.) Introduction to genomics. Methods in genomics

MGGe: Chapter 9, pages 148-173; Lecture: Introduction to genomics. Methods in genomics; Practice: Molecular genetic methods and applications in human genetics I-II.

Genomics, Human Genome, DNA sequencing, Participants in the Human Genome Project, Some results of the HGP, Variations in the human genome, Some novel data about gene expression and genetic variability, Junk DNA in the human genome, Comparative genomics, ENCODE project, Genetic markers, GWAS, Principle of molecular genetic methods: hybridization, restriction enzymes, DNA isolation, Visualization of genomic DNA, separation of DNA fragments by gelelectrophoresis, capillary gelelectrophoresis), non-specific staining of DNA (EtBr), Allele-Specific Oligonucleotide (ASO) test, RFLP, microarray, PCR, PCR- RFLP, Multiplex PCR, MLPA, Significance of real time-PCR. Significance and detection of VNTR. VNTR and trinucleotide diseases. Significance of polymorphism detection in forensic medicine. DNA fingerprint. Foreign DNA (bacterial, viral) detection. Sequencing in genotyping. NGS, RT(reverse transcriptase)-PCR.

13.) Complex inheritance.

MGGe: Chapters 10, pages 174-177; Lecture: Complex inheritance, Practice: Complex inheritance

Features of complex inheritance. Environmental factors. Heritability of the complex diseases. Disease examples

14.) Pharmacogenomics

MGGe: Chapter 14, pages 266-286; Lecture: Pharmacogenomics and nutrigenomics

Pharmacogenetics and pharmacogenomics. Pharmacokinetics, -dynamics, **Drug development Adverse drug response, Genetic background of adverse effects, CYP (cytochrome P-450) gene family, Warfarin, Mercaptopurine, Genes influencing pharmacodynamics, Examples of pharmacogenetic studies, Pharmacogenetics of statins, Clopidogrel, Pharmacotherapy of asthma, MODY**, Succinylcholine sensitivity, Thiopurin methyltransferase variations, Role of membrane receptors in drug effects.

15.) Nutrigenomics

MGGe: Chapter 13, pages 255-263; Lecture: Pharmacogenomics and nutrigenomics

Genetic variations and food, food and gene expression.

16.) Gene therapy

Practice: Genetherapy

Genetherapy types (real, gene expression modification) and forms (in vivo, ex vivo). Nucleic acids applied in gene therapy: DNA, RNA. Forms of introduction of nucleic acids into target cells. Vectors applied in gene therapy: adenovirus, adeno associated virus, retrovirus, lentivirus, nonviral integrating vectors. Comparison of viral vectors. Examples of successful gene therapy trial.

17.) Population genetics

MGGe: Chapter 12, pages 215-224; Lecture: Population and evolution genetics

Types of sample collection, prospective and retrospective studies. Selection of populations for genetic studies. Hardy Weinberg equilibrium. Linkage, haplotype, linkage disequilibrium. Founder populations. Association studies, population stratification, population admixture. Risk calculation, odds ratio and relative risk, p-value.

18.) Evolution genetics

MGGe: Chapter 12, pages 225-236; Lecture: Population and evolution genetics

Gene environmental interactions and the human genome. Natural selection. Role of infections in formation of the genome. Genetic drift, bottleneck effect. Why are some lethal mutations frequent? Examples for effects forming the genome.

19.) Genome and environment

MGGe: Chapter 13, pages 238-254; Lecture: Population and evolution genetics

Penetrance of the genetic variants; Interactions between highly and low penetrant variations and the environment; smoking-genome interaction, gene-environmental interactions;

20.) Gametogenesis, prenatal genetic testing

Practice: Gametogenesis, prenatal genetic testing

Comparison of spermatogenesis and oogenesis; Genetic aspects of infertility; Genetic aspects of assisted reproduction techniques; CGH; aCGH prenatal genetic testing; Non-invasive prenatal testing

21.) Genetics of biological processes

MGGe: Chapter 8, pages 132-147; Lecture: Genetics of biological processes

Genetics of development: development potentials (totipotent, pluripotent, multipotent, unipotent), cell differentiation, significance of stem cells. Role of morphogens and their concentration gradient (Sonic hedgehog), homeotic genes. Genetics of sex: sex determination, male sex determination. Causes of maldevelopment. Oncogenetics: oncogenes and tumor suppressor and mutator genes. Activation mechanisms of oncogenes. Tumor suppressor genes, LOH. Immunogenetics: somatic gene rearrangement, role of epigenetics, genetic background of antibody diversity.

Method and type of evaluation:

Final grade will be calculated from the result of the exam scores and bonus scores. Bonus scores are the grade calculated from the scores collected at the midterm, homeworks and lectures. Competition will be organized during the semester.

How to register for the examination?:

In the Neptun system, according to current university and faculty settings.

Possibilities for exam retake: According to the Study and Exam Policy

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Cs. Szalai (Editor): Medical Genetics and Genomics e-book, 2018

Power Point presentations of the lectures and practices; The e-book and presentations available at the homepage: <http://gsi.semmelweis.hu/index.php/en/education/>

MEDICAL PSYCHOLOGY

Institute of Behavioral Sciences

Type of the course: compulsory

credit: 4 credits

Presenter of the course: Dr. János Kollár

Course leader: Dr. József Kovács

Course objectives: The course is designed to give a broad overview of the field of medical psychology, including concepts, theory, and research.

Learning objectives:

- Develop an understanding of the complex interplay between one’s physical well-being and a variety of biological, psychological, and social factors.
- Learn the nature of the stress response and its impact in the etiology and course of many health problems.
- Understand the approach of bio-psycho-social model and become familiar with some frequent psychosomatic diseases.
- Be able to identify various psychological disorders and key personality traits related to health / disease.

Course Syllabus:

Lectures:

Week 1.	Introduction to Human Behaviour
Week 2.	Major Schools of Psychology
Week 3.	Stress and illness; behavioral interventions
Week 4.	Conscious states, sleep, dreaming and general anesthesia
Week 5.	Stigmatization and people living with disabilities
Week 6.	Psychological correlates of cardiovascular disorders
Week 7.	Affects, Emotion and Motivation

Seminars:

Week 1.	Developmental psychology, attachment theories
Week 2.	Personality theories
Week 3.	Human sexuality and sexual disorders, psychology of reproduction, psychology of birth
Week 4.	Depression and mood disorders.
Week 5.	Anxiety and medical illnesses.
Week 6.	Eating disorders.
Week 7.	Psychosomatic disorders – case studies; somatization and dissociative disorders
Week 8.	Personality disorders.
Week 9.	Sleep disorders
Week 10.	Addiction, substance use
Week 11.	Suicide, cry for help, crisis intervention
Week 12.	Psychology of death, grief, and dying
Week 13.	Behaviour change and psychotherapy. Stress management in medical practice.
Week 14.	Mental health of medical doctors. Prevention and management of burn-out. Bálint-groups.

Participation and making up for absences: Students are expected to attend regularly the course and participation list will be recorded at the end of every lecture and every seminar. To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature needed to absolve the course. The maximum number of absences permitted: one absence from the lectures and three absences from the seminars. Content of the lectures may appear in the exams.

Justification of the absence in the lectures and examinations: Absence should be justified for the seminar leading teacher within three working days.

Checks during the semester (reports, written checks): Every student should prepare presentations on the topics designated by the seminar leader teacher. Active participation is expected.

Requirements for the signature at the end of the semester: Active participation on the practices. The teacher has the right for refusing to give signature to the students who didn't work on the desired level on the seminars.

Method of the calculation of marks: Grades will be based on student's performances at the final written exam.

Type of the exam: Written final examination taken in the examination period.

Requirements for the exam: The material of the lectures and seminars.

Application for the exam: Through the Neptun system.

Changing the application for the exam: Through the Neptun system.

Justification of the absence from the exam: Absence should be justified for the course leading teacher within three working days.

Course and recommended text books:

Required textbook:

1. Behavior & Medicine, 4th Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.

Recommended text books:

1. Kopp M. – Skrabski A.: Behavioural Sciences Applied in a Changing Society, Corvina, 1996.
2. Fadem B: Behavioural Science., Lippincott Williams & Wilkins, 5th ed., 2008.
3. Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6th ed., New York, Wiley, 2008.

Additional readings:

The powerpoint slides and prezi presentations used for the lectures and seminars and also some related papers will be assigned for reading during the course, and they will be made available on the course website.

DEVELOPMENTAL BIOLOGY: from gene to newborn. I. -

"Our real teacher has been and still is the embryo, who is, incidentally, the only teacher who is always right."

Hamburger 1900-2001

Regulatory mechanisms and early development of embryology

2 hours/week, 2 credits

Prof. Dr. Imre Oláh

Department of Human Morphology and Developmental Biology

Introduction to developmental biology

Comparative embryology, epigenesis and preformation, evolutionary embryology, medical implications

Regulatory elements of the ontogenesis I.

Hormones, growth factors, transcription factors, instructive and permissive interactions

Regulatory elements of the ontogenesis II.

DNA-methylation, X chromosome inactivation, genomic imprinting

Cell-cell and cell-extracellular matrix interactions

Adhesion molecules, integrins, cytoskeleton and cell movement, cell polarization

Cell lineages

Fate map, stem cells, peripheral blood fibrocytes, cell specification, polarity in biological system

Neurogenesis

Origin of neural cells, switch between neuronal and glial fates, axonal specificity, synaptic plasticity

Neural crests and placodes

Origin of neural crest and placodes, flexibility and heterogeneity of neural crest cells.

Myogenesis

Embryonic origin of skeletal, smooth and cardiac muscles. Induction of myogenesis, regulatory factors of myogenesis, regeneration of skeletal muscles

Teratogenesis

Morphogens, morphogenetic period, cancer as an altered development, stem cell therapy, teratogens.

Primordial germ cells (PGC)

Origins, migration, mitosis, differences between male and female PGC, maturations

Fertilization

Acrosome reaction, prevention of polyspermy, activation of egg metabolism

Embryonic induction

Spemann organization center, mosaic and regulative zygotes

Early embryonic development

Cleavage, neurulation, X-chromosome inactivation, parental imprinting

Gastrulation

Differentiation of mesoderm, primary tissue formation

Axis formations in birds and mammals

Symmetry breaking, left-right asymmetry formation.

ORGANOGENESIS

2 hours/week, 2 credits

Prof. Dr. Imre Oláh

Department of Human Morphology and Developmental Biology

Axial and paraxial mesoderm Formation of axial skeleton, somitogenesis, clinical correlations

Segmentation and Homeobox genes Retinoic acid, gain of function, loss of function

Intermediate mesoderm I. Development of kidney, clinical correlations

Intermediate mesoderm II. Development of gonads, sex determination, clinical correlations

Lateral plate mesoderm, splanchnopleura I. Vasculogenesis, blood formation, hematopoietic stem cell.

Lateral plate mesoderm, splanchnopleura II. Early development of the heart. Cardiac anlage, cardiac jelly, cardiac skeleton, development of coronary vessels, contribution of neural crest cells, epicardial body, clinical correlations

Lateral plate mesoderm, somatopleura Development of the limb, evolutionary and ontogenetic aspects, clinical correlations

Branchiogenic arches and their derivatives Clinical correlations

Prechordal plate as head organizer, AVE-anterior ventral entoderm Cranial neural crest and head mesoderm, somatic and visceral head and neck, clinical correlations

Development of arteries Branchiogenic, parietal and visceral segmental arteries, clinical correlations

Epithelio-mesenchymal interactions Ecto-entoderm <—> mesoderm, tooth and lung development, clinical correlations

Neurogenesis Antero-posterior, and craniosacral regionalization, axon guidance, growth, synapsis formation

Development of eye Retina, lens

Entoderm formation Foregut and its derivatives (thymus, thyroid, parathyroid), development of pancreas

Environmental regulation of development Developmental symbiosis, seasonality and sex, nutritional contribution

BIOINFORMATICS

Department of Bioinformatics

Credit value: 2

Number of lessons per week: lecture: 1 practical course: 1

Subject type: elective course

II. semester

Name of the course leader: Prof. Dr. Balázs Győrffy

Objectives of the subject, its place in the medical curriculum:

Today, we have plenty of data in medicine and the challenge lies not any more in obtaining the data but in interpreting the data. Figuring the result of genomics, transcriptomics and other omics technologies present a serious obstacle in understanding the molecular mechanism behind definite diseases. Luckily, bioinformatics is at hand to assist in solving these problems.

Bioinformatics comprises of the computer-assisted evaluation of clinical and biological data. We will discuss in detail three areas of bioinformatics. The first contain databases dealing with clinical and biological data. These also include biobanks and data repositories for storing and accessing information. The second area contains the data processing, modelling, visualization and interpretation. The third pillar is the interpretation of the data within the clinical context of a selected disease.

We will give lectures on the most important chapters of medical bioinformatics including databases, decision-support tools, genomics, transcriptomics, proteomics, medical informatics and artificial intelligence.

Successful completion of the subject results in the acquisition of the following competencies:

Students will be able to understand the theoretical basics and to utilize the most important bioinformatical tools. They will know the advantages and limitations of each method. The students will have a hand-on experience of these tools enabling successful application in research projects and in clinical diagnostics.

Course prerequisites:

Completed first two semesters.

Number of students required for the course (minimum, maximum) and method of selecting

students:

minimum: 20

maximum: 60

Thematics

I. section: Basics of bioinformatics

1. Introduction to bioinformatics (Balázs Győrffy)
2. Utilization of a training and test set (János Tibor Fekete)
3. Statistical errors and dichotomania (János Tibor Fekete)
4. Survival analysis* (Balázs Győrffy)
5. ROC analysis: predicting sensitivity and specificity * (János Tibor Fekete)

II. section: Omics

6. Similar genes and proteins, BLAST* (Balázs Gyórfy)
7. Introduction to genomics (Balázs Gyórfy)
8. Genomics: quality control* (Ádám Nagy)
9. Genomics: alignment of data to a reference genome * (Ádám Nagy)
10. Genomics: identifying mutations (SNV, indels) (Ádám Nagy)
11. Genomics: determining the consequence of a mutation* (Ádám Nagy)
12. Genomics: what is the clinical relevance of a mutation, ClinVar, dbSNP* (Ádám Nagy)
13. Genomics: mutation signatures (Ádám Nagy)
14. Genomics: copy number variations* (Ádám Nagy)
15. Genomics: identifying processing artefacts and quality issues (Otília Menyhárt)
16. Proteomics: pre-processing (Balázs Gyórfy)
17. Transcriptomics: processing RNA-seq data (Balázs Gyórfy)
18. Proteomics: tools to analyze immunohistochemistry results (Áron Bartha)
19. Proteomics: processing mass spectrometry (Áron Bartha)
20. Proteomics: understanding molecular functions, Uniprot (Otília Menyhárt)
21. Genomics: GeneBank (Attila Marcell Szász)

III. section: Integrative science

22. Application of multi-omic tools (Otília Menyhárt)
23. Clinical studies utilizing multi-omics (Otília Menyhárt)
24. Multiple hypothesis testing* (Balázs Gyórfy)
25. Analyzing COVID-19 (Ádám Nagy)
26. Reproducibility issues in medicine (Otília Menyhárt)

IV. section: Artificial intelligence

27. Introduction to artificial intelligence (Balázs Gyórfy)
28. Machine learning* (János Tibor Fekete)
29. The Bayes rule (János Tibor Fekete)
30. Clinical application of a decision tree (Áron Bartha)
31. Determining distance* (Balázs Gyórfy)
32. Clustering* (Balázs Gyórfy)
33. Neuronal networks* (Balázs Gyórfy)
34. Principal component analysis (Áron Bartha)
35. Support Vector Machines (János Tibor Fekete)
36. Regression* (Áron Bartha)
37. Diagnostic tools using artificial intelligence (Attila Marcell Szász)

V. section: Medical informatics

38. Using REDcap (Attila Marcell Szász)
39. Electronic health records (Áron Bartha)
40. Time distortion and computer addiction (Otília Menyhárt)
41. Development, learning and work (Otília Menyhárt)
42. Outlook (Balázs Gyórfy)

Each lecture comprises of three 15-minute talks. Starred lectures have associated exercises.

The exercises are held by:

Balázs Györfy, Áron Bartha, János Tibor Fekete, Máté Balajti, Ádám Nagy

It is recommended to bring a private laptop for the exercises.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes: Bio-physics (biostatistics), translational medicine Requirements for participation in classes and the possibility to make up for absences: According to the current regulation of the University. Missed exercises can be repeated at the last exercise.

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

Completed exercises give 33% of the final result.

Requirements for signature:

Maximal number of missed lectures: 25% of all lectures.

Type of examination:

The semester ends with a colloquium.

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

The final exam will comprise a theoretical part (42 multiple-choice selection test) and an exercise. The exercise will comprise a bioinformatic evaluation of a new data. Any support tool, including utilization of a private laptop is allowed when solving this final exercise.

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

Completed exercises (33%), multiple-choice test (33%), final exercise (33%)

Possibilities for exam retake:

According to the current Study and Examination Regulations.

Printed, electronic and online notes, textbooks,

guides and literature (URL address for online material) to aid the acquisition of the material:

The lectures contain all necessary information, a hard copy of the slides will be provided at each lecture.

HUNGARIAN MEDICAL TERMINOLOGY III.

Responsible organisational unit:

Department of Languages for Specific Purposes

Programme director:

Dr. Katalin Fogarasi-Nuber, associate professor, Director

4 lessons per week, 2 credits

Assessment: midterm (written) and endterm (written and oral) tests

Role of subject in fulfilling the aim of training:

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

Brief description of subject:

The first three modules are dedicated to learning basic general vocabulary and grammar. In the third module students acquire basic structures and the vocabulary for everyday topics / e.g. travelling in a city, travelling abroad, arranging accommodation etc. /, language for „survival.“. The course places special emphasis on phrases essential for everyday communications, e.g. past time activities, telephoning, buying/ordering tickets etc. Grammar is of less importance in this phase of language studies.

weeks	curriculum
	Hungarian instructions during examination on the following topics
1	Revision: present complaint
2	Inspection, palpation, percussion, auscultation
3	Taking the temperature
4	Weight and height
5	Physical examination of the lungs
6	Physical examination of the heart
7	Physical examination of blood pressure and pulse Blood-glucose level
8	Physical examination of the abdominal organs; hernia
9	Physical examination of the "acute abdomen"
10	Examination of the musculoskeletal system
11	Physical methods of examination of the hematopoietic system
12	Examination of lymph nodes
13	Revision
14	Oral interview

Course material, recommended text book(s), professional literature and supplementary reading(s)

Gyöngyösi Lívía – Hetesy Bálint. *Hungarian language: Jó napot kívánok!* Semmelweis Egyetem Egészségtudományi Kar, 2011.

HUNGARIAN MEDICAL TERMINOLOGY IV.

Responsible organisational unit:
Faculty of Health Sciences, Division of Foreign Languages and Communication

Programme director:
Zöldi Kovács Katalin PhD, Head of the Division

4 lessons per week, 2 credits

Assessment: midterm (written) and endterm (written and oral) tests

Role of subject in fulfilling the aim of training:
The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective professional communication in the language they use during their field practice. With the help of this course they become able to communicate with the patients in the Hungarian hospitals.

Brief description of subject:
The fourth module is dedicated to learning basic medical vocabulary. Students acquire the skills needed in taking family, social, and medical history in internal medicine. They also learn how to address the patient during an examination and give advice for the treatment.

weeks	curriculum
	Hungarian instructions during examination on the following topics
1	Revision: Hungarian instructions during examination
2	Gastroenterology I. Reflux Ulcerative disease Colon cancer
3	Gastroenterology II. Ileus Cholelithiasis
4	Liver diseases Cirrhosis
5	Infectious diseases Cystitis Renal pelvic inflammation
6	Endocrine and metabolic diseases Diabetes Osteoporosis Hyperthyroidism
7	Oral interview
8	Cardiology I. Atrial fibrillation Heart failure
9	Cardiology II. Acut coronary heart disease Hypertension

weeks	curriculum
	Hungarian instructions during examination on the following topics
10	Hematology Anemia Lymphoma
11	Immunology RA
12	Pulmonology I. Pneumonia Pulmonary embolism
13	Pulmonology II. Asthma, COPD, Lung cancer
14	Mock exam

Course material, recommended text book(s), professional literature and supplementary reading(s)

Marthy Annamária – Végh Ágnes. *Egészségére! - Magyar orvosi szaknyelv*. Semmelweis Egyetem Egészségtudományi Kar, 2010.

PHYSICAL EDUCATION III.

Department of Physical Education

Subject: Physical Education III.

Type of Subject: Compulsory

Code of Subject: AOKTSI009_3A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

II. St. year I. semester:

1 – 2 weeks:	General information Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra -curricular activities. Theory and practical application of the warm-up as a sports injury risk significantly reducing factor. Common to the bench. Free exercises.
3 – 4 weeks:	Stamina Development Long-term (at least 45 – 60 minutes) running and skipping exercises.
5 – 6 weeks:	Balls skill development Practicing the fundamentals of volleyball (serves, over – and underhand touches, movements, etc.)
7 – 8 week:	Strength development Overall strength development using the circle-training method-setting up different stations working on different muscle groups.
9 – 10 weeks:	Coordination enhancing exercises Jumping rope exercises in place and in motion.
11 – 12 weeks:	Posture correction Stick exercises, in various position and motion.
13 – 14 weeks:	Stretching – relaxation exercises Stretching exercises using large medicine-balls in sitting, standing, kneeling and recumbent positions.

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons.

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

PHYSICAL EDUCATION IV.

Type of Subject: Compulsory

Code of Subject: AOKTSI009_4A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

II. St. year II. semester:

- | | |
|----------------|--|
| 1 – 2 weeks: | General information
Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra -curricular activities. Theory and practical application of the warm-up as a sports injury risk significantly reducing factor. Common to the bench. Free exercises. |
| 3 – 4 weeks: | Cardio – vascular system development
The floorball: Using the basic elements of the game dribbling, passing, shooting, etc. Playing against each other in the interval system on high intensity level. |
| 5 – 6 weeks: | Posture corrective exercises
Exercises on floor mats, focusing on the core muscles in various body-positions. |
| 7 – 8 week: | Coordination enhancing exercises
Special education and practice material for spatial vision, perception of body schema, right-left orientation, muscle development and perception of coordination at the technical skills of playing sports (tennis, badminton). |
| 9 – 10 weeks: | Strengthening exercises
Using manual and other exercises equipment (dumbbells, boxes, bench, wall bars, etc.) |
| 11 – 12 weeks: | Balls skill development
Exercise of basic technical elements of football. Learning and practicing tactical elements. During locomotion ball control exercises, skill development. |
| 13 – 14 weeks: | Stretching – relaxation exercises
Various stretching relaxing exercises after the meditative practices and knowledge (yoga, tai chi, etc.) |

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons.

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

PRE-CLINICAL MODULE



Faculty of Medicine
3rd year

STUDY PROGRAMME

Third year in the 2021/2022 academic year

5th semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practive (h/week)			
Pharmacology and Pharmacotherapy I	2,5	2,5	5	Medical Microbiology I. Molecular Cell Biology II. Medical Physiology II.	semi-final
Translational Medicine – Pathophysiology I.	1,5	1,5	3	Macroscopic Anatomy and Embriology II. Medical Physiology II., Medical Biochemistry II.	semi-final
Medical Microbiology II	1,5	2,5	4	Medical Microbiology I.	semi-final
Pathology I.	3	4	7	Microscopic Anatomy and Embriology II. Macroscopic Anatomy and Embriology II. Medical Physiology II.	semi-final
Internal Medicine - Propedeutics	2	5	7	Medical Physiology II. Medical Biochemistry II. Hungarian Medical Terminology IV.	semi-final
Medical Aspects of Disaster Preparedness and Response I.	1x2/ semester	0	0	–	signature
Hungarian Medical Terminology V.	0	4	2	Hungarian Medical Terminology IV.	final
Medical Statistics, informatics and telemedicine	1	1	2	Medical Biophysics II.	semi-final
Clinical ECG	1	2	3	Medical Biophysics II. Medical Physiology II.	semi-final
PE V.	0	1	0	PE IV.	signature

Third year

6th Semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	prattice (h/week)			
Pharmacology and Pharmacotherapy II.	2,5	2,5	5	Pharmacology and Pharmacotherapy I, Medical Microbiology II., Pathology I	final
Translational Medicine – Pathophysiology II.	3	3	3	Pathology I. Translational Medicine – Pathophysiology I.	final
Pathology II.	3	4	7	Pathology I.	final
Internal Medicine – Propedeutics	1	3	4	Medical Biochemistry II., Medical Physiology II., Hungarian Medical Terminology IV.	semi-final
Bioethics- Medical Ethics	2	0	2	Medical Psychology	final
Medical Aspects of Disaster Preparedness and Response II.	1x2/ semester	0	0	–	signature
Basic Surgical Techniques	0,5	1,5	2	Microscopic Anatomy and Histology II. Medical Physiology II.	semi-final
PE VI.	0	1	0	Testnevelés V.	signature
Summer Practice – Internal Medicine	1 month		–	–	signature

(*The prerequisite is that registration has been done for the marked subject – corequisite – as well)

LIST OF TEXTBOOKS (The list may change!)

- 1 Bickley, L.S.: Bates' Guide to Physical Examination and History Taking. 12th ed. Wolters Kluwer, 2016.
- 2 Murray, Rosenthal, Kobayashi, Pfaller: Medical Microbiology. 8th ed. Elsevier, 2016. ISBN 9780323299565
- 3 Robbins: Basic Pathology, 2008. V. Kumar, A. K. Abbas, N. Fausto, R. Mitchell Saunders; 8 edition
- 4 Szende B, Suba Zs.: Introduction to Histopathology. Bp. Medicina, 1999.
- 5 Katzung: Basic and Clinical Pharmacology. Lange 10th ed, 2007
- 6 Owen, Punt, Stranford, KUBY Immunology • W. H. Freeman and Company • New York • 2013; International Edition ISBN-13: 978-14641-3784-6; ISBN-10: 1-4641-3784-6

Recommended textbooks:

- 1 Kumar & Clark's Clinical Medicine. Ed. Feather, Randall, Waterhouse. Elsevier, 10th ed. 2020. ISBN 9780702078682
- 2 Harrison's Principles of Internal Medicine. Ed. Jameson, Fauci, Kasper, Hauser, Longo, Loscalzo. 20th ed. McGraw Hill Inc. 2018
- 3 William J. Marshall, Stephen K. Bangert: Clinical Chemistry. 5th ed. Elsevier Health Sciences 2004. ISBN: 0723433283.
- 4 H. Thiel, H. Diem, T. Haeflacher: Color Atlas of Hematology 2nd ed. Georg Thieme Verlag 2004. ISBN: 9783136731024
- 5 N. Goldschlager et al.: Principles of Clinical Electrocardiography. 3rd ed. 1989. Appleton and Lange ISBN: 0-8385-7951-5.
- 6 Mahta, Atul B. Hoffbrand, A. Victor: Haematology at a Glance 2nd ed. Blackwell Publishing 2005. ISBN: 1405126663
- 7 Carl A. Burtis: Tietz Textbook of Clinical Chemistry. W.B. Saunders 3rd 1999 ISBN 0721656102
- 8 Carl A. Burtis: Tietz Fundamentals of Clinical Chemistry. WB. Saunders 5th 2001 ISBN 0721686346
- 9 Davis et al.: Clinical Laboratory Science. (Strategies for Practice.) 1988. Lippincott-Raven Cldh Text. ISBN: 0-397-50860-3
- 10 E. Rubin-J.L. Farber: Pathology (J.B. Lippincott 1994). – 3rd edition (1999)
- 11 Nemes Z.: Atlas of Histopathology (TEMPUS edition, Debrecen 1998)
- 12 CP.L. Wheeler, H.G. Burkitt, Stevens J.S. Lowe: Basic Histopathology, a Colour Atlas and Text. (Churchill Livingstone; 4Rev Ed edition, 2002)
- 13 Zaltnai A.: 500 Practice Questions about Pathology (Semmelweis University of Medicine)
- 14 Illyés Gy.: Path Nebulo 2000. Version 1.0 (English-Hungarian)
- 15 Székely E.: Practice on Histopathology I-II. (Semmelweis University of Medicine) - video

PHARMACOLOGY AND PHARMACOTHERAPY I.

Tutor: *Dr. Pál Riba*

First and Second Semester

Department of Pharmacology and Pharmacotherapy

Credits: 5

Total number of hours: 70 lectures: 35 practices: 35

Type of the course (mandatory/elective): mandatory

Academic year: 2021/2022

Code of the course: AOKFRM034_1A

Course director (tutor): *Dr. Ferdinandy, Péter*

Contact details:

Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4.

Tel: +36-1-2104416, e-mail: ferdinandy.peter@med.semmelweis-univ.hu

Position: Head of Department, full professor

Aim of the subject and its place in the curriculum:

Pharmacology is an essential subject in the medical education. It provides strong fundamentals for further clinical subjects since pharmacological therapies have a crucial role in treating diseases. Pharmacology draws upon previously acquired knowledge of biochemistry, physiology, pathophysiology as well as the basics of clinical subjects. The subject includes general pharmacology, detailed pharmacology, clinical pharmacology and toxicology as well as the basics of drug prescriptions. General pharmacology (pharmacodynamics, pharmacokinetics) is important for understanding the basic pharmacological terminology, how medicines act and what is their fate in the body. Detailed pharmacology describes the mechanisms of actions, main effects, adverse effects of the drugs and the most important drug interactions as well as the logics of dosage and prescribing. Clinical pharmacology and pharmacotherapy connect the drugs to diseases dealing with the indications, contraindications and warnings regarding their use. The diseases which have the greatest impact on public health are further detailed and their complex pharmacological treatment strategies are discussed. Medical students gain knowledge from simple case reports that show the logic of pharmacological treatment. Toxicology covers the most important poisons, intoxications, their symptoms and management thereby providing theoretical basics for emergency medicine of poisoning and drug overdoses. During pharmacological education the students will also learn the basics of prescription writing.

Location of the course (lecture hall, practice room, etc.):

Nagyvárad téri Elméleti Tömb, 1089 Budapest, Nagyvárad tér 4.

Prerequisite(s) for admission to the subject:

Medical Physiology II, OR Medical Biochemistry, Molecular and Cell Biology III,
Medical Biochemistry III, Pathophysiology II OR Pathophysiology and Clinical Lab. Diagnostics II.
Molecular Cell Biology II

Minimum and maximum number of students registering for the course:

Since it is a mandatory subject all the students in the fourth year of medical education must register.

Student selection method in case of oversubscription:

N/A

How to register for the course:

Through the NEPTUN system

Detailed thematic of the course:

week	Lecture	Practice
1 st week	Introduction to Pharmacology (history of pharmacology, pharmacogenomics, general principles of toxicology). Development of Drugs (clinical trials: phase I. II. III. IV.). Evidence Based Medicine (ethic disciplines, role of placebo in clinical trials). (CP)	Pharmacodynamics I (drug receptors, receptor theories, drug-receptor interactions).
2 nd week	Pharmacokinetics (drug absorption, distribution, elimination). Clinical pharmacokinetic principles. (CP)	Pharmacodynamics II (quantal dose-response curves, therapeutic indices, tolerance, drug interactions). Basics of prescription writing
3 rd week	Basics of the neurotransmission of the autonomic nervous system. Pharmacology of the cholinergic systems	Parasympathomimetics and parasympatholytics, centrally acting cholinergic drugs
4 th week	Pharmacology of the adrenergic system	Sympathomimetics and sympatholytics
5 th week	Pharmacology of the skeletal muscles. Pharmacology of the local anesthetics	Nitrates, Ca-channel blockers and other vasodilators. Pharmacology of RAAS.
6 th week	Drugs used in coagulation disorders	Fibrinolytics, drugs against bleeding, drugs acting on blood cell production. Diuretics and antidiuretics
7 th week	Treatment strategy of ischemic heart disease (CP). Treatment strategy of acute and chronic heart failure (CP)	Positive inotropic agents. Antihyperlipidemic drugs.
8 th week	Treatment strategy of hypertension (CP)	Drugs acting on blood glucose control. Antidiabetics.
9 th week	Treatment strategy of 2nd type diabetes mellitus (CP). Metabolic syndrome (CP)	Antiarrhythmic drugs. Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation.
10 th week	Pharmacology of the respiratory system. Pharmacotherapy of bronchial asthma and COPD (CP)	Expectorants (secretomotorics, secretolytics, mucolytics), antitussive drugs. Autacoids, histamine, antihistamines.
11 th week	Corticosteroids. Drugs affecting bone mineral homeostasis. Treatment strategy of osteoporosis (CP)	Pituitary hormones and hypothalamic hormones controlling their production. Hormonanalogs and hormone antagonists.
12 th week	Thyroid hormones and antithyroid drugs. Sexual hormones. Contraceptives (CCP)	Androgens, antiandrogens, anabolic steroids, drugs influencing sexual activity.
13 th week	Special aspects of pediatric and geriatric pharmacology (Pharmacokinetic Differences and Variations in Drug Responsiveness according to Age or State of Health.)	Nutrients, traditional plant medicines, vitamins, anorectic drugs.
14 th week	Regulation of Drugs. Pharmacovigilance. Biological Drugs. Orphan Drugs (CP) Advanced Therapy Medicines	Pharmacovigilance (reporting adverse effects), drug registration, ATC code, generics, biosimilar drugs). Drug formulations.

CP: clinical pharmacology/pharmacotherapy material

Potential overlap(s) with other subjects:

Physiology, biochemistry, molecular biology, pathology, internal medicine, cardiology, pulmonology, clinical pharmacology, pediatrics

Special training activities required:

N/A

Policy regarding the attendance and making up absences:

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence the student can attend another class the same week.

Means of assessing the students' progress during the semester:

There are no mandatory midterm tests during the semester.

Requirement for acknowledging the semester (signature):

The number of absences must not be more than 25 percent of the number of practices in the semester.

Type of the examination:

oral semifinal exam

Exam requirements:

One question is given from two topic lists each. Acceptable knowledge must be proven.

Topic list "A"

1. Pharmacodynamics I (Molecular targets of drugs. Drug receptors. Receptor theory.)
2. Pharmacodynamics II (relation between drug dose and clinical response, therapeutic index, tolerance, pharmacodynamic drug interactions). The process of drug development.
3. Drug absorption, distribution and bioavailability. Membrane transport mechanisms.
4. Drug biotransformation, linear and non-linear kinetics. Enzyme inhibition and induction. Clearance, half-life, loading and maintenance dose. Elimination. Pharmacokinetic drug interactions
5. Local anesthetics.
6. Glucocorticoids for oral and parenteral use
7. Mineralocorticoids. Topically applied glucocorticoids
8. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
9. Estrogens and antiestrogens
10. Progestins and antiprogestins
11. Contraceptives
12. Thyroid and antithyroid drugs. Hypothalamic and pituitary hormones
13. Pancreatic hormones and parenterally applied antidiabetic drugs. Pharmacotherapy of IDDM.
14. Oral antidiabetics. Pharmacotherapy of non-insulin dependent diabetes mellitus.
15. Agents affecting bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.). Pharmacotherapy of osteoporosis.
16. Drugs used in coagulation disorders I: Antiplatelet agents
17. Drugs used in coagulation disorders II: Anticoagulant drugs
18. Drugs used in coagulation disorders III: Fibrinolytic drugs. Drugs used in bleeding disorders
19. Agents used in anemias
20. Special aspects of pediatric and geriatric pharmacology
21. Biological Drugs. Orphan Drugs (CP) Advanced Therapy Medicines
22. Pharmacovigilance (reporting adverse effects), drug registration, ATC code, generics, biosimilar drugs). Drug formulations.

Topic list "B"

1. Cholinergic transmission and its presynaptic modification.
2. Adrenergic transmission and its presynaptic modification
3. Cholinomimetics
4. Muscarinic receptor blocking drugs
5. Catecholamines
6. Indirect sympathomimetics. Selective α_2 -agonists and drugs acting on the imidazoline receptors
7. α -receptor antagonists
8. β -receptor antagonists
9. Centrally acting skeletal muscle relaxants (spasmolytics). Dantrolene. Botulinum toxin
10. Skeletal muscle relaxants acting on the neuromuscular junction
11. Selective β_2 -stimulants and other bronchodilators. Pharmacotherapy of bronchial asthma and COPD.
12. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants
13. Drugs used for the treatment of peripheral vascular diseases. Therapy of migraine
14. Drugs used for treatment of heart failure I: Drugs decreasing the load on the heart. Drugs of acute cardiac failure. Pharmacotherapy of chronic heart failure.
15. Drugs used for treatment of heart failure II: Positive inotropic agents. Pharmacotherapy of acute heart failure.
16. Antiarrhythmic agents
17. Drugs used for the treatment of hypertension I: Classification of antihypertensive agents and their mechanisms of action. Pharmacotherapy of hypertension.

18. Drugs used for the treatment of hypertension II: Ca^{++} -channel blockers and other vasodilators
19. Drugs used for the treatment of hypertension III: Drugs acting on the renin-angiotensin-aldosterone system
20. Drugs used for treatment of angina pectoris. Pharmacotherapy of ischemic heart disease.
21. Agents used in dyslipidaemias.
22. Potassium excreting (wasting) diuretics
23. Potassium sparing diuretics, ADH antagonists, osmotic diuretics
24. Histamine and antihistamines.

Type and method of grading:

According to the knowledge proven at the exam.

How to register for the exam:

Registration must be done through the NEPTUN system for the days set by the department up to the limits.

Opportunities to retake the exam:

According to the Study and Examination Policy of Semmelweis University

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):

Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9

Materials discussed during lectures and seminars: <http://semmelweis.hu/pharmacology>, Moodle (<https://itc.semmelweis.hu>)

Pharmacology and Pharmacotherapy II.

Credits: 5

Total number of hours: 70 lectures: 35 practices: 35

Type of the course (mandatory/elective): mandatory

Academic year: 2021/2022

Code of the course: AOKFRM034_2A

Course director (tutor): *Dr. Ferdinandy, Péter*

Contact details: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: ferdi-nandy.peter@med.semmelweis-univ.hu

Position: Head of Department, full professor

Aim of the subject and its place in the curriculum:

Pharmacology is an essential subject in the medical education. It provides strong fundamentals for further clinical subjects since pharmacological therapies have a crucial role in treating diseases. Pharmacology draws upon previously acquired knowledge of biochemistry, physiology, pathophysiology as well as the basics of clinical subjects. The subject includes general pharmacology, detailed pharmacology, clinical pharmacology and toxicology as well as the basics of drug prescriptions. General pharmacology (pharmacodynamics, pharmacokinetics) is important for understanding the basic pharmacological terminology, how medicines act and what is their fate in the body. Detailed pharmacology describes the mechanisms of actions, main effects, adverse effects of the drugs and the most important drug interactions as well as the logics of dosage and prescribing. Clinical pharmacology and pharmacotherapy connect the drugs to diseases dealing with the indications, contraindications and warnings regarding their use. The diseases which have the greatest impact on public health are further detailed and their complex pharmacological treatment strategies are discussed. Medical students gain knowledge from simple case reports that show the logic of pharmacological treatment. Toxicology covers the most important poisons, intoxications, their symptoms and management thereby providing theoretical basics for emergency medicine of poisoning and drug overdoses. During pharmacological education the students will also learn the basics of prescription writing.

Location of the course (lecture hall, practice room, etc.):

Nagyvárad téri Elméleti Tömb, 1089 Budapest, Nagyvárad tér 4.

Competencies gained upon the successful completion of the subject:

Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. They learn the mechanisms of action of the most important poisons, as well as the symptoms and management of intoxications/poisoning. That provides theoretical basics for emergency medicine of poisoning and drug overdoses. Knowing the basics of prescribing drugs is of an utmost importance.

Medical students gain knowledge from simple case reports that show the logic of pharmacological treatment. They learn the pharmacological treatment strategies of the most important diseases with the highest public health interests. This knowledge is based on the actual therapeutic guidelines.

They get insight in the development, applications and the whole lifecycle of drugs and medical devices. They understand the principles and importance of pharmacovigilance and how to report adverse events.

Prerequisite(s) for admission to the subject:

Pharmacology and pharmacotherapy I, Medical Microbiology II, Internal Medicine – Propedeutics OR Internal Medicine I

Minimum and maximum number of students registering for the course: Since it is a mandatory subject all the students in the fourth year of medical education must register.

Student selection method in case of oversubscription:

N/A

How to register for the course:

Through the NEPTUN system

Detailed thematic of the course:

week	Lecture	Practice
1 st week	Basic pharmacology of analgesics	Opioids. Adjuvant analgesics
2 nd week	Immunopharmacology (immunosuppressive and immunomodulatory agents).	Non-Steroidal-Antiinflammatory-Drgs (NSAIDs). Drugs for gout
3 rd week	Treatment strategy of autoimmune diseases (CP). Treatment strategy of pain	Antidepressants and antimanic drugs, mood stabilizers – case reports (CP)
4 th week	Pharmacology of the central noradrenergic and serotonergic systems. Pharmacotherapy of mood disorders (CP)	General anesthetics
5 th week	Pharmacology of the central GABA-ergic system. Pharmacotherapy of anxiety and sleep disorders (CP)	Antipsychotics – case reports (CP)
6 th week	Pharmacology of the central dopaminergic systems. Pharmacotherapy of neurodegenerative diseases (CP)	Antiepileptics
7 th week	Agents used for treatment of peptic ulcer. Treatment strategy of peptic ulcer and gastroesophageal reflux disease (GERD)	Antiemetics. Laxatives. Drugs against diarrhea. Pharmacology of Nutrition (appetizers, agents improving digestion, prokinetic drugs). Pharmacology of liver and bile
8 th week	Antiviral drugs and pharmacotherapy of viral infections (CP)	Cell Wall Synthesis Inhibitors & Membrane-Active Antibiotics
9 th week	Antituberculosics. Antifungal, Antiprotozoal and Antihelminthic Drugs	Antibiotics Inhibiting Bacterial Protein Synthesis
10 th week	Pharmacotherapy of bacterial infections (CP)	Antibiotics Inhibiting Bacterial Nucleic Acid Synthesis. Miscellaneous Other Antibiotics
11 th week	Drugs affecting smooth muscles. Drugs of Abuse (CP)	Autacoids. Drugs Used for Treatment of Migraine and Cluster. Cytotox antitumor agents
12 th week	Basics of toxicology	Cytostatic and other anticancer drugs
13 th week	Treatment strategy of cancer (CP)	Toxicology
14 th week	Pharmacological aspects of emergency care (CP)	Contrast agents. Disinfectants

CP: clinical pharmacology/pharmacotherapy material

Potential overlap(s) with other subjects:

Physiology, biochemistry, molecular biology, pathology, internal medicine, cardiology, pulmonology, neurology, psychiatry, pediatrics, microbiology, infectology, oncology, immunology

Special training activities required:

N/A

Policy regarding the attendance and making up absences:

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence the student can attend another class the same week.

Means of assessing the students' progress during the semester:

There are no mandatory midterm tests during the semester.

Requirement for acknowledging the semester (signature):

The number of absences must not be more than 25 percent of the number of practices in the semester.

Type of the examination:

Final exam has three parts.

1. Preceding exam from toxicology.
2. Written test from clinical pharmacology.
3. Oral exam.

Exam requirements:

Acceptable knowledge of toxicology and the basics of prescription writing. On the day of the final exam acceptable written clinical pharmacology/pharmacotherapy test exam. During the oral exam one question is given from three topic lists each. Acceptable knowledge must be proven.

Topic list "A"

1. Pharmacodynamics I (Molecular targets of drugs. Drug receptors. Receptor theory.)
2. Pharmacodynamics II (relation between drug dose and clinical response, therapeutic index, tolerance, pharmacodynamic drug interactions). The process of drug development.
3. Drug absorption, distribution and bioavailability. Membrane transport mechanisms.
4. Drug biotransformation, linear and non-linear kinetics. Enzyme inhibition and induction. Clearance, half-life, loading and maintenance dose. Elimination. Pharmacokinetic drug interactions
5. Local anesthetics
6. Glucocorticoids for oral and parenteral use
7. Mineralocorticoids. Topically applied glucocorticoids
8. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
9. Estrogens and antiestrogens
10. Progestins and antiprogestins
11. Contraceptives
12. Thyroid and antithyroid drugs. Hypothalamic and pituitary hormones
13. Pancreatic hormones and parenterally applied antidiabetic drugs. Pharmacotherapy of IDDM.
14. Oral antidiabetics. Pharmacotherapy of non-insulin dependent diabetes mellitus.
15. Agents affecting bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.). Pharmacotherapy of osteoporosis.
16. Drugs used in coagulation disorders I: Antiplatelet agents
17. Drugs used in coagulation disorders II: Anticoagulant drugs
18. Drugs used in coagulation disorders III: Fibrinolytic drugs. Drugs used in bleeding disorders
19. Agents used in anemias
20. Special aspects of pediatric and geriatric pharmacology
21. Biological Drugs. Orphan Drugs (CP) Advanced Therapy Medicines
22. Pharmacovigilance (reporting adverse effects), drug registration, ATC code, generics, biosimilar drugs). Drug formulations.
23. Inhalational anesthetics
24. Intravenous anesthetics. Perioperative medication
25. Benzodiazepines
26. Non benzodiazepine anxiolytics and non-benzodiazepine hypnotics. Pharmacotherapy of anxiety disorders.
27. 1st generation ("typical") antipsychotic agents
28. 2nd generation ("atypical") antipsychotic agents
29. Tricyclic, tetracyclic and unicyclic antidepressants. MAO-inhibitors
30. Selective serotonin and/or norepinephrine reuptake inhibitors.
31. Norepinephrine and serotonin receptor antagonist antidepressants. Agomelatine. Tianeptine. Agents used for treatment of manic phase of bipolar disorders. Pharmacotherapy of affective disorders.
32. Antiepileptics used in partial seizures and generalized tonic-clonic seizures except for the "broad spectrum" agents.
33. Antiepileptics used in absence seizures. "Broad spectrum" antiepileptic drugs. Drugs used for treatment of status epilepticus
34. Drugs used for treatment of neurodegenerative disorders. Nootropic drugs
35. Smooth muscle relaxants used for relief GI and UG spasms. Drugs influencing uterus functions.
36. Antiemetic drugs. Prokinetic agents. Drugs for irritable bowel disease (IBS).
37. Drugs used in constipation (laxatives) and diarrhea. Drugs promoting digestion. Pharmacology of liver and biliary tract
38. Drugs used in peptic ulcer diseases. Pharmacotherapy of peptic ulcer diseases.

Topic list "B"

1. Cholinergic transmission and its presynaptic modification.
2. Adrenergic transmission and its presynaptic modification
3. Cholinomimetics
4. Muscarinic receptor blocking drugs
5. Catecholamines
6. Indirect sympathomimetics. Selective α_2 -agonists and drugs acting on the imidazoline receptors
7. α -receptor antagonists
8. β -receptor antagonists
9. Centrally acting skeletal muscle relaxants (spasmolytics). Dantrolene. Botulinum toxin
10. Skeletal muscle relaxants acting on the neuromuscular junction
11. Selective β_2 -stimulants and other bronchodilators. Pharmacotherapy of bronchial asthma and COPD.
12. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants
13. Drugs used for the treatment of peripheral vascular diseases. Therapy of migraine
14. Drugs used for treatment of heart failure I: Drugs decreasing the load on the heart. Drugs of acute cardiac failure. Pharmacotherapy of chronic heart failure.
15. Drugs used for treatment of heart failure II: Positive inotropic agents. Pharmacotherapy of acute heart failure.
16. Antiarrhythmic agents
17. Drugs used for the treatment of hypertension I: Classification of

- antihypertensive agents and their mechanisms of action. Pharmacotherapy of hypertension.
18. Drugs used for the treatment of hypertension II: Ca⁺⁺-channel blockers and other vasodilators
 19. Drugs used for the treatment of hypertension III: Drugs acting on the renin-angiotensin-aldosterone system
 20. Drugs used for treatment of angina pectoris. Pharmacotherapy of ischemic heart disease.
 21. Agents used in dyslipidaemias.
 22. Potassium excreting (wasting) diuretics
 23. Potassium sparing diuretics, ADH antagonists, osmotic diuretics
 24. Histamine and antihistamines.
 25. Natural opiates, opioid receptors
 26. Semisynthetic and synthetic opiates
 27. General properties of NSAIDs. Acetylsalicylic acid.
 28. NSAIDs, except acetylsalicylic acid. Non-opioid and adjuvant analgesics. Drugs used for treatment of gout. Treatment strategy of pain.
 29. Immunopharmacology I. (cytotoxic agents, retinoids). Pharmacotherapy of autoimmune diseases.
 30. Immunopharmacology II. (Inhibitors of cytokine gene expression, 5-ASA derivatives)
 31. Immunopharmacology III. (Antibodies and fusion proteins)
 32. Cancer chemotherapy I (antimetabolites)
 33. Cancer chemotherapy II (alkylating agents)
 34. Cancer chemotherapy III (Topoisomerase inhibitors. Inhibitors of mitotic spindle)
 35. Cancer chemotherapy IV. (Hormonal agents)
 36. Cancer chemotherapy V. (Small molecule signal transduction inhibitors)
 - Cancer chemotherapy VI. (Large molecule signal transduction inhibitors)

Topic list "C"

1. General considerations of antimicrobial therapy. Disinfectants and antiseptics
2. Antimycobacterial drugs
3. Antiprotozoal and antihelminthic drugs.
4. Antifungal agents
5. Agents to treat Herpes simplex (HSV), varicella-zoster (VZV) virus, cytomegalovirus (CMV) and respiratory syncytial virus (RSV) infection. Anti-influenza agents
6. Antiretroviral agents.
7. Agents against hepatitis viruses
8. Penicillins
9. Cephalosporins
10. Carbapenems. Monobactams. Beta-lactamase inhibitors. Pharmacotherapy of respiratory infections.
11. Chloramphenicol. Polymyxins. Antifolate drugs
12. Tetracyclines and glycyclcyclines
13. Aminoglycosides
14. Quinolones and fluoroquinolones
15. Macrolides. Ketolides
16. Clindamycin. Streptogramins. Oxazolidinones
17. Glycopeptides. Fusidans. Lipopeptides. Bacitracin. Mupirocin. Pharmacotherapy of skin and soft tissue infections.
18. Metronidazole. Fidaxomicin. Rifaximin. Pharmacotherapy of abdominal infections.
19. Nitrofurantoin. Phosphomycin. Pharmacotherapy of urinary tract infections.

Type and method of grading⁶:

Written test: according to the scores.

Final exam consists of three parts. The grade will be decided after the oral part of the exam (three questions), taken into consideration the results of the preceding two parts, toxicology exam and written clinical pharmacology/pharmacotherapy exam.

How to register for the exam:

Registration must be done through the NEPTUN system for the days set by the department up to the limits.

Opportunities to retake the exam:

According to the Study and Examination Policy of Semmelweis University

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):

Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9

Materials discussed during lectures and seminars: <http://semmelweis.hu/pharmacology>, Moodle (<https://itc.semmelweis.hu>)

Translational Medicine – Pathophysiology I-II.**5th semester****Credit value:** 3**Number of lessons per week:** 42 **lecture:** 21 **practical course:** 21**Academic year:** 2021/2022 Semester 1**Subject code²:** AOKTLM740_1A**Name of the course leader:** Prof. Zoltán Benyó MD, PhD, DSc

Institute of Translational Medicine, 06-1-210-0306

Director

Objectives of the subject, its place in the medical curriculum:

The objective of the course is to have the students understand the complex mechanisms responsible for the development of functional disturbances in common conditions affecting the function of the entire organism through integration of the knowledge imparted by initial courses (most importantly anatomy, biochemistry and physiology), as well as the regulatory processes that are activated in order to fend off these disturbances. Having assimilated the knowledge encompassing organ systems and disciplines and the integrative approach, the students will be ready to understand, in the course of their clinical education, the mechanisms and symptomatology of various diseases and the respective therapeutic possibilities.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Centre of Theoretical Medicine, 37–47 Tűzoltó street, 1094 Budapest

Theoretical Building, 4 Nagyváradi square, 1089 Budapest

Successful completion of the subject results in the acquisition of the following competencies:

Based on their basic training in anatomy, biochemistry and physiology, the students will become capable of understanding the manifestation, on the organism level, of the pathological processes underlying the most common diseases, their symptoms, causes and potential therapeutic outcomes. Helped by practice sessions closely linked with the theoretical material, the students will acquire the skills necessary for following causality relationships in the disturbances of physiological processes and for recognizing the effects of these disturbances on the totality of the function of the organism, and will gain experience in test methods utilized in clinical practice, their theoretical bases, margins for interpretation and actual execution.

Course prerequisites:

Macroscopic Anatomy II.

Medical Biochemistry II.

Medical Physiology II.

Number of students required for the course (minimum, maximum) and method of selecting students:

Based on registration in the Neptun system; offered in the autumn semester for the entire class.

How to apply for the course:

In the Neptun system

Detailed curriculum:

Lectures (1.5 lessons/week)

Semester 1

Complex endocrine disorders

Week 1	Complex endocrine disorders I. (Zoltán Benyó)
Week 2	Complex endocrine disorders II. (Tamás Ivanics)
Week 3	Complex endocrine disorders III. (Tamás Ivanics)

Disorders of the carbohydrate and lipid metabolism. Diabetes mellitus, dyslipidemia, obesity and the metabolic syndrome

Week 4	Insulin resistance. Metabolic syndrome. Etiology and pathomechanism of type 1 and type 2 diabetes. (Domokos Gerő)
Week 5	Complications of diabetes mellitus. (Domokos Gerő)
Week 6	Regulation of body mass; abnormal undernourishment and hypernourishment. Obesity. (László Tornóci)
Week 7	Disorders of lipid metabolism. (Éva Margittai)

Aging, menopause, osteoporosis

Week 8	Aging. (Péter Hamar)
Week 9	Menopause and its consequences. (Zsuzsanna Miklós)
Week 10	The etiology and pathomechanism of osteoporosis. Disorders of the regulation of calcium and phosphate metabolism. (Gábor Kökény)
Week 11	Joint diseases and systemic autoimmune processes. (Gábor Kökény)
Week 11	Joint diseases and systemic autoimmune processes. (Gábor Kökény)

Coagulation disorders

Week 12	(Zoltán Benyó)
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Immobilization, cachexia and tumorous condition

Week 13	Disorders developing in the course of immobilization and their treatment. Cachexia. Rehabilitation. (Zoltán Benyó)
Week 14	Secondary disorders developing in tumorous diseases. (Péter Hamar)

Practices (3 lessons every two weeks)

Semester 1

Weeks 1–2	Clinical case discussion: Adrenal cortex + thyroid gland (Tünde Kriston, Tamás Ivanics)
Weeks 3–4	Clinical case discussion: Diabetes (Gábor Kökény, Domokos Gerő)
Weeks 5–6	Complications of diabetes I: Examination of blood vessel functions (Éva Ruisanchez)
Weeks 7–8	Complications of diabetes II: Examination of nervous system functions (Zsuzsanna Miklós)
Weeks 9–10	Determination of nutritional state + clinical case discussion (Tímea Tímár, Éva Margittai, László Hricisák)
Weeks 11–12	Clinical case discussion: Menopause and osteoporosis (Gábor Kökény, Sára Zsigrai)
Weeks 13–14	Vascular cognitive disorder: fNIRS and cognitive tests (Éva Pál, Csaba Schvarcz)

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of the syllabuses:

Pathology, immunology, laboratory medicine and general medicine

Special study work required to successfully complete the course:

None

Requirements for participation in classes and the possibility to make up for absences:

Participation at practice sessions is compulsory. Absence from a maximum of 25% of the practice sessions is acceptable. Absence from more than 75% of the practice sessions in a semester means that the student did not fulfil his/her semestrial study obligations. There is no possibility for making up for absence from lectures; absence from practice sessions can be made up for with another group in the same week, if there is room for additional participants

Methods to assess knowledge acquisition during term time:

Students give account of their theoretical knowledge of the material so far presented in the lectures on two occasions in the course of the semester, at predetermined dates/times, in the form of written demonstrations.

The students should take notes at the practice sessions, which are then evaluated by the practice supervisor by "Excellent", "Passed" or "Unsatisfactory" qualifications. Unsatisfactory practice notes have to be resubmitted.

Requirements for semestral signature:

The requirement for the end-of-semester signature, and, consequently, for taking the exam is completion of the two intrasemestral written theoretical tests.

Absence from more than 75% of the practice sessions in a semester also means that the student did not fulfil his/her semestral study obligations, therefore he/she is not permitted to take the exam.

Type of examination:

Semifinal exam

Requirements of the examination:

List of theoretical items

- Possible causes of the overproduction of growth hormone and prolactin, and the pathomechanism of the consequent disorders**
Regulation of growth hormone secretion and its main effects in the individual organs and tissues. Pathomechanism of the symptoms of acromegaly. Regulation of prolactin secretion and the main causes of the development of hyperprolactinemia. The consequences of hyperprolactinemia and their pathomechanisms.
- Male hypogonadism and the androgen insensitivity syndrome**
Regulation of sex hormone release in men; metabolism and main effects of androgen hormones. Pathomechanisms of the development and consequences of primary, secondary and tertiary hypogonadism; the physiological basis of differential diagnostics. The hormonal basis of sexual differentiation and the pathomechanism of the androgen insensitivity syndrome
- Physiological disturbances of female hormonal regulation**
The physiological basis of female hormonal regulation; the most common causes and symptoms of primary and secondary amenorrhea/oligomenorrhea and their pathomechanisms. Causes and consequences of functional hypothalamic amenorrhea. The pathomechanism of the development and symptoms of polycystic ovary syndrome and its long-term outcomes.
- Pathogenesis of the hypo- and hyperfunctional disorders of the thyroid gland, and the pathomechanisms underlying the symptoms of these conditions**
The major physiological effects of thyroid hormones. The causes of congenital and acquired hypothyroidisms. Types of primary and secondary hyperthyroidisms. Pathogenesis and diagnostic traits of Hashimoto thyroiditis and Grave's Basedow disease. The major symptoms of congenital hypothyroidism. Pathomechanisms underlying the symptoms manifesting at the organ system level in adult hypo- and hyperthyroidism. Characteristics of myxoedema coma and thyrotoxic crisis.
- The pathogenesis of acute and chronic adrenocortical insufficiency and the pathomechanisms underlying the major symptoms characterizing the conditions. Congenital adrenal hyperplasia**
The major physiological effects of glucocorticoids and mineralocorticoids. The causes of the development of primary and secondary adrenocortical insufficiency. The leading symptoms of Addison's disease; changes in hormone levels characteristic of the condition. Pathomechanisms resulting in the organ system damages developing in chronic adrenocortical insufficiency. Characteristics of the Addisonian crisis. Enzyme defects leading to congenital adrenal hyperplasia, and changes in glucocorticoid, mineralocorticoid and androgen hormone production brought about by these defects. Consequences of androgen hypersecretion.
- Pathogenesis of Cushing syndrome, pathomechanisms underlying its characteristic symptoms, and diagnosing the condition**
The major physiological effects of glucocorticoids and mineralocorticoids. Various types of Cushing syndrome. Leading symptoms of the condition. Pathological changes in lipid, carbohydrate and protein metabolism. Characterization of the pathomechanisms resulting

in abnormal functioning of the individual organs and organ systems. Laboratory tests facilitating the diagnosis of Cushing syndrome. Determination of the origin of Cushing syndrome using the dexamethasone test.

7. Pathogenesis of primary and secondary hyperaldosteronism. Pathomechanisms underlying the symptoms developing in the conditions

Major physiological effects of mineralocorticoids. Causes of the development of primary and secondary hyperaldosteronism. Changes in plasma renin activity taking place in the conditions; mechanism of the change in renin secretion. Leading symptoms of hyperaldosteronism and their causes. Characterization of pathomechanisms elicited by hyperaldosteronism in the abnormal functioning of various organs and organ systems.

8. Pathogenesis of type 1 diabetes mellitus

Genetic factors of type 1 diabetes mellitus, environmental factors playing a role in pathogenesis, and their relative contribution to the development of the disease. The process of the development of type 1 diabetes; the presentation form of manifest diabetes. The concept of absolute insulin deficiency and its consequences regarding clinical presentation and treatment.

9. Pathogenesis of type 2 diabetes mellitus

Genetic factors of type 2 diabetes mellitus and environmental factors playing a role in its pathogenesis. Relative roles of genetic factors in predisposition and the significance of controllable environmental factors. The time course of the development of type 2 diabetes; the concepts of insulin resistance and glucotoxicity. The consequences of relative insulin deficiency regarding the clinical picture and the treatment.

10. Microvascular complications of diabetes mellitus

The role of hyperglycemia in microvascular damage. Mechanism of the development of glucose-induced oxidative stress, inflammation, prothrombogenic status and endothelial dysfunction. Clinical presentation forms of microvascular damage; related screening tests and therapeutic intervention points.

11. Macrovascular complications of diabetes mellitus

The process of atherosclerosis in prediabetes and diabetes; factors playing a role in accelerated macrovascular damage. Presentation form and role of dyslipidemia developing in insulin resistance. The significance of residual risk in diabetes. Clinical presentation forms of macrovascular damage; related screening tests and therapeutic intervention points.

12. Starvation, undernutrition and diets

The energy requirement and food reserves of the organism. The effect of starvation on protein, sugar and lipid metabolism in the various phases of the process. The role of ketone bodies in starvation and diabetes. The long-term consequences of negative energy balance. Various forms of protein/energy undernutrition: kwashiorkor, marasmus and cachexia. Protein losing conditions. Comparison of low-fat, Mediterranean and low-carbohydrate diets. Paleolithic and other fashionable diets; fasting from a medical aspect.

13. Obesity and its relationship with insulin resistance

Obesity: definition, extent, types and prevalence. Obesity as a risk factor of other diseases. The major causes of the increase in mortality due to obesity. Possible causes of the increase in the prevalence of obesity observed. The combined effect of the colon microbiome and diet in the regulation of body mass. The concept and significance of the metabolic syndrome. The relationship between hepatic lipid metabolism and visceral adipose tissue. The role of positive energy balance in the development of insulin resistance and type 2 diabetes mellitus: the "double circle" theory. Results achievable in type 2 diabetes patients by negative energy balance.

14. Characterization of lipoproteins; lipoprotein metabolism

Classification and composition of lipoproteins; characterization of the receptors of lipoprotein metabolism; formation and metabolism of chylomicrons, VLDL, HDL and LDL and their routes in the organism; reverse transport of cholesterol.

15. Classification of dyslipidemias; syndromes associated with primary hyperlipoproteinemia

Classification of dyslipidemias; differentiation between primary and secondary forms, through examples. Detailed description of primary hyperlipoproteinemias, enumeration of their types, causes and main properties. Description, causes, diagnostics, symptoms and treatment of familial hypercholesterolemia, hyperchylomicronemia and familial dysbetalipoproteinemia.

16. Syndromes associated with secondary hyperlipoproteinemia

Enumeration of the most common diseases accompanied by the development of dyslipidemia. Characteristic changes in lipid metabolism, and pathomechanism of lipid metabolism disorders in these conditions.

17. Aging at the molecular and cell level

Definition and forms of aging. Hypotheses at the molecular (genomic instability [telomeres, epigenetics], proteostasis) and cell level (disturbance of nutrient perception, mitochondria, senescence, stem cells, intercellular communication).

18. Organ-level manifestations of the aging syndrome

Aging of the cardiovascular and nervous system. Neurocognitive disorders; pathomechanism of Parkinson's disease. Aging of the sensory organs, the hemato-immune system, the musculature and the kidneys.

19. **The menopausal transition and the menopause**
Definition of the menopause and the reproductive life stages connected with the menopause. Hormonal events and symptoms of the menopausal transition and the pathophysiological background of the symptoms.
20. **The postmenopause**
Hormonal changes in the post-menopausal life stage. Long-term consequences of estrogen deficiency and their pathophysiological background.
21. **Hormonal regulation of calcium and phosphate metabolism under physiological and pathological conditions. Pathogenesis of primary and secondary hyperparathyroidism.**
Hormones playing a primary role in the calcium and phosphate homeostasis of the organism and their effects on their target organs. Pathophysiology and symptoms of primary and secondary hyperparathyroidism. Causes and main symptoms of hypo- and hypercalcemia.
22. **Hormonal regulation of calcium and phosphate metabolism under physiological and pathological conditions; effects on the bone system.**
Pathomechanisms, diagnostics and therapeutic possibilities of primary osteoporoses. Etiology and pathomechanisms of osteomalacia and the most common forms of secondary osteoporosis.
23. **Non-osteoporotic adult bone diseases and the effects of vitamin D deficiency outside the bone system**
Renal osteodystrophy, tumour-associated hypercalcemia; the role of FGF-23 in pathological processes. Etiology and significance of vitamin D deficiency. Effects of vitamin D on the bone system; its non-endocrine effects.
24. **General mechanisms of the development of systemic autoimmune diseases**
General mechanisms of the development of systemic autoimmune diseases. The concept of autoimmunity. The significance of immune tolerance. The role of genetic and environmental factors in its pathogenesis. The most common organ manifestations of systemic autoimmune diseases; major diagnostic possibilities and general therapeutic directions. Possibilities of biological therapies in autoimmune diseases.
25. **Autoimmune joint diseases. Rheumatoid arthritis and Bechterew's disease**
The mechanism of the development of the diseases; the role of known genetic and environmental factors. The pathomechanism of gout. Most common manifestations and related differential diagnostic problems. Main diagnostic and therapeutic possibilities based on the pathomechanisms.
26. **Pathomechanisms of systemic lupus erythematoses, systemic sclerosis and Sjörger's syndrome**
Significance of the diseases; differential diagnostic problems. Known genetic and environmental factors in disease development. Organ manifestations and complications. General and disease-specific therapeutic guidelines.
27. **Conditions involving insufficiency of the blood coagulation system.**
Primary and secondary hemostasis. The most common causes of the insufficient function of the blood coagulation system. Pathomechanisms of hemophilia A and B, von Willebrand disease and thrombocytopathies. The main causes of thrombocytopenias; pathomechanism of immune thrombocytopenic purpura.
28. **Conditions involving hyperfunction of the blood coagulation system.**
Main causes and characteristics of hereditary thrombophilias. The cause and consequence of aPC resistance. The pathomechanism of antiphospholipid syndrome. The role of the Virchow-triad in the development of arterial and venous thromboses. Genetic and environmental factors influencing thrombophilia. The mechanism of the development of increased thrombophilia in Covid-19 infection.
29. **Coagulation disorders involving parallel hypo- and hyperfunction.**
Pathomechanisms of thrombotic thrombocytopenic purpura (TTP), heparin-induced thrombocytopenia (HIT) and disseminated intravascular coagulation (DIC).
30. **Effect of the immobilization syndrome on somatic functions**
Manifestation of the immobilization syndrome in the central and peripheral nervous system, the bone and muscular system, the skin and the mucous membranes. Pathological regulatory processes underlying the disorders; theoretical basis and practical possibilities of their prevention and reversion.
31. **Effect of the immobilization syndrome on vegetative functions**
Manifestation of the immobilization syndrome in the cardiovascular, respiratory, gastrointestinal and urogenital organ systems and in hormonal regulation and metabolism. Pathological regulatory processes underlying the disorders; theoretical basis and practical possibilities of their prevention and reversion.
32. **Secondary disorders developing in tumour patients – 1. Consequences of organ involvement in cancer.**
Consequences of the involvement of the heart, the gastrointestinal system (nausea – vomiting), the bone and muscle system (hypercalcemic osteolysis), the bone marrow and the lymphatic system.
33. **Secondary disorders developing in tumour patients – 2. Systemic consequences of cancer.**
Pathomechanisms of systemic inflammation, cachexia and pain.

List of practical items

Case studies

1. Thyroid gland, case 1.
2. Thyroid gland, case 2.
3. Adrenal gland, case 1.
4. Adrenal gland, case 2.
5. Diabetes, case 1.
6. Diabetes, case 2.
7. Diabetes, case 3.
8. Diabetes, case 4.
9. Assessment of nutritional state, case 1.
10. Assessment of nutritional state, case 2.
11. Assessment of nutritional state, case 3.
12. Menopause and osteoporosis, case 1.
13. Menopause and osteoporosis, case 2.
14. Menopause and osteoporosis, case 3.
15. Menopause and osteoporosis, case 4.

Instrumental tasks:

16. Diabetic vessel function – practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure, describe the blood flow response elicited by heating, its alteration in diabetic vessel dysfunction and the underlying pathomechanism.
17. Diabetic vessel function – practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure, describe post-occlusive reactive hyperemia, its alteration in diabetic vessel dysfunction and the underlying pathomechanism.
18. Diabetic vessel function – practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure; describe the venoarterial reflex and its alteration in diabetic vessel dysfunction, together with the underlying pathomechanism.
19. Diabetic neuropathy – practical test: Presentation forms and symptoms of diabetic neuropathy and their pathomechanisms.
20. Diabetic neuropathy – practical test: Examination procedures applied in the diagnostics of neuropathies involving somatic nerves. Description of the performance of the physical examinations presented at the practical session.
21. Diabetic neuropathy – practical test: Diagnostic procedures employed in the examination of autonomous neuropathic deviations. Description of the performance of Ewing's test.
22. Please enumerate the available methods for the determination of nutritional state. What are the advantages and disadvantages of the different methods?
23. How does the body composition measuring device based on bioelectric impedance work? Which are the most important parameters determined?
24. What are the fields of clinical practice that utilize the body composition measuring device based on bioelectric impedance? What are the parameters mainly used in the various fields?
25. The mechanism of neurovascular coupling and its significance in cerebral functional imaging. The theoretical background of the fNIRS method, the basis of its practical utilization, and its significance in the investigation of frontal cortical functions.
26. Different varieties of cognitive tests and their significance in the diagnostics of neurodegenerative disorders. The significance of the recognition of mild cognitive disturbances, and the theoretical basis of their differential diagnostics.

Method and type of evaluation:

Grades are based partly on theoretical knowledge and partly on its practical application.

Semifinal exam

The semifinal exam consists of a written and an oral part. If the student fails the written part, he/she cannot sit for the oral exam. The oral exam covers a theoretical and a practical item. The average of the results of the two oral questions is used for calculating the final grade.

How to register for the examination:

Applications for the dates posted should be submitted via the Neptun system.

Possibilities for exam retake:

According to the TVSZ (Study and Examination Regulations (SER))

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

The Figures of the lectures available for download at the website, and short written extracts of the lectures ("handout")

Gary D. Hammer, Stephen J. McPhee: Kórélettan – Bevezetés a klinikai orvostudományba, Semmelweis Kiadó 2018

6th Semester

Credit value: 3

Number of lessons per week: 42 **lecture:** 21 **practical course:** 21

Name of the course leader: Zoltán Benyó MD, PhD, DSc

His/her workplace, phone number: Institute of Translational Medicine, 06-1-210-0306

Position: Director, University Professor

Date and registration number of their habilitation: 2008, 259

Objectives of the subject, its place in the medical curriculum:

The objective of the course is to have the students understand the complex mechanisms responsible for the development of functional disturbances in common conditions affecting the function of the entire organism, through integration of the knowledge imparted by initial courses (most importantly anatomy, biochemistry and physiology), as well as the regulatory processes that are activated in order to fend off these disturbances. Having assimilated the knowledge encompassing organ systems and disciplines and the integrative approach, the students will be ready to understand, in the course of their clinical education, the mechanisms and symptomatology of various diseases and the respective therapeutic possibilities.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Centre of Theoretical Medicine, 37–47 Tűzoltó street, 1094 Budapest

Theoretical Building, 4 Nagyvárad square, 1089 Budapest

Successful completion of the subject results in the acquisition of the following competencies:

Based on their basic training in anatomy, biochemistry and physiology, the students will become capable of understanding the manifestation, on the organism level, of the pathological processes underlying the most common diseases, their symptoms, causes and potential therapeutic outcomes. Helped by practice sessions closely linked with the theoretical material, the students will acquire the skills necessary for following causality relationships in the disturbances of physiological processes and for recognizing the effects of these disturbances on the totality of the function of the organism, and will gain experience in test methods utilized in clinical practice, their theoretical bases, margins for interpretation and actual execution.

Course prerequisites:

Pathology, semifinal exam

Translational Medicine – Pathology, semifinal exam

Number of students required for the course (minimum, maximum) and method of selecting students:

Based on registration in the Neptun system; offered in the spring semester for the entire class.

How to apply for the course:

In the Neptun system

Lectures (1.5 lessons/week)

Semester 2

Circulatory shock, sepsis and anaphylactic reaction

- Week 1 Counterregulatory mechanisms activating in circulatory shock; processes responsible for its progression and its becoming irreversible. (Zoltán Benyó)
- Week 2 The development of septic shock and its consequences. Anaphylactic reactions of the organism and their consequences. (Zoltán Benyó)

Hypertension and cardiac insufficiency

- Week 3 Overview of the pathomechanism of hypertension. The process of blood vessel aging. The physiological consequences of hypertension, its organ-level complications and their manifestation. Advantageous and adverse effects of long-term antihypertensive therapy. (Zsuzsanna Miklós)
- Week 4 The effect of acute and chronic cardiac insufficiency on the physiological function of the individual organ systems and the totality of the organism. (László Tornóci)

The effects of acute alcohol poisoning and alcoholism on the physiological functions of the organism.

- Week 5 (Éva Margittai)

Disorders of liver function and bile secretion

- Week 6 The effects of acute and chronic disturbances of liver function on the physiological functions of the organism and their regulation. Symptoms of bile secretion disorders and their effects on the physiological functions of the organism. (Éva Margittai)

Acute and chronic impairment of renal function; post renal transplantation state

- Week 7 Causes and systemic consequences of acute renal insufficiency. Rejection reactions following renal transplantation and their possible therapies. The consequences of immunosuppression. (Péter Hamar)
- Week 8 Pathological changes in organs affected by chronic renal insufficiency (cardiovascular, hematopoietic, bone and central nervous system, lipid metabolism). Hypertensive nephropathy; cooperation of kidneys and liver in detoxication of the organism. Cardiorenal and hepatorenal syndromes. (Péter Hamar)

Respiratory insufficiency

- Week 9 Organism-level effects of acute respiratory insufficiency. Special aspects of respiratory insufficiency associated with circulatory insufficiency. (György Losonczy)
- Week 10 Adaptation mechanisms activating in the course of chronic respiratory insufficiency. The effect of chronic respiratory insufficiency on the physiological function of other organs. (György Losonczy)

Disturbances of the salt-water balance and the acid-base balance; the basics of fluid therapy

- Week 11 Complex regulation of acid-base balance as reflected by the metabolic processes of the organism – levels of regulation, diagnostics of complex deviations and the principles of the therapy. (Domokos Gerő)
- Week 12 Na^+ -, K^+ - and water balance: complex regulation, pathophysiological significance and treatment of disorders. (Zsuzsanna Miklós)

Disorders and compensation mechanisms of erythropoiesis. The etiology of anemias and their consequences regarding the function of the entire organism.

- Week 13 (Miklós Molnár)
- Week 14 Competitive examination

Practices (3 lessons every two weeks) Semester 2

Weeks 1–2	Clinical case discussions with the aim of presenting the differential diagnostics of circulatory shock and the physiological basis of shock therapy
Weeks 3–6	Hypertension, case discussion

Blood pressure measurement and determination of the ankle brachial index. Methods for the examination of blood vessel aging.

Weeks 7–8	Clinical case discussions with the aim of presenting the pathophysiological background of abnormal laboratory results associated with icterus
Weeks 9–10	Urine analysis
Weeks 11–12	Blood gas analysis, respiratory function
Weeks 13–14	Clinical case discussions with the aim of presenting the pathophysiological background of abnormal laboratory results associated with acid-base balance disorders

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of the syllabuses:
Pathology, immunology, laboratory medicine and general medicine

Special study work required to successfully complete the course:
None

Requirements for participation in classes and the possibility to make up for absences:

Participation at practice sessions is compulsory. Absence from a maximum of 25% of the practice sessions is acceptable. Absence from more than 75% of the practice sessions in a semester means that the student did not fulfil his/her semestral study obligations. There is no possibility for making up for absence from lectures; absence from practice sessions can be made up for with another group in the same week, if there is room for additional participants.

Methods to assess knowledge acquisition during term time:

Students give account of their theoretical knowledge of the material so far presented in the lectures on two occasions in the course of the semester, at predetermined dates/times, in the form of written demonstrations.

The students should take notes at the practice sessions, which are then evaluated by the practice supervisor by “Excellent”, “Passed” or “Unsatisfactory” qualifications. Unsatisfactory notes have to be resubmitted.

Requirements for signature:

The requirement for the semestral signature, and, consequently, for taking the exam is completion of the two intrasemestral written theoretical tests. Absence from more than two practice sessions in a semester also means that the student did not fulfil his/her semestral study obligations, therefore he/she is not permitted to take the exam.

Type of examination:
Final exam

Requirements of the examination:

List of theoretical items, Semester 1

- Possible causes of the overproduction of growth hormone and prolactin, and the pathomechanism of the consequent disorders**
Regulation of growth hormone secretion and its main effects in the individual organs and tissues. Pathomechanism of the symptoms of acromegaly. Regulation of prolactin secretion and the main causes of the development of hyperprolactinemia. The consequences of hyperprolactinemia and their pathomechanisms.
- Male hypogonadism and the androgen insensitivity syndrome**
Regulation of sex hormone release in men; metabolism and main effects of androgen hormones. Pathomechanisms of the development and consequences of primary, secondary and tertiary hypogonadism; the physiological basis of differential diagnostics. The hormonal basis of sexual differentiation and the pathomechanism of the androgen insensitivity syndrome

3. **Physiological disturbances of female hormonal regulation**

The physiological basis of female hormonal regulation; the most common causes and symptoms of primary and secondary amenorrhea/oligomenorrhea and their pathomechanisms. Causes and consequences of functional hypothalamic amenorrhea. The pathomechanism of the development and symptoms of polycystic ovary syndrome and its long-term outcomes.

4. **Pathogenesis of the hypo- and hyperfunctional disorders of the thyroid gland, and the pathomechanisms underlying the symptoms of these conditions**

The major physiological effects of thyroid hormones. The causes of congenital and acquired hypothyroidisms. Types of primary and secondary hyperthyroidisms. Pathogenesis and diagnostic traits of Hashimoto thyroiditis and Grave's Basedow disease. The major symptoms of congenital hypothyroidism. Pathomechanisms underlying the symptoms manifesting at the organ system level in adult hypo- and hyperthyroidism. Characteristics of myxoedema coma and thyrotoxic crisis.

5. **The pathogenesis of acute and chronic adrenocortical insufficiency and the pathomechanisms underlying the major symptoms characterizing the conditions. Congenital adrenal hyperplasia**

The major physiological effects of glucocorticoids and mineralocorticoids. The causes of the development of primary and secondary adrenocortical insufficiency. The leading symptoms of Addison's disease; changes in hormone levels characteristic of the condition. Pathomechanisms resulting in the organ system damages developing in chronic adrenocortical insufficiency. Characteristics of the Addisonian crisis. Enzyme defects leading to congenital adrenal hyperplasia, and changes in glucocorticoid, mineralocorticoid and androgen hormone production brought about by these defects. Consequences of androgen hypersecretion.

6. **Pathogenesis of Cushing syndrome, pathomechanisms underlying its characteristic symptoms, and diagnosing the condition**

The major physiological effects of glucocorticoids and mineralocorticoids. Various types of Cushing syndrome. Leading symptoms of the condition. Pathological changes in lipid, carbohydrate and protein metabolism. Characterization of the pathomechanisms resulting in abnormal functioning of the individual organs and organ systems. Laboratory tests facilitating the diagnosis of Cushing syndrome. Determination of the origin of Cushing syndrome using the dexamethasone test.

7. **Pathogenesis of primary and secondary hyperaldosteronism. Pathomechanisms underlying the symptoms developing in the conditions**

Major physiological effects of mineralocorticoids. Causes of the development of primary and secondary hyperaldosteronism. Changes in plasma renin activity taking place in the conditions; mechanism of the change in renin secretion. Leading symptoms of hyperaldosteronism and their causes. Characterization of pathomechanisms elicited by hyperaldosteronism in the abnormal functioning of various organs and organ systems.

8. **Pathogenesis of type 1 diabetes mellitus**

Genetic factors of type 1 diabetes mellitus, environmental factors playing a role in pathogenesis, and their relative contribution to the development of the disease. The process of the development of type 1 diabetes; the presentation form of manifest diabetes. The concept of absolute insulin deficiency and its consequences regarding clinical presentation and treatment.

9. **Pathogenesis of type 2 diabetes mellitus**

Genetic factors of type 2 diabetes mellitus and environmental factors playing a role in its pathogenesis. Relative roles of genetic factors in predisposition and the significance of controllable environmental factors. The time course of the development of type 2 diabetes; the concepts of insulin resistance and glucotoxicity. The consequences of relative insulin deficiency regarding the clinical picture and the treatment.

10. **Microvascular complications of diabetes mellitus**

The role of hyperglycemia in microvascular damage. Mechanism of the development of glucose-induced oxidative stress, inflammation, prothrombogenic status and endothelial dysfunction. Clinical presentation forms of microvascular damage; related screening tests and therapeutic intervention points.

11. **Macrovascular complications of diabetes mellitus**

The process of atherosclerosis in prediabetes and diabetes; factors playing a role in accelerated macrovascular damage. Presentation form and role of dyslipidemia developing in insulin resistance. The significance of residual risk in diabetes. Clinical presentation forms of macrovascular damage; related screening tests and therapeutic intervention points.

12. **Starvation, undernutrition and diets**

The energy requirement and food reserves of the organism. The effect of starvation on protein, sugar and lipid metabolism in the various phases of the process. The role of ketone bodies in starvation and diabetes. The long-term consequences of negative energy balance. Various forms of protein/energy undernutrition: kwashiorkor, marasmus and cachexia. Protein losing conditions. Comparison of low-fat, mediterranean and low-carbohydrate diets. Paleolithic and other fashionable diets; fasting from a medical aspect.

13. **Obesity and its relationship with insulin resistance**

Obesity: definition, extent, types and prevalence. Obesity as a risk factor of other diseases. The major causes of the increase in mortality due to obesity. Possible causes of the increase observed in the prevalence of obesity. The combined effect of the colon microbiome and diet in the regulation of body mass. The concept and significance of the metabolic syndrome. The relationship between hepatic lipid

metabolism and visceral adipose tissue. The role of positive energy balance in the development of insulin resistance and type 2 diabetes mellitus: the “double circle” theory. Results achievable in type 2 diabetes patients by negative energy balance.

14. Characterization of lipoproteins; lipoprotein metabolism

Classification and composition of lipoproteins; characterization of the receptors of lipoprotein metabolism; formation and metabolism of chylomicrons, VLDL, HDL and LDL and their routes in the organism; reverse transport of cholesterol.

15. Classification of dyslipidemias; syndromes associated with primary hyperlipoproteinemia

Classification of dyslipidemias; differentiation between primary and secondary forms, through examples. Detailed description of primary hyperlipoproteinemias, enumeration of their types, causes and main properties. Description, causes, diagnostics, symptoms and treatment of familial hypercholesterolemia, hyperchylomicronemia and familial dysbetalipoproteinemia.

16. Syndromes associated with secondary hyperlipoproteinemia

Enumeration of the most common diseases accompanied by the development of dyslipidemia. Characteristic changes in lipid metabolism, and the pathomechanism of lipid metabolism disorders in these conditions.

17. Aging at the molecular and cell level

Definition and forms of aging. Hypotheses at the molecular (genom instability [telomeres, epigenetics], proteostasis) and cell level (disturbance of nutrient perception, mitochondria, senescence, stem cells, intercellular communication).

18. Organ-level manifestations of the aging syndrome

Aging of the cardiovascular and nervous system. Neurocognitive disorders; pathomechanism of Parkinson's disease. Aging of the sensory organs, the hemato-immune system, the musculature and the kidneys.

19. The menopausal transition and the menopause

Definition of the menopause and the reproductive life stages connected with the menopause. Hormonal events and symptoms of the menopausal transition and the pathophysiological background of the symptoms.

20. The postmenopause

Hormonal changes in the post-menopausal life stage. Long-term consequences of estrogen deficiency and their pathophysiological background.

21. Hormonal regulation of calcium and phosphate metabolism under physiological and pathological conditions. Pathogenesis of primary and secondary hyperparathyroidism.

Hormones playing a primary role in the calcium and phosphate homeostasis of the organism and their effects on their target organs. Pathophysiology and symptoms of primary and secondary hyperparathyroidism. Causes and main symptoms of hypo- and hypercalcaemia.

22. The effects of calcium and phosphate metabolism on the bone system. Osteomalacia, osteoporosis.

Pathomechanisms, diagnostics and therapeutic possibilities of primary osteoporoses. Etiology and pathomechanisms of osteomalacia and the most common forms of secondary osteoporosis.

23. Non-osteoporotic adult bone diseases and the effects of vitamin D deficiency outside the bone system

Renal osteodystrophy, tumour-associated hypercalcaemia; the role of FGF-23 in pathological processes. Etiology and significance of vitamin D deficiency. Effects of vitamin D on the bone system; its non-endocrine effects.

24. General mechanisms of the development of systemic autoimmune diseases

General mechanisms of the development of systemic autoimmune diseases. The concept of autoimmunity. The significance of immune tolerance. The role of genetic and environmental factors in its pathogenesis. The most common organ manifestations of systemic autoimmune diseases; major diagnostic possibilities and general therapeutic directions. Possibilities of biological therapies in autoimmune diseases.

25. Autoimmune joint diseases. Rheumatoid arthritis and Bechterew's disease

The mechanism of the development of the diseases; the role of known genetic and environmental factors. Most common manifestations and related differential diagnostic problems. The pathomechanism of gout. Main diagnostic and therapeutic possibilities based on the pathomechanisms.

26. Pathomechanisms of systemic lupus erythematoses, systemic sclerosis and Sjörgen's syndrome

Significance of the diseases; differential diagnostic problems. Known genetic and environmental factors in disease development. Organ manifestations and complications. General and disease-specific therapeutic guidelines.

27. Conditions involving insufficiency of the blood coagulation system.

Primary and secondary hemostasis. The most common causes of the insufficient function of the blood coagulation system. Pathomechanisms of hemophilia A and B, von Willebrand disease and the thrombocytopathies. The main causes of thrombocytopenias; pathomechanism of immune thrombocytopenic purpura.

28. Conditions involving hyperfunction of the blood coagulation system.

Main causes and characteristics of hereditary thrombophilias. The cause and consequence of aPC resistance. The pathomechanism of the antiphospholipid syndrome. The role of the Virchow-triad in the development of arterial and venous thromboses. Genetic and environmental factors influencing thrombophilia. The mechanism of the development of increased thrombophilia in Covid-19 infection.

29. Coagulation disorders involving parallel hypo- and hyperfunction.

Pathomechanisms of thrombotic thrombocytopenic purpura (TTP), heparin-induced thrombocytopenia (HIT) and disseminated intravascular coagulation (DIC).

30. Effect of the immobilization syndrome on somatic functions

Manifestation of the immobilization syndrome in the central and peripheral nervous system, the bone and muscular system, the skin and the mucous membranes. Pathological regulatory processes underlying the disorders; theoretical basis and practical possibilities of their prevention and reversion.

31. Effect of the immobilization syndrome on vegetative functions

Manifestation of the immobilization syndrome in the cardiovascular, respiratory, gastrointestinal and urogenital organ systems and in hormonal regulation and metabolism. Pathological regulatory processes underlying the disorders; theoretical basis and practical possibilities of their prevention and reversion.

32. Secondary disorders developing in tumour patients – 1. Consequences of organ involvement in cancer.

Consequences of the involvement of the heart, the gastrointestinal system (nausea – vomiting), the bone and muscle system (hypercalcaemic osteolysis), the bone marrow and the lymphatic system.

33. Secondary disorders developing in tumour patients – 2. Systemic consequences of cancer.

Pathomechanisms of systemic inflammation, cachexia and pain.

List of theoretical items, Semester 2

1. Definition and classification of circulatory shock.

Mechanism of the decrease in cardiac output and of shock development in different forms of shock; similarities of and differences between the hemodynamic parameters of hypovolemic and distributive shock. The course of systemic circulatory parameters in the early and late phases of different forms of shock.

2. Forms of hypovolemic shock

Forms of hypovolemic shock classified according to the root cause; their development mechanisms, characteristic features and possible therapies. Systemic and local circulatory changes characteristic of the individual phases of hypovolemic shock, and the mechanisms of their development.

3. Different phases of hypovolemic shock

Counterregulatory processes activating in different phases of hypovolemic shock, their mechanisms, and the cause and kinetics of their activation and depletion.

4. The progression of circulatory shock

Mechanism and consequences of the development of the processes responsible for the progression and eventual irreversibility of circulatory shock. Positive feedback loops and metabolic alterations causing the progression of circulatory shock.

5. Organ-level manifestations of circulatory shock

Organ-level manifestations of the multiple organ failure/multiple organ dysfunction syndrome (MOF/MODS) in the central nervous system, heart, lungs, kidneys, liver and gastrointestinal tract, mechanisms of their development, and their consequences regarding shock progression.

6. Possible causes of cardiogenic shock

Possible causes of cardiogenic shock. Systemic circulatory changes developing in the initial phase of cardiogenic shock, as a function of the root cause. Mechanisms responsible for the progression of cardiogenic shock. Possible causes of the “no-reflow” phenomenon. Treatment choices for cardiogenic shock.

7. Septic shock: definition and mechanism of development

Definition of septic shock; its mechanism of development. Changes in systemic and local circulatory parameters in different phases of septic shock. Mechanism of the development of post-sepsis syndrome and its consequences.

8. Mechanisms of the development of pro- and anti-inflammatory processes and their consequences in septic shock

Mechanisms of the development of pro- and anti-inflammatory processes and their consequences in septic shock, and their role in the development of late complications. The effect of septic shock on the blood coagulation system, the mechanism and consequences of these effects, and the relevant therapeutic possibilities. Causes and consequences of the functional changes of the endothel in septic shock. Theoretical basis of the treatment of septic shock.

9. **Definition and forms of hypertension. Hypertensions with known origins. Complications of hypertension.**
Definition of hypertension; criteria of the diagnosis. Measurement methods and threshold limits. Pathomechanisms of hypertension forms with known origins. Complications of hypertension and the underlying mechanisms.
10. **Essential hypertension. Basic principles of the treatment of hypertension.**
Overview of the mechanisms playing a role in the development of essential hypertension. Salt sensitivity and salt intake. Blood vessel aging. Pharmacological and non-pharmacological treatment possibilities.
11. **Significance, causes and symptoms of cardiac insufficiency**
Clinical significance of cardiac insufficiency; classification of its forms. Symptoms and their explanations. Root causes and aggravating factors. Diagnostic possibilities. The effect of systolic and diastolic insufficiency on the pressure-volume curves.
12. **Overview of the changes brought about by cardiac insufficiency and of therapeutic possibilities**
Differences in compensation mechanisms between healthy persons and cardiac insufficiency patients. Neurohormonal and cell-level changes. Treatment basics: curative, palliative, pharmacological and non-pharmacological therapies.
13. **Alcohol metabolism**
The main routes of ethanol metabolism, varieties of metabolism; the CYP2E1 enzyme; the effect of alcohol on drug metabolism.
14. **Acute alcohol poisoning**
The forms, clinical symptoms and therapy of acute alcohol poisoning. The pathomechanism of alcohol poisoning; metabolic changes accompanying the poisoning.
15. **Chronic alcoholism**
The symptoms of chronic alcoholism; the forms and pathomechanism of liver damage taking place in alcoholism.
16. **Functional disorders of the liver 1.**
Causes and laboratory diagnosis of the functional disorders of the liver. The pathomechanism of acute and chronic liver damage. The forms and differential diagnosis of viral liver damage.
17. **Functional disorders of the liver 2.**
Characteristics, symptoms and course of acute and chronic liver insufficiency. Pathomechanism of the metabolic conditions causing liver damage.
18. **Causes and systemic consequences of acute renal insufficiency.**
Renal functions, causes and consequences of acute renal insufficiency, nephrosis and nephritis syndrome.
19. **Rejection reactions following renal transplantation. Immunosuppression.**
Definition and pathomechanism of hyperacute, accelerated, acute and chronic rejection. Relationships between immunosuppression and cardiovascular mortality.
20. **Causes and definition of chronic renal insufficiency.**
The causes of chronic renal insufficiency, the mechanism of the development of uremic symptoms, stage classification and symptoms of chronic renal insufficiency, uremic toxins, undernutrition and inflammation in uremia, the pathomechanism of renal fibrosis.
21. **Pathological changes in the organs affected by chronic renal insufficiency.**
Pathological changes of the cardiovascular, hematopoietic, gastrointestinal and central nervous systems, the skin, the lungs, and lipid and bone metabolism.
22. **Complex nephrological syndromes**
Cooperation of the kidneys and the liver in detoxication of the organism. Hypertensive nephropathy. Cardiorenal and hepatorenal syndromes.
23. **Different forms of pulmonary ventilation disorders and their testing by respiratory function measurement. Definition and forms of respiratory insufficiency.**
Examples for obstructive and restrictive pulmonary diseases. Oxygen transport and oxygen consumption. Arterial blood gas and acid-base tests. The mechanism of V/Q unevenness and arterial hypoxemias of right to left pulmonary shunt origin; the cause of the different efficiencies of O₂ supplementation.
24. **The symptoms of acute respiratory insufficiency. The effect of consequential hyperventilation on blood gas and acid-base values**
Work of breath, neurohumoral response and cardiovascular response in acute respiratory insufficiency. Cerebral effects of aggravating hypoxemia. Exertional dyspnoe and syncope in diffusion disorders. Main therapeutic methods of acute respiratory insufficiency; pathophysiological basis
25. **The effect of prolonged smoking on large and small airways and the elastic fibers of the lungs.**
Changes in respiratory function in obstructive ventilatory disorders of the lung. Biomarkers of the systemic inflammation elicited by smoking, cytokines, inflammatory cells. The appearance of smoking-related systemic inflammation in certain organs. What are the common clinical signs suggesting that pulmonary disease caused by smoking is also accompanied by the chronic disease of the cardiac and skeletal musculature?

26. The relationship between the decrease in FEV₁ and arterial pO₂ and pCO₂ in chronic respiratory insufficiency (COPD and pulmonary fibrosis).

The relationships of dyspnea, cyanosis, cardiac insufficiency and hypercapnia in COPD patients suffering in chronic respiratory insufficiency. The cause and clinical significance of erythrocytosis (polyglobulia) developing as a consequence of chronic hypoxemia.

27. Other common organ damages associated with chronic global respiratory insufficiency (most commonly with COPD).

The cause of the aggravation of respiratory insufficiency in cardiac insufficiency. The prevalence, severity and clinical significance of chronic hypoxic pulmonary vasoconstriction. ECG signs of right heart strain. The causes of muscle degeneration. Main therapeutic methods of chronic respiratory insufficiency; pathophysiological basis.

28. Acid-base disorders of metabolic origin: metabolic acidosis and metabolic alkalosis.

The concept of **metabolic acidosis** and the characteristic parameters of this acid-base disorder. The causes of metabolic acidosis and their classification based on the anion gap. The concept of the anion gap. The concept of respiratory and metabolic compensation developing in metabolic acidosis, and their time course. The mechanism and expectable magnitude of respiratory compensation. A selected example for the condition, and the basis of the therapy of acid-base deviation in the given case.

The concept of **metabolic alkalosis** and the characteristic parameters of this acid-base disorder. Root causes of metabolic alkalosis and their classification based on volume status. The concept of respiratory and metabolic compensation developing in metabolic alkalosis, and their time course. The mechanism and expectable magnitude of respiratory compensation. A selected example for the condition, and the basis of the therapy of acid-base deviation in the given case.

29. Acid-base disorders of metabolic origin: Respiratory acidosis and respiratory alkalosis.

The concept of **respiratory acidosis** and the characteristic parameters of this acid-base disorder. The causes of respiratory acidosis. The concept and time course of metabolic compensation developing in respiratory acidosis. The mechanism of metabolic compensation and its expectable magnitude depending on the duration of the disorder. The significance of ammonia excretion in metabolic compensation. A selected example for the condition, and the basis of the therapy of acid-base deviation in the given case.

The concept of **respiratory alkalosis** and the characteristic parameters of this acid-base disorder. The root causes of respiratory alkalosis. The concept of respiratory compensation developing in metabolic alkalosis, and its time course. The mechanism of metabolic compensation and its expectable magnitude depending on the duration of the disorder. A selected example for the condition, and the basis of the therapy of acid-base deviation in the given case.

30. Disorders of Na⁺ and water balance.

Pathophysiological causes underlying the development of hyponatremia and hypernatremia. Symptomology of acute and chronic Na⁺ balance disorders. Basic principles of the correction of Na⁺ deviations. Mechanisms playing a role in the maintenance of water balance, and their disorders. Causes and clinical presentation forms of conditions associated with hyperosmolarity and hypoosmolarity. Therapeutic principles of the correction of fluid balance disorders.

31. K⁺ balance disorders.

Renal and extrarenal processes playing a part in the maintenance of potassium balance. The consequences of hypokalemia and hyperkalemia, and the pathophysiological causes underlying their development. The connection between hyperkalemia and renal insufficiency. Hyperkalemia and diabetes. Principles of the correction of K⁺ balance disorders.

32. Megaloblastic anemias.

The concept of anemias, their symptoms and classification. Aplastic anemias. Anemias associated with chronic renal disorders, liver insufficiency and endocrine diseases. The role of vitamin B₁₂ and folic acid in the nucleic acid metabolism of erythrocytes. The causes of folic acid and vitamin B₁₂ deficiencies. Characteristic symptoms of megaloblastic anemias.

33. Anemias based on iron deficiency or iron incorporation disorder.

The cause and pathomechanism of iron deficiency conditions. Clinical, hematological and laboratory changes characteristic of iron deficiency anemias. Forms of anemia brought about by disorders of heme synthesis. Anemias associated with chronic diseases.

34. Hemolytic anemias.

Symptoms of enhanced hemolysis (acute, chronic). Symptoms of enhanced hemolysis (acute/chronic, intravascular/extravascular). Forms of extracorporeal and corpuscular hemolytic anemias. Hemoglobinopathies. Paroxysmal nocturnal hemoglobinuria (PNH). Polyglobulias.

List of practical items, Semester 1

Case studies:

1. Thyroid gland, case 1.
2. Thyroid gland, case 2.
3. Adrenal gland, case 1.
4. Adrenal gland, case 2.
5. Diabetes, case 1.
6. Diabetes, case 2.
7. Diabetes, case 3.
8. Diabetes, case 4.
9. Assessment of nutritional state, case 1.
10. Assessment of nutritional state, case 2.
11. Assessment of nutritional state, case 3.
12. Menopause and osteoporosis, case 1.
13. Menopause and osteoporosis, case 2.
14. Menopause and osteoporosis, case 3.
15. Menopause and osteoporosis, case 4.
- Instrumental tasks:
16. Diabetic vessel function, practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure, describe the blood flow response elicited by heating, its alteration in diabetic vessel dysfunction and the underlying pathomechanism.
17. Diabetic vessel function, practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure, describe post-occlusive reactive hyperemia, its alteration in diabetic vessel dysfunction and the underlying pathomechanism.
18. Diabetic vessel function, practical test: Please give a brief summary of the principle of laser-doppler flowmetry and transcutaneous measurement of partial oxygen pressure; describe the venoarterial reflex and its alteration in diabetic vessel dysfunction, together with the underlying pathomechanism.
19. Diabetic neuropathy, practical test: Presentation forms and symptoms of diabetic neuropathy and their pathomechanisms.
20. Diabetic neuropathy, practical test: Examination procedures applied in the diagnostics of neuropathies involving somatic nerves. Description of the performance of the physical examinations presented at the practical session.
21. Diabetic neuropathy, practical test: Diagnostic procedures employed in the examination of autonomous neuropathic deviations. Description of the performance of Ewing's test.
22. Please enumerate the available methods for the determination of nutritional state. What are the advantages and disadvantages of the different methods?
23. How does the body composition measuring device based on bioelectric impedance work? Which are the most important parameters determined?
24. What are the fields of clinical practice that utilize the body composition measuring device based on bioelectric impedance? What are the parameters mainly used in these various fields?
25. The mechanism of neurovascular coupling and its significance in cerebral functional imaging. The theoretical background of the fNIRS method, the basis of its practical utilization, and its significance in the investigation of frontal cortical functions.
26. Different varieties of cognitive tests and their significance in the diagnostics of neurodegenerative disorders. The significance of the recognition of mild cognitive disturbances, and the theoretical basis of their differential diagnostics.

List of practical items, Semester 2

Case studies:

1. Hypertension, case 1.
2. Hypertension, case 2.
3. Hypertension, case 2.
4. Circulatory shock, case 1.
5. Circulatory shock, case 2.
6. Circulatory shock, case 3.
7. Circulatory shock, case 4.
8. Icterus, case 1.
9. Icterus, case 2.
10. Icterus, case 3.
11. Icterus, case 4.
12. Icterus, case 5.
13. Icterus, case 6.
14. Respiration, case 1.
15. Respiration, case 2.
16. Respiration, case 3.
17. Respiration, case 4.
18. Respiration, case 5.
19. Respiration, case 6.
20. Kidney, case 1.
21. Kidney, case 2.
22. Acid-base, case 1.
23. Acid-base, case 2.
24. Acid-base, case 3.
25. Acid-base, case 4.
26. Acid-base, case 5.
27. Acid-base, case 6.
28. Acid-base, case 7.
29. Acid-base, case 8.

Instrumental tasks:

30. What rules should be adhered to in the course of blood pressure measurements?
31. What is ABPM? What are its indications, and how is it done? What does assessment of the diurnal rhythm help with?
32. What are the criteria of hypertension in the case of the different available measurement options? What are the indications and benefits of home blood pressure monitoring?
33. Phenotypic presentation of vessel aging; its pathophysiological mechanisms (outline), enumeration of examination methods.
34. Characterization of the physiological arterial pulse wave and its changes brought about by aging.
35. Determination and significance of the ankle brachial index.
36. Measurement and significance of the propagation velocity of the pulse wave.
37. Pathological findings in urine analysis, their leading symptoms and causes. Reference values.
38. Enumeration of the examination methods of renal function; restriction of renal function in old age.
39. Possible causes of the abnormal colour of urine.
40. Pathomechanism of diabetic nephropathy, its stages, monitoring its progression; the consequences of microangiopathy.

Method and type of evaluation:

Grades for the final exam are based partly on theoretical knowledge and partly on its practical application.

Final exam:

The final exam consists of a written and an oral part. If the student fails the written part, he/she cannot sit for the oral exam. The oral exam covers two theoretical items and one practical item. The average of the results of the three oral questions is used for calculating the final grade

How to register for the examination:

Applications for the dates posted should be submitted via the Neptun system.

Possibilities for exam retake:

According to the TVSZ (Study and Examination Regulations (SER))

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

The Figures of the lectures available for download at the website, and short written extracts of the lectures ("handout").

Gary D. Hammer, Stephen J. McPhee: Kórélettan – Bevezetés a klinikai orvostudományba, Semmelweis Kiadó 2018

MEDICAL STATISTICS, INFORMATICS AND TELEMEDICINE

lecture 1 hour/week practice 1 hour/week 2 credits

Tutor: Dr Dániel Veres

week	lecture topic	practice topic
1	Principles of quantitative medicine.	Introduction. Data types. Introduction to data types.
2	Summary of data: descriptive statistics	Graphical representation of data and interpretation of plots I. Plotting frequencies: visualization of samples with a large number of elements on a histogram, bar plot.
3	Event, probability, distribution.	Graphical representation of data and interpretation of plots II. Box plots, scatter plot, mosaic plot. Outliers. Interpretation of percentile curves. Descriptive values. Determination of descriptive values from a large sample size.
4	Estimations.	Distributions. Using binomial distributions. Using normal distributions.
5	Principles of hypothesis testing in medical practice.	Reference interval. Approximate calculation for normal distribution. Interpretation. Confidence intervals. Simple calculation of the confidence interval of mean. Interpretation.
6	T-tests; chi-square tests. Multiplicity.	Hypothesis tests. Logic of hypothesis tests.
7	Correlation. Simple linear regression.	Student t-tests. Making t-tests. Interpretation of effect size, confidence interval and p-value. Multiplicity. Examples for multiple testing.
8	Arguing.	Correlation, regression. Interpretation of correlation coefficient. Making simple linear regression, interpretation of the slope.
9	Linear regression as a tool against confounding,	Arguing. Examples. Bias. Examples
10	Evaluation of diagnostic tests.	Regression models. Interpreting the results of regression models.
11	ROC curves. Likelihood ratios.	Diagnostic tests I. Evaluation of diagnostic tests. Examples from the literature.
12	Our own research, diploma work, dialogue with the statistician: How much is enough? How not to make a very bad questionnaire? How to make a good data table?	Diagnostic tests II. ROC curves. Likelihood ratios.
13	Introduction to medical decision theory, Bayesian theory: a priori and a posteriori distributions, learning model.	Preparing data. Organizing data tables.
14	Databases, expert systems, AI supported diagnostics, BigData.	When and how to ask a statistician. Questionnaires. Reflection on a questionnaire - how not to do very badly.

MEDICAL MICROBIOLOGY II.

Institute of Medical Microbiology
Program Director: *Prof. Dr. Dóra Szabó*
Tutor: *Dr. Ágoston Ghidán*

Second Semester

Week	Lectures (1,5 hours per week)
1.	Medical Mycology
2.	Medical Parasitology – 1
3.	Medical Parasitology – 2
4.	Medical Parasitology – 3
5.	General Virology
6.	• DNA viruses – 1
7.	• DNA viruses – 2
8.	• RNA viruses – 1
9.	• RNA viruses – 2
10.	• RNA viruses – 3
11.	Hepatitis viruses
12.	Retro viruses. AIDS. Viral oncogenesis
13.	• Slow viruses and Prions. Control of viral diseases. Antiviral chemotherapy
14.	• Iatrogenic and Nosokomial infections

Week	Practicals (2 hours per week)
1.	Medical Mycology
2.	Medical Parasitology – 1
3.	Medical Parasitology – 2
4.	Medical Parasitology – 3
5.	Midterm exam I. General Virology
6.	DNA viruses
7.	RNA viruses
8.	Midterm exam II.
9.	Clinical Bacteriological Diagnosis – 1: Skin, wound and eye infections
10.	• Clinical Bacteriological Diagnosis – 2: Respiratory tract infections
11.	• Clinical Bacteriological Diagnosis – 3: Infections of the uro-genital tract. Abdominal and Enteral infections. Sexually transmitted diseases
12.	• Clinical Bacteriological Diagnosis – 4: Bacteraemia, sepsis, endocarditis, meningitis
13.	Summary and review
14.	Practical exam

PATHOLOGY I.

1st Dept. of Pathology and Experimental Cancer Research

Tutor: **Dr. Gergely RÁCZ**

First Semester

Lectures (14 weeks): (all lectures for the whole class are held at the 2nd Dept. of Pathology).

Autopsy and histology practice (14 weeks) absence: more than 3 absences invalidate semester. Missing any half (either histology or autopsy) of the practice is considered an absence.

Lectures (3 hours per week)

1. Introduction
2. Cell injury
3. Cell injury
4. Inflammation
5. Inflammation
6. Wound healing, regeneration and fibrosis
7. Immunopathology
8. Neoplasia
9. Neoplasia
10. Neoplasia
11. Genetic diseases
12. Haemodynamic disorders
13. Haemodynamic disorders

Histopathology practices

- Autopsy demonstration
- Nutmeg liver H&E (1)
- Cardiac fibrosis in liver H&E(7)
- Pulmonary edema H&E (2)
- Haemosiderin in alveolar macrophages H&E (8)
- Thromboembolism H&E (3)
- Hemorrhagic infarction of the lung H&E (4)
- Anemic infarction of the kidney H&E(5)
- Emolition of the brain H&E (6)
- Fatty degeneration of the liver H&E (12)
- Phlegmone H&E(13)
- Cerebral abscess H&E(14)
- Fibrinous pericarditis H&E (15)
- Pseudomembranous colitis (16)
- Actinomycosis H&E (98)
- Candidiasis PAS (17)
- Aspergillosis (slide demonstration)
- Acute appendicitis H&E(66)
- Oxyuris in appendix H&E(67)
- Chronic polypous sinusitis H&E (18)
- Chronic abscess (9)
- Granulation tissue H8LE (19)
- Foreign-body granuloma H&E (20)
- Metaplasia (slide demonstration)
- Dysplasia of the cervical epithelium (CIN) H&E(24)
- In-situ carcinoma of the cervix H&E (25)
- Invasive squamous cell carcinoma of the cervix H&E (26)
- Squamous cell papilloma H&E (23)
- Squamous cell carcinoma of the larynx H&E (10)
- Tubulovillous adenoma of the colon H&E (30)
- Adenocarcinoma of the colon H&E(31)
- Metastasis in lymph node H&E (36)
- Metastatic carcinoma in the lung (slide demonstration)
- Leiomyoma H&E (37)
- Leiomyosarcoma (slide demonstration)
- Lipoma H&E (11)
- Liposarcoma (slide demonstration)
- Malignant fibrous histiocytoma H&E (38)
- Immunohistochemistry (slide demonstration)

Lectures (3 hours per week)

14. Environmental and nutritional pathology

15. Blood vessels

16. Blood vessels

17. Heart

18. Heart

19. Respiratory system

20. Respiratory system

21. Respiratory system

22. Infectious diseases

23. Infectious diseases

24. Infectious diseases

25. Gastrointestinal tract

26. Gastrointestinal tract

27. Gastrointestinal tract

28. Pancreas

Histopathology practices

Atherosclerosis of the aorta H&E (45)

Benign nephrosclerosis H&E(46)

Coronary-sclerosis H&E(47)

Polyarteriitis nodosa H&E (48)

Giant cell arteriitis H&E (49)

Cystic medianecrosis of the aorta H&E (86)

Fatty infiltration of the myocardium H&E (41)

Myocardial infarction, early H&E (42)

Myocardial infarction, old H&E (43)

Myocarditis H&E(44)

Endocarditis H&E(96)

IRDS H&E (50)

Lobar pneumonia H&E(51)

Bronchopneumonia H&E (52)

Pneumoconiosis H&E (54)

Pleuraefibrosis H&E (97)

Miliary tuberculosis in lung H&E (55)

Tuberculous lymphadenitis H&E (56)

Sarcoidosis H&E (57)

Oat cell carcinoma of the lung H&E (58)

Mesothelioma H&E (59)

Nasopharyngeal carcinoma (slide demonstration)

Mixed tumor of the parotid gland H&E(32)

Warthin-tumor (slide demonstration)

Mucoepidermoid carcinoma (slide demonstration)

Adenoid cystic carcinoma (slide demonstration)

Chronic peptic ulcer H&E (60)

Chronic gastritis H&E (61), Giemsa (62)

Signet ring cell carcinoma of the stomach H&E(63), PAS (64)

Ventricular-lymphoma (slide demonstration)

Villous atrophy in small intestine (65)

Ulcerative colitis H&E(68)

Crohn's disease H&E (69)

Carcinoid H&E (53)

Peritoneal carcinosis H&E (99)

Organ demonstration

PATHOLOGY II.

Second Semester

Lectures (3 hours per week)

29. Liver and biliary system
30. Liver and biliary system
31. Liver and biliary system
32. Kidney
33. Kidney
34. Urinary tract
35. Male genital system
36. Gynecologic pathology
37. Gynecologic pathology
38. Neonatology
39. Breast
40. Blood and lymphoid organs
41. Blood and lymphoid organs
42. Blood and lymphoid organs
43. Blood and lymphoid organs
44. Endocrinology

Histopathology practices

- Alcoholic hepatitis H&E(70)
- Chronic hepatitis H&E (71)
- Liver cirrhosis H&E(72)
- Hepatocellular carcinoma H&E (73)
- Cavernous haemangioma of liver H&E (35)
- Chronic cholecystitis H&E(74)
- Chronic pancreatitis H&E(75)
- Acute hemorrhagic necrotising pancreatitis H&E(76)
- Pancreatic pseudocyst (slide demonstration)
- Adenocarcinoma of pancreas H&E (77)
- Islet cell tumor of pancreas (slide demonstration)
- Diabetic nodular glomerulosclerosis (Kimmelstiel-Wilson) H&E (78)
- Glomerulonephritis H&E (79)
- End stage kidney H&E (80)
- Acute rejection in transplanted kidney H&E (22)
- Acute pyelonephritis H&E (81)
- Chronic pyelonephritis H&E (82)
- Renal cell carcinoma H&E (83)
- Normal adrenal cortex (slide demonstration)
- Wilm's tumor H&E(84)
- Transitional cell carcinoma H&E (28)
- Nodular hyperplasia of the prostate H&E(85)
- Adenocarcinoma of prostate H&E(87)
- Seminoma H&E (88)
- Embryonal carcinoma (slide demonstration)
- Teratoma H&E(89)
- Placenta retention H&E (90)
- Extrauterine gravidity H&E (91)
- Arias-Stella phenomenon (slide demonstration)
- Hydatiform mole H&E (92)
- Choriocarcinoma H&E (93)
- Endometrial hyperplasia H&E (94)
- Endometriosis (slide demonstration)
- Endometrium carcinoma H&E (95)
- Chronic cervicitis H&E (123)
- HPV infection in cervix H&E (124)
- In situ hybridisation (slide demonstration)
- Condyloma acuminatum (slide demonstration)
- Follicular cyst of the ovary H&E (125)
- Mucinous cystadenoma of the ovary H&E(29)
- Mucinous cystadenocarcinoma (slide demonstration)
- Borderline serous papillary cystadenoma of the ovary H&E (126)
- Serous papillary cystadenocarcinoma of the ovary (slide demo)
- Granulosa cell tumor (slide demonstration)
- Fibrocystic disease of the breast H&E(101)

Lectures (3 hours per week)

45. Endocrinology

46. Skin

47. Skin

48. Head and neck

49. Bones and joints

50. Bones and joints

51. Bones and joints

52. Eye

53. Skeletal muscle

54. Nervous system

55. Nervous system

56. Nervous system

57. Clinicopathologic conference

Histopathology practices

Peri- and intracanalicular fibroadenoma of the breast H&E (33)

Phyllolid tumor (slide demonstration)

Intraductal carcinoma H&E (102)

Invasive ductal carcinoma H&E(103)

Invasive lobular carcinoma H&E (104)

FNAB of the breast (cytol. smear demonstration)

Normal bone marrow H&E (127)

Leukemic bone marrow H&E(128)

Leukemic infiltration of parenchymal organs
(slide demonstration)

Multiple myeloma H&E (106)

Amyloidosis Congo (21)

Non Hodgkin lymphoma (low grade) H&E (107)

Non Hodgkin lymphoma (high grade) H&E (108)

Follicular lymphoma (slide demonstration)

Tonsillar lymphoma (slide demonstration)

MALT lymphoma (slide demonstration)

Hodgkin lymphoma H&E (109)

Hodgkin lymphoma histologic types (slide demonstration)

Colloid goiter H&E(110)

Graves disease H&E (111)

Follicular adenoma of the thyroid gland H&E(112)

Follicular carcinoma (slide demonstration)

Papillary carcinoma of the thyroid gland H&E (113)

Medullary carcinoma (slide demonstration)

Adrenal cortical adenoma H&E(105)

Parathyroid adenoma (slide demonstration)

Osteosarcoma H&E (114)

Rhabdomyosarcoma H&E (115)

Rheumatoid arthritis H&E (116)

Autoimmun diseases (slide demonstration)

Basocellular carcinoma H&E (27)

Verruca vulgaris H&E (100)

Naevus pigmentosus H&E (39)

Malignant melanoma H&E (40)

Metastatic melanoma (slide demonstration)

Bowen's disease (slide demonstration)

Capillary haemangioma of the skin H&E (34)

Purulent meningitis H&E(117)

Encephalitis H&E (118)

Meningeoma H&E (119)

Glioblastoma multiforme H&E(120)

Schwannoma H&E (121)

Neuroblastoma H&E (122)

Ganglioneuroblastoma (slide demonstration)

Paraganglioma (slide demonstration)

Review

Semifinal Exam: Autopsy demonstration on the last autopsy practice will be graded 1 to 5. This grade, if not 1, will be added to the scores of written test. Written test is composed of 100 Qs (true-false, simple choice, problem solving, combination, multiple choice, relations, medical term, assay, scores are 0-65:1; 66-73:2; 74-83:3; 84-89:4; 90-105:5). Further details available in the semifinal exam protocol provided one month before examination period.

PATHOLOGY I - II.

2nd Department of Pathology

Head of Department: **Prof. Dr. András Kiss**

Index

- Lectures
- List of textbooks
- Histopathology practices - slides for the histopathology exam and slide demonstrations
- General information - Lectures, practices, competition
- Examinations: Semifinal
- Examinations - Final
- Schedule
- Schedule for the academic year

1st SEMESTER

	LECTURES	HISTOPATHOLOGY
Week 1	<p>Introduction (Kiss)</p> <p>Cell injury (Kiss) Reversible cell injury (hydropic swelling, atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia, intracellular storage). Irreversible cell injury (necrosis, apoptosis, ischemic cell injury, external damaging agents, calcification, hyaline, aging).</p>	<p>Practice 1- Introduction</p> <ul style="list-style-type: none">• Digital teaching system• Teleconsultation• E-school• Safety rules• Cell injury, adaptation, storage disorders• Necrosis, coagulative• Necrosis, liquefactive• Apoptosis• Hypertrophy• Hyperplasia• Fatty degeneration• Amyloidosis
Week 2	<p>Hemodynamic disorders I. (Madaras) Basic notions in hemodinamics. Hemorrhage, active and passive hyperemia. Disorders of water and electrolytes. Edema.</p> <p>Hemodynamic disorders II. (Madaras) Thrombosis, embolism. Infarction. Shock.</p>	<p>Practice 2-Hemodynamic disorders I.</p> <ul style="list-style-type: none">• Acute congestion –• Pulmonary edema• Chronic congestion in lung• Haemosiderin in alveolar macrophages<ul style="list-style-type: none">◦ (“heart failure cells”)• Chronic congestion in liver<ul style="list-style-type: none">◦ (“Nutmeg liver”)• Nutmeg liver with fibrosis• Centrilobular necrosis
Week 3	<p>Inflammation I. (Tímár) Definition. Symptoms. Vascular permeability. Inflammatory mediators and their origin. Cellular recruitment. Acute inflammation. Systemic manifestations of inflammation. Inflammation of avascular tissues. Wound healing, regeneration and repair. Classification of cells and tissues according to their regenerative capability. Extracellular matrix.</p> <p>Inflammation II. (Lotz) Chronic inflammation. Fibrosis, scar formation. Granulomatous inflammation: (tuberculosis, syphilis. etc.)</p>	<p>Practice 3– Hemodynamic disorders II.</p> <ul style="list-style-type: none">• Thrombus• Fat embolism• Anemic infarction-kidney• Hemorrhagic infarction-lung

	LECTURES	HISTOPATHOLOGY
Week 4	<p>Neoplasia I. (Schaff) Neoplasia-definition. Characteristics of benign and malignant tumours. Histological classification of tumours.. Grading.</p> <p>Neoplasia II. (Schaff) Causes of neoplasia. Epidemiology. Chemical, physical and biological carcinogenesis. Prevention. Screening.</p>	<p>Practice 4 –Inflammation, repair</p> <ul style="list-style-type: none"> • Acute appendicitis • Fibrinous pericarditis • Granulation tissue • Foreign body granuloma
Week 5	<p>Neoplasia III. (Tímár) Molecular mechanisms of tumour development: protooncogenes, oncogenes, tumor suppressor genes, growth factors.</p> <p>Neoplasia IV. (Tímár) Tumor growth, tumor progression, metastasis. Familiar cancer</p> <p>Neoplasia V. (Kulka) (Saturday) Prognostic factors in tumour pathology. Staging and grading of tumours. TNM. Handling of surgical biopsy material.</p>	<p>Practice 5- Neoplasia I</p> <ul style="list-style-type: none"> • Squamous metaplasia • Condyloma (LSIL) • CIN 3 (HSIL) • Invasive carcinoma
Week 6	<p>Childhood tumours (Halász)</p> <p>Genetic and developmental disorders. Gene pathology I. (Kiss) Single-gene abnormalities. Autosomal dominant and recessive inheritance, sex-linked disorders. Lysosomal storage disease.</p>	<p>Practice 6-Midterm I (cell injury, hemodynamics, inflammation)</p> <p>Neoplasia II. (Benign and malignant tumours)</p> <ul style="list-style-type: none"> • Squamous papilloma • Squamous cell carcinoma • Adenoma • Adenocarcinoma • Lymph node metastasis • Liver metastasis
Week 7	<p>Genetic and developmental disorders. Gene pathology II. (Kiss) Chromosomal abnormalities. Morphogenic disorders, malformations, multifactorial inheritance. Prenatal diagnosis. Familiar diseases and symptoms.</p>	<p>Practice 7-Neoplasia III. (Soft tissue and childhood tumours)</p> <ul style="list-style-type: none"> • Leiomyoma • Leiomyosarcoma • Osteosarcoma • Wilms tumour • Neuroblastoma • Teratoma maturum
Week 8	<p>Cardiovascular pathology I. (Glasz) Structure of vessels. Atherosclerosis. Aneurysms. Hypertensive vascular disease. Inflammatory disorders of blood vessels. Microvascular disease. Diseases of veins and lymphatic vessels. Vascular tumours.</p> <p>Cardiovascular pathology II. (Glasz) Endocarditis, myocarditis, pericarditis. Rheumatic heart disease. Ischemic heart disease.</p>	<p>Practice 8- Biopsy techniques, protein- and DNA-based diagnostics</p> <ul style="list-style-type: none"> • Cytology smear • Core needle biopsy • Biopsy by endoscopy • Frozen section • Special stains • Immunohistochemistry • FISH
Week 9	<p>Cardiovascular pathology III. (Glasz) Congenital heart diseases. Cardiomyopathies. Heart failure. Systemic diseases involving the heart. Cardiac tumors.</p> <p>Head and neck (Székely E) Neoplastic and non-neoplastic lesions of lips, oral cavity, tongue, teeth, salivary glands, sinuses, pharynx, larynx, ear.</p>	<p>Practice 9- Cardiovascular diseases</p> <ul style="list-style-type: none"> • Arteriosclerosis • Atherosclerosis • Acut myocardial infarction • Myocardial infarction-healing • Endocarditis

	LECTURES	HISTOPATHOLOGY
Week 10	<p>Respiratory system I. (Székely E) Diseases of conducting airways and lung parenchyma. Diffuse alveolar damage. Chronic obstructive pulmonary diseases. Restrictive lung diseases.</p> <p>Respiratory system II. (Tímár) Development of lung cancer. Neoplasia (primary cancer of the lung, metastasis, benign tumors). Etiology, genetic abnormalities. Diseases of the pleura.</p>	<p>Practice 10- Midterm II. (Neoplasia, Cardiovascular system, Head and neck) Pulmonary pathology I. - non-neoplastic</p> <ul style="list-style-type: none"> • IRDS • Bronchopneumonia • Tuberculosis • Boeck sarcoidosis
Week 11	<p>Immunopathology (Kiss) Constituents of the immune system. Hypersensitive reactions. Allergy. Transplantation. Immunodeficiency. AIDS.</p> <p>Autoimmune diseases (Glasz) Etiology. Monosystemic diseases (e.g. chronic atrophic gastritis, myasthenia gravis, Basedow disease, Hashimoto thyroiditis, Addison disease, insulin dependent diabetes mellitus, Sclerosis multiplex) and Oligo- polysystemic diseases (e.g. SLE, Sjögren syndrome, RA, scleroderma, dermatomyositis)</p>	<p>Practice 11- Pulmonary pathology II- neoplastic</p> <ul style="list-style-type: none"> • Small cell carcinoma • Squamous cell carcinoma • Adenocarcinoma • Mesothelioma • Pulmonary metastasis
Week 12	<p>Infectious diseases (Lotz) Diseases caused by viruses (tick-borne viruses, polio, variola, herpes, CMV, EBV, rubella, varicella, mumps, influenza), Rickettsiae, Spirochetes. Bacteria (tularaemia, pertussis, legionella, brucellosis, listeriosis, clostridial infections (tetanus, botulism), Streptococci) Actinomycosis. Mycobacteria (tbc, leprosy). Protozoa (malaria, toxoplasmosis, amebiasis)</p> <p>Skin pathology (Székely T./Kovács A.) Basic notions in skin pathology. Primary lesions. Dermatitides. Infectious conditions of the skin. Manifestations of systemic diseases. Tumors of the surface epithelium and skin appendages. Pigmented nevi and malignant melanoma.</p>	<p>Practice 12- Skin</p> <ul style="list-style-type: none"> • Seborrheic keratosis • Basal cell carcinoma • Melanocytic nevus • Malignant melanoma
Week 13	<p>Environmental and nutritional pathology (Kerényi) Smoking, alcoholism, drugs. Iatrogenic injuries. Environmental chemical and physical factors. Obesity, protein malnutrition, vitamins.</p> <p>Bones and joints (Arató) The structure of the bone and cartilage. Osteogenesis. Growth and maturation disorders of the skeleton. Aseptic bone necrosis. Reactive osteogenesis. Osteomyelitis and specific inflammations. Metabolic disorders. Tumors and tumor-like lesions of the bones. Joints</p>	
Week 14	<p>Clinical pathology I. (Székely E) Tumor Screening, Cytodiagnosics. Basic cytopathological morphology of benign and malignant lesions. Case presentations.</p> <p>Clinical pathology II. (Kiss) Diagnostic parameters, requirements, which guide the clinical protocols. Molecular diagnostics of tumors. Targeted therapy</p>	<p>Practical exam</p>

2nd Semester

Week 1	Gastrointestinal tract I. (Kiss) Esophagus (anatomy and developmental disorders, inflammation, trauma, tumors). Stomach- part I.	Practice 1- The pathology report
Week 2	Gastrointestinal tract II. (Madaras) Pathology of the stomach(-part 2) and small bowel. Appendix. Gastrointestinal tract III. (Madaras) Colon (congenital disorders, infections, diverticular disease, inflammation, Crohn-disease, ulcerative colitis, vascular diseases, neoplasms, other disorders). Peritoneum.	Practice 2- Gastrointestinal pathology I. <ul style="list-style-type: none">• Pleomorphic adenoma- parotis• Peptic ulcer-stomach• Gastritis chronica (H. pylori)• Carcinoma sigillocellulare• GIST
Week 3	Pathology of the liver I. (Schaff) Anatomy of the liver, function. Bilirubin-metabolism and jaundice. Hepatic failure. Hepatorenal syndrome. Viral hepatitis. Chronic hepatitis. Cirrhosis. Portal hypertension. Non-viral hepatitis. Pathology of the liver II. (Schaff) Alcoholic liver disease, toxic liver injury. Hemochromatosis. Vascular disorders.	Practice 3-Gastrointestinal pathology II. <ul style="list-style-type: none">• Celiac disease• Pseudomembranous colitis• Ulcerative colitis• Crohn disease
Week 4	Pathology of the liver III. (Kiss) Neoplasms. Gallbladder and bile ducts (congenital anomalies, cholecystitis, cholelithiasis, cholangitis, neoplasms). Pathology of the exocrine pancreas (Székely E) Developmental abnormalities, inflammations, tumors of the exocrine pancreas.	Practice 4- Liver pathology <ul style="list-style-type: none">• Alcoholic hepatitis• Viral hepatitis• Cirrhosis• Hepatocellular carcinoma• Cavernous hemangioma• Liver metastasis
Week 5	Endocrinology I. (Székely E) Pathology of the endocrine pancreas: Diabetes mellitus. The hypothalamus-hypophysis system. Pathology of the pituitary gland. The thyroid gland: hypo- and hyperfunction, inflammations, tumors. Endocrinology II. (Kovács A) Pathology of the parathyroid gland. Hypo- and hyperfunction and other diseases of the adrenal cortex. Tumors of the adrenal gland. Pineal gland. Ectopic hormone production.	Practice 5- Pathology of the pancreas <ul style="list-style-type: none">• Acute pancreatitis• Chronic pancreatitis• Adenocarcinoma of the pancreas• Neuroendocrine tumour
Week 6	Renal pathology I. (Kardos) Anatomy. Clinical syndromes. Glomerular diseases. Tubulointerstitial diseases. Renal disease and systemic disorders. Kidney transplantation. Renal pathology II. (Somorácz) Hydronephrosis. Lithiasis. Pyelonephritis. Congenital abnormalities. Tumors of the kidney.	Practice 6- Endocrine pathology <ul style="list-style-type: none">• Adrenal cortical adenoma• Goiter• Autoimmune thyreoiditis (Hashimoto)• Thyroid gland-follicular adenoma• Thyroid gland-papillary carcinoma
Week 7	Uropathology I. (Székely E) Congenital abnormalities of the urinary tract. Inflammations. Urinary bladder (malformations, inflammations, tumors). Urethra. Uropathology II. (Székely E) Diseases of the epididymis, testis, prostate, penis and scrotum.	Practice 7- Midterm III (GI, liver, pancreas, endocrine) Renal- and uropathology <ul style="list-style-type: none">• Acute pyelonephritis• End stage kidney• Renal cell carcinoma• Transitional cell carcinoma

Week 8	<p>Gynecologic pathology I. (Schaff) Pathology of the vulva and vagina. . Non-neoplastic diseases of the cervix. Precancerous lesions of the cervix. HPV. Cervix-screening. Conisation. Cervix carcinoma. Bethesda system.</p> <p>Gynecologic pathology II. (Madaras) Pathology of the uterus. Uterine bleeding disorders. Endometrial hyperplasia, endometriosis. Tumours of the endometrium, myometrium and serosa.</p>	<p>Practice 8- Uro pathology- prostate, testis</p> <ul style="list-style-type: none"> • Prostatic hyperplasia • Prostatic adenocarcinoma • Testis- seminoma • Testis-embryonal carcinoma
Week 9	<p>Gynecologic pathology III. (Kulka) Pathology of the fallopian tube and ovarium. Pregnancy related pathology of the uterus.</p> <p>Neonatology (Kiss) Premature birth and its complications. Intrauterine infections and their consequences. Twin pregnancy. Diseases of the perinatal period. Sudden infant death.</p>	<p>Practice 9- Gynecologic pathology I.</p> <ul style="list-style-type: none"> • Ectopic pregnancy • Endometriosis • Endometrial hyperplasia (simple) • Endometrial carcinoma
Week 10	<p>Breast pathology I. (Kulka) Symptoms and diagnosis of breast diseases. Malformations. Benign symptomatic lesions (inflammations, fibrocystic disease, epithelial dysplasia and its significance, benign tumours)</p> <p>Breast pathology II. (Kulka) Malignant tumours - epidemiology, risk factors. Histologic types of breast carcinoma. Prognostic factors in breast cancer. Non-epithelial breast malignancies. Screening: non-palpable breast lesions. The male breast.</p>	<p>Practice 10- Gynecologic pathology II.</p> <ul style="list-style-type: none"> • Follicular cyst- ovary • Mucinous cystadenoma-ovary • Serous cystadenoma-ovary • Serous papillary (cystadeno-)carcinoma-ovary
Week 11	Spring break	
Week 12	<p>Easter-Public Holiday</p> <p>Hematopathology I. (Székely E) Hemopoetic system. Normal function (bone marrow, lymph nodes, spleen). Morphology and immunologic evaluation. Disorders of platelets and coagulation. Anemias, polycythemia. Neutrophilia. Proliferative disorders of mast cells. Monocytosis. Sinus histiocytosis. Benign disorders of lymphoid cells</p>	<p>Practice 11- Breast pathology</p> <ul style="list-style-type: none"> • Fibrocystic disease • Fibroepithelial tumours • Ductal carcinoma in situ (DCIS) • Invasive carcinoma (NOS, lobular) <p>COMPETITION- 1st round</p>
Week 13	<p>Hematopathology II- (Székely E) Acute myeloproliferative syndromes (acute leukaemias). Chronic myeloproliferative syndromes (CML, myelofibrosis, thrombocytopenia). Acute and chronic lymphocytic leukaemias. Disorders of the spleen</p>	<p>Practice 12-Hematopathology</p> <ul style="list-style-type: none"> • Reactive lymphadenopathy • Hodgkin lymphoma • Nodal non-Hodgkin lymphoma • Extranodal non-Hodgkin lymphoma
Week 14	<p>Hematopathology III. (Székely E) Lymphomas (Hodgkin, non-Hodgkin). Metastatic tumors in bone marrow and lymph nodes. Clinicopathological case demonstrations</p> <p>Central nervous system I. (Schaff) Trauma, vascular and circulatory disorders. CSF dynamics. Encephalomyelitis, meningitis. Congenital malformations. Metabolic storage Demyelinating diseases. Neurodegenerative diseases. Pathology of the eye and ear. Metabolic diseases</p>	<p>Practice 13-Midterm IV (renal and uro pathology, gynecologic pathology)</p> <p>CNS histopathology:</p> <ul style="list-style-type: none"> • Purulent meningitis • Meningeoma • Glioma • Brain metastasis <p>COMPETITION- 2nd round</p>
Week 15	<p>Central nervous system II. (Reiniger) Neoplasms (neuroectodermal, embryonic, ectopic tissue, metastasis). Peripheral nervous system (neuropathies, inflammations, trauma, tumors).</p>	<p>Consultation</p>

List of textbooks

- 1 Kumar, Abbas, Aster, Malone Robbins and Cotran: Pathologic Basis of Disease (Elsevier Saunders, Ninth Edition, 2015), ISBN-13: 978-1455726134
- 2 Szende B., Suba Zs Introduction to Histopathology (Medicina, 1999)

Webpage www.path2.sote.hu

General Informations: www.path2.sote.hu

General information, downloads: www.semmelweis.hu/patologia2

Online available case center (digital slides): <http://casecenter-korb2.sote.hu/casecenter/>

User name and password for Java based version: student_jav

User name and password for Panoramic Viewer based uasege: student_pv

The visit of the internet based Case Center and Practice Test on tuition and exam dates is allowed after 4 p.m. only!

Mr. Rúben Kis and Mr. Endre Kontsek shall be approached with technical problems regarding server availability:

e-mail: for Mr. Rúben Kis: kis.ruben@semmelweis-univ.hu

for Mr. Endre Kontsek: kontsek.endre@med.semmelweis-univ.hu

Panoramic Viewer free download at : <http://www.3dhistech.com/>

4D pathology and auxilliary materials at: www.4dpathology.hu

Panoramic Viewer free download: <http://www.3dhistech.com/>

Practice test: <http://casecenter-korb2.sote.hu/espractice/>

General information

Lectures

The topic of the lectures include both general and systemic pathology. Each lecture lasts 1hour 10 minutes and is illustrated with macroscopic and microscopic photographs, radiologic images, illustrating the presented material. Occasionally interesting autopsy cases will be demonstrated during the lectures.

Attending the lectures is compulsory, since the semifinal and final exams are partly based on them. The 2nd Department of Pathology may record the absences and those students who skip more then 15 % of the lectures may not be registered for examination.

Practices

There are 14 two + two hours practices in both semesters, which are divided into autopsy and histopathology. Not more than 2 autopsy practices and not more than 2 histopathology practices can be missed in each semester. Catch up is possible only for autopsy hall practices, students can join other groups and their presence should be registered and signed by the tutor of the autopsy hall practice attended. In case the absences exceed the allowed limit the student will not be accepted for examination.

The histopathology practices provide basic histopathology skills. The topic of the histopathology practices matches that of the lectures. Brief theoretical background for the presented slides will be discussed in the frame of the practice. The pathological lesions will be presented in form of digital slides and will be demonstrated by the tutor with the help of a computerized multidiscussion/teleconsultation system. The digitalized slides will be individually studied and analyzed by the students as well. The digital slides are also available for the students through the internet every day from 4 p.m. till 8 a.m. the next day.

During autopsy practices the students will learn the basic skills of autopsy and how to recognize what's pathological and will gain skills to demonstrate and describe these lesions. The emphasis is on the clinicopathologic aspects of the discussed cases. If there is no autopsy available, organ demonstration will take place on plastinated organs. Alternatively, visit of the laboratories (Laboratory of Histopathology, Laboratory of Immunohistochemistry and Laboratory of Molecular Pathology) of the Department will be on the program.

The medical and patient information provided during autopsies, lectures and demonstrations is confidential. The requirement to maintain professional secrecy and preserve confidentiality also applies for medical students.

It is strictly forbidden to make any kind of record (photography, video, sound-record) of the material provided during the tuition and demon-

strations in the facilities and building of the Department, especially during lectures and practices (including autopsy and histology practices). The material presented during the tuition is the intellectual property of the Department and their presentation is directly controlled by the Department. Therefore, it is not intended for the public and must not be published or arbitrarily recorded, alternatively taken away without the permission of the Department. Violation of the rules mentioned above implies disciplinary action. Exception can be made only based on the previous and written permission provided by the Head of the Department. The Department reserves the rights to completely control the communication of the information about the Department.

Midterm exams: There are two midterm exams in each semester. The participation and successful absolution (average result exceeding 60 %) of the midterm exam is compulsory. If a student can not attend one of the midterms or the average 60% is not achieved, the tutor should assess the basic knowledge of the student (see list of definitions on our webpage).

Pathology competition

Pathology competition has two rounds: the first, during the 12th and the second, during the 14th week of the 2nd semester. Macroscopic photographs will be projected in the first round and diagnoses should be given. The students with the best results (up to 8-10 people, depending on the number of participants) will enter the second round. The 2nd round has two parts: theoretical and histopathology parts. In the former, participants should recognize and describe autopsy macrophotos (virtual autopsy). During the histopathology part, participants should recognize and describe a neoplastic and a non-neoplastic slide.

Students use pseudonyms in both rounds. Those students who enter the second round are exempt from test writing, those who recognize both of the histopathology slides in the second round are exempt from histopathology in the final exam. The first three ranked students will get only 2 theoretical questions in the final examination.

Consultation

Upon request there is a possibility for a consultation with the tutor. The students are welcome to autopsy practices of other groups for retake or extra occasion as long as it does not disturb the ongoing practice. **There is no consultation during the exam period.**

Examinations

SEMIFINAL:

1. Prerequisites:

Absences: **not** more than 2 autopsy practices and not more than 2 histology practices (histology practice and autopsy hall practice counts separately) can be missed in each semester. Attending the lectures is compulsory. If one does not fulfill the above mentioned prerequisites the 2nd Department of Pathology has the right for not acknowledging the semester.

Midterm exams: Completion of the 2 midterm exams during each semester is compulsory.

2. Autopsy demonstration

will be held during the last autopsy hall practice. One should be able to recognize the organ (complex), orientate it properly, precisely describe the pathological lesions and establish a macroscopical diagnosis. The performance is graded on a scale from 1 to 5. In case the mark of autopsy demonstration would be 1 (failure) it should be retaken otherwise the student will not be examined at the semifinal. The score (1-5) of the autopsy demonstration will be added to the written exam's result if the latter is over the passing limit.

3. The semifinal exam is a **written test!!**

The material for the examinations is based on the book, the lectures and practices as well. The questions are prepared based on the official pathological textbook, but the factual data of the lectures are also constituents of the written test.

The test consists of 80 questions. The students have 80 minutes for writing the test. The test is given in one session, there will be no break during the examination. Your sitting order is determined by the actual supervisor. The written test will be held in the Histopathology practice room using the teleconsultation computerized system. Every student to be examined on a certain exam day will receive the same set of questions, however, in different order within one question and regarding the numbering of the questions as well. The actual set of questions will be randomly selected from a pool by the computer. Upon submission of the test for evaluation, the computer will evaluate it. The result is immediately available and will be recorded. Since there is no possibility of human error in the correction the result of the written test is not subject of personal consultation.

The test questions include simple choice (one correct answer out of 5), multiple choice (2 answers are correct), “true-false” analysis and definitions should be given. Every correct answer of a multiple choice question will be awarded with one point, false statements of the multiple choice questions will result in one point deduction in order to avoid randomly crossing every possible answer of the multiple choice questions. Altogether, the deductions can not conclude a negative score, the worst score for one question is 0. Before submitting the test for evaluation the answers might be changed. Copying the questions are not permitted. The results are posted at the same day, generally early afternoon.

Evaluation: The passing level is 60 %. Each correct answer is worth of 1 point.

0-59,99%: = 1
60-69,99%: = 2
70-79,99%: = 3
80-89,99%: = 4
90-100%: = 5

Suspension: If you have any problem during the test, ask the supervisor. In case of communicating, unacceptable behaviour, cheating (usage of mobile phone, books, notes, etc.,) your exam is immediately suspended and the exam will not be evaluated and counts as a failed exam. Written report of the incident will be prepared and signed by the teachers.

4. The exam for EM begins at 8.30 a.m. sharp at the **2nd Department of Pathology**, meeting at the **Histology practice room**. The grade books are collected by the supervisor before starting the exam. Students without a grade book should provide a photo ID, otherwise they are not allowed to take the examination.

5. Exam dates: You will be notified about the dates offered by the Department before the exam period and they will be finalized at the Staff/Student meeting. Then these fixed days will figure in NEPTUN.

Important! Taking examinations before the exam period is not permitted! (University Policy). In exceptional cases (such as near-delivery, etc.), you must have a written permission from the Dean's Office.

6. Registration The internet based sign up system (NEPTUN) regarding pathology has been established for 3rd year students as well. The sign up procedure is controlled and regulated by the software and the institute can not interfere with the system. The officially signed up students will be scheduled for examination.

7. Rescheduling the exam date: The list of examinees is completed 2 days before the examination date (deadline: 9.00. a.m.), the NEPTUN system automatically closes the sign up list by expiration of the deadline. Example: if the exam is on Thursday the data sheet for Thursday will be taken in and finalized on Tuesday at 9 a.m..You may remove your name prior to this period. After that changes are not permitted. If you do not show up on the given exam date, you should justify it within 3 days at the head of the Institute or at the tutor responsible for the English program. Otherwise, „not appeared” note is written in your index, and the exam is not allowed without having a retake ticket! The skipped exam is deducted from the number of possible retake exams.

8. Retake exam: In case of failure or for those who are unsatisfied with the result of the first exam a retake exam should be taken to improve the mark. For that a retake ticket is required from the secretariate. If one retakes an exam to improve the previous mark it is not granted that mark of the retake exam can not be the same or worst than the previous mark.

The retake exam - the first retake exam as well - may be oral by request !!

At least 4 days should be passed between the day of the failed exam and the day of the retake exam (the days of the examinations are not included). One must also register on the NEPTUN system and indicate that this is the first, second, etc. retake exam. Without retake ticket and NEPTUN registration one is not allowed to take an examination.

Any further details regarding the exam and exam dates will be discussed on a STUDENT / STAFF meeting held in the last week of November. The date of the meeting is to be announced on the lecture.

FINAL EXAM

Form of the **FINAL** examination _

The final exam consists of two practical and two theoretical parts. The practical parts are **histopathology** in the histology practice room and **organ demonstration** in the autopsy hall. The theoretical parts are: **written test (60 questions – 60 minutes)** and **oral exam about theoretical topics** – concerning not only the organ or organ complex to be demonstrated, but the complete material discussed in the official pathology books as well as the material presented in the lectures. **The written test is compulsory part of the exam! The passing limit is 60 %.** The test is given in one session, there will be no break during the examination. Your sitting order is determined by the actual supervisor.

Written test: The test questions include simple choice (one right answer out of 5), and multiple choice (2 correct answers are correct), “true-false” analysis. Every correct answers of multiple choice questions will be awarded with one point, false statements of the multiple choice questions will result in one point deduction on order to avoid randomly crossing every possible answers of the multiple choice questions. Every answer should be marked in the computer. Before submitting answers for evaluation the answers might be changed.

Oral exam: the 2 theoretical questions of the oral examination are from a list of theoretical questions. The list of these theoretical questions is on the website of the department.

The material for the examinations is based on the book, the lectures and practices as well !!

The examination will take place at the 2nd Department of Pathology starting with the written test in the Histology Practice Room.

The final exam starts at 8.30 a.m. sharp!!!

MEETING POINT: In the Histology Practice Room at the 2nd Dept. of Pathology!!!

The students to be examined will be identified by picture ID cards by the supervisor before starting the exam. Therefore, students should present a picture ID, otherwise they are not allowed to take examination !

Evaluation: The passing level is 60 %. Each correct answer is worth of 1 point.

0-59,99%:	= 1
60-69,99%:	= 2
70-79,99%:	= 3
80-89,99%:	= 4
90-100%:	= 5

After test writing, examinees are required to take the **histology** part of the final. Two slides from the pool are given to the student and the examinee should describe the organ (if there is one present on the side) and the histological findings. Finally, a correct diagnosis should be given. The Histology part can not be examined by the tutor of the student.

After the test and histology, **organ demonstration** follows. During this part of the exam dissected organs or organ complexes are to be described. The student should be able to orientate the organ (or organ complex) properly, to describe it fully and evaluate the pathological alterations and establish diagnoses.

Finally, the **2 theoretical questions** are to be discussed.

The final mark will be decided by the exam board of the institute based on the marks received on the practical and theoretical parts of the final exam.

It could be kept in mind that the final mark is not merely the mathematical average of the given grades of different parts of the exam! Additional factors, for example your midterm results, your general performance during the academic year (evaluated by your tutor), the competition results, etc. are also taken into consideration. Serious mistakes or „clear spots” in your knowledge may significantly affect the final mark or even result in a failed exam.

Retake exam: In case of failure or for those who are unsatisfied with the result of the first exam a retake exam should be taken to improve the mark. If the student retakes the exam to improve the previous mark, the mark of the retake exam may be the same or worst than the previous mark.

At least 4 days should be passed between the day of the failed exam and the day of the retake exam (the days of the examinations are not included). The student must also register on the NEPTUN system and indicate that this is the first, second, etc. retake exam. Without retake ticket and NEPTUN registration the student is not allowed to take an examination.

By retake examination in case of failure the written test or/and the histology exam should not be repeated in case it has reached at least grade 3 by the previous examination.

In case of a retake exam that serves as improving the grade, the complete examination should be repeated, except if the written test/histology part was grade 5.

Failure on any part of the exam excludes a result of 5!

Announcement of the results is at the same day. Signed grade books can be obtained in the office of the Head of Department.

Suspension: If you have any problem during the test, ask the supervisor. In case of communicating, unacceptable behaviour, cheating (usage of mobile phone, books, notes, etc.,) your exam is immediately suspended and the exam will not be evaluated and counts as failed exam. Written report of the incident will be prepared and signed by the teachers.

Tutors

- Dr. Benedek GYÖNGYÖSI
- Dr. Judit HALÁSZ
- Dr. Dóra HARGITAI
- Dr. Ildikó ILLYÉS
- Dr. István KENESSEY
- Dr. Magdolna KARDOS
- Dr. András KISS
- Dr. Zsófia KRAMER
- Dr. Gábor LOTZ /
- Dr. Lilla MADARAS
- Dr. Tekla KOVÁCS
- Dr. Márton SÁGHI
- Dr. Eszter SZÉKÁCS
- Dr. Ildikó SZIRTES

CLINICAL ECG

Credit value: 3

Weeks 1–7: Total number of lessons/week: 4 lecture: 2 practical course: 2

Weeks 8–14: Total number of lessons/week: 2 lecture: 0 practical course: 2

Academic year: 2021/2022

Subject code: AOKKAR680_1A

Name of the course leader: *Zoltán Benyó* MD, PhD, DSc (weeks 1-7)

Institute of Translational Medicine, 210-0306

Position: director, professor

Name of the course leader: *Dávid Becker* MD, PhD, (weeks 8-14)

Heart and Vascular Center, +36-1-458-10

Position: deputy director

Objectives of the subject, its place in the medical curriculum:

The aim of the subject is to prepare students for the courses in cardiology and internal medicine.

The student should be able to recognize the conditions requiring immediate cardiac intervention and the most important arrhythmias

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Nagyvárad square Building, 1089 Bp. Nagyvárad tér 4. (weeks 1–7: lectures and practicals)

Heart and Vascular Center, 1122 Budapest, Városmajor u. 68. (weeks 8–14: practicals)

Successful completion of the subject results in the acquisition of the following competencies:

The student will be able to independently record an ECG and give a professionally correct description of a 12-lead ECG at rest. He/she will be able to estimate basic parameters, identify abnormalities and list clinical conditions that may cause the abnormalities described. Of particular importance is the ability to recognize ST-elevation myocardial infarction, atrial fibrillation and arrhythmias requiring acute intervention.

Course prerequisites:

biophysics, physiology

Number of students required for the course (minimum, maximum) and method of selecting students:

Based on the registration in the Neptun system

How to apply for the course:

Through the Neptun system

Weeks 1–7, lectures (2:45 min):

Week	Translational Medicine (45 min)	Cardiovascular Center (45 min)
1	The concept and classification of arrhythmias. Mechanisms of origin of tachyarrhythmias.	Examination of a patient with supraventricular tachycardia. Differential diagnosis of narrow QRS tachycardias.
2	Classification of conduction disorders, mechanisms of bradyarrhythmias	The practical significance of impulse formation and conduction disorders
3	Repolarization disorders. ECG signs of different forms of ischaemic heart disease.	The role of ECG in the investigation of chest pain pathologies and its role in risk stratification.
4	Ventricular arrhythmias	Differential diagnosis of wide QRS tachycardias. Detection of ventricular tachycardias, ECG criteria.
5	Basics of pacemaker systems	ECG of a patient with pacemaker
6	Cases with multiple abnormalities	Description of complex ECGs, ECG differential diagnostics.
7	Cases to learn from	Revision

Weeks 1-7, practicals:

1. ECG lead systems, nomenclature. Analysis of normal ECG tracings. Estimation of frequency and heart axis. The ladder diagram
2. Recognition of nodotopic and heterotopic pacemaker disturbances, supraventricular and ventricular tachycardias on ECG tracings.
3. Recognition of SA, AV and intraventricular conduction disturbances. Aberrant conduction.
4. Angina and NSTEMI. Localization and staging of ST-elevation infarcts.
5. Recognition of electrolyte abnormalities, atrial and ventricular strain and hypertrophy.
6. Recognition and practice of multiple abnormalities.
7. **Mid term exam**

Weeks 8-13, practicals:

During the practicals, theoretical knowledge is correlated with clinical practice at the bedside of the wards of the Heart and Vascular Center, and ECG curves of patients are analyzed.

Week 14, Examination (written)

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes: biophysics, physiology, cardiology

Special study work required to successfully complete the course: none

Requirements for participation in classes and the possibility to make up for absences:

In accordance with the study and examination regulations, participation in 75% of the practicals is compulsory. It is not possible to make up lectures, but you can make up the practicals in another group in the same week.

Methods to assess knowledge acquisition during term time:

An oral mid term of the material from the basic course (first 6 weeks) in week 7 (analysis of ECG tracings. Attendance is compulsory

Requirements for signature:

Successful (at least satisfactory) oral demonstration (as the subject is taught by two different departments).

Type of examination:

Written MCQ test

Requirements of the examination:

Recognition of attendance

Method and type of evaluation:

Grading is based on performance in the written test.

How to register for the examination:

through the Neptun system

Possibilities for exam retake:

In accordance with the study and examination regulations

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Thaler, Malcolm S.: Az egyetlen EKG-könyv, amire szükséged lehet, Medicina Kiadó, 2019

Malcolm S. Thaler: The Only EKG Book You'll Ever Need, Wolters Kluwer, 2019

Trappe, Hans-Joachim, Schuster Hans-Peter: EKG-Kurs für Isabel, Thieme, 2013

Simon András–Tornóci László: EKG érthetően (munkafüzet), Semmelweis Kiadó, 2015

Simon András–Tornóci László: Understanding ECG (workbook), Semmelweis Kiadó, 2016

INTERNAL MEDICINE - PROPEDEUTICS

First or Second Semester

Department of Internal Medicine and Oncology
Department of Internal Medicine and Hematology

Course directors: *prof. István Takács* and *prof. Tamás Masszi*

Course coordinators: *dr Péter Studinger* and *dr Katalin Keltai*

Exam type: semi-final, oral exam

Credit: 4

Objective of the course: Primary objective of the course is to have the student to acquire the basic skills of examination of a medical patient. Lectures will present the fundamental components of a complete medical patient interview and methods of physical examination. Bedside practices will allow students to gain experience in using these methods. Special emphasis will be placed on the of proper physician behavior with patients.

Lectures:

1. Patient interview, comprehensive health history.
2. Techniques of physical examination: inspection, palpation, percussion, auscultation.
3. Measurement and evaluation of body temperature. Evaluation of body weight, height, composition. Urinalysis, measurement of urine output.
4. Physical examination of the thorax and lung.
5. Physical examination of the heart. Pathophysiology of heart murmurs.
6. Heart sounds and murmurs, diagnosis of valvular diseases.
7. Evaluation of blood pressure, pulse, and vascular system.
8. Physical examination of the abdomen and hernias.
9. Signs, symptoms and differential diagnosis of "acute abdomen".
10. Examination of the urogenital tract.
11. Evaluation of the musculoskeletal system.
12. Examination of the breasts. Patient with malignant neoplasm, ECOG classification.
13. Examination of the lymph nodes. Physical and laboratory evaluation of the hematologic diseases.
14. Signs and symptoms of diseases of the endocrine system.

Practices:

1. Introduction to medicine. Patient interview and health history
2. Approach to symptoms, patient documentation (patient chart, flowsheet, follow up)
3. Methods of physical examination: inspection, palpation
4. Methods of physical examination: percussion, auscultation
5. Practicing physical examination of the thorax and lung I.
6. Practicing physical examination of the thorax and lung II.
7. Practicing physical examination of the heart I.
8. Practicing physical examination of the heart, ECG evaluation.
9. Practicing blood pressure and pulse measurement, evaluation of the vascular system
10. Practicing physical examination of the abdomen I.
11. Practicing physical examination of the abdomen II.
12. Practicing evaluation of changes in body temperature and examination of the urogenital system. Bedside blood glucose measurement.
13. Practicing physical examination of the musculoskeletal system, breasts and lymph nodes.
14. Summary and review

BASIC SURGICAL TECHNIQUES

Department of Surgical Research and Techniques

Theoretical Block at Nagyvárád Square, Operating training center,
1089 Budapest, Nagyvárád sq. 4.

Lecturer: **Professor Dr. György Wéber**

Tutor: **Dr. Györgyi Szabó**

Credit: 2

Second Semester

Prerequisites: Microscopic Anatomy and Histology II., Medical Physiology II.

The aim of the subject is to practice the basic surgical techniques, to present hygienic approach, which attainments are indispensable for clinical doctors working in manual field of medicine. This subject provide basics about special behavior in the operating theatre, preparation of the patient and surgical team before operation, surgical tools and instruments, wound management, laparoscopic instruments and techniques. Recommended for students interesting in manual fields of medicine.

Practices are held on every second week (7x135 minutes).

1. The operating room.
2. Knoting and suturing on in vitro models.
3. Knoting and suturing on in vivo models.
4. Operations on small animals I.
5. Operations on small animals II.
6. Basics of the video-endoscopic techniques.
7. Practices on pelvitrainers.

Attendance is obligatory on every practice. Because of limited capacity of operating theatre, absence cannot be repeated by joining another group. One missed practice can be repeated on 14th week of the semester.

Absence should be certified with medical or other official certificate. Absence from practices is not to exceed 25%.

Requirement: Practical exam (5 degree evaluation).

Textbook: Basic surgical techniques (textbook and video)

PROBLEM BASED MEDICAL PHYSIOLOGY

Course Director: Prof. Dr. László Hunyady M.D., Ph.D., D.Sc.,
Head of the Department of Physiology

Lecturers: *Professor László Hunyady* M.D., Ph.D., D.Sc.
Professor Péter Enyedi M.D., Ph.D., D.Sc.
Péter Várnai M.D., Ph.D., associate professor
Miklós Geiszt M.D., Ph.D., associate professor
Gábor Cziráj M.D., Ph.D., assistant professor

Credits: 4

Programme:

The primary purpose of this course is the synthesis of the theoretical and practical knowledge of the students. The thematic of the course includes various clinical and non-clinical practical problems (e.g. acclimatisation). The students will receive questions related to a specific problem and they have usually one week to find the proper answer in available electronic and printed information sources. Problem solving is based on the discussion of the students with directions from the instructors. This course requires the active participation of the students. The role of the instructor is to determine the thematics of the course and to provide guidance to the discussions.

Thematics:

1. Physiologic principles of circulatory problems I.
2. Physiologic principles of circulatory problems II.
3. Physiologic principles of circulatory problems III.
4. Physiologic principles of respiratory problems I.
5. Physiologic principles of respiratory problems II.
6. Physiology of acclimatisation.
7. Dysfunctions of kidneys I.
8. Dysfunctions of kidneys II.
9. Immune cells and blood coagulation.
10. Physiologic principles of the regulation of food intake.
11. Dysfunctions of neuroendocrine system I.
12. Dysfunctions of neuroendocrine system II.
13. Dysfunctions of central nervous system I.
14. Dysfunctions of central nervous system II.

Requirement and attendance

Requirement: Medical Physiology (AOKIKELT2A)

In case of an over-application selection will be made on the base of the exam achievement.

Condition of the sign: participation at min. 75% of the lessons. Replacement of an absence is not possible.

Absence: Certification of the absence from the lessons is not required. Absence from the exam should be certificated in three weekdays (medical certificate).

Semester requirement: Recitation: every week, oral or written. Details will be given on the first lesson.

End-semester evaluation: Condition of the sign: participation at min. 75% of the lessons. A practical mark will be given.

Mark: Weekly results plus the oral exam grade.

Exam sign up: On the last week, personal.

Written subject-matter of instruction: the discussable themes were selected by the lecturers of the Department of Physiology, and are given to the students every week. The necessary subject-matter of instruction will be published on the home page of the Department of Physiology. Use of data bases in the Central Library of the University (e.g. PubMed) is required.

BIOETHICS—MEDICAL ETHICS

Department:

Institute of Behavioral Sciences

Department of Bioethics

NET Building, 19th, 20th floor

1089. Budapest, Nagyváradi tér 4.

Tel: 210-2953

Secretary: Csilla Motyovszki, e-mail: motyovszki.csilla@med.semmelweis-univ.hu

Tel: 210-2930/56114, NET Building, 20th floor, Room-2015

(28 hours)

2020/2021 year II. semester

Course objectives:

- To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patient research subjects and fellow health care professionals
- To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

Lectures:

Time: Thursdays, 14.35-16.10

Venue: NET, Brown Auditorium (1089. Budapest, Nagyváradi tér 4.)
or possibly Online lectures via Zoom

1. week. Lecture (18 February, 2021)

Principles of Medical Ethics (Jozsef Kovacs)

2. week. (Lecture) (25 February, 2021)

Informed Consent I. (Jozsef Kovacs)

3. week. (Lecture) (4 March, 2021)

Informed Consent II. (Jozsef Kovacs)

4. week. (Lecture) (11 March, 2021)

Competence and Capacity to Make Health Care Decisions
(Orsolya Peter)

5. week. Lecture (18 March, 2021)

Ethical Questions of Human Research
(Jozsef Kovacs)

6. week. Lecture (25 March, 2021)

Reproductive Issues (Orsolya Peter)

7. week. Lecture (1 April, 2021)

Organ and Tissue Transplantation (Jozsef Kovacs)

8. week. Lecture (8 April, 2021)

Information Disclosure to Terminally Ill Patients. Telling the Truth to Patients (Orsolya Peter)

9. week. Lecture (15 April, 2021)

Confidentiality and Medical Records. Reportable Illnesses, HIV-Related Issues, Sexually Transmitted Diseases (STDs) (Orsolya Peter)

10. week. Lecture (22 April, 2021)

End of Life Issues (Jozsef Kovacs)

11. week. Lecture (29 April, 2021)

Doctor-Patient, Doctor-Doctor Relationship (Jozsef Kovacs)

12. week. Lecture (6 May, 2021)

Doctor and Society (Jozsef Kovacs)

13. week. Lecture (13 May, 2021)

Malpractice (Orsolya Péter)

14. week. Lecture (20 May, 2021)

The Rights of Patients (Orsolya Péter)

Course Faculty:

Jozsef Kovacs, MD, PhD, (Head of the Department of Bioethics),
210-2930/56115; e-mail: kovacs.jozsef@med.semmelweis-univ.hu
(Room 2003)

Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@gmail.com (Tel: +36-30-9-912-462)

Imre Szebik, MD, PhD e-mail: szebik.imre@med.semmelweis-univ.hu (Room 1914) (Tel: +36-20-824-3195)

Jenő Lőrincz, MD, JD e-mail: lorincz.jeno@med.semmelweis-univ.hu (Room 2007) (Tel: +36-30-749-4768)

Ágnes Zana, PhD e-mail: zana.agnes@med.semmelweis-univ.hu (Room 2008) (Tel: +36-30-53-01-647)

Orsolya Péter, JD, PhD, peter.orsolya@med.semmelweis-univ.hu; peterorsolya@gmail.com (Room 2012) (Tel: +36-30-906-5787)

Course attendance statistics can be found on NEPTUN in the following way:

Taken courses -- options -- Course details -- Attendance statistics.

List of questions

1. The principles of medical ethics
2. Competence and the capacity to make decisions
3. Paternalism in medical practice
4. Informed consent
5. Information disclosure for terminally ill patients
6. Withholding and withdrawal of medical treatment
7. Advance Directives
8. Do not resuscitate (DNR) orders
9. Withholding Fluids and Nutrition in terminally ill patients
10. Physician assisted suicide
11. Active and Passive Euthanasia
12. Terminal sedation and the law of double effect
13. Futile medical care
14. Determination of death and brain death
15. Ethical problems of live organ donation
16. Organd donation from brain-dead donors: the system of donor cards.
17. Organd donation from brain-dead donors: presumed consent
18. Reproductive issues (abortion, contraception, sterilization, donation of sperm and eggs)
19. HIV related issues (confidentiality, partner notification, HIV-positive health-care workers, refusal to treat HIV-positive patients) and sexually transmitted diseases (STDs)
20. Malpractice
21. Doctor-patient relationship (beginning and ending the relationship, gifts from patients, doctor/patient sexual contact)
22. Doctor and society (child abuse, elder abuse, impaired drivers, physician participation in executions, torture, spousal abuse, gunshot wounds, gifts and industry funding)
23. Doctor-doctor relationship (reporting impaired physicians, physician disagreements)
24. Confidentiality and medical records
25. Ethical Questions of Human Research
26. The Rights of Patients

Textbook:

Conrad Fischer—Caterina Oneto (2016): Medical Ethics for the Boards. (Third edition) New York: McGraw-Hill Education.

ISBN: 978-1-259-64121-3

MHID 1-25-964121-X

The textbook can be ordered in the following bookshop: Medicina könyvesbolt, Budapest, IX. Üllői út 91/a (tel: 06-1-215-3786)

Lectures: The power point slides of the lectures can be found at:

<http://semmelweis.hu/magtud/en/education/faculty-of-medicine>

Password is given on the lectures

A thorough knowledge of the textbook is the absolute minimum for passing the exam, although in itself it may not be enough to pass it. Because the power point slides contain only the outline of each lecture, participation on the lectures is indispensable for a full understanding of the subject.

MEDICAL ASPECTS OF DISASTER PREPAREDNESS AND RESPONSE

Directorate for Safety Technology
Department for Disaster Management and Education

Supervisor: **Pál Kocsik**

Lecturer: **Csaba Csendes**

Credit value: 1

Second Semester

Purpose of the lecture:

The goal of the subject is to provide basic knowledge of the definition, mission, reasons and circumstances of establishment of civil protection/disaster management, on its place and role in the country's defense/protection system; to provide information on the types of disasters and their features. Based on experience gained in real incidents, to provide information on the peculiarities of disaster management and the tasks of medical authorities in this context.

The syllabus:

(M1) Concept, mission, tasks and establishment of civil protection and disaster management in Hungary. Types and features of disasters, the disaster vulnerability of Hungary, the organizational system of the protection against disasters, command and control of protection, the role of medical authorities.

(M2) The early warning system and signals of disaster management. The elimination of the consequences of disasters, the staff work applied during protection. Features and activities of Hungarian disaster management organizations and authorities, international possibilities of disaster management and the lessons learnt, demonstrated by examples.

Requirements and the potential for absences to participate in the sessions:

The subject consists of 4 modules. Module 1 does not have any prerequisites; module 2 anticipates the fulfillment of module 1. Students must register to attend the course announced as required. Those who are unable to fulfill module 1 or 2 (do not attend), may participate in a supplementary lesson in the 1st semester of the following year.

The method of certificate for the workshops and the exam absences:

Certificate of absence: medical, official – court of justice, local government, Students' Union, etc.

The mid-term controls' (reports, midterm) number, topic and date, replacements and repairs:

Method of making up for the absence justified by certificate: participation in a supplementary lesson.

Requirements for the signature:

Students must participate in the lesson announced to acquire signature, or in case of absence justified by certificate, in a supplementary lesson. Only registered students may participate in a supplementary lesson announced.

The method of grading: signature

Type of examination: none

Requirements: none, students must fulfill the obligation to attend the lessons.

Application for exam: none

Changing procedure for exam application: none

Absence from the examination: none

Notes, textbooks, study aids and literature list: László Major PhD – Ronald Barham PhD – Dr. György Orgován PhD: Medical Aspects of Disaster Preparedness & Response – Semmelweis Kiadó 2017. ISBN 978-963-331-420-3

BASIC CELL BIOLOGY – Department of Genetics, Cell- and Immunobiology

OBLIGATORY ELECTIVE COURSE FOR MEDICINE I. II. III. YEARS

Course Director: **Dr. Valéria László Ph.D.**

Prerequisite subject: Anatomy, Cell, Histology and Embryology I.

Credit: 3

Lectures (2 hours per week)

First semester

1. Intracellular transport mechanisms
2. Endoplasmic reticulum. Vesicular transport
3. Secretion and Golgi
4. Endocytosis. Endosomal – lysosomal system
5. Nuclear envelope and nuclear lamina. Nuclear pores and gated transport
6. Functions and malfunctions of some nuclear components
7. rRNA synthesis. Telomerase
8. Endosymbiotic cell organelles. Mitochondrion
9. Peroxisome
10. Cytoskeleton. Microtubules
11. Microfilaments and intermediate filaments
12. Cell – cell and cell – ECM adhesion and junction
13. Regulation of cell cycle I
14. Cell aging and death

Important notes: No possibility to make up of absences.
There are no mid-term exams.
Attendance of 75% of lectures is necessary for the end-term signature.
Requirement: practice grade based on the result of the written or oral exam.
(depending on the number of students).

Core text:

Alberts et al. Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546

Lecture presentations are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

CLINICAL CARDIOVASCULAR PHYSIOLOGY

Institute of Translational Medicine

Credit value: 2

Number of lessons per week: lecture: 2 seminar: 2

Subject type: elective course

Academic year: 2021/2022

Subject code: AOVTL828_1A

Name of the course leader: Dr. Zoltán Benyó

Position: professor, head of department

Objectives of the subject, its place in the medical curriculum:

To refresh and extend – in selected topics – the basic knowledge related to normal and pathological functions of the human circulatory system.

To integrate the latest scientific results related to different organization levels – from molecular mechanisms to system physiology – of the cardiovascular system.

To discuss and demonstrate measurement principles and techniques, as well as physiological and pathophysiological mechanisms related to the application of state of the art non-invasive cardiovascular diagnostic procedures in the clinical practice.

Researchers as well as skilled clinical practitioners have also been included among the lecturers to provide a translational point of view and help the transition of the students' theoretical knowledge to modern clinical cardiovascular medicine.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Semmelweis University, Centre of Theoretical Medicine

Successful completion of the subject results in the acquisition of the following competencies:

After completion of the subject, students will deepen their knowledge of the physiology and pathophysiology of the cardiovascular system, better understand the pathological processes that occur during the most common cardiovascular diseases and the potential therapeutic options. Completion of the course thus helps and establishes the acquisition of cardiovascular pharmacology, cardiology-angiology and cardiovascular surgery with sufficient detail.

Course prerequisites:

Completion of Physiology II.

Number of students required for the course (minimum, maximum) and method of selecting students:

Min: 5 students

Max: 80 students (in case of more applicants, the first 80)

How to apply for the course:

In the Neptune system.

Detailed curriculum:

- Hemodynamic background of normal and pathological cardiovascular functions; "hemodynamic exercise" and prevention of diseases (Dr. Anna Monori-Kiss)
- Modern methods for measuring and monitoring arterial blood pressure (Dr. Ákos Jobbágy), Cardiovascular effects of hypersensitivity reactions (CARPA) (Dr. László Dézsi)
- Biomechanical properties of cerebral aneurisms, their computer modeling (Dr. István Nyáry, Dr. Róbert Nagy)
- Physiological mechanisms supporting venous return of blood; orthostatic tolerance, Pathophysiology of chronic venous insufficiency (Dr. Anna Monori-Kiss)
- Investigation of blood pressure regulation by use of transgenic technologies (Dr. Zoltán Benyó)
- Cardiovascular implications of the healthy and the diseased kidney (Dr. Péter Hamar)
- Age related changes in the vascular system, role of sexual hormones. Interventional radiological procedures on arteries and veins (Dr. György Nádasy, Dr. Viktor Bérczi)
- Ultrasonic investigation of the human heart: theoretical back-

ground; 2D-, M-, Doppler-mode, color Doppler imaging, echocardiography; diagnostics of valve insufficiency and coronary diseases. Duplex ultrasonic investigation of large vessel function: measurement of vessel wall elasticity, Doppler-indexes (Dr. Domonkos Cseh, Dr. Adrienn Sárközi)

- Coronary circulation. Physiological background of the treatment of myocardial ischemia (Dr. Tamás Ivanics, Dr. Gergely Szabó)
- The cardiovascular risk and the protection of menopausal women. Alterations of the cardiovascular system in pregnancy and polycystic ovary syndrome (Dr. Gabriella Masszi, Dr. Szabolcs Várbíró)
- Role of endothelial mechanisms in clinical symptoms (Dr. Zolt Pécsvárady)
- Visit to the MRI Cardiovascular Diagnostic Unit of the Semmelweis University Heart Center (Dr. Attila Tóth)
- Vascular cognitive impairment (Dr. Zoltán Ungvári)
- Written examination

(Guest lecturers are underlined)

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

- Cardiology
- Medical Imaging
- Obstetrics and Gynecology
- Vascular Medicine
- Pathophysiology

Requirements for participation in classes and the possibility to make up for absences:

It is compulsory to attend the seminars. Students are not allowed to miss more than 3 seminars (6 lessons), otherwise the semester cannot be accepted.

Methods to assess knowledge acquisition during term time:

Theoretical knowledge will be assessed by a written test on the 14th week.

Requirements for signature:

Regular attendance (max. 3 missed seminars) of classes and successful written exam. No more than three absences from seminars are allowed; otherwise the course will not be credited.

Type of examination:

The semester performance is assessed by the result of the written test (10-15 questions based on the material of the seminars) on the 14th week.

Requirements of the examination:

The question pool for the written test is available for the registered students. The question pool contains 2 short essay-type questions and 5-10 multiple choice questions per seminar.

Method and type of evaluation:

The grade is based on the result of the test written on the 14th week. The written test will be evaluated as follows:

- 90-100% – honor (5)
- 80 – 89 % – good (4)
- 70 – 79 % – fair (3)
- 51 – 69% – pass (2)
- < 51% – fail (1)

How to register for the examination:

There is no exam in the exam period.

The exam is organized on the last seminar of the semester.

Possibilities for exam retake:

For students who cannot attend the exam for reasonable excuses, we provide extra occasions to make up for the practical exam.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Guyton and Hall Textbook of Medical Physiology 13th edition (Elsevier, 2015)

Emil Monos: Hemodynamics, biomechanics of the blood circulation, Second edition, Semmelweis Kiadó, 2011.

Emil Monos: Physiology of the venous system, Second edition, Semmelweis Kiadó, 2010

Material of the lectures and supplementing literature provided by the lecturers.

CLINICAL PHYSIOLOGY OF RESPIRATION AND RESPIRATORY DISEASES

AOVTLM768_1A

Elective course for medical students in the 3rd, 4th and 5th years.

The aims of the course are to strengthen knowledge on basic physiological principles related to respiration, summarize the most important aspects of cardiorespiratory adaptation in sport activities and also its changes in respiratory diseases and to provide integrated information about the physiological and pathophysiological background of the most important respiratory disorders in light of results from cutting edge research.

Program:

1. COVID-19 from the frontline
2. COVID-19 outcome stats
3. Personalized medicine in lung cancer
4. Asthma
5. Bronchiectasis, COPD.
6. Obstructive sleep apnoea
7. Hypoventilation syndromes
8. Translational research, biomarkers, drug development, machine learning
9. Cystic fibrosis-case presentation
10. Pneumonia
11. Invasive ventilation and intensive care, ECMO, particular aspects of COVID-19
12. Chest imaging I - Screening
13. Chest imaging II- Lung Fibrosis-COVID score, Ultrasound
14. Exam

Acknowledgement of the course: regular attendance (maximum 3 absences) is required; signature in the Neptun, and 2 credit points will be provided after a successful written exam.

CARDIORESPIRATORIC AND NEUROPHYSIOLOGICAL MEASURING METHODS

Institute of Translational Medicine

Subject type: optional

Subject code: AOSTLM770_1A

Credit value: 2

Name of the course leaders:

Prof. Dr. Zoltán Benyó, Department Head,

Dr. Habil. László Dézsi, Research Associate Professor, Course Director, Semmelweis University

(Invited Lecturers: Dr. Iván Füzes, Dipl. Electrical Engineer, Master Teacher, Semmelweis University

Prof. Dr. Ákos Jobbágy, Professor Emeritus in Electrical Engineering, Budapest University of Technology and Economics,

Dr. György L. Nádasy, Associate Professor, Semmelweis University)

Academic year: 2021/2022/1st semester

Objectives of the subject, its place in the medical curriculum:

The purpose of the course: To review the theory and practice of modern measuring methods in experimental and clinical medicine, and providing practical knowledge to medical and pharmacy students on cardiorespiratory and neurophysiological measurements. The course based on and further extends the material of the course of Medical physiology. Throughout the lectures, we put an emphasis on potential methodological errors of measurements and examinations, discussing how to avoid them.

Successful completion of the subject results in the acquisition of the following competencies:

The course offers practical knowledge to medical and pharmacy students on cardiovascular, respiratory and neurophysiological measurements based on, but further extending the course material of Medical physiology. Involving engineers into teaching, students receive real technological knowledge on a basic level. Throughout the lectures we put an emphasis on potential methodological errors of measurements and examinations, discussing how to avoid them, and so we utilize a critical approach.

Detailed curriculum:

Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks).

1. Introduction. Biomedical engineering. Design and safety requirements of biomedical equipment
2. General metrology. Basics of measurement and control theory
3. Computerized data acquisition and analysis. Telemetry systems
4. Sampling of continuous signals. Digitizing analogue signals
5. Home monitoring of cardiovascular health status. Determination of blood glucose and tissue glucose concentrations
6. Experimental study of pulmonary function. Measurements of blood gases and the acid-base balance
7. Investigating the electrical activity of the heart. Design of ECG amplifiers
8. Direct and indirect methods to determine cardiac output and peripheral blood flow
9. Neurophysiological measurements (action potentials, brain stem evoked potentials). Objective studies in audiology
10. Adaptive processes in the cardiovascular system. Investigative methods in experimental angiology
11. Measuring blood pressure in the lab and clinics (invasive and noninvasive methods)
12. Complement-related immunological and cardiopulmonary responses (CARPA)
13. Studying brain function by functional imaging systems. The linear CT method
14. Experimental methods to study pain and nociception

Requirements for participation in classes and the possibility to make up for absences:

Regular attendance is required, which will be registered. In case of absence make up of material is possible based on lecture sketches.

Methods of verification of absence from classes or the exam:

Absence can be verified by medical notice only.

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)
From the course material, no midterms are written.

Requirements for signature:

Signature will be awarded upon regular attendance of the lectures.

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

Marks are based upon the result of the written exam. Students will be graded on a 5-grade-scale:

0-49 % - 1, 50-64 % - 2, 65-79% - 3, 80-89% - 4, 90-100% - 5.

Type of examination:

Written exam + 2 re-takes

How to register for the examination?:

Personal registration by the Course Director.

How to modify the registration for the examination?:

Personal notice by the Course Director.

Possibilities for exam retake:

Upon obstacles (medical notice, or parallel exam) or failure of the exam, two re-takes are possible.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

1. A.C. Guyton: Textbook of Medical Physiology W.B. Saunders Company, 2006
2. Fonyó Attila: Principles of Medical Physiology, Medicina Kiadó, 2002
in Hungarian https://regi.tankonyvtar.hu/hu/tartalom/tamop425/2011_0001_524_Elettan/index.html
3. Lecture sketches of course tutors <https://drive.google.com/drive/folders/0B5lj4aPM88ChLU9mR0xobkpOcjg>
3. Bronzino, D. Joseph The Biomedical Engineering Handbook, 3rd Ed, CRC Taylor & Francis, 2006
https://brainmaster.com/software/pubs/brain/The_Biomedical_Engineering_Handbook_.pdf

INTRODUCTION TO THE METHODOLOGY OF CLINICAL RESEARCH I. Observational studies

Number of lessons per week: 2 **lecture:** – **practical course:** 2x45 min for 3 weeks **seminar:** 2x45 min for 11 weeks

Subject type: elective course

Academic year: 2021/2022

Subject code: AOVTL769_1A

Name of the course leader: *Dr. Zoltán Benyó*

Institute of Translational Medicine, (+36-1) 210-0306

Position: professor, head of department

Goals of the course:

Nowadays most physicians will inevitably be involved in clinical research during their careers. Many of them will participate actively in clinical research programs, while others will get in contact with clinical studies via the literature or by interpreting new clinical guidelines. Therefore, at the time of graduation physicians of the 21st century must possess skills which enable them to join research programs and critically interpret scientific evidence. The ultimate goal of the course is to prepare future doctors for these challenges by offering a curriculum which helps to acquire these skills during the academic years of their gradual studies.

The course aims to give a comprehensive insight into the methodology of clinical research. The broad spectrum of methodological approaches will be presented in 2 separate courses built on each other. The course „**Introduction to the Methodology of Clinical Research I.**” will focus on observational studies. Accordingly, the course will:

describe the types of observational studies and the pros and cons of their application

give a deep insight to clinical epidemiology

and to the ethical and legal concepts related to the planning and conduct of these studies;

describe basic concepts of biomarker and genomic research

introduce the background of the application of screening tests.

Beyond these, the course will introduce the students (without showing mathematical formulae) the statistical approaches which are closely related to the analyses of observational studies:

Within the frame of seminars, we will discuss basic biostatistical terms and principles,

and the steps of basic regression model building.

Moreover, the practicums of the course will provide opportunity to apply the knowledge acquired on seminars to real-life situations. On these labs we aim to perform 2 types of practical tasks in small student groups:

Performing simple statistical analyses on simulated patient datasets using a comprehensive statistical software package under the guidance of the tutor.

Problem-based discussion of pre-released publications, critical interpretation of the published research.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Seminar: Semmelweis University, EOK, Tűzoltó street 37-47. Hári Pál auditorium

Practicum: Semmelweis University, EOK, Tűzoltó street 37-47. Department of Biophysics and Radiation Biology

Successful completion of the subject results in the acquisition of the following competencies:

After successful completion of the subject the students:

- will be able to join research projects based on observational studies (**even as an undergraduate student!**),
- will be able to critically comprehend scientific literature related to observational studies,
- will understand the basic aspects of study design and analysis related to observational studies
- will understand the limitations and factors influencing the validity of observational studies,
- will understand the ethical and legal aspects of observational studies,
- will have basic knowledge about the statistical methodology used to properly plan and analyse observational studies

Number of students required for the course (minimum, maximum) and method of selecting students:

Minimum number students: 5

Maximum number students: 60 (the first 60 applicant can attend the course)

How to apply for the course:

Application occurs via the Neptun system

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks). Please provide the names of the teachers of the seminars and practical lessons and indicate guest lecturers. Do not use attachments!

Always attach a CV for guest lecturers!!

1st week: Types of observational studies (Dr. Monori-Kiss Anna, Institute of Translational Medicine)

- Comparison of observational and experimental studies; types of observational studies, pros and cons of their application (case reports, ecological studies, cross-sectional studies, cohort studies, case-control studies)

2nd week: Introduction to biostatistics I. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Types of variables, description of variables (mean, median, percentile, IQR); types of distribution, population vs. sample, sampling procedures, estimating the population mean, confidence intervals

3rd week: Introduction to biostatistics II. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Power, sample size; hypothesis testing; parametric vs. non-parametric probes; revision of known biostatistical tests (t-test, ANOVA, their non-parametric counterparts; Chi square test)

4th week: Workshop seminar to introduce the biostatistical analysis software package (STATA) (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Interactive presentation of the most important commands and menu points

5th week: Introduction to epidemiology (Dr. Miklós Zsuzsanna, Institute of Translational Medicine)

- The aim of clinical epidemiology; outcome measures (ratio, odds, incidence, prevalence, incidence-ratio); parameters describing the association between outcome measures and intervention/exposition/risk factors (RR, OR, RR, RD); threats to validity and strategies to handle them (confounding, bias, chance etc.)

6th week: PRACTICUM I. (Dr. Miklós Zsuzsanna, Institute of Translational Medicine)

- Clinical epidemiology. Finding an epidemiology related research question based on a simulated patient dataset and answering the question by performing statistical analysis using STATA statistical software package.

7th week: Ethical and legal aspects of observational studies. (Dr. Szentmártoni Gyöngyvér, Department of Internal Medicine and Oncology)

8th week: Applied regression I. (Dr. Ferenci Tamás, biostatistician, invited lecturer)

- Basic concepts, linear regression

9th week: Applied regression II. (Dr. Ferenci Tamás, biostatistician, invited lecturer)

- Multivariate linear regression, steps of model building

10th week: Applied regression III. (Dr. András Ittész, biostatistician, invited lecturer)

- Logistic regression

11th week: PRACTICUM II. (Dr. Monori-Kiss Anna, Institute of Translational Medicine; Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Steps of multivariate regression model building. The students will build regression models on a simulated patient dataset using STATA statistical analysis software package. They experience how the inclusion of different variables/confounders can affect results and data interpretation.

12th week: PRACTICUM III. (Dr. Szentmártoni Gyöngyvér, Department of Internal Medicine and Oncology)

- Critical interpretation and discussion of a pre-released publication (original article)

13th week : Biomarker research, genomics. (Dr. Tóthfalusi László, Department of Pharmacodynamics) Screening tests. (Dr. Terebessy András, Department of Public Health)

14th week: Test exam.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

Medical statistics, informatics and telemedicine (basic terms in biostatistics – partial overlap)

Medical ethics, bioethics (7th week seminar – partial overlap)

Special study work required to successfully complete the course:

(E.g. field exercises, medical case analysis, test preparation, etc.)

Requirements for participation in classes and the possibility to make up for absences:

Students are required to participate on 70 % of the seminars and on all practices.

We offer several occasions during the semester to make up for the missed practices.

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

Students must arrive well-prepared for the practices. Completion of the prespecified tasks will be checked by the practice tutors.

We will provide opportunities to make up for the missed practices several times during the semester.

Requirements for signature:

Students are required to participate on 70 % of the seminars and on all practices.

Type of examination:

Practical exam in the form of a written test at the end of the semester

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

Written practical exam test taken via the e-learning site (Moodle) of the university.

Students are eligible to take the exam if they have obtained the signature.

The written test will be compiled from problem-oriented multiple choice questions which are based on the on-line available seminar material (digests, slide shows, scripts) and the practical knowledge acquired on lab practices. We will provide sample test questions during the semester.

The test will be graded as follows:

90-100% – (5)

80 – 89 % – (4)

70 – 79 % – (3)

60 – 69% – (2)

< 60 % – (1)

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

The final mark will be a 5-grade practical mark obtained on the practical exam test organized in the last week of the semester.

How to register for the examination?:

There is no exam in the exam period.

The practical exam is organized on the last seminar of the semester.

Possibilities for exam retake:

For students who cannot attend the practical exam for reasonable excuses, we provide extra occasions to make up for the practical exam.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Obligatory:

- On-line uploaded material (digests, practicum descriptions, scripts, slide shows).

Recommended:

- Bernard Rosner. Fundamentals of Biostatistics. Cengage Learning Inc. (2010)
- Kenneth J. Rothman Epidemiology - An Introduction. Oxford (2012)

INTRODUCTION TO THE METHODOLOGY OF CLINICAL RESEARCH II. – Experimental studies

Credit value: 2

Number of lessons per week: 2 **lecture:** – **practical course:** 2 × 45 min for 3 weeks **seminar:** 2 × 45 min for 11 weeks

Subject type: elective course

Academic year: 2021/2022

Subject code: AOVLM769_2A

Name of the course leader: *Dr. Zoltán Benyó*

Goals of the course:

Nowadays most physicians will inevitably be involved in clinical research during their careers. Many of them will participate actively in clinical research programs, while others will get in contact with clinical studies via the literature or by interpreting new clinical guidelines. Therefore, at the time of graduation physicians of the 21st century must possess skills which enable them to join research programs and critically interpret scientific evidence. The ultimate goal of the course is to prepare future doctors for these challenges by offering a curriculum which helps to acquire these skills during the academic years of their gradual studies.

The course aims to give a comprehensive insight into the methodology of clinical research. The broad spectrum of methodological approaches will be presented in 2 separate courses built on each other.

The course „**Introduction to the Methodology of Clinical Research II.**” will focus on experimental studies. Accordingly, the course will:

- describe the types of experimental studies and the pros and cons of their application;
- discuss the scientific, statistical and economic aspects of experimental study designs;
- discuss the ethical and legal concepts related to the planning and conduct of these studies;
- emphasize the role of clinical trials in the introduction of new therapies to clinical practice and
- give introduction to the background of the application of methodologies related to clinical trials (questionnaires, systematic review, metaanalysis).

Beyond these, the course will introduce the students (without showing mathematical formulae) the statistical approaches which are closely related to the analyses of experimental studies:

- We will emphasize the utilization of basic biostatistical terms and principles we learnt on the first course in clinical trials
- and discuss the principles of survival analysis and analysis of longitudinal studies.

Moreover, the practicums of the course will provide opportunity to apply the knowledge acquired on seminars to real-life situations. On these labs we aim to perform 2 types of practical tasks in small student groups:

- Performing simple statistical analyses on simulated patient datasets using a comprehensive statistical software package under the guidance of the tutor.

Problem-based discussion of informed consent forms and critical interpretation of published research.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Seminar: Semmelweis University, EOK, Tűzoltó street 37-47. Hári Pál auditorium

Practicum: Semmelweis University, EOK, Tűzoltó street 37-47. Department of Biophysics and Radiation Biology

Successful completion of the subject results in the acquisition of the following competencies:

After successful completion of the subject the students:

- will be able to join research projects based on experimental studies (**even as an undergraduate student!**),
- will be able to critically comprehend scientific literature related to experimental studies,
- will understand the basic aspects of study design and analysis related to experimental studies
- will understand the limitations and factors influencing the validity of experimental studies,
- will understand the ethical and legal aspects of experimental studies,
- will have basic knowledge about the statistical methodology used to properly plan and analyse experimental studies
- will be able to perform simple survival analyses and will understand the problematics of correlated outcomes

Course prerequisites:

Successful completion of Introduction to the Methodology of Clinical Research I. – Observational studies (AOVKIK553_1A)

Number of students required for the course (minimum, maximum) and method of selecting students:

Minimum number students: 5

Maximum number students: 60 (the first 60 applicant can attend the course)

How to apply for the course:

Application occurs via the Neptun system

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks). Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments!

Always attach a CV for guest lecturers!

1st week: Experimental studies (Dr. Miklós Zsuzsanna, Institute of Translational Medicine)

- comparison of observational and experimental studies; types of experimental studies, pros and cons of their application, the methods of randomization

2nd week: Ethical aspects of clinical trials. (Dr. Szentmártoni Gyöngyvér, Department of Internal Medicine and Oncology)

- ethical issues, ethical approval, the informed consent

3rd week: Issues related to study design and implementation. (Dr. Szentmártoni Gyöngyvér, Department of Internal Medicine and Oncology, Dr. Monori-Kiss Anna, Institute of Translational Medicine)

- elements and importance of the research protocol, factors influencing the study design

4th week: PRACTICUM I. (Dr. Szentmártoni Gyöngyvér, Department of Internal Medicine and Oncology)

- critical interpretation of the informed consent process using sample forms

5th week: Correlated outcomes I. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- The problematics of correlated outcomes, characteristics of longitudinal data

6th week: Correlated outcomes II. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Analysis of correlated outcomes with LME models

7th week: PRACTICUM II. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Analysis of simulated longitudinal datasets with correlated outcomes using STATA statistical software package.

8th week: Survival analysis. (Dr. Veres Dániel, Department of Biophysics and Radiation Biology)

- Clinical application of survival analysis. Statistical methods related to survival analysis (log rank test, hazard ratios, Cox regression)

9th week: PRACTICUM III. (Dr. Miklós Zsuzsanna, Institute of Translational Medicine)

- Construction of Kaplan-Meier survival curves, log rank analysis and Cox regression analysis on simulated patient datasets using Stata statistical software package

10th week: Supplementary methodologies. Big data (Dr. Monori-Kiss Anna, Institute of Translational Medicine)

- How to make a perfect questionnaires. The features and analysis of Big Data.

11th week: The clinical phase of drug development (Dr. Tóthfalusi László, Department of Pharmacodynamics)

- Phase I-IV studies. Aims, methods, implementation.

12th week: Economic exploitation of scientific results. (Dr. Lacza Zsombor, Institute of Translational Medicine)

- patents, introduction to the market

13th week: From data to evidence. (Dr. Ferenci Tamás, biostatistician, invited lecturer)

- metaanalysis, systemic review

14th week: Test exam.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

Introduction to the Methodology of Clinical Research I. – Observational studies (prerequisite – some basic concepts are revised)
Medical statistics, informatics and telemedicine (basic terms in biostatistics – partial overlap)
Medical ethics, bioethics (7th week seminar – partial overlap)

Special study work required to successfully complete the course:
(E.g. field exercises, medical case analysis, test preparation, etc.)

Requirements for participation in classes and the possibility to make up for absences:

Students are required to participate on 70 % of the seminars and on all practices.
We offer several occasions during the semester to make up for the missed practices.

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)
Students must arrive well-prepared for the practices. Completion of the prespecified tasks will be checked by the practice tutors.
We will provide opportunities to make up for the missed practices several times during the semester

Requirements for signature:

Students are required to participate on 70 % of the seminars and on all practices.

Type of examination:

Practical exam in the form of a written test at the end of the semester

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

Written practical exam test taken via the e-learning site (Moodle) of the university.

Students are eligible to take the exam if they have obtained the signature.

The written test will be compiled from problem-oriented multiple choice questions which are based on the on-line available seminar material (seminar digests, slide shows, scripts) and the practical knowledge acquired on lab practices. We will provide sample test questions during the semester.

The test will be graded as follows:

- 90-100% - (5)
- 80 – 89 % - (4)
- 70 – 79 % - (3)
- 60 – 69% - (2)
- < 60 % - (1)

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

The final mark will be a 5-grade practical mark obtained on the practical exam test organized in the last week of the semester.

How to register for the examination?:

There is no exam in the exam period.
The practical exam is organized on the last seminar of the semester.

Possibilities for exam retake:

For students who cannot attend the practical exam for reasonable excuses, we provide extra occasions to make up for the practical exam.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Obligatory:

- On-line uploaded material (seminar digests, practicum descriptions, scripts, slide shows).

Recommended:

- Bernard Rosner. Fundamentals of Biostatistics. Cengage Learning Inc. (2010)
- Kenneth J. Rothman Epidemiology - An Introduction. Oxford (2012)

CLIMATE CHANGE AND HEALTH IN SOCIOLOGICAL PERSPECTIVES

Institute of Behavioral Sciences

Lecturer: László Antal Z.

Credit: 2

Code: AOSMAG372_1A

Thematics:

- 1. week: The history of climate change science
- 2. week: Climate change and society, sociological perspectives
- 3. week: Animal and plant health impacts of climate change
- 4. week: Human health impacts of climate change
- 5. week: Consumer society and environmental boundaries
- 6. week: Demographic processes and environmental boundaries
- 7. week: Climate change and health care
- 8. week: Adaptation to climate change
- 9. week: Adaptation to heat waves and to UV radiation
- 10. week: Adaptation to climate change at local level
- 11. week: Civil society, social movement and climate change
- 12. week: Climate communication
- 13. week: Climate change and the social values

ULTRASONOGRAPHY IN OBSTETRICS AND GYNECOLOGY

(obligatory elective course – 6th semester)

AOVNO1554_1A

Course director: **Prof. Dr. János Rigó**

Lecturer: **Dr. Gábor Szabó PhD**

Department: First Department of Obstetrics and Gynecology

Study time: In every second week 2x45 minutes. Advised Semester: between 6. und 12. Semester

Exam: Written test and practical note

Credit: 1

Minimal/maximal participants: (1/5 person)

Application deadline: 1. December

Prerequisite: Completion of second year

The knowledge gained in theoretical basic subjects (anatomy, physiology) can be used by medical students as practical knowledge in the clinic. As a result of more than four decades of experience, ultrasound examination has a fundamental role in modern obstetrical and gynecological diagnostic. The course helps you to acquire skill in this field. Performing obstetrical-gynecological ultrasound tests and assessment of findings can only be learned through appropriate training. This non-invasive procedure is also safe for patients. The modern ultrasound equipment of the Department and the wide range of patients and diseases provide the opportunity for learning. Not only obstetricians and gynecologists, but also other associate colleagues such as clinical genetics, radiologists, gynecological cancer surgeons, anesthetists, and intensive therapists can utilize the knowledge provided by the subject.

Themes:

Physical basics of ultrasound examination. Parts of the ultrasound device. Application modes (amplitude, motion, brightness, Doppler). Gynecological ultrasound examination. Early pregnancy tests. Ectopic pregnancy. Standard planes of the first ultrasound screening during the 11-13th week of pregnancy. Neurosonography and fetal echocardiography. Standard planes of the second ultrasound screening during the 18-22th week of pregnancy. Ultrasound examinations in the third trimester. Amniotic fluid index and fetal Doppler examinations. 3-4-dimensional ultrasound examinations and their practical application.

THE SCALPEL AND THE PARAGRAPH: SPECIAL ISSUES OF MEDICAL PRACTICE IN LIGHT OF THE LAW

elective subject

Lecturer: Prof. Dr. József Kovács

Department of Behavioural Sciences

1st semester

2 hours / week

Within the framework of the course the participants, who have an affinity for Bioethics and Law, will gain insight into the special characteristics of the legal domain and certain fundamental legal concepts and methods that are relevant for a practicing physician, but cannot be sufficiently investigated into within the framework of other compulsory courses. The course considers the general part of medical law governing the legal relationship between medical practitioners and their patients, first by distinguishing between civil law and criminal law and explaining their respective characteristics. The legal position, the customary rights and obligations of physicians and patients are examined, together with the issues of informed consent. Topics will also include the civil and criminal liability of physicians and the issue of malpractice. Selected medico-legal issues over human life are also examined; these will include foetal rights, modern reproductive technologies, various aspects of human genetic research, and certain end-of-life issues such as advance directives and euthanasia. The foregoing topics will be discussed from the perspective of comparative law, by presenting various court cases from the countries of the European Union and the United States of America as well. Attending students will gain the ability to recognise and analyse legal health care issues by engaging in interactive discussions and informative research.

Attending students will gain insight into the special characteristics of the legal way of thinking, the basic concepts of civil and criminal law, and also the approach to the most controversial medico-legal issues in the European Union and the United States.

Students intending to practice in any field of medicine may find the course profitable.

Minimum number of participants: 10

Maximum number of participants: 20; applications are accepted through the „Neptun” system.

Students are to register through the „Neptun” system. No special achievement/prior completion of other course(s) is required.

Thematics:

1. Introduction: Aims and objectives of the course; presentation of the interdisciplinary method (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
2. The concept of „law”; the branches of law particularly relevant for medical practice (civil/private law; criminal law) (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
3. The human being and the law. Legal personhood and capacity to act. Man as a subject to fundamental human rights. (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
4. The parties to a medical legal relationship: doctor and patient. The legal position of the physician and the patient; their principal rights and obligations in the various legal systems (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
5. Creating a doctor-patient relationship: informed consent in the member countries of the European Union and in the USA (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
6. Various legal models of the doctor-patient relationship (mandate agreement, service agreement, treatment agreement etc.) (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
7. The physician and civil liability: malpractice/liability for damages in the member countries of the European Union and in the USA (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
8. The physician and criminal liability: specific criminal offences that can be committed by a physician/health care specialist (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
9. The beginnings of human life and the law: legal position of the human foetus in the various legal systems (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).

10. The beginnings of human life and the law: surrogacy and the legal issues generated by the recent developments in assisted human reproduction in Europe and in the world (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
11. The issues of medical research on humans: the framework set up by law (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
12. End-of-life decisions and the law: the “living will” and other forms of advance directives in the various legal systems; the refusal of life-saving treatments (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
13. End-of-life decisions and the law: euthanasia in the member countries of the European Union and in the USA (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).
14. Review of the semester; suggestions, observations and proposals (instructor: dr.iur. Orsolya Marta Peter PhD, Lecturer).

Participants will meet weekly (2 hours/week) as a discussion/seminary group.

Participating students are required to prepare and hold an oral presentation (15-20 mins) about a preferred medical legal issue, to be previously approved by the instructor. A suitable schedule for such presentations will be worked out together with the students.

Students are required to attend at least 75% of the meetings; a maximum of 4 (four) absences is acceptable. Attendance will be verified at the beginning of each meeting. In the event of more than 4 (four) absences an additional oral presentation or an essay will be required, provided such excessive absence is unjustified.

No medical certificate/other proof is required up to the maximum number (4) of excused absences. In the event of more than 4 (four) absences an authentic proof of justifiable absence is accepted.

„Aláírás” (the instructor’s „signature” indicating the fulfilment of the term requirements) will be granted as follows:

1. Preparation and actual holding of an oral presentation.
2. Proper attendance (max. 4 absences; proper justification or additional work in the event of more than 4 absences)

The performance of participating students will be graded as follows:

1. Excellent (5): less than four absences; active and constructive participation in group discussions; an oral presentation of outstanding quality.
2. Satisfactory (3): regular attendance; an oral presentation of good quality.
3. Insufficient (1): more than four absences without proper justification; no presentation or presentation of an inferior quality.

Participants will be given a „gyakorlati jegy” (term mark) at the end of the semester; no further examination is required.

Recommended reading materials:

Kuhse – Singer: A Companion to Bioethics, 2nd Edition (Wiley-Blackwell)

Kuhse – Singer: Bioethics. An Anthology, 2nd Edition (Blackwell)

See also the extensive bibliography in Kuhse-Singer

HUNGARIAN MEDICAL TERMINOLOGY V.

Responsible organisational unit:

Department of Languages for Specific Purposes

Programme director:

Dr. Katalin Fogarasi-Nuber, associate professor, Director

4 lessons per week, 2 credits,

Assessment: midterm (written) and endterm (written and oral) tests and a final examination

Role of subject in fulfilling the aim of training:

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective professional communication in the language they use during their field practice. With the help of this course they become able to communicate with the patients in the Hungarian hospitals.

Brief description of subject:

The last module covers the terminology of the main body systems and provides further training in taking history. The symptoms, diseases and common treatments of the diverse body systems (respiratory, cardiovascular, urinary, digestive and endocrine) are discussed during the semester.

Course content of practical lessons:

Lesson 1-4:	Communication practice (family and social history)
Lesson 5-6:	Communication practice (internal medicine – medical history)
Lesson 7-8:	Communication practice (treatments, medication)
Lesson 9-10:	Common illnesses - symptoms
Lesson 11-16:	The respiratory system
Lesson 17-22:	The cardiovascular system
Lesson 23-24:	Consolidation
Lesson 25-26:	Test 1 + situation
Lesson 27-32:	The urinary system
Lesson 33-38:	The digestive system
Lesson 39-44:	The Endocrine system
Lesson 45-50:	Consolidation
Lesson 51-52:	Test – situation, communication practice
Lesson 53-56:	Mock final exam (oral part), assessment

Course material, recommended text book(s), professional literature and supplementary reading(s)

Marthy Annamária – Végh Ágnes. *Egészségére! - Magyar orvosi szaknyelv*. Semmelweis Egyetem Egészségtudományi Kar, 2010.

PHYSICAL EDUCATION V-VI.

Practice: 1 hour per week

SUMMER (INTERNAL MEDICINE) PRACTICE

Managing (and contributing) institutes:

Hajnal Imre Internal Medical Clinic

In English: Internal medicine summer practical

Total hours: practice: 6 hours daily for 1 month

Type of course: compulsory

Course code: AOKNSG600

Responsible for course: Prof. Dr. Tamás Masszi

Aim of the course, its position in the medical curriculum:

The main aim of the internal medicine summer practical following the 6th semester is, apart from practicing taking medical history and performing physical examination, detailed introduction to and participation in practical clinical work, as well as utilisation of obtained pre-clinical knowledge. Acquiring the basics of the integrative approach of internal medicine, practicing differential diagnostics.

Location of course (address of lecture-hall, seminar room, etc.):

SE Hajnal Imre Internal Medical Clinic, H-1085 Budapest, Üllői út 26.

External training sites (see list of accepted practical locations)

Acquired competences after successfully completing the course:

Practical and internal medical utilisation of knowledge obtained during theoretical courses and propaedeutics within the internal medicine famulus practical. The goal is that the student is able to receive the patient, start examination, set up diagnostic and, as far as possible, treatment plan, as well as to perform routine treatment, under supervision. Furthermore, the aim is to acquire professional and human communication skills with medical staff, patients and their relatives.

Prerequisite(s) for admission to the course:

Attendance requirements of propaedeutics and signature in propaedeutics. Successful exam in propaedeutics is not a criteria for attending summer practical.

Student enrolment requirements (minimum, maximum), method of student selection:

Based on registration in the Neptun system maximum 25 students per shift per clinic.

How to apply for course:

In Neptun system

Detailed syllabus:

Students participate in practice 6 hours daily, 5 days a week for 1 month. Students take part once for an evening or weekend shift on call for 6+ hours.

General syllabus:

Introduction to the internal medical ward and the hospital.

Examination of patient, treatment of assigned patients at an assistant physician level under supervision, according to only partial pharmacological knowledge.

Medical history:

- taking medical history of patient, documenting the organised collected information with medical terms.
- interpretation of medical history in patient's documentation (abbreviations, recognition of connection of events)
- considering an expected home treatment based on medical history

Medication

- connecting the name of the patient's medications with the active ingredients
- identifying indication of drugs (in medical history)
- setting up a medical treatment plan for the condition indicated upon admission

Physical examination

- practicing head-to-toe examination and its professional description
- practicing targeted examination (e.g. patient with dyspnoea, anaemia, hepatic cirrhosis)
- recognising connection between acquired results of physical examination and medical history

Practicing the most important medical interventions

- Measuring pulse, blood pressure, temperature, weight, blood glucose
- Administration methods of medication
- Blood sample collection, injection administration, insulin administration, utilisation of pen (perhaps insulin pump)
- Prepare and administer infusions with supervision, introduction to transfusion
- Utilisation of diagnostic devices (ECG, Doppler, ultrasound, monitor, blood gas)

Introduction to patient's documentation (patient's chart, medical record, glucose chart, fluid chart, critical patient sheet), individual documentation. Professional demonstration of patient case known and followed by student on clinical rounds.

Acquiring skills of communication with patient and relatives, especially of informing patient and confidentiality. Become familiar with informed consents required for interventions, their introduction to patient, obtaining consent.

As far as possible, participation in consultations, in imaging diagnostics, in examination with devices, in clinical pathological consultations, especially in case of patient's known by student.

Participation in professional consultations of the institute.

Schedule

8:00-8:15	AM short meeting about events of night shift, daily tasks
8:15-9:30	AM medical rounds at ward - making rounds in the ward with the ward physician
9:30-10:00	AM clinical case consultation
10:00-10:20	AM coffee break
10:20-11:00	AM participation in ward tasks, participation in scheduled examinations, admission of new patients
11:00 AM-12:00	PM medical rounds with senior physician of ward
12:00-12:30	PM midday medical consultation
12:30-01:00	PM lunch break
01:00-01:30	PM assessment of and consultation on laboratory findings
01:30-02:00	PM consultation on daily tasks, reviewing and correction of documentation, reviewing activities log book, discussion of home study

Cross-border issues of the given course related to other courses (compulsory and elective). Possible overlaps in curriculum: general hospital bedside practice, practical basics of clinical courses

Special study work required to complete the course:

Activities

The student prepares an activity log book during the practical. Each student follows the patient turnover of a hospital bed. Student prepares medical record for the patient assigned to the bed and documents daily events. Student may analyse and explain patient's medication, details of therapy (e.g. choice of antibiotics, adjusting medication of cardiac insufficiency, etc.). Student may document main points of examinations, interventions, consultations they participated in during the day. The log book may be electronic or hand-written.

Requirements for participation in classes and opportunities to make up for absences:

According to the Studies and Exams Code, the criteria for obtaining signature is at least 75% participation in the practical.

Examination of acquired knowledge during term:

cannot be interpreted

Type of exam: report

Exam requirements:

Presentation of activity log book, exam on the subjects listed in the general syllabus within the context of a bedside consultation.

Method and type of class marks:

The completion of the practical is confirmed by a signature. Confirmation is given based on the activity shown during the practical and the complex patient examination at the end of the practice.

How to apply for the exam:

Application happens automatically when applying for the practical.

Opportunity to repeat the exam:

you will not receive a failing mark for this exam, no repetition is required

The list of printed, electronic and online notes, textbooks, study aids and literature to be used for to learn the curriculum (in case of online sources, html address):

A belgyógyászat alapjai (Tulassay, Zs. ed., 2016)

A belgyógyászat alapjai (Tulassay, Zs. ed., 2017)

Belgyógyászati diagnosztika (Petrányi, Gy., 2009)

Belgyógyászati fizikális diagnosztika (Szarvas, F.-Csanády, M., 2005)

Oxford Textbook of Medicine (Weatherall, Ledingham, Warrel, 10th ed. 2017).

Harrison's Principles of Internal Medicine 18th ed. (McGraw-Hill, 2017).

Herold Internal Medicine, B+V (medical and technical) Lap- és Könyvkiadó Kft., 2009)

Practical examination

1. taking medical history of a given patient, documenting the organised collected information with medical terms, complete physical examination of patient and its professional presentation (may be performed previously during the days before the exam, student is expected to present the documentation in the test)
2. theoretical and practical consultation on one item of the exam items.

Exam items

1. targeted examination of patient with dyspnoea
2. targeted examination of patient with anaemia
3. targeted examination of patient with renal insufficiency
4. targeted examination of patient arriving with chest pain
5. targeted examination of patient with fever
6. measurement of pulse, bedside diagnostics of vascular stenosis
7. blood pressure measurement technique, ABPM, assessing values of blood pressure measured at home
8. describing transfusion process (indication, choosing blood supply, bedside tasks)
9. blood glucose measurement (technique), assessing glucose chart, therapy recommendations
10. practical instructions on insulin treatment, describing utilisation of pen
11. primary/hospital treatment of hypoglycaemic patient
12. primary treatment of patient with ketoacidosis
13. diagnosis and treatment of pleural effusion
14. diagnosis and treatment of ascites
15. arterial blood gas analysis (technique, assessment)
16. recognising septic patient/patient in critical condition (ABCDE), report on condition (SBAR)
17. examination procedure of patient with icterus
18. utilisation of bedside ultrasound device
19. administration methods of medication, preparation of infusion
20. placement technique of urinary catheter

OBLIGATORY ELECTIVE AND ELECTIVE SUBJECTS – SCHEDULE OF THE BASIC AND PRE-CLINICAL MODULES (1st, 2nd & 3rd year) – Find detailed curricula after the 5th year

OBLIGATORY ELECTIVE SUBJECTS

1st semester					
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
History of Medicine	2	–	2	pract. mark	–
Developmental Biology I.	2	–	2	pract. mark	Anatomy, Cell, Histology and Embryology II.
Library Informatics	2	–	3	pract. mark	–
Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.
Basic Cell Biology	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
Teaching assistance (Demonstrator)	1	–	1	pract. mark	Only 2 nd year students and up with an average of 3,51 from the previous school year and having achieved a final grade of “good” (4) or better in the course related to the teaching assistant work
Teaching assistance II. (Demonstrator)*	1	–	1	pract. mark	–
Work within the union of research students (TDK munka)	1	–	1	pract. mark	–
Introduction to Clinical Medicine	2	–	2	pract. mark	Medical Profession
Medical Profession	0,67	1,33	2	pract. mark	–
Mathematical and Physical Basis of Medical Biophysics	1	–	1	pract. mark	–
2nd semester					
History of Medicine	2	–	2	pract. mark	–
Clinical anatomy – propedeutics	2	–	2	pract. mark	Anatomy, Cell, Histology and Embryology III.
Developmental Biology II.	2	–	3	pract. mark	Developmental Biology I.
Clinical cardiovascular physiology	2	–	2	pract. mark	Medical Physiology II.
Introduction to Medical Informatics	–	1	1	pract. mark	Medical Profession
Library Informatics	2	–	3	pract. mark	Med. Fac.: Medical Physiology II. Dent. Fac.: Medical and Dental Physiology I.
Teaching assistance (Demonstrator)	1	–	1	pract. mark	Only 2 nd year students and up with an average of 3,51 from the previous school year and having achieved a final grade of “good” (4) or better in the course related to the teaching assistant work
Teaching assistance II. (Demonstrator)*	1	–	1	pract. mark	–
Work within the union of research students (TDK munka)	1	–	1	pract. mark	–
Preclinical and clinical neuropsychopharmacology and psychopharmacogenetics	1	–	1	pract. mark	Previous attendance of courses in Biology, Physiology and Biochemistry
The Scalpel and the Paragraph: Special Issues of Medical Practice in Light of the Law	2	–	2	pract. mark	–
Ultrasonography in obstetrics and gynecology	1	–	1	pract. mark	completion of second year
Introduction to Clinical Anatomy	2	–	2	pract. mark	Macroscopic Anatomy and Embryology I-II.; Microscopic Anatomy and Embryology I-II.

ELECTIVE SUBJECTS

1st semester					
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
Art of Learning	2	–	2	pract. mark	–
Social media in medicine	2	–	2	pract. mark	–
The theory and the practice of Mindfulness Based Stress Reduction	2	–	2	pract. mark	–
Introduction to Epigenetics	2	–	2	pract. mark	Immunology
Lessons in Digital Health	2	–	2	pract. mark	–
Traditional Chinese Medicine	2	–	2	pract. mark	basic module
Highlights on Mental Health and Mental Treatment (Culture in Medicine II.)	2	–	2	pract. mark	–
Culture in Medicine, Culture of Medicine	2	–	2	pract. mark	–
Basic Cell Biology	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
Cardiorespiratorical and neurophysical measuring techniques	2	–	2	pract. mark	Medical Physiology II.
Jewish Medical Ethics I.	2	–	2	pract. mark	–
History of Medical Professionalism	2,5	–	2	pract. mark	–
Introduction to Pharmacological Research	2	–	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I.
Basics of Medical Chemistry	2	–	3	pract. mark	–
Medical Genomics	2	–	2	pract. mark	Medical Biochem., Molecular and Cell Biology I, II, III
Cardiac Electrophysiology	2	2	2	semi-final	Medical Physiology I.
2nd semester					
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
Art of Learning	2	–	2	pract. mark	–
Clinical Hungarian	–	4	2	pract. mark	Hungarian Medical Terminology V.
Medical Terminology II.	–	2	2	pract. mark	–
Disruptive Technologies in Medicine	2	–	1	pract. mark	–
Pathobiochemistry	2	–	2	pract. mark	Medical Biochemistry II.
Social media in medicine	2	–	2	pract. mark	–
Traditional Chinese Medicine	2	–	2	pract. mark	basic module
Culture in Medicine, Culture of Medicine	2	–	2	pract. mark	–
Problem based medical physiology	2,5	–	4	pract. mark	Medical Physiology II.
Clinical cardiovascular physiology	2	–	2	pract. mark	Medical Physiology II.
History of Medical Professionalism	2,5	–	2	pract. mark	–
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite

Sexual genetics	2	–	2	pract. mark	Anatomy, Cell, Histology and Embryology II. Biochemistry, Molecular and Cell Biology I.
Jewish Medical Ethics II.	2	–	2	pract. mark	–
Chemotaxis – Its significance in biology and clinical sciences	2	–	2	pract. mark	Medical Chemistry
Introduction to Pharmacological Research	2	–	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I. or Medical Biochemistry I.
Systems Neuroscience	–	2	2	pract. mark	–
Clinical Gastroenterology	2	–	3	pract. mark	Internal Medicine – Propedeutics
Climate Change and Health in Sociological Perspectives	2	–	2	pract. mark	Medical Sociology
Pathobiochemistry	2	–	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology II.
Hate Crimes	2 hours	14 hours	1	oral semifinal	Medical Sociology, Medical Physiology II.
Introduction to Principles of Students' Scientific Research	2	–	1	pract. mark	completion of the 1 st and 2 nd semester
Biomedical Innovation for the 21 st century	2	–	2	pract.mark	recommended from 2 nd year

CLINICAL MODULE



Faculty of Medicine
4th year

STUDY PROGRAMME

Fourth Year in the 2021/2022 academic year

4th and 5th Years (7th-10th semesters)

Teaching is done in “clean” blocks: Theory + Practice + Exam. (Practices are taught by “shadowing”)

The time span of each block depends on the credit value of the subjects: 1 to 5 weeks

Pharmacology and Pharmacotherapy is taught on a weekly regular basis for 2*14 weeks in the 7th and 8th semesters

For example: based on a subject of 2 credits:

- 2 credits × 14 lessons = 28 lessons (1 semester consists of 14 weeks. The number of credits are equal with the lessons in a week)
- Education is provided as 8 lessons in a day: 4 days × 8 lessons = 32 lessons
- the training and the exam must be completed in 2 weeks
- approx. 40 students will be trained by providing 4 days of training and 2 days of exams within 10 working days.

7th and 8th semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	praticce (h/week)			
Internal Medicine (Metabolism, Endocrinology, Gastroenterology, Nephrology)	13	19+21	4	Internal Medicine - Propedeutics Medical Physiology II. Medical Microbiology II.	semi-final
Cardiology, Heart Surgery, Angiology, Vascular Surgery	2	4,5	6	Medical Microbiology II, Pathology II., Internal Medicine - Propedeutics	semi-final
Surgery	3	3	6	Anatomy, Histology, and Embryology IV., Basic Surgical Techniques, Pathology II.	semi-final
Traumatology	18	26	3	Pathology II. Basic Surgical Techniques Medical Imaging*, Surgery I-II.* (*The prerequisite is that registration has been done for the marked subject – corequisite - as well)	semi-final
Orthopedics	12	48	3	Anatomy, Histology, and Embryology IV., Pathology II., Surgery I-II.*	semi-final
Medical Imaging	1	2	3	Pathology II. Behavioural Science I. (Medical communication) Medical Biophysics II.	semi-final
Otorhinolaryngology	14	28	3	Anatomy, Histology, and Embryology IV., Basic Surgical Techniques Surgery I-II.*	semi-final

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	pratic (h/week)			
Dermatology	1,5	2,5	4	Pathophysiology II., Internal Medicine I.*, Pharmacology II.	semi-final
Oral Surgery and Dentistry	–	28	2	Anatomy, Histology, and Embryology IV., Basic Surgical Techniques Pathology II.	semi-final
Laboratory Medicine	1,5	1	3	Internal Medicine – Propedeutics, Pathology II., Basic Surgical Techniques	semi-final
Pulmonology – Thoracic Surgery	1,5	2,5	4	Pathology II., Basic Surgical Techniques Internal Medicine - Propedeutis	semi-final
Oncology and Reconstructive Oncoplastic Surgery	1	2	3	Pharmacology II., Pathology II., Basic Surgical Techniques	semi-final
Emergency Medicine and Oxyology	1	1,5	2	Internal Medicine I.*, Cardiology, Cardiac Surgery, Angiology, Vascular Surgery*	semi-final
Pharmacology and Pharmacotherapy I (7th semester)	2,5	2,5	5	Medical Physiology II, Medical Biochemistry III, Molecular Cell Biology II OR Medical Biochemistry, Molecular and Cell Biology III, Pathophysiology II OR Pathophysiology and Clinical Lab. Diagnostics II.	semi-final
Pharmacology and Pharmacotherapy II. (8th semester)	2,5	2,5	5	Pharmacology and Pharmacotherapy I, Medical Microbiology II., Internal Medicine I OR Internal medicine – propedeutics	final
Family Medicine	1	1	2	Internal Medicine - Propedeutics	semi-final
Medical Ethics, Bioethics	2	0	2	Medical Psychology	semi-final
PE VII.	0	1	0	PE VI.	signature
PE VIII.	0	1	0	PE VII.	signature
Summer Practice – Surgery	1 month		1	Surgery	pract. mark
The Medical Basis of Disaster Management III.	2/semester		0	The Medical Basis of Disaster Management II.	signature
The Medical Basis of Disaster Management IV.	2/semester		0	The Medical Basis of Disaster Management III	signature

*The prerequisite is that registration has been done for the marked subject – corequisite - as well

LIST OF TEXTBOOKS (The list may change!)

- 1 Cecil's Essentials of Medicine. Ed. Andreoli, Carpenter, Griggs. Loscalzo.W.B. Saunders. 5th ed. 2001. ISBN 0-7216-8179-4
- 2 Adler: ABC of AIDS. 1993. 3rd ed. ISBN 727907611. BMJ
- 3 Adler: ABC of Sexually Transmitted Diseases. 3rd ed. 1995. ISBN 72790261X. BMJ
- 4 Becker,W.- Naumann,H.- Pfaltz R.: Ear, Nose and Throat Diseases. Thieme. Stuttgart, New-York, 1994. ISBN 0-86577-536-2 or 3-13-671202-3
- 5 Répássy,G.: Otolaryngology. Eger, Radó Ny. 2000.
- 6 Churchill's pocketbook of cardiology. Grubb, NR-Newby,D.E. Edinburgh 2006.
- 7 Adams,J.C-Hamblen,D.L.:Outline of Orthopaedics. 12th ed. Churchill Livingstone, Edinburgh, 1995. ISBN 0443 05149 6
- 8 Horst Cotta: Orthopaedics. Georg Thieme Verl. New York, 1980. ISBN 3-13590001-0
- 9 Szendrői Miklós (szerk.): Orthopaedics. Semmelweis Kiadó, 2008. ISBN 978 963 9656 93 2
- 10 Bourne, Brewis: Lecture Notes on Respiratory Disease. Blackwell. 5th ed. 1998. ISBN 0-632-04968-5
- 11 Sabiston Essentials of Surgery. Saunders. 1994. ISBN 0-7216-3492-3.
- 12 Szabó Gy.ed: Oral and Maxillofacial Surgery. Semmelweis Kiadó, Budapest, 2001.
- 13 Szende B.-Suba Zs.: Introduction to Histopathology. Medicina, Budapest, 1999.
- 14 Koerner KR: Manual of Minor Oral Surgery for the General Dentist, Blackwell Munksgaard, 2008
- 15 Peitzman B.A,Rhodes M, Schwab C.W, Yealy M.Y, Fabian C.T: The Trauma Manual: Trauma and Acute Care Surgery, Third edition, Publisher: Wolters Kluwer / Lippincott Williams & Wilkins
- 16 Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9
17. Conrad Fischer—Caterina Oneto (2016): Medical Ethics for the Boards. (Third edition) New York: McGraw-Hill Education. ISBN: 978-1-259-64121-3 ;MHID 1-25-964121-X

Recommended textbooks:

- 1 Cecil Textbook of Medicine. 21th ed. W.B. Saunders, 2000. Vol.1-2.
- 2 Lynn S. Bickley: Bates' Guide to Physical examination and history taking
- 3 Tulassay Z. (Ed): A belgyógyászat alapjai (I.-II.)
- 4 Internet links for Internal Medicine
- 5 Current Medical Diagnosis and Treatment. (Ed.)Tierney, McPhee, Papadakis. Appleton & Lange, McGraw-Hill 2002. ISBN 0-07-136466-8
- 6 Harrison's Principles of Internal Medicine. 15th ed. McGraw-Hill Inc. 2001.
- 7 Concise Oxford Textbook of Medicine. Ed. Ledingham, Warrell. Oxford University Press, Oxford, 2000.
- 8 Davis-Christopher: Textbook of Surgery / Synopsys for students (Sabiston)
- 9 Clive R. G. Quick, Joanna B. Reed et al.: Essential SURGERY(5th Edit.) Churchill Livingstone
- 10 Duckworth,T.: Orthopaedics and Fractures. 3rd ed. Blackwell Science, 1995.
- 11 Semmelweis Egyetem e-learning rendszere Ortopédia fejezet – Semmelweis University e-learning system: Orthopaedics
- 12 Szécsény-Berentey: Sebészet. Bp. Medicina.
- 13 Gaál: Sebészet. Bp. Medicina.
- 14 Littmann: Sebészeti műtétan. Bp. Medicina.
- 15 Fitzpatrick's Dermatology in General Medicine Editor: Freedberg, Irwin M.; Eisen, Arthur Z.; Wolff, Klaus; Austen, K. Frank; Goldsmith, Lowell A.; Katz, Stephen I. Publisher: McGraw-Hill Edition: 6th Edition ISBN: 0-07-138076-0, 0-07-138066-3, 0-07-138067-1 full-text online access: <http://gateway.ut.ovid.com/gw1/ovidweb.cgi?New+Database=SingleI0&S=IDNJKIDNCGILP00>
- 17 Shimizu's Textbook of Dermatology – accessible online also
- 18 Clinical Dermatology Editor: Rona M.MacKie 5th Edition Oxford Core Texts, 2003 ISBN13: 9780198525806ISBN10: 019852580X Paperback or the latest edition
- 19 Dermatology Editor: Otto Braun-Falco, Gerd Plewig, Helmut H. Wolff, Walter Burgdorf Publisher: Springer Verlag; 3 edition (November 2009)
- 20 Peterson: Principles of Oral and Maxillofacial Surgery. Decker, 2004.
- 21 Robinson PD: Tooth Extraction. A Practical Guide, Oxford, Boston, 2000
- 22 Ward Booth P, Eppey B, Schmelzeisen R: Maxillofacial Trauma and Esthetic Facial Reconstruction, 2nd Edition, Elsevier, 2011
- 23 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. SOTE, Bp. 1992.
- 24 W. Becker, H.H. Naumann, C.R. Pfaltz: Ear, Nose and Throat Diseases Georg-Thieme Verlag, Stuttgart 1994. ISBN: 3-13-671202-1
- 25 Rakel,R.E: Essentials of Family Practice. W.B.Saunders Co. 1998.
- 26 Taylor,R.B.: Fundamentals of Family Medicine. Springer, 1996.

INTERNAL MEDICINE I. – Metabolism, Endocrinology, Nephrology, Gastroenterology

Department of Internal Medicine and Oncology, 1083 Budapest, Korányi S. u 2/a

Course director: *prof. István Takács*

Course coordinator: *dr. Péter Studinger*

4 weeks

Lectures: 2.5 hours per week

Practices: 10 hours per week

Credit: 4

Examination: semi-final. On the last Monday of the course a written test is taken by all students. On the following days (Tuesday/Wednesday/Thursday/Friday), students continue with a bedside, patient-oriented oral exam.

Objectives of the course:

The primary objective of the course in internal medicine for fourth-year students, who have been acquired the the basic skills of physical examination, is the symptom-based and patient-oriented education of various segments of internal medicine. Internal medicine I comprises **nephrology and gastroenterology** (students have already learned endocrinology and metabolic diseases). Students become familiar with the diagnostics and the treatment of the most common disorders of these disciplines.

Lectures:

1. Glomerular diseases
2. Tubulointerstitial and cystic kidney diseases
3. Electrolyte disorders
4. Renal transplantation
5. Differential diagnostics of renal disease
6. Disorders of the upper gastrointestinal tract, epigastric pain
7. Diagnosis and differential diagnosis of malabsorption and mal-digestion
8. Inflammatory bowel diseases
9. Diagnosis and management of disorders associated with diarrhea or constipation
10. Differential diagnosis of gastrointestinal bleeding
11. Diagnosis and management of acute hepatic failure. Differential diagnosis of jaundice

Case discussions:

1. A young female patient with acute kidney injury and liver dysfunction (90')
2. Approach to a patient with glomerulonephritis (90')
3. Dialysis treatment (90')
4. Management of a patient with chronic kidney disease (45')
5. Kidney stones, urinary tract infection (45')
6. Hematuria and proteinuria during pregnancy (45')
7. Approach to a patient with an abnormal liver function test. (45')
8. Approach to a patient with acute abdominal pain (90')
9. Management of a patient with a pancreatic disease (45')
10. Management of a patient with an inflammation of the large bowel. (90')
11. Approach to a patient with swallowing difficulty (45')
12. Celiac disease (45')
13. Management of a patient with diabetes mellitus (90')

CARDIOLOGY – Heart Surgery, Angiology, Vascular Surgery

Heart Center Department of Cardiology

Tutor: **Dr. György Bárczi**

Lectures (2 hours per week)

1. Introduction. Differential diagnosis in acute cardiac care
History, epidemiology
Acute coronary syndrome, pulmonary embolism, aortic dissection
- 2.
3. Ischaemic heart disease I.
atherosclerosis
Invasive/non invasive tests
Stable coronary artery disease
4. Ischaemic heart disease II.
Acute coronary syndrome
5. “Cardiology Day”
Live demonstrations, interactive lectures, resuscitation practice, etc.
6. Heart failure
Cardiomyopathies
7. Arrhythmias I.
Supraventricular arrhythmias
8. Arrhythmias II.
Ventricular arrhythmias
Syncope, sudden cardiac death
9. Acquired valve diseases
10. Congenital heart diseases in children and in adults
11. Cardiac Surgery
Indications and recommendations
12. Infective heart diseases, cardiac tumours
13. Primary and secondary prevention
14. Interactive case presentations

Practices (ward rounds, 4,5 hours per week)

1. Bedside practice – ECG
2. Bedside practice – heart failure, echocardiography
3. Bedside practice – valvular heart diseases
4. Coronary care unit – intraaortic balloon pump
5. Coronary care unit – invasive haemodynamics
6. Coronary care unit – cardiogenic shock
7. Out patient care – ischemic heart diseases
8. Out patient care – arrhythmias
9. Common practice – invasive cardiology
10. Common practice – non-invasive cardiology
11. Common practice – electrophysiology
12. Common practice – pediatric cardiology
13. Common practice – cardiac surgery
14. Practical exam

Students are strongly recommended to visit regularly our website where updated informations are available: <http://vszek.semmelweis.hu/education-cardiology>

SURGERY I-II.

I. Department of Surgery and Interventional Gastroenterology Department of Transplantation and Surgery

Tutors: **Dr. Ónody Péter**
Dr. Gábor Telkes

Lectures (3 hours per week)

- Definitions, indications and types of surgery, surgical techniques, perioperative treatment
- Emergency surgery
- Surgical oncology
- Hernias
- HPB surgery (liver-biliary tract)
- HPB surgery (pancreas I-II)
- Endocrine surgery
- Breast surgery
- IBD, Diverticulitis
- Proctology
- Intensive Care
- Malignant diseases of the small- and large intestine

After all the lectures we have a case report/case discussion about a real case at the department. (11x)

Practice (3 hours per week)

All in wards (bedside practice) and the operation theatre:

- Investigate of surgical patients
- Method of physical examinations.
- Evaluation of the findings.
- Visiting the operation theatre.
- Visiting the intensive care unit
- Wound treatment, dressings
- Participation in the work of the surgical ambulance
- Surgical administration
- Postoperative treatment, medication
- Endoscopy

Form of EXAM:

Oral exam

TRAUMATOLOGY

Department of Traumatology

Type of subject: Mandatory

Code: AOKTRA063_1A

credit points: 3

Head of Department: Prof. Dr. Hangody László

Number of lessons per week: 44* **lecture:** 18* **practical course:** 74*

The ratio between lectures and practices may also vary, depending on the institute's subspeciality.

Objectives of the subject, its place in the medical curriculum:

Traumatology as a specialty deals with the treatment of injured patients, independent of the injured organ, patient's age or previous diseases. In developed countries, the 4-5th leading cause of death is injury, while in the actively working population, the rate of death is even higher. Morbidity in children and in the elderly is also high. Traumatology treatment for the most part deals with extremity surgery in correlation to orthopedics, however cranial, thoracic, abdominal, spinal and pelvic injuries as well as the treatment of polytraumatized patients also belong to the field of trauma care.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Uzsoki Hospital, Department of Orthopedics-Traumatology, Conference room (ground floor)
1145 Budapest, Uzsoki street 29-41.

Péterfy Traumatology Center, *Conference room (8th floor)*

1081 Budapest, Fiumei street 17.

Successful completion of the subject results in the acquisition of the following competencies:

During practices, students will have the opportunity to learn the following: physical examination of injured patients, bandaging, suturing, casting techniques, and the uses of orthoses and splints. Students will have the opportunity to enter the operating theater, scrubbing, and become acquainted with special instruments used in Traumatology. Consultation of typical and the more frequent trauma cases, radiologic diagnostics, as well as videos in the operative theater are also part of the curriculum. During on duty shifts, students will have an opportunity to examine and participate in the trauma care of patients under supervision.

Course prerequisites:

Pathology II., Basic Surgical Techniques

Detailed thematic of the course:

Lectures

Traumatology lectures are available on Semmelweis University's E-learning portal (moodle)

- | | |
|--|--|
| 1. General Traumatology. Soft tissue injuries. Thermal injuries. | 8. Knee Injuries. Cartilage repair, ligament surgeries |
| Wound management. | 9. Injuries of the upper extremity |
| 2. Fracture management. Bone healing | 10. Hand injuries |
| 3. Immediate care and major accidents. (Multiple injuries, shock, major disasters) | 11. Pediatric trauma |
| 4. Thoracic and abdominal trauma | 12. Management of open fractures. Septic and non-septic complications in Traumatology. |
| 5. Neurotrauma. Spinal, cranial and facial trauma. | 13. Endoprosthetic replacement possibilities in Traumatology. |
| 6. Pelvic injuries. Femoral fractures (proximal femur and shaft) | Periprosthetic fractures and complications |
| 7. Fractures of the tibia and fibula. Injuries of the ankle, talus, calcaneus and the foot | |

* Groups are subdivided into further smaller groups, where more tutors will be teaching (the total maximal amount of teaching hours is about 104).

	Day 1 – Monday	Day 2 – Tuesday	Day 3 – Wednesday	Day 4 – Thursday	Day 5 – Friday
08:30 – 09:15	Introduction to the Traumatology department	Cast splinting/Wound dressing	Free Day	Femoral fractures	Injuries of hands (wrists) forearms
09:15 – 09:30	Break	Break		Break	Break
09:30 – 10:15	Assignment homework	Trauma implants		Knee fractures	Injuries if the upper extremity
		Trauma radiographs demonstration			
10:15 – 10:30	Break	Break		Break	Break
10:30 – 11:45	Polytrauma/scenario	Septic ward		Fractures of the tibia angle and the foot	Postoperative infenctions, septic complications
	Chest/abdomin/pelvic trauma	Trauma implants			
11:45 – 12:30	Lunch break	Lunch break		Lunch break	Lunch break
12:30 – 16:00 with 30 minutes break	ER	Arthroscopy, cartilage and ligament injuries of the knee		Operating theater 1-3	Operating theater 5-6
	Operating theater 1-3			Operating theater 5-6	Ward/OPD
	Operating theater 5-6			Ward/OPD	ER
	Ward/OPD			ER	Operating theater 1-3
	Day 6 – Monday	Day 7 – Tuesday	Day 8 – Wednesday	Day 9 – Thursday	Day 10 – Friday
08:30 – 09:15	Neurotraum	Mini presentation	Free Day	Exam/free day	Exam/free day
09:15 – 09:30	Break	Break			
09:30 – 10:15	Pediatric trauma	Mini presentation			
10:15 – 10:30	Break	Break			
10:30 – 11:45	Physical Th	Mini presentation/ Consultation			
	Bonee healing/Wound healing				
11:45 – 12:30	Lunch break	Lunch break			
12:30 – 16:00 with 30 minutes break	Ward/OPD	Exam/free day			
	ER				
	Operating theater 1-3				
	Operating theater 5-6				

The Traumatology Department reserves the right to make changes to the order of practices depending on which institute the student attends the practice at.

Requirements for participation in classes and the possibility to make up for absences:

According to the SZMSZ 17§ 7. regulation of Semmelweis University, the attendance of minimum 75% of seminars and practices is necessary.

Requirements for signature:

Attendance of consultations and practices or repeating of unattended practices and the written exam result is required. We cannot verify the semester, or allow the student to take the midterm if the student did not attend at least 75% of practices during the semester.

Only those students will be allowed to take the exam, who have presented their trauma topic to the group and tutor.

Type of examination:

Written MCQ electronic exam (single answer and multiple choice test), on Semmelweis University's E-learning portal (moodle)

Requirements of the examination:

The knowledge of the given textbook, electronic lecture and practice material.

Method and type of evaluation:

Written electronic exam (single answer and multiple choice test).

Percentage grading, not Bell curve

Possibilities for exam retake:

Retaking of the written electronic exam (single answer and multiple choice test), on Semmelweis University's E-learning portal (moodle)

Students may take the exam a total of maximum 3 times.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Name of Textbook:

The Trauma Manual:

TRAUMA AND ACUTE CARE SURGERY

Third edition

Editors:

Andrew B. Peitzman

Michael Rhodes

C. William Schwab

Donald M. Yealy

Timothy C. Fabian

Publisher:

Wolters Kluwer / Lippincott Williams & Wilkins

Internet

The lecture material can be downloaded from Semmelweis University's E-learning portal <https://itc.semmelweis.hu/moodle/>

OTORHINOLARYNGOLOGY

Tutor: **Dr. Beáta Bencsik**

Lecture (1 hour per week)	Practice (2 hours per week)
The role of otorhinolaryngology in medicine. Clinical anatomy of the ear. Diseases of the external ear.	Clinical examinations.
Acute and chronic otitis media I. (etiology, diagnosis, pathology).	Diagnostical methods of the ear.
Acute and chronic otitis media II. (Complications and therapy)	Evaluation of different types of perforations of the tympanic membrane. Cadaver bone practice.
Types of hearing losses, etiology. Audiological diagnostic methods.	Routine audiology. Uning fork practice.
Surgical management of hearing losses. Otosclerosis. Cochlear implant.	Operating theatre. Video.
Physiology and lesions of the vestibular system.	Examination of the vestibular system. ENG. CCPG.
Neurological and ophthalmological aspects of ear diseases. Prevention and rehabilitation.	Evaluation of different otological cases.
Clinical anatomy and physiology of the nose and paranasal sinuses. Nasal obstruction. Epistaxis.	Anterior and posterior rhinoscopy. Clinical management of the epistaxis.
Infections and tumors of the nose and the paranasal sinuses. Therapeutical possibilities.	X-ray photos of the paranasal sinuses. Operating theatre. Video.
Clinical anatomy, physiology and diseases of the pharynx.	Advanced examination of the pharynx. Directoscopy, fiberoscopy.
Diseases of the tonsils and their complications. Indications and complications of the tonsillectomy.	Peritonsillar abscess. Dangers of the tonsillectomy. Tonsillectomy. Operating theatre.
Anatomy and physiology of the larynx. Disorders. Infections of the larynx and their managment.	Direct and Indirect of the voice. Laryngoscopy. Videostroboscopy.
Dyspnoe and suffocation with upper airway origin. Conicotomy and tracheotomy.	Emergency management of suffocation.
Tumors of the larynx and their therapy. Rehabilitation of patients after total laryngectomy.	Operating theatre. Video. Voice prostheses.
Diseases of the trachea and the oesophagus. Foreign bodies. Medial and lateral neck masses.	Oesophagoscopy, bronchoscopy. Case reports. Palpation and investigation of patients with different neck masses.

ORAL SURGERY AND DENTISTRY

Course Leader: *Dr. Zsolt Németh*
Department of Oro-Maxillofacial Surgery and Stomatology
Dental Training Centre of the Faculty of Dentistry
Department of Community Dentistry

Credit value: 2

Number of lessons per week: 28 hours **lecture:**0 **practical course:** 28 hours **seminar:** 0

Subject type: compulsory course

Subject code: AOKSZB690_1M, AOKSZB690_1A, AOKSZB690_1N

Objectives of the subject, its place in the medical curriculum:

The main aim of the „Oral surgery and Dentistry” course for 4th year medical students is to introduce the most specific symptoms, recognition and treatment of the most common dental, oral and maxillofacial diseases. In addition, the knowledge of various specialisations of dentistry is important to medical students because later, as specialized medical doctors - regardless of their specialization – they will find numerous correlations and these skills will prove to be essential in case of many borderline diseases and to face diagnostic difficulties. During the course students learn about the method of oral examination and stomato-oncological screening. The practice focuses on the oral and dental contexts of disciplines of medicine. It is extremely important for future medical doctors to be aware of the symptoms of systemic diseases in the oral cavity and know which dental and oral diseases may lead to systemic diseases.

Successful completion of the subject results in the acquisition of the following competencies:

As practicing physicians they will be in the possession of modern theoretical and practical skills and will be able to perform medical practice on their own and build correct human relationships with their patients and family members as well as other health professionals.

It is important that they will receive a comprehensive picture of the concept of oral health.

As practicing physicians they will be able to examine the oral cavity and the head and neck region, and interpret the lesions and altered functions, initiate the diagnostic and therapeutic process. In accordance with the preventive approach that is characteristic for today's medicine, they will be able to prevent and detect tooth (oral) diseases of systemic effect at their early stage.

Course prerequisites:

Microscopic anatomy and embryology II.

Pathology II.

Basic surgical techniques

Number of students required for the course (minimum, maximum) and method of selecting students:

Based on registration through the Neptun system.

How to apply for the course:

through the Neptun system

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks). Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments! Always attach a CV for guest lecturers!)

The duration of the course is 1 week in one block.

According to the schedule of the 2020/2021 academic year, the English language practice will be on 2nd, 5th, 12th, 15th, 22nd, 25th, 32nd, 35th educational week.

The courses take places in the building of Department of Oro-Maxillofacial Surgery and Stomatology and in the Dental Training Centre of the Faculty of Dentistry during the semester.

The courses take places in the building of Department of Oro-Maxillofacial Surgery and Stomatology and in the Department of Community Dentistry of the Faculty of Dentistry during the semester exam period.

The schedule of the one-week block:

one - week block					
	Monday	Tuesday	Wednesday	Thursday	Friday
from 8:00 am to 11:30 am (with half an hour break)	education	education	education	day off (obligatory)	Preparing for the exam
lunch break from 11:30 am to 12:30 pm	break	break	break		break
from 12:30 pm to 16:00 pm (with half an hour break)	education	education	education		exam

About 20-25 students attends to the clinics weekly. The students are divided into six groups (2-4 students per little group) as the practice are taught by six disciplines of Faculty of Dentistry. The small groups of students (2-4 person) take part on practice in the rotating system on Monday, Tuesday and Wednesday. The practices are held in educational period (semester) in Department of Oro-Maxillofacial Surgery and Stomatology and the Clinics of Dental Training Centre of the Faculty of Dentistry, in exam period in Department of Oro-Maxillofacial Surgery and the department of Community Dentistry.

The schedule of rotating system for small (2-4 person) students groups:

The schedule of rotating system for small (2-4 person) students groups						
	Monday morning	Monday afrenoon	Tuesday morning	Tuesday afternoon	Wednesday morning	Wednesday afternoon
A	conservative dentistry	prosthodontics	periodontology	oral and maxillofacial surgery	pediatric dentistry and orthodontics	oral diagnostics
B	prosthodontics	prosthodontics	oral and maxillofacial surgery	periodontology	oral diagnostic	pediatric dentistry and orthodontics
C	pediatric dentistry and orthodontics	oral diagnostic	conservative dentistry	conservative dentistry	periodontology	oral and maxillofacial surgery
D	oral diagnostic	pediatric dentistry and orthodontics	prosthodontics	prosthodontics	oral and maxillofacial surgery	periodontology
E	periodontology	oral and maxillofacial surgery	pediatric dentistry and orthodontics	oral diagnostic	conservative dentistry	conservative dentistry
F	oral and maxillofacial surgery	periodontology	oral diagnostic	pediatric dentistry and orthodontics	prosthodontics	prosthodontics

The list of Clinics and Departments are involved in rotating system:

- Department of Oro-Maxillofacial Surgery and Stomatology
- Department of Conservative Dentistry
- Department of Prosthodontics
- Department of Periodontology
- Department of Pediatric Dentistry and Orthodontics
- Department of Oral Diagnostics
- Department of Community Dentistry (in the exam period of Faculty of Dentistry)

The teachers/instructors of Clinics and Departments are involved in rotating system:

- **Department of Oro-Maxillofacial Surgery and Stomatology**

Zsolt Németh Dr., Sándor Bogdán, Dr., Mihály Vaszkó Dr., Tamás Huszár Dr., Iván Decker Dr., Péter Barabás Dr., Gergely Csókay Dr., Zsófia Somogyi Dr., Tamás Würsching Dr., Gábor Pintér Dr., Szófia Szentpéteri Dr., Lillik Péter Dr., Ákos Dora Dr., Lőrincz Zatik Dr.

- **Department of Conservative Dentistry**

Dr. Eszter Szalai Dr., Andrea Demeter Dr., Ákos Mikolicz Dr., Gergely Hriczó-Koperdák, Dr. Krisztina Árendás, Dr. Eszter Danko, Dr. Roland Daubner, Dr. Réka Fazekas, Dr. Ádám Fekete, Dr. Krisztián Csomó, Dr. Barbara Gedei, Dr. Anna Herczeg, Dr. Brigitta Huszta, Dr. Dávid Jelencsics, Dr. Péter Komora, Dr. Alexandra Kovács, Dr. Alexandra Kunszt, Dr. Karolina Kőműves, Dr. Barbara Mikecs, Dr. Sándor Mikó, Dr. Eszter Molnár, Dr. Mátyás Nagy, Dr. Fruzsina Anna Németh, Dr. Réka Németh, Dr. Petra Papp, Dr. Orsolya Pethő, Dr. Melinda Polyák, Dr. Kinga Sárdy, Dr. Boglárka Szántai, Dr. Barbara Szanyi, Dr. Zsuzsanna Tóth, Dr. Klaudia Varga, Dr. Enikő Vasziné Szabó, Dr. Noémi Zala

- **Department of Prosthodontics**

Dr. Tamás Hegedűs, Dr. Klaudia Lipták, Dr. Anna Németh, Dr. Judit Schmalzl, Dr. Péter Tajti, Dr. Fanni Andrea Vass, Dr. Máté Jász, Dr. Szilvia Ambrus, Dr. Emőke Takács, Dr. Bálint Jász

- **Department of Periodontology**

Dr. Ferenc Dóri, Dr. Boldizsár Bartha, Dr. Andrea Dobos, Dr. Kristóf Forgó, Dr. Nándor Haba, Dr. Attila Horváth, Dr. Kinga Kelemen, Dr. Bálint Molnár, Dr. György Nagy Pál, Dr. Florina Németh, Dr. Kristóf Orbán, Dr. Claudia Paár, Dr. Dániel Palkovics, Dr. Zsombor Radóczy- Drajkó, Dr. Eleonóra Solyó, Dr. Gábor Szabó, Dr. Orsolya Láng, Dr. Lili Sipos, Dr. Fanni Bolya-Orosz, Dr. Dóra Szőnyi

- **Department of Pediatric Dentistry and Orthodontics**

Dr. Bálint Nemes, Dr. Gergely Balaton, Dr. Stefánia Radó, Dr. Réka Bálint, Dr. Dorottya Bánai, Dr. Lili Heckenast, Dr. Levente Szegedi Dr. Gergely Kaán, Dr. Anna Moldován, Dr. Réka Sklánitz, Dr. Violetta Szabó, Dr. Adrienn Auth, Dr. Fanni Török, Dr. Eszter Rózsa Bogárné, Dr. Gergely Lőrincz, Dr. Réka Kulin, Dr. Lili Ács, Dr. Anna Bosch, Dr. Szilvia Baksa, Dr. Lőchli Heike, Dr. István Simon, Dr. Bence Benedikti, Dr. Miklós Nagy

- **Department of Oral Diagnostics**

Dr. Szabolcs Gyulai-Gaál, Dr. László Simonffy, Dr. Róbert Bernát, Dr. Fruzsina Gyekiczki, Dr. Bálint Trimmel

- **Department of Community Dentistry (in the exam period of Faculty of Dentistry)**

Dr. Flóra Döngölő, Dr. Gergely Oláh

Topics of each sub-practices:

Maxillofacial and dentoalveolar surgery:

Benign neoplasms of the orofacial region. Praecancerous lesions, prevention of oral cancer, screening methods. Malignant oral tumors and its treatments. Developmental anomalies (craniofacial malformations, cleft lip and palate, dysgnathia). Reconstructive surgery. Traumatology. Inflammatory diseases and therapeutic options. Tooth extraction, dentoalveolar and preprosthetic surgery. Basics of dental implantology. Oral rehabilitation for patient with special needs.

Cons

Medical and dental history taking. Correlations between medical conditions and dental, periodontal status. High risk patients. Examination, evaluation of clinical findings and making diagnosis. Aspects of making treatment plan. Prevention options of oral diseases. Age-related changes in oral condition and its results. Diagnosis and treatment methods of caries. Importance of pulpal and periodontal diseases. Types of conservative dentistry procedures. Focal (dental) infection. Use of antibiotics in the field of conservative dentistry. Importance of regular dental examination considering medical status.

Prosthodontics:

Indications and contraindications of prosthodontics treatments. Making prosthodontic treatment plan: when and which type, fixed or removable and implant retained prosthetic appliances etc. Demonstration of the most frequently used fixed and removable prosthetic appliances emphasizing which types are must be removed from oral cavity of an unconscious patient. The significance of the control and care for patients after prosthetic treatment. Examination of the temporomandibular joint, its dysfunction (TMD), diagnosis and conservative treatment options. The clinical team of treating TMD patients. Detection and treatment of early and late outcome of complete edentulousness.

Periodontology:

Survey of the patient's oral hygiene and setting professional oral hygiene. Examination of the oral mucosa and diagnosis. Opportunity to assist in subgingival debridement (in non-surgical pocket treatment) and surgical periodontic procedures.

Pediatric Dentistry and Orthodontics:

Dental examination in childhood, medical and dental history, dental screening. Opportunity to assist in paedodontic procedures e.g. sealant application, primary and permanent tooth filling, primary tooth extraction; alternative solutions to treatment of childhood caries. Characteristics of primary, mixed and permanent dentition. Difficulties and emergencies in paedodontics. Scanning and eliminating focal infections. Oral manifestations of childhood infections. Use of anaesthetics and drugs in childhood. The connection between paedodontics- orthodontics and other dentistry specialties. Opportunity to assist in activation of removable and fix orthodontic appliances. The most frequently used orthodontic appliances.

New methods of orthodontics, digitalized procedures and esthetic appliances. The importance of age in orthodontic treatment.

Oral diagnostics:

Patient with dental symptoms, making dental and medical history, making diagnosis. Considering correlations between medical conditions and dental problems. Examination of head and neck, stomato-oncological screening. Steps of the intraoral examination, making description of the clinical findings. Lesions of oral mucosa. Oral manifestation of systematic autoimmune diseases. Oral manifestation of infections. Symptoms of medicine side effects. Additional modalities in oral mucosa examination. Dentoalveolar and maxillofacial imaging techniques. Manifestations of medical conditions on dental X-ray. Imaging modalities in traumatic injuries. Imaging techniques in screening.

More specialties contain similar course topics:

Emergency cases and its treatments, the importance of prevention and connection of medical specialties.

Dental and dentoalveolar outpatient department connection to maxillofacial and otolaryngology departments work. Gerostomatology. Dental infectology.

The study materials of practices are available to students on E-learning interface.

Students can take a written exam on E-learning interface on the educational week on Friday from 7 pm to 8 pm. It is possible to repeat / replace the exam by priori arrangement, following the rules of Study and Exam Policy.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!).**Possible overlaps of themes:**

- Cleft lip and cleft palate – Pediatric surgery
- Sinus illnesses, head and neck cancers – Otorhinolaryngology
- Allergy, mucosa – skin diseases – Dermatology, Internal Medicine
- Focal diseases – Internal medicine, Dermatology, Rheumatology
- Hemorrhagic patients' care – Hematology
- Head and neck medical imaging – Radiology
- Interventions in general anesthesia– Anesthesiology
- Transfusion – 2 week transfusion course
- Sepsis – Intensive Therapy, Infectology, Microbiology
- Oncologic patients' care – Oncology, Oncoradiology
- Dental, oral surgical care in elder patients – Gerontology
- Injuries of teeth, maxillofacial bone and soft tissue – Traumatology
- Facial pain – Neurology
- Orbital diseases due to infections and traumatologic causes – Traumatology, Ophthalmology
- Examination of tissue from orofacial area - Pathology

Special study work required to successfully complete the course:

(E.g. field exercises, medical case analysis, test preparation, etc.)

None

Requirements for participation in classes and the possibility to make up for absences:

At least 75% participation is obligatory of the practices, according to the Study and Exam Policy. The replacement of practices is available at the time of same language group by priori arrangement (depending on the student's number).

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

During the short modules of education there will be no exams. All through the interactive practices and consultations it is enabled to assess the students knowledge and the usage of the information which is provided, available.

Requirements for signature:

At least 75% participation.

Type of examination:

Written test exam on E-learning interface.

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

Written test exam on E-learning according to the practices. The study materials of practices are available for student on E-learning interface. The test questions (simple choice – 1 correct answer from 4 options) are made up by the Departments and Clinics participated in the education.

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

Test exam.

Above 90% grade 5, 80-89% 4, 70-79% 3, 60-69% 2, under 60% 1.

How to register for the examination?

On Neptun system.

Possibilities for exam retake:

According to the Study and Exam Policy.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

The study materials are available for students on E-learning interface: <https://itc.semmelweis.hu/moodle/>

The student can find more study materials, additional resources, notes, textbooks and literature links on the website of clinics and departments participated in education.

DERMATOLOGY

Department of Dermatology-Venerology and Dermatooncology

Head of the Department: *Prof. Dr. Miklós Sárdy*

Tutor: *Dr. Kende Lőrincz*

Credits: 4

Lectures: 2 hours (90min) /week; practices: 8 hours (8x45min or 4x90min) /day

At the first day of the block the students have an introduction lesson. Afterwards the focus is on the practical learning. There are special practices – e.g. problem-based learnings, special seminars – and in- /outpatient practices as well divided in smaller groups.

Objectives of the course:

Morphology, structure, physiology and general pathology of the skin. Bacterial, viral and other infections of the skin. Sexually transmitted diseases (STD). Dermatoallergy. Dermatoimmunopathology. Basics of the skin immune system (SIS). Bullous skin disorders. Psoriasis. Skin symptoms of autoimmune diseases. Skin symptoms of vascular diseases. Oncodermatology. Skin symptoms of internal diseases. Basic principles of general and topical dermatological treatment.

The goal of the training:

- Knowledge of diagnostics, etiopathogenesis and treatment of skin diseases concerning the competency of general practitioners.
- Problem-oriented assessment of skin symptoms and the knowledge of their connections to general medicine.

Half of the fourth-year students take the subject in the first semester, the other half in the second semester in form of block rotations. The curriculum contains the following topics discussed as problem-based learnings or special seminars: anatomy and functions of the skin, dermatoinfectology, oncodermatology, atopic dermatitis, eczema, drug eruptions, bullous diseases, allergic skin diseases, autoimmune skin disorders, sexually transmitted diseases, psoriasis, pathology of the skin.

During practices students examine patients, master the description of skin symptoms, evaluation of symptoms and dermatological treatment options. Fungal infections are discussed during a special practice.

Important notes:

All preclinical modules are required. Registration in the Neptun system is imperative at the beginning of the semester.

Attendance of the lectures and practices is compulsory. Three absences are accepted.

Lectures are compulsory. Each student should attend the practice of one particular teacher. Attendance of a practice at another teacher is accepted for the missed practices. The deputy teacher's signature is required.

Semester requirement: One mid-term exam (written test) – around the 10th week of the semester. Optional: at the end of semester a competition for clinical examination (a written quiz with projected clinical cases) is announced. The best students are dispensed from taking the practical part of the semi-final examination.

Sign up in the Neptun system is imperative.

Evaluation: Practical part (clinical examination and discussion of one patient) and theoretical part with randomly selected three main topics compose the semi-final examination.

Exam: Semi-final examination.

Sign up and modifying exam: Via Neptun.

Absence from the exam: Only an official medical certificate is accepted within 3 working days.

PULMONOLOGY AND THORACIC SURGERY

Department of Pulmonology

Tömő str. 25-29., Budapest, Hungary 1083
<http://semmelweis.hu/pulmonologia/english/>

Course director: **Prof. Dr. Veronika Muller**
 Course tutor: **Dr. Gabor Horvath**

Subject code: AOKPUL751_1A

Credits: 4

Hours: 56 hours/3-week course

Lectures (18 hours)

- Lung cancer
- Chronic obstructive pulmonary disease
- Pneumonia. Tuberculosis
- Respiratory insufficiency. Non-invasive mechanical ventilation
- Bronchial asthma
- Pulmonary rehabilitation. Smoking cessation
- Lung transplantation. Cystic fibrosis
- Pulmonary embolism
- Sleep related breathing disorders
- Chest surgery: lung cancer, pneumothorax, pleural effusion, lung transplantation

Practices (35 hours)

Practical demonstrations/laboratory visits:

- Lung function measurement laboratory techniques
- Pulmonary diagnostics
- Non-invasive ventilation methods
- Oxygen therapy methods
- Inhalation therapy methods
- Pulmonary hypertension

Interactive demonstrations/skill development:

- Bronchology/skill laboratory examinations
- Non-invasive ventilation patient care
- Allergology tests
- Sleep laboratory tools/methods
- Pulmonary rehabilitation procedures
- Chest drainage

General/specific patient examinations:

- Pulmonary dept.
- Pulmonary-oncology dept.
- Transplantation dept.
- Chest surgery dept.

Attendance: lectures and practices are compulsory. Absence hours less than 25% of total are accepted.

Exam type: oral

Exam sign up: Neptun system

Textbook:

Bourke SJ, Burns GP: Lecture Note: Respiratory Medicine. 9th ed. 2015. ISBN 978-1-118-65232-9

Department of Thoracic surgery

Ráth György str.7-9., Budapest, Hungary 1122
<https://semmelweis.hu/mellkassebeszet/education/>

Course director: **Dr. Rényi-Vámos Ferenc**

Lectures (3 hours)

- Surgical aspects of lung cancer
- Emergency chest pathologies:
- pneumothorax, pleural effusion
- lung transplantation

Practices (5 hours)

Interactive demonstrations

- Lung cancer case recognition, diagnosis and treatment
- Recognition, diagnosis and treatment of pulmonary metastases
- Recognition, diagnosis and treatment of pleural effusions
- Recognition, diagnosis and treatment of pneumothorax
- Surgical mediation
- Thoracic drainage

General/specific patient examinations:

- Transplant outpatient clinic/department.
- Thoracic surgery outpatient clinic/department

Attendance: lectures and practices are compulsory. Absence hours less than 25% of total are accepted.

Exam type: oral

Exam sign up: Neptun system

Textbook:

Bourke SJ, Burns GP: Lecture Note: Respiratory Medicine. 9th ed. 2015. ISBN 978-1-118-65232-9

ONCOLOGY AND RECONSTRUCTIVE ONCOPLASTIC SURGERY

Department of Oncology and Department of Clinical Oncology

Credits: 3

Total number of hours: 40 **lecture:** 14 **practice:** 26 **seminar:** 0

Course type: obligatory

Academic year: 2020/21 1st semester

Course code: AOKONK752_1M

Name of the person in charge of the subject: Prof. Dr. Polgár Csaba

The aim and place of the teaching of the subject in the curriculum of medical education: To get acquainted with the epidemiology, etiology, biological properties, prevention (primary and secondary prevention), diagnostics and multidisciplinary therapy of cancer diseases, to acquire the complex oncological approach. To get acquainted with the modern treatment of the most common solid tumours (surgical, radiation, chemo-, hormone, immunological and biological therapy) and their results. Understanding the possibilities of oncological reconstructive and oncoplastic surgeries. Early and late side effects of oncology treatments, their possible prevention and treatment. Palliative treatment, analgesia, somatic and mental rehabilitation of oncology patients. Oncological emergencies and their treatment. Defining the role of the practitioner in the prevention, early detection of tumours and in the care and care of cancer patients.

Place of teaching the subject (address of lecture hall, seminar room, etc.):

Semmelweis University Department of Oncology, National Institute of Oncology, Budapest, 1122 Ráth György u. 7-9. Semmelweis University Department of Oncology Department of Clinical Oncology, Budapest, 1083, Tömö u. 25-29. IV. floor

Successful completion of the subject results in the acquisition of competencies: Acquisition of general oncological knowledge in 4th year medical students, based on preliminary studies, knowledge of the main etiological factors, epidemiology, early detection, diagnosis and 3 main therapeutic modalities of tumours (tumour surgery, radiotherapy, drug treatments) and the main solid tumour type treatment and rehabilitation, including mastering the basics of oncoplastic surgical solutions.

Prerequisite (s) required for the admission or acquisition of the subject: Pharmacology II., Pathology II., Basic Surgical Techniques

Student headcount conditions for starting the course (minimum, maximum), method of selecting students: Based on registration in the NEPTUN system, it is 1/8 of the class

How to apply for the course: In the NEPTUN system

Detailed topics of the subject:

Classroom lectures (14 hours):

Block Day 1:

1. Etiology, epidemiology and biology of tumours, methods of prevention and screening. Principles of complex oncotherapy (45 minutes) (Cs. Polgár, J. Lövey, Z. Takácsi-Nagy)
2. Imaging diagnostics of tumours (45 minutes) (M. Gödény, P. Manninger)
3. Histological and molecular pathological diagnosis of tumours (Szőke J./Tóth E.)
4. Principles of tumour surgery, surgical reconstruction, oncoplastic options, and oncological rehabilitation options (T. Mersich, F. Oberna, Z. Mátrai)
5. Basics of radiotherapy and radiochemotherapy of tumours (Cs. Polgár, J. Lövey, Z. Takácsi-Nagy)
6. Basics of oncological drug treatments (chemo-, hormone, biological and immunotherapy) (Dank M., Rubovszky G.)

Block Day 2:

7. Oncotherapy of head and neck tumours (Takácsi Nagy Z.)
8. Oncotherapy of gastrointestinal tumours (Lövey J.)

Block Day 3:

9. Oncotherapy of gynecological tumours (Polgár Cs., Vízkeleti J.)
10. Complex treatment of breast tumours (Cs. Polgár, N. Mészáros)

Block Day 4:

11. Complex treatment of lung tumours (Lövey J.)
12. Oncotherapy of urological tumours (Ágoston P., Jorgo K.)

Block Day 5:

13. Treatment of central nervous system / bone and soft tissue tumours (Lövey J./Ágoston P.)
14. Oncological emergencies / Oncological rehabilitation and follow-up (Dank M., Szentmártoni Gy.)

Block practices (26 hours):

Block Day 1:

Tumour Diagnosis I: Cytological, Histological, Molecular Pathology Practice (2x45 minutes)

Block Day 2:

Tumour Diagnosis II: Imaging Diagnostic Practice 1. (4x45 minutes; 1 hour mammography / UH, 1 hour CT, 1 hour MRI, 1 hour PET-CT)

Tumour Radiation I: Treatment Planning Practice (2x45 minutes)

Block Day 3:

Tumour surgery (surgical practice) (4x45 minutes)

Oncoteam practice (2x45 minutes)

Block Day 4:

Systemic treatment of tumours I: Chemotherapy, hormone therapy (2x45 minutes)

Systemic treatment of tumours II: Targeted biological and immunotherapy (2x45 minutes)

Systemic treatment of tumours III: Supportation, treatment of side effects (2x45 minutes)

Block Day 5:

Radiation Treatment of Tumours II: Practice of External Radiation Treatment (2x45 minutes)

Tumour radiotherapy III: Brachytherapy practice (2x45 minutes)

Consultation (2x45 minutes)

Other subjects concerning the border issues of the given subject (both compulsory and optional subjects!).

Possible overlaps of themes:

Urology: diagnosis and surgical treatment of urological tumours

Clinical genetics: hereditary tumours

Special study work required for successful completion of the course:

There is no such

Requirements for participation in classes and the possibility to make up for absences:

According to the study and exam regulations, 75% of the classes are compulsory

How to check the acquired knowledge during the diligence period:

During the short period of education available to us, there is no intermediate, formal examination. However, the interactive nature of the practices and consultations allow teachers to test the students' knowledge and how they use the information available to them.

At least 75% participation in classes. Checking each session by keeping a catalog.

Type of exam:

Oral exam based on a pre-issued line of items.

Exam requirements:

General oncology and radiotherapy line items

1. Etiology of cancer
2. Epidemiology of cancer
3. Screening and early detection of tumours
4. Imaging methods and their role in the treatment of tumours
5. Imaging diagnostics of major tumour groups
6. Histological diagnosis of tumours
7. Molecular pathological diagnosis of tumours
8. Methods of treatment of tumours - surgery
9. Methods of treatment of tumours - radiation therapy
10. Methods of treating tumours - medication
11. Physical, chemical and biological bases of radiation therapy
12. Basic concepts of dosimetry
13. Computer treatment planning, significant volumes in radiation therapy
14. Structure and operating principle of teletherapeutic devices
15. Structure and operating principle of brachytherapy devices
16. Brachytherapy applicators
17. Brachytherapy planning system, imaging devices
18. Interstitial brachytherapy
19. Image Guided Radiation
20. Intensity Modulated Radiation Therapy
21. Stereotaxic Radiotherapy and Radiosurgery
22. Basics of chemotherapy
23. Side effects of chemotherapy
24. Basics of simultaneous radio-chemotherapy
25. Basics of targeted, biological therapy
26. Side effects of targeted, biological therapy
27. Basics of immunotherapy
28. Side effects of immunotherapy
29. Basic elements of oncopharmacology
30. Clinical pharmacology studies in cancer
31. Evaluation of objective clinical response and general condition

Detailed line of oncology and radiotherapy items

1. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of head and neck tumours.
2. Radiation therapy, surgical and pharmacological treatment of head and neck tumours.
3. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of oesophageal tumours.
4. Radiation therapy, surgery and systemic treatment of oesophageal tumours.
5. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of gastric tumours.
6. Radiation therapy, surgical and pharmacological treatment of gastric tumours.
7. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of colorectal tumours.
8. Surgical and pharmacological treatment of colorectal tumours.
9. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of rectal tumours.
10. Radiation therapy, surgery and systemic treatment for rectal tumours.
11. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of pancreatic tumours.
12. Radiation therapy, surgical and pharmacological treatment of pancreatic tumours.
13. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of liver tumours.
14. Radiation therapy, surgery and systemic treatment for liver tumours.
15. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of cervical tumours.
16. Radiation therapy, surgery and systemic treatment for cervical tumours.
17. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of uterine tumours.
18. Radiation therapy, surgery and systemic treatment for uterine tumours.
19. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of vulvar, vaginal and ovarian tumours.

20. Radiation therapy, surgery and systemic treatments for tumours of the vulva, vagina and ovaries.
21. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of penis, testis and kidney tumours.
22. Radiation therapy, surgery and systemic treatment for penile, testicular and kidney tumours.
23. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of prostate and bladder tumours.
24. Radiation therapy for prostate and bladder tumours.
25. Surgical and pharmacological treatment of prostate and bladder tumours.
26. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of lung tumours.
27. Radiation therapy of lung tumours.
28. Surgical and pharmacological treatment of lung tumours.
29. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of breast tumours.
30. Radiation therapy of breast tumours.
31. Surgical and pharmacological treatment of breast tumours.
32. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of central nervous system tumours.
33. Radiation therapy of central nervous system tumours.
34. Surgical and pharmacological treatment of central nervous system tumours.
35. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of bone tumours.
36. Radiation therapy, surgical and pharmacological treatment of bone tumours.
37. Epidemiology, etiology, histology, staging, symptoms and pre-treatment examination of soft tissue tumours.
38. Radiation therapy, surgery and medication for soft tissue tumours.
39. Oncological emergencies.
40. Radiation treatment of distant metastases and oncological rehabilitation.
41. Principles of the possibilities of reconstructive plastic surgery.
42. Oncoplastic surgery for head and neck tumours.
43. Oncoplastic surgery for breast tumours.

Method and type of rating:

Activity during the block (20%) + oral exam (80%)

Marks: Excellent above 90%, good 80-89%, satisfactory 70-79%, pass 60-69%, fail 60%

How to apply for the exam:

Students apply for the exam exclusively with the help of the NEPTUN unified study system according to the regulations described in the TVSZ (Study and Examination Regulations-SER).

Options for retaking the exam:

According to the Study and Examination Regulations (SER)

Printed, electronic and online notes, textbooks, aids and literature (html title in case of online material) can be used to acquire the study material:

Curriculum: University Note on Oncology and Radiation Therapy (Ed.: Csaba Polgár):

- in Hungarian, English and German in the form of an electronic note
- in Hungarian in print (Semmelweis Publishing House, Budapest, 2018)

Recommended reading:

Basics of oncology (Ed.: Miklós Kásler), university textbook (2nd edition Medicina Könyvkiadó Zrt., Budapest, 2018)

ORTHOPEDICS

Tutor: **Dr. Gergely Holnapy**

Lectures

- Subject of Orthopedic Education. Organization.
- Orthopedic care in Hungary. Possibilities of prophylaxis.
- Inflammatory diseases in orthopaedics.
- Anatomy and biomechanics of the spine. Mai posture.
- Scheuermann's disease. Vertebra plana, Calve.
- Scoliosis. Theories concerning the etiology of various kinds of scoliosis. Pathological, clinical and radiological symptoms and appearance. Symptomatology and therapy of the functional scoliosis. Symptoms and therapy of scoliosis with recognized etiology (congenital, paralytic, rachitic).
- Degenerative diseases of the spine. Etiology of low back pain, clinical symptoms, therapy. Low back of disc origin. Significance of the intervertebral discs under normal and pathological conditions. Symptomatology of the ischias syndrome and its therapy.
- Spondylolysis and spondylolisthesis. Lumbalization and Sacralization.
- Deformities and diseases of the neck and the upper extremity.
- Congenital torticollis, Klippel-Feil deformity. Cervical rib. Sprengel deformity.
- Obstetricalisparalysis. Recurrent dislocation of the shoulder. Cervicobrachial syndrome.
- Periarthritis of the shoulder. Dupuytren contracture. Kienböck disease. Tennis elbow.
- Madelung deformity. Sudeck dystrophy of the upper extremity.
- Osteoarthritis of the hip. Etiology, pathology, clinical and radiological symptoms.
- Methods of conservative and operative Treatment.
- Diseases of the child's hip. Legg-Perthes-Calve disease. Slipped capital femoral epiphysis. Acute and chronic arthritis of the hip.
- Congenital dislocation of the hip. Anatomy and development of the hip joint. Concept of dysplasia. Subluxation and luxation. Pathology. Early and late clinical and X-ray signs. Early and late conservative therapy. Various methods of operative treatment. Palliative operation.
- Diseases of the knee. Recurrent dislocation of the patella.
- Osteochondritis of the tibial tubercle (Osgood-Schlatter disease). Osteochondrosis of the tibia. Varus, valgus and hyperextension deformity. Osteoarthritis. Chondromalacia of the patella. Meniscus lesions.
- Diseases of the foot. Congenital clubfoot. Tarsal synostosis. Hallux valgus. Aseptic
- necrosis of the bones of the foot. Osteoarthritis of the joints of the foot. Flatfoot.
- Neuromuscular diseases. Classification and treatment. Infantile cerebral palsy. Disturbances of the development of the vertebral body and neural arch. Muscular defects. Progressive muscular dystrophy and other diseases of the muscles.
- Primary tumors of bones and their classification. Benign bone tumors. Osteoid osteoma. Semimalignant and malignant tumors (giant cell tumor, chondroma, osteosarcoma, chondrosarcoma, multiple myeloma, Ewing sarcoma). Main pathologic features..
- Bone disorders. Osteoporosis, osteomalacia, osteogenesis imperfecta, Paget disease.
- Developmental anomalies. Congenital anomalies of the extremities.

Consultation.

Practices

- Instruction of correct behaviour in the Hospital and during practicals. Introduction to the Hospital. Therapeutic aims of Orthopedics. Methods of the clinical practicals.
- Methodology of learning Orthopedics.
- Diagnostic and therapeutic methods of Orthopedics. Anamnesis. Inspection, palpation, examination of motions.
- Basics of radiological examination of the musculoskeletal system. Normal Roentgen anatomy of the bones and joints. Form and function. Methods of examination of limb shortening and alterations of the forms. Contracture. Limping.
- Fixation, relief of weight bearing, plaster splints, plaster bandages. Examination of patients. Examination of the diseases and deformities of the spine, malposture (Calves deformity, spondylarthrosis).

- Preparation of plaster splints, bandages. Examination of patients with lumbago, ischias syndrome, spondylolysis, spondylolisthesis. Demonstration of Roentgenograms.
- Examination of scoliotic patients. Preparation of plaster and other corsets.
- Examination of patients. Tuberculous spondylitis. Demonstration of Roentgenograms.
- Preparation of plaster beds.
- Examination of patients with congenital dislocation of the hip. Early and late symptoms of this disease. Demonstration of Roentgenograms.
- Examination of patients with congenital dislocation of the hip. Demonstration of the means and methods of therapy and their application.
- Examination of patients with juvenile osteochondritis of the hip. Epiphyseolysis.
- Infantile coxa vara. Demonstration of Roentgenograms and methods of treatment.
- Preparation of hip spica.
- Examination of patients with osteoarthritis of the hip. Examination of contractures of the hip. Demonstration of Roentgenograms.
- Examination of patients with recurrent dislocation of the patella, Osteoarthritis, tuberculous arthritis of the knee. Punction of the knee joint. Methods of fixation of this joint, preparation of plaster bandage.
- Examination of patients with diseases and deformations of the neck, upper extremity. Torticollis, cervicobrachial syndrome, periartthritis of the shoulder, tuberculosis of the shoulder joint. Demonstration of Roentgenograms. Application of the methods of hand and arm fixation.
- Examination of patients with congenital clubfoot and flatfoot. Therapy. Application of the methods of foot and lower leg fixation.
- Demonstration of the methods of gymnastics and physiotherapy.
- The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester.
- Exam: Practical exam at the time of last practice.
- Semester Closing exam registration has to be done through the NEPTUN system for the days set by the department up to the limits.
- Students have to fill -during semester- the trial test on Semmelweis University's e-learning system. Modifying of exam dates through the NEPTUN system, as it allows.
- Semester Closing exam is a written test. The material for examination is based on the lectures.
- Test results of exam are available within one day.

MEDICAL IMAGING

Department of Radiology

www.semmelweis.hu/radiologia

Tutor: **Dávid László Tárnoki MD, PhD associate professor**

Course Director: **Prof. Dr. Viktor Bérczi med. habil. PhD, department chair**

Lectures (1 hour)

Practices (2 hours)

Credit: 3

Course topics (order of lectures could change)

Clinical importance of imaging modalities: X-ray, CT, US. Abdominal imaging. Cardiovascular imaging. Chest imaging. Urogenital radiology. Musculoskeletal imaging. Neuroradiology & MR principles. Head and neck imaging. Oncologic imaging. Pediatric imaging. Emergency radiology.

Vascular interventions. Non-vascular interventions. Breast imaging. Radiation biology, Radiation protection. Nuclear Medicine, Molecular imaging. Artificial intelligence in imaging. Radiogenomics.

Practices

Demonstration of imaging methods. Clinical radiology by interactive case reviews. Ultrasound practice (skill centre). Consultation. (Must-see-images: image collection on our website)

Useful and update information about the Institute and the subject can be found at home page: www.semmelweis.hu/radiologia.

LABORATORY MEDICINE

Department of Laboratory Medicine

Address: H-1089 Budapest, Nagyvárad sq 4. Floor XIV
Phone +36-1-210-0278 ext: 56318

Acting Directors

General: **Prof. Barna VÁSÁRHELYI MD., PhD., DSc.** (vasarhelyi.barna@med.semmelweis-univ.hu)

Background

The Department of Laboratory Medicine was founded in 2010 with missions on the following areas:

Education. The main goal is the introduction of basic principles of Laboratory Medicine to graduate medical students. The Department also provides post-graduate education for health-care specialists including physicians and clinical biochemists.

Diagnostics. It coordinates laboratory tests at the majority of University and provides professional support for clinical decision making.

Research. The Department actively participates in research studies involving laboratory tests; it also manages research projects of its own. The Department manages its own PhD program.

Education

The Laboratory Medicine curriculum is based on knowledge acquired during studies of Translational Medicine and Pathophysiology obtained during the third year. The major goal is to present some approach and diagnostic algorithms that are required for efficient test ordering and evaluation of lab test results. As part of education the students obtain information regarding: the procedure that generates laboratory test results (from test ordering to laboratory reports) laboratory tests needed to establish a diagnosis the major aspects that the medical doctors should take into account when they evaluate a laboratory report novel techniques used in general laboratory (with their drawbacks and benefits).

Beyond the basic knowledge integrated into the internal medicine training, real diagnostic problems through life examples are discussed during the practices.

Classroom lectures and practices “Laboratory Medicine” for 4th year medical students

The participation in the tuition is obligatory.

The digital slides are available for the students via our website (www.labmed.usn.hu).

The participation on lectures is highly recommended, since the exam is partly based on them.

The topics of the lectures include the elements of general and practical clinical laboratory.

The areas to be covered by the planned lectures:

- 1. Introduction in Laboratory Medicine** (Specimen collection and processing. Preanalytical variables. To identify the major factors interfering with laboratory tests. Establishment and use of reference values/intervals.)
- 2. Concepts in Laboratory Medicine** (Interpretation of laboratory test results: sensitivity and specificity of a laboratory test, predictive values. Quality control, quality assurance in clinical laboratories.)
- 3. Laboratory investigations of hematology diseases.** (To understand the basic principles of modern hematology analyzers in clinical laboratories.)
- 4. Laboratory investigations of hemostatic disorders.** (Identify the appropriate laboratory tests for evaluation of the bleeding patient and the thrombotic patient.)
- 5. Laboratory investigations of inflammation and tissue damage.** (To understand how cell injury and inflammation can be tracked through plasma markers.)
- 6. Immunological investigations in laboratory medicine.** (Learn the diagnostic tests required to the assessment of autoimmune disorders.)
- 7. Laboratory enzyme diagnostics**
- 8. Endocrine investigations in laboratory medicine** (Understand the laboratory tests used in the diagnosis of the more commonly encountered endocrine disorders.)
- 9. Molecular genetics investigation in laboratory medicine**
- 10. Therapeutic drug monitoring** (To learn when therapeutic drug monitoring is required and how it is performed for commonly monitored drugs. To identify the common drugs of abuse and learn how they are detected.)
- 11. Laboratory investigations of tumor markers**
- 12. Laboratory investigations of cerebrospinal fluid and ascites, pleural fluid**
- 13. To learn the laboratory tests used near patients (Point of care testing)**
- 14. To learn the rationale for selection of laboratory tests in pediatrics including neonatal screening programs.**

The topics of the exercises include some clinical case studies, harmonized with the Internal medicine studies, dealing with the following diagnostic problems:

1. "Sick or not?" screening tests.
2. Hypertensive patient.
3. Obese patient.
4. Diabetic patients.
5. Endocrine patients
6. Patient with fever.
7. Patient with joints complaint
8. Alcoholic patient.
9. Patients with kidney disorders.
10. Liquid, ion homeostasis disorder

We also provide consultation and laboratory visit during the semester.

Exam

The exam is a written test.

The material for examination is based on the lectures. The questions are prepared by lectures.

The exam consists of 50 questions. The students have 60 minutes for writing test.

The test questions include simple choice (one correct answer out of 4 or 5 options).

Test results of exam are available within one day.

Evaluation:

0- 60% = 1 (Failed)

61- 70% = 2

71- 80% = 3

81- 90% = 4

91-100% = 5

Exam dates: You will be notified about the dates offered by the Department before the exam period and they will be finalized at the Staff-Student meeting.

Taking examination before the exam period is not allowed.

The sign up procedure is controlled and regulated by the NEPTUN software and the Department cannot interfere with system. The officially signed up student will be scheduled for examination. The list of examinees is completed 2 days before the date of exam; then NEPTUN system automatically closes the sign up list.

Diagnostic profile of the Department

The Central Laboratory at Semmelweis University forms the basis of the Department. It performs more than 400 different tests in the field of clinical chemistry, hematology, hemostasis, serology, endocrinology, therapeutic drug level monitoring and clinical microbiology with an annual number over 3 million. The laboratory is classified as FJ-3 meaning that it provides a 24 hour service for 7 days a week. Laboratory reports are provided through GLIMS lab informatics system integrated to eMedSolution.

Research at the Department

Laboratory tests are performed in the majority of clinical studies and drug research. In order to use the results more efficiently the colleague who is directly involved in performing the lab tests also participates in study design and evaluation. Therefore, clinical laboratories at the University are active partners of researchers and medical doctors. The major research profile of the Institute is to characterize specific patterns of biomarkers predictive for specific disorders. Characteristic examples are the determination of immune phenotype and analysis of kinetic alteration of intracellular analytes with flow cytometry, measurement of cytokine levels with biochips, genomic analyses (genotyping and gene expression arrays). These instruments and the professional knowledge are also available for research purposes. Medical students are welcome to do research in any of the fields listed above.

Useful and update information about the Institute and the subject of Laboratory Medicine can be found at home page: Semmelweis.hu/laboratorium

EMERGENCY MEDICINE and OXYOLOGY

Dept. of Anesthesiology and Intensive Therapy
Division of Emergency Medicine and Oxyology
Tutor: *Peter Vass MD, (Tel: +36 1 459-1500/62037, 62038, E-mail: seemgrad@gmail.com)*

Compulsory subject: Emergency Medicine and Oxyology (EMO)– program and topics

2 credits

Lectures	Remarks
Pictures and sounds from the 20th century – birth of a new phylosophy of patient care. How do we err? Importance of communication in acute medicine	Historical perspectives, approach and emphasis. SBAR principles. Patient pathways.
Pain syndromes. As long as it hurts you know that you are alive.	Headache, chest and abdominal pain, backpain. The basics of pain management.
Environmental accidents.	Electrocution, drowning, near-drowning, heat exhaustion, heat stroke, hypothermia. What to do on the scene and in the ED.
Group of symptoms in emergency	Dyspnoe, vertigo, syncope, nausea and vomiting, diarrhoea, weakness. Allergic reactions.
Prehospital emergency services as integral parts of emergency care.	First aid, primary emegency systems, levels of rescue, connection of ambulance with hospital care.
Perfuse it or lose it.	Things you’ve missed from pathophys but will surprise you in acute situations.
Emergency cardiac care. From the sliding door to the PCI.	Syncope, heart failure, ACS.
Acute neurological deficit. Time is brain.	Stroke, altered mental states, convulsions.
Paediatric emergencies. The same but downsized?	The most requent emergency situations in kids. Special view of paediatric emergency care.
The severely injured patient. The future: Die Hard 6.	Trauma, burns, compartment syndromes.Integration, teamwork, damage control.
Massive bleeding. The dynamic approach of coagulopathies.	How to deal with bleeding patients?
Toxicology. Alle Ding sind Gift-any stuff is a poison. Two steps above earth.	Toxidromes. Aspecific and specific care. Substances of abuse.
Fever, infections, sepsis. „Blood poisoning” in the 20th century.	Severe heat imbalance, the emergency aspects of sepsis.

Types of practices in Emergency Medicine - Oxyology:

OMV-OV-NOT-Compulsory: (2x45 min) The basic rules of treatment of a critical ill patient during simulation. Basic airway skills during simulation. Oxygen therapy workshop. IV access or alternative ways in critical ill patient during simulation. **OMV-M-RF-1-NOT-Compulsory (2x45 Min):** Monitorising, basics of red flag treatment and team skills. Diagnostic and therapeutic approach of critical ill patient with basic technical and non technical skills. Basic monitorising technics in treatment of emergency patient during simulation. Presentation and practice during simulations of non-technical skills to make teamwork better. Team member non-technical skills presentation and practice during simulations.

OMV-M-RF-2-NOT-Compulsory (2x45 Min): Monitorising, basics of red flag treatment and team skills. Diagnostic and therapeutic approach of critical ill patient with basic technical and non technical skills. Basic monitorising technics in treatment of emergency patient during simulation. Presentation and practice during simulations of non-technical skills to make teamwork better. Team member non-technical skills presentation and practice during simulations.

PBL-SBAR-Compulsory: Problem Based Learning SBAR communication practice (2x45 min) Acquaintance and practice of SBAR-communication method in emergency situations. Communication with patient and relatives in critical situations and during end of life care procedure. Communication practice between dispatch and HCP on the scene.

PBL-Triage-Compulsory: Problem Based Learning – Priorisation practice (2x45 min) Basic technics to solve different problems, with prioritisation techniques and the usefulness of different early warning scores. How to organize and prioritize to maintain Patient safety.

4 hour ER rotation compulsory (4x45 Min): 4 hour rotation at an Emergency Unit Practices. Structure and operation of the Emergency Room/Unit, examination, triage and management of the patients, debriefing of the cases. Examination of emergency patient. Decision making in practice. Make a plan for patient route. Planning and management of diagnostic for emergency patient. PoCT. Planning of treatment of emergency patient. Communication with help of SBAR. Basics of PoCT. Pearls of BGA.

4 hour ER rotation NOT-compulsory: 4 hour rotation at an Emergency Unit Practices (4x45 Min) Structure and operation of the Emergency Room/Unit, examination, triage and management of the patients, debriefing of the cases. Examination of emergency patient. Decision making in practice. Make a plan for patient route. Planning and management of diagnostic for emergency patient. PoCT. Planning of treatment of emergency patient. Communication with help of SBAR.

MEDICAL ETHICS, Bioethics

Institute of Behavioral Sciences

Tutor: **Prof. Dr. József Kovács**

Course Syllabus.

Course objectives:

- To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patients research subjects and fellow health care professionals
- To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

Topics:

- | | |
|---|---|
| 1. week Principles of Medical Ethics | 7. week Reproductive Issues |
| 2. week Informed Consent I. | 8. week End of Life Issues |
| 3. week Competence and Capacity to Make Health Care Decisions | 9. week Organ and Tissue Transplantation |
| 4. week Informed Consent II. | 10. week The Rights of Patients |
| 5. week Information Disclosure to Terminally Ill Patients. Telling the Truth to Patients | 11. week Malpractice |
| 6. week Confidentiality and Medical Records. Reportable Illnesses, HIV-Related Issues, Sexually Transmitted Diseases (STDs) | 12. week Doctor-Patient, Doctor-Doctor Relationship |
| | 13. week Doctor and Society |
| | 14. week Ethical Questions of Human Research |

Course Faculty:

Prof. József Kovács, MD, PhD, (Head of the Department of Bioethics),
210-2930/56115;
Orsolya Péter, JD, PhD, peter.orsolya@med.semmelweis-univ.hu; peterorsolya@gmail.com
(Room 2012) (Tel: +36-30-906-5787)

Secretary: Csilla Motyovszki , e-mail: motyovszki.csilla@med.semmelweis-univ.hu
Tel: 210-2930/56114, NET Building, 20th floor, Room-2015

Department:

Institute of Behavioral Sciences
Department of Bioethics
NET Building, 19th, 20th floor
1089. Budapest, Nagyváradi tér 4.
Tel: 210-2953
Secretary: NET Building, 20th floor, Room-2005

List of questions

1. The principles of medical ethics
2. Competence and the capacity to make decisions
3. Paternalism in medical practice
4. Informed consent
5. Information disclosure for terminally ill patients
6. Withholding and withdrawal of medical treatment
7. Advance Directives
8. Do not resuscitate (DNR) orders
9. Withholding Fluids and Nutrition in terminally ill patients
10. Physician assisted suicide
11. Active and Passive Euthanasia
12. Terminal sedation and the law of double effect
13. Futile medical care
14. Determination of death and brain death
15. Ethical problems of live organ donation
16. Organd donation from brain-dead donors: the system of donor cards.
17. Organd donation from brain-dead donors: presumed consent
18. Reproductive issues (abortion, contraception, sterilization, donation of sperm and eggs)
19. HIV related issues (confidentiality, partner notification, HIV-positive health-care workers, refusal to treat HIV-positive patients) and sexually transmitted diseases (STDs)
20. Malpractice
21. Doctor-patient relationship (beginning and ending the relationship, gifts from patients, doctor/patient sexual contact)
22. Doctor and society (child abuse, elder abuse, impaired drivers, physician participation in executions, torture, spousal abuse, gunshot wounds, gifts and industry funding)
23. Doctor-doctor relationship (reporting impaired physicians, physician disagreements)
24. Confidentiality and medical records
25. Ethical Questions of Human Research
26. The Rights of Patients

Textbook:

Conrad Fischer—Caterina Oneto (2016): Medical Ethics for the Boards. (Third edition) New York: McGraw-Hill Education.
ISBN: 978-1-259-64121-3
MHID 1-25-964121-X

Important:

To participate on at least 75% of the total number of lessons is a prerequisite of getting the signature. Doctor's certificate is required to justify absence from the lessons and the exam.

Exam type: semi-final

Sign up for the exam: through the Neptun system.

PHARMACOLOGY AND PHARMACOTHERAPY I–II

Tutor: *Dr. Pál Riba*

Department of Pharmacology and Pharmacotherapy

Total credits: 2×5 (10)

Course Director: *Dr. Ferdinandy Péter*

Thematics:

Pharmacology and Pharmacotherapy (two semesters)

Topics of Pharmacology and Pharmacotherapy I:

- 1 Introduction to Pharmacology (history of pharmacology, pharmacogenomics, general principles of toxicology). Development of Drugs (clinical trials: phase I. II. III. IV.). Evidence Based Medicine (ethic disciplines, role of placebo in clinical trials). Pharmacodynamics I (drug receptors, receptor theories, drug-receptor interactions).
- 2 Pharmacodynamics II (quantal dose-response curves, therapeutic indices, tolerance, drug interactions). Basics of prescription writing. Pharmacokinetics (drug absorption, distribution, elimination). Clinical pharmacokinetic principles.
- 3 Basics of the neurotransmission of the autonomic nervous system. Pharmacology of the cholinergic systems. Parasympathomimetics and parasympatholytics, centrally acting cholinergic drugs
- 4 Pharmacology of the adrenergic system. Sympathomimetics and sympatholytics.
- 5 Pharmacology of the skeletal muscles. Pharmacology of the local anesthetics. Nitrates, Ca-channel blockers and other vasodilators. Pharmacology of RAAS.
- 6 Drugs used in coagulation disorders. Fibrinolytics, drugs against bleeding, drugs acting on blood cell production. Diuretics and antidiuretics
- 7 Treatment strategy of ischemic heart disease. Treatment strategy of acute and chronic heart failure. Positive inotropic agents. Antihyperlipidemic drugs.
- 8 Treatment strategy of hypertension. Drugs acting on blood glucose control. Antidiabetics.
- 9 Treatment strategy of 2nd type diabetes mellitus. Metabolic syndrome. Antiarrhythmic drugs. Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation.
- 10 Pharmacology of the respiratory system. Pharmacotherapy of bronchial asthma and COPD. Expectorants (secretomotorics, secretolytics, mucolytics), antitussive drugs. Autacoids, histamine, antihistamines.
- 11 Corticosteroids. Drugs affecting bone mineral homeostasis. Treatment strategy of osteoporosis. Pituitary hormones and hypothalamic hormones controlling their production. Hormonanalogs and hormone antagonists.
- 12 Thyroid hormones and antithyroid drugs. Sexual hormones. Contraceptives. Androgens, antiandrogens, anabolic steroids, drugs influencing sexual activity.
- 13 Special aspects of pediatric and geriatric pharmacology (Pharmacokinetic Differences and Variations in Drug Responsiveness according to Age or State of Health.) Nutrients, traditional plant medicines, vitamins, anorectic drugs.
- 14 Regulation of Drugs (drug registration, ATC code, generics, biosimilar drugs). Pharmacovigilance (reporting adverse effects). Biological Drugs. Orphan Drugs (CP) Advanced Therapy Medicines. Drug formulations.

Topic of Pharmacology and Pharmacotherapy II:

- 1 Basic pharmacology of analgesics. Opioids. Adjuvant analgesics
- 2 Immunopharmacology (immunosuppressive and immunomodulatory agents). Non-Steroidal-Antiinflammatory-Drugs (NSAIDs). Drugs for gout
- 3 Treatment strategy of autoimmune diseases (CP). Treatment strategy of pain. Antidepressants and antimanic drugs, mood stabilizers
- 4 Pharmacology of the central noradrenergic and serotonergic systems. Pharmacotherapy of mood disorders. General anesthetics
- 5 Pharmacology of the central GABA-ergic system. Pharmacotherapy of anxiety and sleep disorders. Antipsychotics.
- 6 Pharmacology of the central dopaminergic systems. Pharmacotherapy of neurodegenerative diseases. Antiepileptics
- 7 Pharmacology of the Gastrointestinal System (agents for treatment of peptic ulcer, gastroesophageal reflux disease (GERD), irritable bowel syndrome (IBS). Treatment strategy of peptic ulcer and gastroesophageal reflux disease (GERD). Antiemetics. Laxatives. Pharmacology of Nutrition (appetizers, agents improving digestion, prokinetic drugs). Drugs against diarrhea. Pharmacology of liver and bile.

- 8 Antiviral drugs and pharmacotherapy of viral infections. Cell Wall Synthesis Inhibitors & Membrane-Active Antibiotics
- 9 Antibiotics Inhibiting Bacterial Protein Synthesis. Antituberculotics. Antifungal, Antiprotozoal and Antihelmintic Drugs.
- 10 Antibiotics Inhibiting Bacterial Nucleic Acid Synthesis. Miscellaneous Other Antibiotics. Pharmacotherapy of bacterial infections
- 11 Drugs affecting smooth muscles. Agents Affecting the Function of Uterus. Autacoids. Drugs Used for Treatment of Migraine and Cluster. Drugs of Abuse. Cytotoxic antitumor agents
- 12 Cytostatic and other anticancer drugs. Treatment strategy of cancer
- 13 Basics of toxicology. Detailed Toxicology
- 14 Pharmacological aspects of emergency care. Contrast agents. Disinfectants

Maximum number of absences is 25 percent of the number of practices in the semester.

Certifying absence from the lesson:

Medical certificate is accepted

In each semester two written midterms are arranged. The topics of the midterms are the material discussed from the beginning of the semester or after the previous midterm.

The number of absences must not be more than 25 percent of the number of practices in the semester.

Grading: Written test: according to the scores. The semi-final exam is oral.

Final exam consists of three parts. The grade will be decided after the oral part of the exam (three questions), taken into consideration the results of the preceding two parts (see below).

Exam type:

1st semester. Semi-final, oral

2nd semester. Final exam has three parts. 1. Preceding exam from toxicology. 2. Written test from clinical pharmacology. 3. Oral exam.

Exam sign up:

Registration has to be done through the NEPTUN system for the days set by the department up to the limits.

Modifying:

Through the NEPTUN system, as it allows

Certifying absence from the exam:

Medical certificate is accepted.

Literature:

- 1 Basic and Clinical Pharmacology (Ed. B. G. Katzung), 14th edition, McGraw-Hill Education, 2018. ISBN 978-1-260-28817-9
- 2 Materials discussed during lectures and seminars.

FAMILY MEDICINE

Department of Family Medicine

H- 1085 Budapest, Stáhly u. 7-9. Phone: +36-1-355-8530

Head of the Department: Dr. Péter Torzsa M.D. Ph.D.

Credits: 2

Total number of hours: 20 lectures: 8 practices:16

Type of the course (mandatory/elective): mandatory

Academic year: 2021/2022

Code of the course: AOKCSA695_1A

Aim of the subject and its place in the curriculum:

Health care is based on the family practice system. It's important for future doctors to get to know the gatekeeping function of family practices. It's also important to show them on a one-to-one tutoring basis that family practice is an integrating profession. While getting involved in the work of the family practice medical students are introduced to the preventive approach, the ways of how to solve holistic, complex, bio-psycho-social and somatic problems and the differential diagnostics of frequent diseases. The aim is to teach them how to use and apply the basic means of diagnostic and therapeutic procedures and tools, to give them an insight into the most frequent laws and courses of action they may meet, to develop the medical students' communication skills in practice and to practise how to work with short interventions.

Location of the course (lecture hall, practice room, etc.):

Accredited tutorial practices

The lecture hall of the Department of Family Medicine

Competencies gained upon the successful completion of the subject:

- Preventive approach, screening
- Holistic patient care
- Managing complex bio-psycho-social-health problems
- Frequent chronic illness care
- Differential diagnostics
- How to use basic diagnostic tools on their own and how to assess test results
- Basic health-care-connected legal knowledge

Prerequisite(s) for admission to the subject:

Internal medicine propaedeutics, Pharmacology I, Laboratory medicine

Minimum and maximum number of students registering for the course:

Student selection method in case of oversubscription:

Turn based system.

How to register for the course:

To register for the course in the 'Neptun' system

Detailed thematic of the course:

Lectures

- Lectures take place on the first day of the course in an eight-hour period in the following categories:
 - Screening procedures
 - Mood- and sleep disorders
 - Diabetes screening and care
 - Gastrointestinal disease care
 - Emergency care in the practice
 - Cardiovascular prevention, hypertonic patient care
 - Supplementary medicine

Practices

- The subject is taught in blocks. Medical students have five lessons in the family practice on one-to-one tutoring basis on the second and the fourth day plus a three-lesson long case discussion with a practical and differential diagnostic approach.
- During the training session in the family practice medical students will get to know and acquire
 - the possible forms of prevention
 - chronic illness care
 - acute illness care
 - the managing of complex bio-psycho-social problems
 - how to use the available diagnostic and therapeutic devices and tools

The subject of the case discussion includes the most frequent problems in basic care and provides an opportunity to discuss the diagnostic, differential diagnostic and therapeutic ways and possibilities in the following topics in an interactive way:

Screening procedures

- Complex cardiovascular/metabolic diseases
- Frequent, serious communicable diseases
- Patients with musculoskeletal diseases that have a strong negative impact on their life
- Patients with psycho-social problems

Potential overlap(s) with other subjects:

Internal medicine

Policy regarding the attendance and making up absences:

It's compulsory for the student to attend 75 percent of the training sessions.

Means of assessing the students' progress during the semester:

During training the tutor checks whether the students have acquired the practical and theoretical content of the training. There is no formal assessment.

Requirement for acknowledging the semester (signature): It's compulsory for the student to attend at least 75 percent of the training sessions.

Type and method of grading:

Assessment and grading of the course: with a 1 to 5 term mark:

It's based on the student's activity through the training assessed by the tutor (40 percent) and the grade of the required case study (60 percent).

Assessment of the case study is based on the following:

Grade 1: failing to hand in the essay on the deadline, the number of characters is under 3,000, the case study is not original, but plagiarism

Grade 2: absence of a required part of the case study, unsophisticated wording, serious professional failure

Grade 3: 2-3 professional or formal mistakes

Grade 4: one not too significant professional mistake

Grade 5: precise and accurate wording in the medical jargon, logical conclusions

How to register for the exam:

Registering for the exam in the 'Neptun' system

Opportunities to retake the exam:

In accordance with the Studies and Exams Code.

Type of the examination:

Assessment of how actively the student has participated in the training by the tutor.

Compiling a 3-4,000 character case study based on what students have learnt through the training period in one of the topics given in advance.

Exam requirements:

Compiling a case study about a specific patient based on the following topics:

Patient picked through screening

A complex cardiovascular/metabolic disease

Frequent serious communicable disease

Patient with a musculoskeletal disease that has a strong negative impact on their life.

A case study displaying psycho-social problems

Parts of the presentation of the case:

1. Anamnesis
2. Current complaints
3. An examination plan
4. Examinations
5. Diagnosis
6. Therapy
7. Care
8. Processing and assessing the case based on professional literature
9. Bibliography

Chapters of Sports Surgery and Sports Medicine

Department of Traumatology Departmental Group of Sports Surgery and Sports Medicine and University of Physical Education

Credit value: 2

Number of lessons per week: 1 lecture 2x45 minutes practical course

Subject type: compulsory course

Academic year: 2021-2022 / I

Name of the course leader: *Prof. Dr. István Berkes*

Position: Head of the Departmental Group

Objectives of the subject, its place in the medical curriculum: Our aim is to teach our students the basic knowledge of sports surgery and sports medicine. Gaining knowledge about the complex health effects of sport. Mastering the concept of locomotor medicine. The knowledge of the subject is closely related to the knowledge of all major clinical subjects, especially surgery, accident surgery and orthopedics, as well as internal medicine and rehabilitation. Among the theoretical subjects, the most related are physiology, pathophysiology and biochemistry.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Lectures: in the lecture hall of the Uzsoki Hospital

Practice: in the classroom, the library, the wards, the outpatient care rooms, the operation theater of Uzsoki Hospital

Address: 1145 Budapest, Uzsoki utca 29-41.

Successful completion of the subject results in the acquisition of the following competencies:

The following competencies will be gained by the students upon successful completion of course:

Guidance of physical activity life style, prevention of NCDs and sports injuries, and the field side assessment of sports injuries.

Course prerequisites:

Finished the 3rd year of a Medical University with completed subjects of anatomy 2 and physiology.

Number of students required for the course (minimum, maximum) and method of selecting students:

min:3;

max: 30

none

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks) . Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments!

Always attach a CV for guest lecturers!!

Week	Lectures	Pratice
1st week:	Prof. István Berkes MD, PhD: Histry of sports medicine. Epidemiology, prevention and management of sports injuries	
2nd week:	Time Kovács MD, PhD: Effect of the sport for the human system organs	Konditioning
3rd week:	Prof. Miklós Tóths MD, DSC: Conception of Exercise Medicine	
4th week:	Prof. Béla Merkely MD, DSC: Knowledges of Sports Cardiology	
5th week:	István Györe MD: Basics of Load physiologiogy	
6th week:	Dr. Péter Osváth MD, PhD: Sports nutrition, dietary supplements, antidopping activity	
7nd week:	Prof. László Hangody MD, DSC: Up to date management of sports injuries	Surgical demonstration
8th week:	Imre Szerb Md, PhD: Sports injuries of upper limb	Clinical, radiological, ultrasound, CT and MRI examinations
9th week:	György Béres MD, Krisztián Magos MD: Sports injuries of lower limb	Clinical, radiological, ultrasound, CT and MRI examinations
10th week:	GergelyPánics MD, PhD: Field side assessment of sports injuries	First aid
11th week:	Árpád, Viola MD, PhD: Acute and chronic spine injuries	Clinical, radiological, ultrasound, CT and MRI examinations
12rd week:	Zsófia Duska: Rehabilitation of sports injuries	Kinesio-Taping
13th week:	Sándor Nagy: Sportpsychology	Relaxations techniquesk
14th week:	Zsolt Komka MD: Szeminar, prectice – physical examinations, resuscitation	
15th week:	Exam (written test)	

Other subjects concerning the border issues of the given subject (both compulsory and optional courses !). Possible overlaps of themes:

Orthopaedics, Traumatology, First aid, Hand surgery, Plastic surgery

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

Homework (modern management of different sports injuries) until the end of the 13th week of the semester

Type of e xamination:

written test

Requirements of the examination:

(In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)

Method and type of evaluation:

(Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)

The grade depends on the practice score and homework given by the tutor of the student and on the result of the written test.

How to register for the examination?

Through the Neptun system

Possibilities for exam retake:

Oral exam, registration through the Neptun System

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

- 1.Note book of the Departmental Group
- 2.Power point presentation collected by Departmental Group
- 3.Lars Peterson and Per Renström: Sports Injuries Their Prevention and Treatment, Third Edition
4. DeLee & Drez's Orthopaedic Sports Medicine 4th Edition

Online:

Semmelweis University E-learning (Moodle)

<https://itc.semmelweis.hu/moodle/>

PHYSICAL EDUCATION VII-VIII.

Practice: 1 hour per week

Credit value: 0

Number of lessons per week: 1

Practical course: 14

Subject type: compulsory course

Subject code: AOTS1009_7A

Name of the course leader: Várszegi Kornélia

Objectives of the subject, its place in the medical curriculum:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Gymnasium, Artificial football court, Artificial tennis court

University's Centre for Physical Education and Sports 1107 Budapest Zágrábi utca 14.

Successful completion of the subject results in the acquisition of the following competencies:

Upon completion of the course the student will be able to carry out regular physical activity.

After completing the „beginner swimming” course, one will acquire water-confident swimming skills.

Detailed curriculum:

(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks). Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments!

Always attach a CV for guest lecturers!!

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1 x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,

4 x 3 hrs. and 1x 2 hrs. session packages: Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

P.E. Teachers:

Doharné Buczkó Anikó
 Farkas Dominika
 Kalmus Dániel
 Lehel Zsolt
 Sótornyiné Hrehuss Nóra
 Várszegi Kornélia
 Weisz Miklós

Requirements for participation in classes and the possibility to make up for absences:

The number of active participations for physical education classes is 10, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Methods to assess knowledge acquisition during term time:

(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)

There is no mandatory control during the term.

Requirements for signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat

until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

ELECTIVE SUBJECTS

Detailed programs see in the 5th year Study Program of Medicine!

SUMMER (SURGERY) PRACTICE

Credit point: 1

Total hours: practical: 160

Type of course: compulsory

Responsible for course: *Dr. Szijártó Attila*

Workplace, contact details: 1st Department of Surgery, phone: +36-1-333-5343

Position: university professor, director

Date and number of habilitation: 2015.06

Aim of the course, its position in the medical curriculum:

The main aim of the fourth semester surgery practical is introduction to the general symptomology, diagnostics, and specifics of therapeutic decisions of surgical conditions. In addition to the basics of surgery, students learn about surgical conditions of the organ systems, their diagnosis and surgical treatment. Our primary task is to teach an approach of cooperation with accompanying specialities, we guide students through the process of outpatient specialist treatment through surgery to postoperative care.

Acquired competences after successfully completing the course:

Education of surgery starts in the 4th year, and it embraces the whole curriculum until the 4th year comprehensive surgery exam, providing the framework of clinical training. During this time our main goal is to blend the knowledge provided by theoretical courses and accompanying clinical specialities with the surgical approach and decision making.

Prerequisite(s) for admission to the course:

- According to the Study and Examination Policy.
- Student enrolment requirements (minimum, maximum), method of student selection:
- Based on registration in the Neptun system.

How to apply for course:

In Neptun system

Detailed syllabus:

The surgery summer practical, based on “block” syllabus education for the 4th year, provides practical knowledge involving students in daily patient care.

Recommended practical activities:

- *Examination of acute surgical patient*
- *Examination of elective surgical patient*
- *Wound care*
- *Participation in the work of the surgical outpatient clinic*
- *Surgery assistance*
- *Surgery administration*
- *Postoperative care, medication*

Cross-border issues of the given course related to other courses (compulsory and elective). Possible overlaps in curriculum:

- internal medicine – gastroenterology, endocrinology
- oncology
- anaesthesiology and intensive therapy
- radiology

Special study work required to complete the course:

none

Requirements for participation in classes and opportunities to make up for absences:

There is an attendance register for the practical.

According to Chapter 3, Section 17 § 7 of the Organisational and Operational Rules of the Semmelweis University, attendance at min. 75-75% of lectures and practices is compulsory

Further general information on attendance at lectures and practical can be found in the Studies and Exams Code (Section 17 § 7; 8) of the Semmelweis University.

Examination of acquired knowledge during term:

There is no intermediate exam during the short practical time. The interactive features of the practical and consultations provide an opportunity to continuously assess students' knowledge.

The criteria for end-of-term signatures:

Attendance at min. 75% of classes.

Type of exam:

Practical exam based on previously defined syllabus

Exam requirements:**Practical exam items:**

Knowledge of the below exam items will be tested based on information acquired from literature and practical:

1. What is vital indication?
2. How can free abdominal air be detected by means of percussion?
3. What are the most common complications of thyroid surgery?
4. What is a fundoplication?
5. What can cause dysphagia?
6. With what tissue can the oesophagus be replaced?
7. Draw the Billroth's gastric resections.
8. List the blood supplying vessels of the stomach.
9. Draw/describe the Calot's triangle.
10. What are the 3 main signs of cholangitis, what is the name of the triad?
11. What are the surgical indications of a benign liver tumour?
12. What are the blood supplying vessels of the liver?
13. What imaging diagnostic(s) is necessary to diagnose a liver tumour?
14. What are the pillars of the diagnosis of acute pancreatitis?
15. Name the typical symptoms of chronic pancreatitis.
16. Which laboratory parameter indicates obstructive jaundice?
17. What is the Courvoisier sign? What is the Murphy sign?
18. With which surgical process can a caecal tumour be removed?
19. Why is "short" bowel resection the aim in case of a Morbus Crohn?
20. When is a rectum extirpation performed?
21. What is an indirect inguinal hernia?
22. Which is the most common benign breast tumour?
23. What is a sentinel lymph node?
24. What is a Hartmann surgery?

25. What is an R0 resection?
26. Name 3 precancerous signs in surgery.
27. What is a neoadjuvant therapy?
28. What is pseudomembranous colitis?
29. When is nasojejunal feeding applied?
30. Where is the McBurney's point?
31. What are the indirect signs of acute appendicitis?
32. List the conditions of wound healing.
33. Define the phases of wound healing in chronological order.
34. How can nosocomial infections be prevented?
35. What is the difference between an abscess and a phlegmon?
36. List the inflammatory conditions (min. 3) of the skin and cutaneous annexes.
37. What is a relative indication?
38. What is the difference between a curable and a resectable case/tumour?
39. How is a bite wound and a gunshot wound to be treated?
40. What is the LES?
41. What is diastasis recti?
42. What are (surgical) complications of peptic ulcers?
43. What is the surgical relevance of a Meckel's diverticulum?
44. What are surgical indications in inflammatory bowel diseases?
45. Which perianal diseases are emergency surgical conditions?
46. What vaccination is necessary in case of a planned splenectomy?
47. What causes haematemesis?
48. What causes haematochezia?
49. What are the 3 groups of ileuses based on aetiology?
50. Which is more critical, urgent: ileus of the small or large intestine?

Method and type of class marks:

Practical test of one exam item

How to apply for the exam:

In Neptun system

Opportunity to repeat the exam:

As described in the Study and Examination Policy

The list of printed, electronic and online notes, textbooks, study aids and literature to be used to learn the curriculum (in case of online sources, html address):

Sebészeti Horváth, Örs Péter - Oláh, Attila (editors)

Sebészeti (10th edition) Gaál, Csaba (editor)

Sebészeti műtét Boros, Mihály (editor)

Littmann Sebészeti műtét Horváth, Örs Péter - Kiss, János

CLINICAL MODULE



Faculty of Medicine
5th year

STUDY PROGRAMME

Fifth Year in the 2021/2022 academic year

4th and 5th Years (7th-10th semesters)

Teaching is done in “clean” blocks: Theory + Practice + Exam. (Practices are taught by “shadowing”)
The time span of each block depends on the credit value of the subjects: 1 to 5 weeks

For example: based on a subject of 2 credits:

- 2 credits × 14 lessons = 28 lessons (1 semester consists of 14 weeks. The number of credits are equal with the lessons in a week)
- Education is provided as 8 lessons in a day: 4 days x 8 lessons = 32 lessons
- the training and the exam must be completed in 2 weeks
- approx. 40 students will be trained by providing 4 days of training and 2 days of exams within 10 working days.

9th and 10th semester

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	pratic (h/week)			
Internal Medicine (Hematology, Infectology, Immunology, Rheumatology)	2	5,5	7	Internal Medicine I., Laboratory Medicine, Medical Imaging	semi-final
Forensic Medicine	18	10	2	Pathology II., Genetics and Genomics, Pharmacology II.	semi-final
Obstetrics and Gynecology	2	4	6	Pharmacology II., Medical Imaging, Surgery I-II.	semi-final
Pediatrics	2	6	8	Internal Medicine I., Laboratory Medicine, Medical Imaging	semi-final
Urology	1	2	3	Pharmacology II., Surgery I-II.	semi-final
Intensive Therapy and Anesthesiology	1,5	2,5	4	Cardiology, Heart Surgery, Angiology, Vascular Surgery Clinical Pharmacology Emergency Medicine and Oxyology	semi-final
Ophthalmology	1,5	2,5	4	Pharmacology II., Medical Imaging, Surgery I-II.	semi-final
Neurology and Neurosurgery	2	4,5	6	Internal Medicine I., Medical Imaging	semi-final
Psychiatry and Psychotherapy	2	4	6	Pharmacology II.	semi-final
Sports Medicine	0	2	2	Internal Medicine I., Cardiology, Heart Surgery, Angiology, Vascular Surgery	semi-final

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	pratices (h/week)			
Clinical Genetics	0	20	2	Pharmacology II., Genetics and Genomics, Pathology II.	semi-final
Medical Rehabilitation	0	2	2	Cardiology, Heart Surgery, Angiology, Vascular Surgery, Orthopedics	semi-final
Public Health	3	4	7	Cardiology, Heart Surgery, Angiology, Vascular Surgery Oncology and Plastic Surgery, Medical Statistics, Informatics	semi-final
PE IX.	0	1	0	PE VIII.	signature
PE X.	0	1	0	PE IX.	signature

LIST OF TEXTBOOKS (The list may change!)

- 1 William W. Hay, Jr., Myron J. Levin, Robin R. Deterding, Mark J. Abzug: Current Diagnosis & Treatment Pediatrics. 23rd edition, Lange, 2016. ISBN: 978-0071848541
- 2 Lecture Notes of Forensic Medicine Ed. by Péter Sótónyi, Éva Keller, Semmelweis Publisher, 2008.
- 3 Knight's Forensic Pathology. 3rd ed. 2004. Arnold.
- 4 Lang, G.K.: Ophthalmology. A Pocket Textbook Atlas. Thieme Flexibook. Stuttgart, 2000. ISBN 3-13-126161-7
- 5 Hacker N.F-Moore J.G-Gambone J.C.: Essentials of Obstetrics and Gynecology. 4th ed. W.B. Saunders Co. ISBN 0-721601790 Paperback
- 6 Smith's General Urology. E.A.Tanagho, J.W.McAninch (ed.) Appleton & Lange. 15th ed. McGraw-Hill Professional Publ. 2000. ISBN 0-83-858607-4
- 7 P. Nyirády, I. Romics (ed.): Textbook of Urology, Semmelweis Publisher, Budapest, 2009.
- 8 Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients.
- 9 Adams and Victor's Principles of Neurology, Eleventh Edition, McGraw-Hill ISBN 978-0-07-184261-7
- 10 Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone
- 11 Marini J.J.-Wheeler A.P.: Critical Care Medicine – The Essentials. Williams and Wilkins. Baltimore, 2nd ed. 1997. ISBN 0-683-05555-0
- 12 The New Public Health: An Introduction for the 21st Century. By: T. Tulchinsky, E.A. Varavikova. 2000. ISBN 03350-5 Note: The list of the textbooks in Public Health, please find after its syllabus!
- 13 Textbook of Medicine 10th Ed. (Weatherall, Ledingham, Warrel, 2017).
Harrison's Principles of Internal Medicine 20th Ed. (McGraw-Hill, 2018).
- 14 Bates' Guide to Physical Examination and History Taking. 12th Ed. (Wolters Kluwer, 2016).

Recommended textbooks:

- 1 T.E.OH: Intensive Care Manual.
- 2 Basic Ophthalmology for Medical Students and Primary Care Residents. Ed. by: C.A. Bradford. 1999. 7th ed.
- 3 Derek I. Johnston: Essential Paediatrics. 4th edition. Churchill Livingstone, 1999. ISBN: 978-0443059582
- 4 Silver, Kempe Bryn and Fulginiti's Handbook of Pediatrics. Appleton and Lange. ISSN 0440-192
- 5 Meckleod's: Clinical Examination. J. Munro. CRW Edards Churchill Livingstone Ed.
- 6 Papp Z.: Obstetric Genetics. Bp. Akadémiai K. 1990. ISBN 963-05-5689-8
- 7 Papp Z.: Atlas of Fetal Diagnosis. Elsevier, London, 1992. ISBN 0-444-98675-8
- 8 Knight B.: Simpson's Forensic Medicine. E. Arnold Co. London. 1991.
- 9 Marsden, Fowler: Clinical Neurology. Raven Press
- 10 Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
- 11 Gilroy: Basic Neurology. Pergamon Press
- 12 Weiner- Lewitt: Neurology of House Officer. Williams and Wilkins
- 13 Bannister: Brain and Bannister's Clinical Neurology. Oxford University Press
- 14 Mumenthaler: Neurology. Georg Thieme Verlag.
- 15 Manual of Emergency Medicine. 5th ed. Jon L. Jenkins, G.R. Braen. 2004. Lippincott Williams and Wilkins. Prod. Nr. 479531-1019

INTERNAL MEDICINE – Hematology, Infectology, Immunology, Rheumatology

Lecture: 2 hour per week
Practice: 5,5 hours per week
Credit: 7
Examination: semi-final

Internal Medicine II. is taught in a block system. During the 5-week block, students spend 14 days (8 hours/day) in the Department. Theoretical and practical (bedside) classes are taught. Students are assigned into groups for bedside practices, case discussions and consultations that are held in rotation resulting in fewer students learning about a given topic at a time.

According to the topics below, classes are taught also dependent on the available patients.

Hematology

Topic list of the lectures:

- Aplastic anemia. Agranulocytosis. Hemopoetic stem cell transplantation. (Prof. Masszi Tamás)
- Acute myeloid leukemia. Myelodysplastic syndromes (dr. Szombath Gergely)
- Malignant lymphomas: Hodgkin-lymphoma, non-Hodgkin lymphomas. (dr. Benedek Szabolcs)
- Chronic myeloproliferative diseases: CML, myelofibrosis, polycythemia rubra vera, essential thrombocythemia (dr.Várkonyi Judit)
- Regulation of hemopoiesis. Differential diagnosis of anemias (dr. Farkas Péter)
- Thrombocytopenias and és thrombocytopathy. Hemophylas (dr. Horváth Laura)
- Increased coagulation (thrombophylas). Disciplines and practice of anticoagulant therapy. (dr. Bodó Imre)
- Plasmacytic dyscrasias. Acute lymphoid leukemia. (dr. Varga Gergely)

Topic list of the practices:

- Neutropenic fever
- Palliative treatment of acute leukemia
- Curative treatment of acute leukemia
- NHL low-grade / NHL high-grade / Hodgkin's disease
- CLL
- Myelodysplasia
- Bone marrow sampling. Presentation of sampling.
- Myeloma

Topic list of the consultations:

- Ph-negative myeloproliferative diseases
- Anemia – differential diagnostics
- Anemia – case based discussion
- CML
- Hemophylia
- Thrombophylia
- Bone marrow transplantation

Infectology

Topic list of the lectures:

- Emergencies in infectology (dr. Kempler Miklós)
- Differential diagnosis of fever (dr. Temesszentandrás György)
- HIV/AIDS, Tropical diseases in Hungary (dr. Lakatos Botond)
- Multiresistent pathogens, infection control and antimicrobial stewardship (dr. Peskó Gergely)

Topic list of the practices:

- Urinary tract infections
- Airway tract infections
- Skin and soft tissue infections
- Infectological situations in practice (sepsis, meningitis, Lyme, pharyngitis)

Topic list of the consultations:

- Introduction to infectology
- FUO
- Sepsis
- Intraabdominal infections
- Infective endocarditis
- Application of antibiotics in the practice, stewardship

Immunology

Topic list of the lectures:

- Vasculitides of the great vessels. (dr. Temesszentandrás György)
- Rare autoimmune diseases (PAN, sarcoidosis, polycondritis) (dr. Temesszentandrás György)
- HANO (dr. Farkas Henriette)
- Topic list of the practices:
- SLE
- Autoimmun myopathies
- Kisereket érintő (ANCA asszociált) vasculitisek
- Sjögren sy – Progressive systemic sclerosis
- Primary and secondary immunodeficiencies
- Therapy of autoimmune diseases. Side effects of steroid therapy
- Rheumatoid arthritis
- Spondylarthropathies
- Gout, arthrosis

Topic list of the consultations:

- Autoimmune ophthalmopathies
- Dermatological presentation of autoimmune diseases
- Allergic diseases

Examination: semi-final

Each course is concluded by a practical skill oriented oral exam. During the exam the students are required to answer questions based on the knowledge acquired during practical sessions and by reading the compulsory chapters of the theoretical curriculum, by elaborating on 3 themes of the titles below.

OBSTETRICS AND GYNECOLOGY

Dept. of Obstetrics and Gynecology

Tutor: **Dr. Gyula Richárd Nagy**

Lectures and Practices in blocks

- Introduction. General information. The menstrual cycle. Conception. Normal pregnancy.
- Normal labor and delivery. Obstetrical examinations.
- Changes in maternal anatomy and physiology during pregnancy.
- Prenatal care. Symptoms and signs of pregnancy.
- Spontaneous abortion. Ectopic pregnancy. Basic knowledge of ultrasonography.
- Maternal diseases complicating pregnancy. Gestational diabetes.
- Abnormalities of pregnancy.
- Abnormalities of labor and delivery.
- Monitoring of the fetus.
- Hypertensive disorders in pregnancy.
- Premature delivery. Intrauterine growth retardation (IUGR).
- Neonatology.
- Twin pregnancy. Operative delivery.
- Normal and abnormal puerperium.
- Major issues in current obstetrics.
- Gynecological endocrinology. Menstrual disorders.
- Inflammatory diseases in obstetrics and gynecology.
- Sterility, infertility. Assisted reproduction.
- Cervical cancer.
- Tumors of the ovary.
- Tumors of the vulva, vagina and corpus uteri.
- Principles of cancer therapy.
- Endometriosis. Polycystic ovary syndrome (PCOS).
- Genetic Counseling.
- Prenatal genetic diagnosis.
- Fetal anomalies. Dysmorphology.
- Perimenopausa.
- Genital prolapse. Urogynecology.
- Vital statistics. Medical legal problems in obstetrics and gynecology.
- Occasionally the topics are interchangeable.

PEDIATRICS

1st Dept. Tutor: **Dr. Dóra Krikovszky**

2nd Dept. Tutor: **Dr. Klára Horváth**

Credits: 8

Total duration: 112 hours, lectures: 28 hours, practices: 84 hours

Prerequisites: Internal Medicine I., Laboratory Medicine, Medical Imaging

Aims: To introduce students to the most common diseases of the pediatric population.

Curriculum:

The 5th year Pediatric course is organized in the framework of the new block structure. Students spend 3.5 weeks in our department, 1.5 weeks are reserved for home study and the oral exam.

LECTURES IN PEDIATRICS FOR 5th GRADE MEDICAL STUDENTS

Location:

I. Department of Pediatrics, Budapest VIII, Bokay J. u. 54. I. floor

II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

1. Introduction to Pediatrics, Growth and development
2. Development, screening, immunisation
3. Pediatric emergencies
4. Pulmonology
5. Neonatology // Cardiology
6. Infectious diseases
7. Gastroenterology, hepatology
8. Nephrology
9. Neurology
10. Endocrinology
11. Surgery // Traumatology
12. Dermatology // Immunology
13. Psychiatry
14. Genetics // Inborn errors of metabolism

Practices

Location:

I. Department of Pediatrics, Budapest VIII, Bokay J. u. 53–54.

II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

Practices at 1st Department of Pediatrics:

- Physical examination of children
- Communication with families
- Cardiology
- Diabetology
- Emergency
- Gastroenterology
- Hepatology
- Hematology (at 2nd Department)
- Infancy
- Neonatal Intensive Care Unit
- Neonatal surgery
- Nephrology
- Neurology
- Pulmonology
- SKILL (Pediatric Basic Life Support)
- Surgery

Requirements (1st Department):

Attendance: according to Semmelweis University regulations, students may not miss more than 25% of their scheduled sessions (including practices, seminars and lectures). Students will be provided an opportunity to make up missed sessions at the end of the semester.

Students should bring their own gown and stethoscopes to the practices.

Examination (1st Department):

Practical exam will be scheduled at the end of the pediatric blocks. Practical exams are not graded. Grades will be given based on the result of the oral exam.

SEMI-FINAL TOPIC

1. The unconscious child
2. Paediatric headaches
3. Sore throat
4. Fever of unknown origin
5. Paediatric rashes
6. Allergic skin diseases
7. Cough
8. Heart murmurs
9. Arrhythmias
10. Principles of fluid and electrolyte balance and their disorders
11. Principles of acid-base balance and its disorders
12. Hypo-, and hyperglycaemia
13. Obesity in children
14. Lymphadenopathy
15. Acute abdomen

Practices at 2nd Department of Pediatrics:

- Physical examination of children
- Pediatric Basic Life Support
- Foreign body airway obstruction
- Rheumatology
- Neurology
- Hematology
- Endocrinology
- Cardiology
- Communication with families
- Gastroenterology
- Oncology
- Surgery
- NICU (at 1st Department of Pediatrics and at the Obstetrics and Gynecology Departments)

Requirements (2nd Department):

Students should bring their own stethoscopes to the practices. Attendance: students have to attend all practices with making up for all absences according to university regulations. 25% of the lectures and 25% of the consultations can be missed.

Examination (2nd Department): The final grade consists of the average grade of the practical and the oral exams (50-50%), students should pass both parts with a minimum grade of 2. The practical exam is organised to the last day of the block. If the final average is between two grades, we round the final grade towards the mark of the oral exam .

16. Abdominal mass
17. Chronic abdominal pain
18. Differential diagnostics of vomiting
19. Differential diagnostics of diarrhoea
20. Eating disorders in children
21. Behavioural disorders in children
22. Hematemesis
23. Bloody stool
24. Anaemia in children
25. Haemostatic disorders
26. Hepatomegaly, splenomegaly
27. Differential diagnostics of oedema
28. Haematuria
29. Polyuria, polydipsia
30. Causes of enuresis in children

Note concerning the 6th year's rotations: Only legibly, completely and accurately filled out, institutionally sealed, original acceptance letters are recognized!

PSYCHIATRY, PSYCHOTHERAPY

Tutor: **Dr. Attila Pulay**

1st WEEK Monday

Introductory lecture: What we teach in psychiatry, curriculum, objectives, exams. The history of psychiatry. Psychiatric epidemiology.

Lecture: Psychopathology. Mental status examination. Transcultural psychiatry. Gene-environment interactions in psychiatry.

Practice: Psychiatric patient examination, psychiatric status, preparation of psychiatric medical history, psychopathology

1st WEEK Tuesday

Lecture: Classification of mental disorders.

Lecture: Affective disorders: diagnosis and treatment

Practice: Psychopathological reports of students, Organic diseases, affective diseases, anxiety disorders

1st WEEK Wednesday

Lecture: Schizophrenia and other psychotic disorders

Lecture: Anxiety disorders: diagnosis and treatment. Eating disorders: diagnosis and treatment. Sexual disorders.

Practice: Student Psychopathological Reports, Schizophrenia and Psychotic Disorders, Emergency Care, Psychiatric Risk Assessment, Voluntary and Compulsory Treatment

1st WEEK Friday

Lecture: Neurocognitive disorders: diagnosis and treatment. Geriatric Psychiatry

Lecture: Emergency psychiatry. Legal and ethical issues in psychiatry. Suicide

Practice: Psychopathological reports of students, general patient presentation, psychiatric referral, request for consultation

2nd WEEK Monday

Lecture: Introduction to psychotherapy. Definition, indications, effects, main trends, basic competencies of psychotherapy

Lecture: The cognitive model: anxiety disorders, depression, somatization, sleep disorders, psychotherapeutic approach of sexual disorders

Lecture: Stages of motivational interview and behaviour change: addictions, eating disorders, lifestyle changes required due to chronic diseases, management of compliance problems. Sleep disorders: diagnosis and treatment

Lecture: Suicide prevention, crisis intervention, aggressive, psychotic, psychotherapeutic approach for patients with personality disorders

2nd WEEK Tuesday

(group with the lower number within the rotation)

Introductory session, the process of group formation, the presentation of the group's functions through passing around a string,

sensitization to psychotherapeutic work and role-plays. Practicing empathic reflection, feedback.

Presentation and application of a cognitive model to conceptualize everyday anxieties. Imagination of a conversation: Someone comes face to face in the street and ignores our greetings. Three-column method, logical errors, 7-column method, cognitive model of panic attack and its education, practice of progressive relaxation.

Depression, cognitive conceptualization of sleep disorders (three-column method, logical errors, 7-column method, behaviour activation), psychotherapeutic approach.

Exploration of sexual disorders, basic techniques for treatment

2nd WEEK Tuesday

(group with the higher number within the rotation)

Addictology practice

Lecture: Neuropsychology, Clinical Psychology (Theoretical Introduction)

Neuropsychology, Clinical Psychology Practice (Case Study)

2nd WEEK Wednesday

Lecture: Pharmacotherapy in psychiatry

Transcultural psychiatry

Lecture: Posttraumatic stress disorder. Somatoform disorders, Somatization and Conversion disorders, Hypochondriasis

Lecture: EEG and event related potentials in psychiatry

2nd WEEK Friday

(group with the lower number within the rotation)

Motivational interview and identification of stages of behavior change, practice of interventions: addictions, eating disorders, required due to chronic diseases

Treatment of lifestyle changes and compliance problems required due to chronic diseases

Suicide prevention, practice of crisis intervention steps, basic techniques, Psychotherapeutic interventions in aggressive, psychotic, borderline personality disorder

2nd WEEK Friday

(group with the higher number within the rotation)

Child psychiatry practice

Community Psychiatric Practice (Day Hospital)

3rd WEEK Monday

Lecture: Child and adolescent psychiatry (ADHD, autism, tic disorders)

Lecture: Adult ADHD (symptoms, comorbidity, course, therapy)

Lecture: Diagnosis and treatment of alcohol and substance use disorder

Electroconvulsive therapy and repetitive transcranial magnetic stimulation in psychiatry

3rd WEEK Tuesday

(group with the lower number within the rotation)

Addictology practice

Lecture: Neuropsychology, Clinical Psychology (Theoretical Introduction)

Neuropsychology, Clinical Psychology Practice (Case Study)

3rd WEEK Tuesday

(group with the higher number within the rotation)

Introductory session, the process of group formation, the presentation of the group's functions through passing around a string, sensitization to psychotherapeutic work and role-plays. Practicing empathic reflection, feedback.

Presentation and application of a cognitive model to conceptualize everyday anxieties. Imagination of a conversation: Someone comes face to face in the street and ignores our greetings. Three-column method, logical errors, 7-column method, cognitive model of panic attack and its education, practice of progressive relaxation.

Depression, cognitive conceptualization of sleep disorders (three-column method, logical errors, 7-column method, behaviour activation), psychotherapeutic approach.

Exploration of sexual disorders, basic techniques for treatment

3rd WEEK Wednesday

Lecture: Personality disorders

Lecture: Community psychiatry, rehabilitation of psychiatric patients. Consultation and liaison psychiatry

Practice: Patient presentation, differential diagnosis, discussion of drug and psychotherapeutic treatment strategies, writing a medical history

Opportunities to retake the semi-final exam:

Retake of the semi-final exam are permitted: there are two occasions of passing attempts in the form of a written exam. The third attempt to correct the failed exams can be oral.

Textbook:

Rebecca McKnight, Jonathan Price, John Geddes. Psychiatry 5th edition. Oxford University Press, 2019. Oxford, United Kingdom.

3rd WEEK Friday

(group with the lower number within the rotation)

Child psychiatry practice

Community Psychiatric Practice (Day Hospital)

3rd WEEK Friday

(group with the higher number within the rotation)

Motivational interview and identification of stages of behaviour change, practice of interventions: addictions, eating disorders, required due to chronic diseases

Treatment of lifestyle changes and compliance problems required due to chronic diseases

Suicide prevention, practice of crisis intervention steps, basic techniques, Psychotherapeutic interventions in aggressive, psychotic, borderline personality disorder

4th WEEK Monday

Lecture: Consultation

Practical exam: i.e. report of a patient case to the practice teacher on the last practical session of the rotation.

At the end of the course of **Psychiatry, Psychotherapy** there is a practical report of a patient case presented by all students participating within the rotation.

4th WEEK Wednesday, Thursday, Friday: Written semi-final exam

Written semi-final exam

The written semi-final exam on MOODLE containing **50 multiple choice questions**. Some of them are related to case vignettes within the body of the test paper.

FORENSIC MEDICINE

Tutor: **Dr. Zsófia Almádi**

The course is organised in the block-based education system, throughout 40 weeks, in blocks of 2 weeks. Practical classes are preceded by short theoretical preparation sessions, followed by a gradual introduction to the clinically oriented practices, emphasising the importance of examination of cadavers for every student. During the sessions we organize the students into small groups, challenging them to examine and process cases, while the theoretical preparation classes are held in bigger groups. Regular oral and written contribution of the students (case reports, and independent documentation) is substantial during the course. All sessions are required to contain feedback elements. At the end of the course an oral exam is conducted on the second week (see details below).

Week A

Monday

- Examination of dead bodies, Postmortem changes (number of classes: 2 periods)
- Examination and documentation of injuries (number of classes: 2 periods)
- Suffocation and asphyxia, sexual offence (number of classes: 1 period)
- Electrical fatalities (number of classes: 1 period)
- Head trauma (number of classes: 1 period)
- General toxicology, Drug related death (number of classes: 1 period)

Tuesday

- Autopsy (number of classes: 2 periods)
- Crime scene (number of classes: 2 periods)
- Crime scene practice I-II (number of classes: 1 period)
- Autopsy practice (number of classes: 1 period)
- Medico-legal aspects of traffic accidents (number of classes: 1 period)
- Firearm injuries, burns and scalds (number of classes: 1 period)

Wednesday

- Autopsy (number of classes:: 2 periods)
- Sudden death and forensic histopathology (number of classes:: 2 periods)
- DNA (number of classes: 2 periods)
- Identification (number of classes: 2 periods)

Friday

- Autopsy (number of classes:: 2 periods)
- Child abuse (number of classes:: 1 period)
- Natural or violent death - Consultation (number of classes:: 1 period)

Week B

- Wednesday, Friday – oral exam

UROLOGY

Tutor: **Dr. András Horváth**

UROLOGY

Head of Department: **Prof. Dr. Péter Nyirády**

Tutor: **Dr. András Horváth**

Aim of education: Our aim is to teach our students for a basic knowledge in urology (the most important differential diagnostic steps, urological physical examination, imaging techniques, different treatment options) and also to educate them to perform the most important, minor urological procedures (like urethral and suprapubic catheterization).

Syllabus:

- Embryology of the urological tract
- History of urology, Symptoms, Diagnostic Measures
- Urolithiasis. Diagnosis and Treatment
- Incontinency, Neurogenic Bladder
- Benign Prostatic Hyperplasia
- Prostate Cancer
- Renal Tumours
- Tumours of the Urinary Bladder
- Injuries to the GU Tract
- Testicular and Penile Tumours
- Male Infertility
- Endoscopic Urology (Endourology)
- Emergency in Urology
- Paediatric Urology
- Nonspecific Infections of the GU Tract

Attendance

Lectures: 1 lecture weekly

Practice: 2 weeks course in rotation system at the Department of Urology.

During practices all parts of urology are covered and as many as possible physical examinations and procedures are shown.

Absence from practice: 20% absence is accepted, in case of more absence it has to be compensated by joining another group's practices.

Exam: oral exam, topics are available at our website.

The mark depends on the practice score given by the tutor of the student and also on the oral exam result.

Absence from the exam: Only an official medical certificate is accepted.

Exam sign up: Through the Neptun system.

INTENSIVE THERAPY AND ANESTHESIOLOGY (ITO)

Tutor: **Dr. András Kállai**
Dr. Dóra Konczig

Lectures:

1. Introduction
Basics of intensive therapy and anesthesiology. Diseases requiring intensive therapy. Patient safety. Psychological methods (hypnosis, suggestive communication) in anesthesiology and intensive therapy
2. Acid-base balance. Fluid - electrolyte homeostasis. Metabolic disorders in diabetes mellitus
3. Disorders of salt - water homeostasis. Disorders of electrolyte homeostasis, hypokalaemia and hyperkalaemia. Enteral and parenteral nutrition
4. Basics of respiratory failure. Obstructive pulmonary diseases. ARDS: definition, classification, diagnosis and therapy
5. Principles of ventilatory support. Postoperative respiratory failure. Weaning
6. Shock states: pathophysiology, classification, diagnosis and therapy
7. SIRS, sepsis and septic shock
8. Volume therapy: crystalloids and colloids. Hemostasis management. Massive hemorrhage protocols
9. Cardiopulmonary resuscitation (CPR, BLS, ALS), the periarrest period and the Post Cardiac Arrest Syndrome (PCAS). Chain of survival. In-hospital BLS and ABCDE-approach. Managing ALS (defibrillation, 4H-4T, iv./io., drugs) and PCAS. Importance of non-technical skills (task management, team work, situation awareness, decision making, communication). Organizing CPR. CPR on CPR-Bas and CPR-Sim practices
10. Pulmonary embolism. Stroke. Disseminated intravascular coagulation (DIC)
11. Polytrauma: Emergency and Intensive care management
12. Preoperative risk stratification, preconditioning, premedication. Cardiopulmonary protection. Perioperative approach of heart and lung transplantation
13. General anesthesia using intravenous and/or volatile anesthetics. Airway management. Analgetics. Muscle relaxants. Antidotes
14. Regional (spinal and epidural) anesthesia: anatomy, techniques, indications, practice and complications. Local anesthetics. Pain management

Lecture attendance:

Recommended. Attendance will not be taken.

Practices:

ICU bed side practices:

1. Introduction, ABCDE-approach (BEV)
2. Respiratory intensive care practice 1 (Resplnt 1)
3. Respiratory intensive care practice 2 (Resplnt 1)
4. Shock practice 1 (Shock 1)
5. Shock practice 1 (Shock 1)
6. Gastrointestinal bleeding and metabolic disorders (GIVMET)
7. Anesthesiology practice (ANE)
8. Anesthesiology and intensive care of trauma patients (TraumIA)

Simulation practices:

9. CPR-Basic
10. ABC-skills
11. ALS-Sim1 (CPR Simulation 1)
12. ALS-Sim2 (CPR Simulation 2)
13. HiFi-Sim (High Fidelity Simulation)

Problem based learning practices:

14. Perioperative care
15. Pain management
16. Homeostasis
17. Case report
18. Consultation

Attendance criteria and absences:

In order to complete Intensive Therapy and Anesthesiology you need to be present **on 13 out of the first 17 practices**. Also you need to pass a practical exam in In-Hospital Basic Life Support (CPR)) and ABC-skills.

Bed-side practices will be held at the Intensive Care Unit of the new building “Központi Betegellátó Épület” (Klinikák metro station, Bp. 1082 Üllői út 78., building section “B”, 4th Floor). Trauma practices will be at the Trauma-ICU (1081. Budapest, Fiumei út 17., 7th floor). Simulation practices will take place at Simulation Center (Bp. IX. Ernő u. 7.). The PBL practices will be held via Zoom. Practice schedule will be uploaded in Moodle.

Keep in mind that before the HiFi-sim and CPR-sim practices you need to pass a 5-minute “pre-practice test” in order to attend.

For bed-side practices we kindly ask you to wear a white coat and have a stethoscope on you. For changing clothes please use the wardrobe located under the escalator at the entrance of the 2nd Dept. of Gyne/Obs. (In the case of Trauma practices our colleagues on the 7th floor will give you coats for the practice.)

In case of a missed practice you have two options. You can find another group (on a different week) in Moodle with the same theme as the practice you have missed and join them (please note that the group limit is 7 students). Or at the end of the semester you can join the extra practices we will hold, but please note that the capacity of these practices will be limited to 7 person just like the ones during the semester.

Grading:

1. Written (multiple choice test)
2. Retaking of the written exam is also possible. Repeating of the examination can be taken in the form of oral exam.

Type of exam: written (multiple choice test)

Make-up exam: written or oral

Exam requirements:

The knowledge of the given textbook, lecture and practice material.

If there is anything we can help you with feel free to contact us via int.ane.edu@gmail.com.

OPHTHALMOLOGY

Dept. of Ophthalmology

Tutor: **Dr. Miklós Resch**

24 theoretical lessons, 32 practical lessons in 3-week blocks

Educational materials: pre-recorded, available in the Moodle

- E: 60 minute blocks of lectures; 70x 10-20 minutes lectures
 ES: case presentation seminars 12x; 5 minute case presentations (total of 80-100 cases);
 Pre-recorded lectures (in Kaltura) can be viewed in the Media Gallery.

The students should attend 20 classes at our Department

- Contact consultation (CC); 8x 45 minutes
 PP: patient presentation, 12x 45 minutes (9x 60 min)

In 1 block: 18-24 students, 6 teachers

- DAY 1:** basic knowledge, preparation of patient examination
 students divided into 3 groups, i.e. 6-8 students / lecturers; 3 working hours / instructor
DAY 2-7: patient examination
 students are divided into 6 groups, i.e. max. 2-4 students / lecturers; 9 working hours / instructor
 Colloquium from **DAY 8** (test exam)

For students:

- at least 75% attendance in practical sessions: the instructor signs each contact consultation or patient examination class in the student's attendance document. According to new regulations of the University, the missed practical sessions need to be retaken. There is an opportunity for delayed completion in case of absence, at the time of on-call shifts, by appointment with the block leaders.
- **successful partial tests**
 - o **partial test:** opens on Day 1 in the morning, can be tried several times, longer writing time. Target: to reach min. 90% satisfactory result
 - o **Exam I.:** Lectures 1-7. and contact consultations 1-6.
must be completed till Day 2, 9am
 - o **Exam II.:** Lectures 8-37. and case presentations 1-6.
must be completed till Day 8, 13pm
 - o **Exam III.:** Lectures 38-70. and case presentations 7-12.
must be completed till Day 8, 13pm
- **practical exam:** on Day 7.
- **Colloquium (test):** from Day 8

Contact consultations

1. The place of ophthalmology in medicine. History of the Department. Anatomy of the eyeball. Dissection of the eye.
2. General ophthalmic physical examination, exploration of conjunctival sac, eversion of the eyelids, estimation of the intraocular pressure with palpation, applanation tonometry. Anterior segment: focal light (pupil lamp) and slitlamp; examination of eye movements, pupil reactions.
3. Red reflex, indirect ophthalmoscopy using an eye model, methods of fundus Examination; eye drops, bandage; kötés; Hertel exophthalmometer; colour vision (Ishihara, Farnworth), contrast sensitivity; critical fusion frequency (CFF).
4. Vision tests: visual acuity (automatic refractometry, eye charts, ophthalmic trial lens set), visual field (confrontational, Goldman, automatic), electrophysiology testing.
5. Fluorescein staining of the cornea, diagnostic tools of the anterior segment (demonstration), lasers.
6. OCT, invasive angiographies, ophthalmic ultrasound: demonstration of diagnostic tools.
7. Consultation
8. Practical exam

Checklist for practical lessons:

Vision, refraction:

- automatic refractometry, keratometry
- eye charts
- handheld eye-chart (Csapody)
- ophthalmic trial lens set

Physical examination of the anterior segment:

- slit lamp
- Hertel exophthalmometer
- fluorescein dye
- Schirmer paper
- eversion of the upper eyelid
- bindings

Glaucoma:

- Goldmann applanation tonometry; non-contact tonometry
- automatic perimetry
- papilla OCT
- manual eye pressure checking

Basic skills in Ophthalmology

In practice:

1. Assessment of near and distance visual acuity in adults and in children
2. Confrontal visual field testing
3. Color vision test
4. Examination of eye movements in the six cardinal directions
5. Checking ocular alignment, screening for amblyopia
6. Examination of the pupil: pupil size, reactions
7. Examination of the eyelids, lacrimal apparatus, conjunctiva, cornea, anterior chamber, iris, and the pupil with pupil lamp
8. Fluorescein staining of the cornea
9. Estimating intraocular pressure with palpation
10. Examination of the upper tarsal conjunctiva by eyelid eversion
11. Red reflex examination
12. Examination of the papilla, posterior segment, retinal vessels by direct ophthalmoscopy

Therapy:

Conjunctivitis (viral, bacterial, allergic)
Hordeolum

Emergency care: chemical burns, injuries, conjunctival foreign body removal
Management of acute angle closure glaucoma

Conditions requiring ophthalmology specialist care:

When should a patient be referred urgently to an ophthalmologist?
Ophthalmic screening in adulthood and in childhood
Interpretation of an ophthalmic medical record

Functional examinations:

- perimetry
- critical fusion frequency (CFF)
- Color vision (Ishihara, Farnworth)

Posterior segment:

- direct ophthalmoscope
- Volk lens
- macula OCT, angiography
- ultrasound
- laser

Eye movements:

- cover test
- guided eye movements

In theory:

Diagnostics:

1. Differential diagnosis of red eye (conjunctivitis, keratitis, scleritis, anterior uveitis, acute glaucomatous attack).
2. Papilla oedema
3. Hemianopic visual field loss
4. Acute cranial nerve III, IV and VI palsy
5. Leukocoria
6. Orbital cellulitis
7. Retinal tear, suspected retinal detachment
8. Suspected postoperative endophthalmitis
9. Sudden visual impairment
10. Mechanical eye injuries, symptoms of blow out fracture

NEUROLOGY – NEUROSURGERY

General information

Tutor: **Dr. Róbert Debreczeni**

Tel.: 210-0330, Fax: 210-1368

Office hours at the Department of Neurology: Monday 13,00-14,00 Friday 10,00-12,00

Responsible Secretary: Andrea Kovács (Andi)

Official textbooks for 5th year:

1. Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients.
2. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

Other suggested books:

1. Marsden, Fowler: Clinical Neurology. Raven Press
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
3. Gilroy: Basic Neurology. Pergamon Press
4. Weiner-Lewitt: Neurology of House Officer. Williams and Wilkins
5. Bannister: Brain and Bannister's Clinical Neurology. Oxford University Press
6. Mumenthaler: Neurology. Georg Thieme Verlag.
7. Adams and Victor's Principles of Neurology, Eleventh Edition, McGraw-Hill ISBN 978-0-07-184261-7

Hours per week: The two-semester curriculum for fifth-year neurology education is given in 4-week block training. For the first three weeks of the block, there is one day off a week to prepare. There are 32 practical lessons in the first week, 26 practical and 6 theoretical lessons in the second week, 24 practical lessons and 8 theoretical lessons in the third week. In the fourth week of the block, you will have to take both practical and theoretical exams. The detailed schedule will be given to students on the first day of the block.

Form of tuition: lecture, bedside practice

Lecture title

- Basic principles of neurological diagnosis. The anamnesis. The connection between symptoms, localization and causes of neurological diseases.
- Patient examination I. Cranial Nerves (part 1).
- Patient examination III. Motor system (part 1)
- Patient examination IV. Motor system (part 2)
- Patient examination II. Cranial Nerves (part 2)
- Patient examination V. The sensory system
- The spinal cord. The peripheral nervous system.
- The brainstem. The thalamus
- The cerebellum
- Altered states of consciousness
- Organization of speech, language
- The temporal and the parietal lobe
- Control of behaviour. Memory and related structures
- Neuroradiology (CT, MRI, angiography)
- Classification and treatment of cerebrovascular disorders
- Tumors of the central nervous system
- Dementias
- Movement disorders
- Diagnosis and treatment of epilepsy
- Neurological Emergencies
- Neurosurgical aspects of Neurology
- Neuromuscular disorders. Myopathies. Neuropathies
- Motoneuron diseases.
- Multiple sclerosis
- Neurological consequences of craniospinal traumas
- Alcohol related nervous system disorders
- Headaches and neuralgias
- Inflammatory neurological disorders. AIDS.

Block Practice

- Signs of meningeal irritation.
- Examination of the I. and II. Cranial nerve. The visual fields.
- Examination of the III., IV., VI. Cranial nerves. The eye movements. Gaze disorders.
- The V cranial nerve. The facial nerve palsy. The nystagmus. Dizziness and vertigo. The vestibular system.
- Motor functions of cranial nerves. Bulbar, pseudobulbar and suprabulbar paresis.
- Assessment of the paresis. Examination of muscle tone and trophy.
- The mono- and polysynaptic reflexes. The pyramidal signs. The upper and lower motoneuron lesion.
- Examination of the sensory system. Examination of the spine and spinal cord. The vegetative functions.
- The coordination. The cerebellar functions (neo-, paleo-, and archicerebellum).
- The reticular activating system. Examination of speech and higher cerebral functions
- Examination of patients suffering from Cerebrovascular Disorders
- Movement Disorders, Hyperkinesias
- Hypnoid and non-hypnoid unconsciousness. Epilepsy
- Multiple Sclerosis, Neuropathies
- Dementias and cognitive functions

Neurology Examination Question List for 5th year Students

I. Neuroanatomical, physiological and biochemical basis of neurology

1. The visual system
2. Innervation of extraocular muscles. The oculomotor nuclei.
3. Gaze control. Gaze disturbances
4. Pupillary reflex arcs. Disturbances of pupillary reflexes.
5. Trigeminal nerve
6. Facial nerve
7. The vestibular system
8. Hearing
9. Glossopharyngeal, vagus, accessory and hypoglossal nerves
10. Organization of motor control
11. Sensory systems
12. Gross anatomy of the hemispheres
13. Basal ganglia and the thalamus
14. The limbic system
15. The cerebellum
16. Blood supply of the hemispheres. Cerebral metabolism
17. Blood supply of the brainstem, cerebellum and the spinal cord
18. The cerebrospinal fluid

II. Basic Neurology

1. Classification of reflexes (stretch, superficial, abnormal and primitive reflexes)
2. Characteristics of upper and lower motoneuron lesion
3. Paresis syndromes according to the site of lesion
4. Symptoms of spinal cord damage
5. Medulla oblongata (bulbar) syndromes caused by circulatory disorders
6. Pontine syndromes caused by circulatory disorders
7. Mesencephalic syndromes caused by circulatory disorders
8. Muscle tone control
9. Nystagmus
10. Vertigo and dizziness; peripheral and central vestibular syndromes
11. Symptoms of cerebellar lesions
12. Symptoms of frontal lobe damage
13. Symptoms of temporal and occipital lobe damage
14. Symptoms of parietal lobe damage
15. Symptoms of occipital lobe damage
16. Thalamic syndromes
17. Clinical examination and types of aphasia
18. Structural basis and types of unconsciousness
19. Physical examination of the unconscious patient
20. Increased intracranial pressure, brain herniations, hydrocephalus
21. Hyperkinesia
22. Gait disturbances
23. Bladder and bowel dysfunction
24. Symptoms of intervertebral disc herniation
25. Lesions of the peripheral nerves of the upper extremity. Tunnel syndromes on the upper limb.
26. Lesions of the peripheral nerves of the lower extremity.

III. Neurological Disorders

1. Classification of ischaemic cerebrovascular disorders
2. Intracranial bleedings, subarachnoideal hemorrhage
3. Symptomatology of Parkinson's disease
4. Classification of headaches. Trigeminal neuralgia
5. Focal epilepsies
6. Generalized epilepsies
7. Meningitis. Examination of the CSF in inflammatory neurological diseases
8. Encephalitis
9. Diagnosis of polyneuropathies
10. Emergency in neurology
11. Traumatic CNS diseases
12. Diagnosis of dementia
13. Multiple sclerosis: signs and diagnosis
14. Intracranial tumors
15. Spinal tumors
16. Disorders of the nervous system due to alcoholism
17. Myasthenia gravis
18. Guillain-Barre syndrome
19. Encephalopathies
20. The motor neuron diseases
21. Muscular dystrophies

SPORTS MEDICINE

Lecture: Sportsphysiology, Sports surgery, Sports Nutrition

Practice: ECG, Spiroergometry, Echocardiography, MRT, Patient examination, Sport surgery- operating room, ambulance, rehabilitation, physiotherapy

Credit: 2

Examination: semi-final

The aim of sports medicine education is to provide a wide range of up-to-date, usable basic knowledge of sports medicine and to account for the future generation of doctors within the framework of general medical education. Students interested in sports medicine should be provided with advanced training.

Detailed topics:

1. Physiological bases and energy sources of muscle function.
2. Motion control, motion learning. Warming up, dead center, fatigue, muscle fever.
3. Energy turnover, daily energy balance. Sports nutrition. Legal performance enhancers, procedures. Doping.
4. The composition of the blood, its role in sports. Sports adaptation processes of circulation and respiration. Sporty.
5. Strength, speed, endurance. Age characteristics in acute and chronic sports adaptation. Checking the condition. Exercise physiology studies in improving sports performance.
6. Medical history, physical examination, urine examination: sports medicine specialties. Guidelines for Sports Medicine Fitness and Periodic Examination. Indications for refusal / revocation of a sports medical license.
7. The role of physical activity in the primary and secondary prevention and treatment of internal medicine diseases. Obesity, hypertension, diabetes and sports.
8. Electrocardiography in sports medicine screening. Arrhythmias and their treatment in athletes.
9. Imaging procedures in sports-related cardiac remodeling.
10. The importance of sports cardiology screening. Sudden cardiac death in athletes.
11. The concept, division, etiology, prevention and diagnosis of sports injuries. General principles for the treatment of acute and overload sports injuries. One head, one neck, one chest and one have sports injuries.
12. Typical sports injuries and injuries of the upper limb.
13. Typical sports injuries and injuries of the lower limb.
14. Rehabilitation, movement therapy, scientific methods in the conservative treatment of sports injuries. The aim of sports medicine education is to provide a wide range of up-to-date, usable basic knowledge of sports medicine and to account for the future generation of doctors within the framework of general medical education. Students interested in sports medicine should be provided with advanced training.

CLINICAL GENETICS

Institute:	Institute of Genomic Medicine and Rare Disorders
Location:	Semmelweis University Central Patient-Care Unit (Korányi Tömb, Központi Betegellátó Épület) 1082 Budapest Üllői Str. 78/B Building „A” (Radiology Wing) 4th floor
Course lecturer:	Prof. Dr. Mária Judit Molnár
Course tutor:	Dr. Viktor Molnár
Exam type:	multiple choice test
Participation:	min. 75% is obligatory

Aim of the subject and its place in the curriculum:

The Clinical Genetics course introduces medical students to the clinical significance of human genetic variations, covering the principles of diagnosis and treatment of rare diseases, mainly through the presentation of cases, clinical situations and demonstrating correct communication. In addition to diagnosis of monogenic diseases and chromosomal abnormalities, genetic tests are now used to predict susceptibility to certain diseases or the efficacy and side effects of certain therapeutic options (pharmacogenomics) or delineate disease prognosis. The role of the physician in the management of hereditary diseases and the practice of good decision making will also be addressed. The discipline is one of the most rapidly developing field and it is presumably going to be an important component of the future medicine.

Competencies gained upon the successful completion of the subject:

- Students meet the typical clinical scenarios requiring genetic-genomic knowledge for diagnostic, predictive, preventive and pharmacogenomic questions, as well as they are introduced into most common diagnostic, therapeutic decision-making, management and ethical dilemmas of the field.
- Students gain insight into practice how to elicit, document, and act on relevant family history pertinent to the patient's clinical status, how to choose the right genetic or genomic testing to guide patient management and how to use genomic information to make treatment decisions.
- Through problems represented by several real and synthetic/standardized clinical cases and through getting involved into the patient flow of in- and outpatient units, they will learn
 - how to gather information from appropriate information resources,
 - how to employ artificial intelligence-based decision-making systems for phenotype pattern recognition in a problem-based manner.
 - how to communicate with the patients and families with hereditary diseases by playing the role of a counselee (genetic counselling), and
 - how to work together as a team if they are encountered with real-world diagnostic challenges.

Overview of the blocked course with thematic learning modules (2x45 minutes each):

Seminars:

- Clinical genetics in medicine
- The significance and diagnostic potential of congenital genetic disorders
- Genetic disorders of public health significance
- Personalised medicine
- Small group work:
 - Case presentation part 1
 - Case presentation part 2
 - Bedside practice: inpatient department
 - Bedside practice: neurogenetic clinic
 - Team competition (decision-making simulation)

Workshops:

- Web-based search methods in clinical genetics
- Developing genetic diagnostic skills
- Management of patients with a rare disease
- Genetic counselling
- Ethical problems, pre-exam consultation

REHABILITATION

Institute: Department of Rehabilitation Medicine, National Institute for Medical Rehabilitation

Location: National Institute for Medical Rehabilitation, 1121 Budapest, Szanatórium utca 19. Tel: +36 1 391 19 03.

Course director: *Dr Zoltán Dénes*

Tutors: *Dr Orsolya Masát, Dr Mihály Fórián Szabó*

Coordinator: *Gabriella Tápay*

practical training: 32 hours

Aim of the subject and its place in the curriculum:

Special medical knowledge required for recognizing and managing disabilities is summarized in the field of Rehabilitation Medicine. According to WHO about 10 % of the world's population lives with some form of disability. All medical students need to gain a basic knowledge of Rehabilitation Medicine for completion of the graduate program and to practice later as a physician. For this purpose, two theoretical lectures (one in Neurology and one in Traumatology) and one practical seminar in Orthopedics are held during the graduate years on the topic. According to the new curriculum, fifth year students will participate in a one-week clinical rotation in Rehabilitation Medicine.

Detailed thematic of the course:

The course will be one week long and consist of lectures on basics followed by clinical practice. Students will participate in daily clinical activities, such as bedside visits and multidisciplinary team meeting. Moreover, they will perform patient assessment, physical examination and write medical reports under supervision. Getting familiar with basic rehabilitation methods is part of the course: physiotherapy, physical and other treatment modalities, occupational therapy, psychotherapy, speech therapy, neuropsychology, sport therapy, hydro therapy. Students will also gain experience in ambulatory care.

Detailed schedule:

1. Rehabilitation Medicine (RM): core competencies, the field of RM, definition, philosophy, objectives and methods, concept of ICF, quality of life.
2. Clinical and functional assessment in RM.
3. Interventions in RM: medical treatments, physical and other treatment modalities, therapeutic exercises, orthoses and prostheses.
4. Musculoskeletal and orthopedic rehabilitation: upper limb dysfunctions (including hand- and nerve injuries), lower limb dysfunctions (including nerve injuries and amputation).
5. Neurorehabilitation: stroke, brain injury, spinal cord injury.
6. Rehabilitation in other disabling conditions: geriatric-, pediatric-, cardiovascular- and pulmonary rehabilitation and rehabilitation in malignancy.

PUBLIC HEALTH AND PREVENTIVE MEDICINE

Institute: Department of Public Health

Location: NET building, 1089 Budapest, Nagyvárad tér 4., 13th, 14th, 19th and 21st floors.

NET 13th floor, room 1314

Phone: 061 210-2930, extension 56313

E-mail: terand@net.sote.hu

Course lecturer: *Prof. Dr. Károly Cseh*

Course tutor: *Dr. András Terebessy*

Lectures:

- Introduction, history of public health
- Concepts and levels of prevention.
- Health determinants. Health status of the Hungarian population.
- Epidemiology of smoking and related diseases
- Epidemiology of alcohol and illegal drug consumption
- Epidemiology of cardiovascular diseases
- Epidemiology of cancer
- Basics of health policy, public health programs.
- The structure and financing of healthcare.
- Quality assurance in healthcare.
- Basic concepts of health promotion
- Mother-, infant and youth health.
- Public health aspects of handicapped people. Gerohygiene
- Mental hygiene, suicide
- General epidemiology of communicable diseases: Epidemics and the primary and secondary factors of the epidemic process
- Infection control: Nosocomial infections. Antibiotic-resistance.
- Environmental medicine: ecological basics, air pollution, smog
- Environmental medicine: water, the water cycle of Earth, water supply, water management
- Environmental medicine: Ionizing radiation, types, effects and limits
- Environmental medicine: Chemical safety, basics of toxicology, risk assessment
- Environmental medicine: Housing and settlement hygiene
- Occupational medicine: The basics of occupational medicine, occupational diseases, exposition
- Occupational medicine: Physical agents
- Occupational medicine: Chemical agents
- Occupational medicine: Ergonomics. Stress at the workplace.
- Nutrition: Evaluating the nutritional status
- Nutrition: Diet-related diseases
- Nutrition: Food safety

Seminars:

- Basics of demography, standardization
- Epidemiology I: Basic concepts, basic measures. Overview of statistical knowledge
- Epidemiology II: Risk and cause. Epidemiological analysis
- Epidemiology III: Screening. Clinical epidemiology. Evaluation of epidemiological analyses.
- Epidemiology IV: Midterm. Critical reading
- Smoking prevention and cessation programs.
- Alcohol and illegal drug prevention programs
- Prevention of cardiovascular diseases and cancer. Screening methods.
- Evaluation of public health programs
- Health care planning, quality assurance.
- Different levels of health promotion. Health plan.
- Mother and you hygiene.
- Field trip
- Consultation
- Communicable diseases I.: Basic concepts of communicable diseases. Classification of communicable diseases, international statistics
- Communicable diseases II.: Vaccination. Sterilization, disinfection
- Communicable diseases III.: Airborne and enteral diseases
- Communicable diseases IV.: Haematogenic-lymphogenic and animal derived diseases
- Communicable diseases V.: STD
- Basic concepts of toxicology
- Toxicology of certain chemicals.
- Impact of environmental factors on health
- Occupational diseases I.: The definition of occupational diseases. Policy, financing, supervision
Notification.
- Occupational diseases II.: Biological occupational agents, occupational diseases in healthcare.
Accidents.
- Occupational diseases III.: Physical and chemical occupational agents.
- Nutrition I.: Assessment of nutritional status, nutritional fact charts
- Nutrition II.: Diet planning. Food intoxication / infection.
- Field trip

ELECTIVE SUBJECTS

(basic/pre-clinical/clinical modules) – curricula

It is compulsory to choose one subject each semester.

ANTIBIOTIC THERAPY AND INFECTOLOGY

Held in both semesters.

Lectures: 2 hours/week

Credits: 2

Exam type: multiple choice test

Participation: min. 70% is obligatory

Obligatory elective subject for medical students already trained in microbiology, pharmacology and basic clinical subjects.

The subject gives an overview on the basic principles and practice of antimicrobial therapy. The antibiotics represent one of the most important classes of drugs that are prescribed practically in all branches of clinical medicine. It seems easy to use them and that is why we abuse them. Discussing the most important clinical features of the frequent infections, the subject shows the optimal approach to patients with infectious diseases and antimicrobial treatment.

The first two lessons discuss the specific features of antimicrobial therapy, the basic principles of empiric treatment and the pharmacokinetic/pharmacodynamic concept that substantiates the application of antimicrobials in terms of choice, dosage and combination. The following seven lectures deal with the specific features of the most important infections, such as respiratory tract infections, urinary tract and intraabdominal infections, endocarditis, meningitis, sepsis. Obviously, the lecturers bring into focus the considerations concerning antibiotic therapy. In the second half of the course, some of the nosocomial infections, infections of immunocompromised hosts and zoonoses are discussed, followed by the problems of antibiotic prophylaxis and antibiotic policy.

The course is organized only in the first semester

Course director: **Prof. Dr. Endre Ludwig.**

The venue of course: *Szent László Hospital*

1097 Budapest, Gyáli út 5-7. Building N. 19 Lecture Room

Textbooks:

1. E. Ludwig: Antibiotic therapy, Medintel, Budapest, 2003.
2. A. Szalka, L. Tímár, E. Ludwig, Zs. Mészner: Infectology, Medicina, Budapest, 2005.
3. Reese and Betts: A practical approach to infectious diseases. Lippincott Williams and Wilkins 2003.
4. Material of the lectures online availability

Lectures:

- Basic principles of antimicrobial therapy. Microbiological diagnosis, as the basis of antimicrobial therapy. The concept of “drug of choice”
- Diagnosis of infectious diseases: clinical relevance of the various diagnostic tests
- Optimisation of antimicrobial therapy. The pk/pd approach, correlation of dosage and clinical efficacy.
- Infectious diseases with exanthemas
- Upper respiratory tract infections (common cold, acute and chronic rhinosinusitis, acute otitis, tonsillopharyngitis). Epidemiology, the influence of age. Theoretical considerations and practice.
- Community acquired pneumonia. Epidemiology, the difficulties of etiological diagnosis. The impact of emerging bacterial resistance on the clinical efficacy of antibiotics. The modern approach and practice based on it
- The nosocomial infections. Nosocomial pneumonia, difficulties of etiological diagnosis. Antimicrobial treatment. Iv catheter-associated infections.
- Intraabdominal infections (primary and secondary peritonitis, cholecystitis). Urinary tract infections.
- Central nervous system infections. Meningitis, etiological diagnosis, antimicrobial treatment.
- Infections of the immunocompromised hosts. Diagnosis, and the principles of treatment. Invasive fungal infections. Colonisation and infection. Treatment of Candida and aspergillus infections.
- Tropical diseases. HIV and AIDS.
- The modern concept of sepsis. The basis of antimicrobial therapy. Indication of antibiotic combinations. The toxic shock syndrome.

Important note:

Attendance at 70% of the lectures is compulsory. The end semester grade is the result of the multiple choice test.

Recommended textbooks:

1. **Ludwig E.** (szerk): Antibiotikum terápia 2003 Medintel, Budapest, 2003.
2. Szalka A., Tímár L., **Ludwig E.**, Mészner Zs. (Szerk.): Infektológia. Medicina, Budapest, 2005.
3. Reese and Betts: A practical approach to infectious diseases. Lippincott Williams and Wilkins 2003.
4. Figures of the lectures are available electronically

BASICS OF MEDICAL CHEMISTRY

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Lecturer: **Prof. Dr. Gábor Bánhegyi**

Lectures: compulsory

Credit: 1

Topics:

- 1: Basics of atomic and molecular structure, periodic table, bondings.
- 2: Chemical equations, stoichiometry, reaction types. Acids, bases, salts. Solutions. Concentrations.
- 3: Laws of diluted solutions. Electrolytes, ionization of electrolytes. Conductivity. Acid-base theories.
- 4: Chemical equilibria. Le Chatelier principle, law of mass action. Equilibria in aqueous solutions, principle of pH. Buffers. Carbon dioxide/hydrocarbonate buffer.
- 5: Consultation: preparation for the 1st midterm. Focused on calculations: ionization, pH, buffer, solubility product.
- 6: Chemical thermodynamics. Principles of enthalpy, entropy, free enthalpy. Hess' law. Basics of reaction kinetics. Activation energy and catalysis.
- 7: Electrochemistry. Oxidation and reduction, redox systems in the living cells.
- 8: A short summary of inorganic chemistry. Metals and non-metals. Complexes.
- 9: Calculations in electrochemistry and thermochemistry.
- 10: Basics of organic chemistry, hybrid states of carbon, organic reaction types. Isomerism, structural isomerism. IUPAC nomenclature.
- 11: Stereochemistry. Geometric and chiral isomerism, nomenclature. Prochirality.
- 12: The most important groups of organic compounds. Aliphatic and aromatic skeletons, their reactions. Repetitions of their structures. Consultation before the 2nd midterm – focused on organic chemistry.
- 13: The most important groups of organic compounds according to their functional groups, their reactions. Repetitions of their structures.
- 14: Closing test. 30 multiple choice questions and 10 structures

Exam: closing test. 30 multiple choice questions and 10 structures

Note: Material of the lectures is available on the website of the Department.

Max. 3 absences are allowed.

VALUE OF ULTRASONOGRAPHY IN THE CLINICAL DIAGNOSTICS

(Lecturer: **Dr. Ágnes Szébeni** M.D., D. Sc.)

1.
 - a) Basic physics of medical ultrasound
 - b) Demonstration of the ultrasound laboratory; technique of ultrasound scanning.
2.
 - a) Sonography of the liver, the spleen, the gallbladder and the bile ducts.
 - b) Patient demonstrations and training
3.
 - a) Sonography of the pancreas and the pancreas and the lymph nodes.
 - b) Patient demonstrations and training
4.
 - a) Invasive sonography (US guided biopsies and punctions, endosonography, intraoperative sonography).
 - b) Videodemonstrations.
5.
 - a) Urogenital sonography.
 - b) Patient demonstrations and training
6.
 - a) Small part scanning.
 - b) Patient demonstrations and training
7.
 - a) Vascular sonography
 - b) Patient demonstrations and training

INTRODUCTORY LECTURES OF TRADITIONAL CHINESE MEDICINE

The topics:

1. Chinese way of thinking about medicine – Introductory lecture
2. Basic principles in Chinese anatomy and physiology (Yin-yang, Chi, meridian, points, cun, etc.)
– 1 lecture
3. The twelve meridians and their points (locations and indications) – 6 lectures
4. The rules of the point selections – 2 lectures
5. The five- element theory, future trends in research and in the clinical use – 1 lecture

LIBRARY INFORMATICS - AOVKPK088_1A

Lecturer: Dr. Livia Vasas PhD. – Central Library

Institute: Semmelweis University Central Library, 1088 Budapest

Duration: One semester, 30x45 minutes (10x3 lessons)

SUGGESTED SEMESTER 5-10.

Exam-form

Credit-value

Minimum/maximum group-size

Practical mark

3 credit-points

8/200

The aim of the subject:

Teaching students how to use/search in literature sources of medicine, analyse the result of their work supporting the proper competencies.

Thematic:

Medical e-catalogues, e-books, e-libraries, databases, scientific resources of internet

Assistant lecturer:

Anna Berhidi, Edit Csajbók, Skultéti Attila, Szluka Péter

Student records officer:

Application deadline:

September 4 -8, 2019

Precondition:

There isn't.

1. **Introduction, technical details, VPN access, technical details, about the history of the Central Library's Homepage: www.lib.semmelweis.hu and its facilities, UpToDate, ClinicalKey, HS talks: Biomedical & Lifesciences Collections, EBSCOhost, ProQuest, Pharmacopoeia, Turnitin Dissertations: Dart Europe, Open dissertations, OATD**
2. **Catalogs: books, online books**
 Semmelweis University catalog Huntka: <http://huntka.lib.semmelweis.hu/search>
 Online book catalog: <https://lib.semmelweis.hu/nav/ekonyvek>
 National Library of Medicine (Bethesda, USA)
 NLM catalog: <https://www.ncbi.nlm.nih.gov/nlmcatalog>
 Worldcat: <https://www.worldcat.org/>
 Copac: <https://copac.jisc.ac.uk/>
 Books PPT
3. **Scientific publishers and periodicals:**
 printed/electronic/open access
 - Browser and matching searching, archive and the newest editions Characterization of periodicals/reviews/journals, ISSN, DOI, Crossmark, Article metrics - Online attention
 - Publishers: Springer, LWW, Wiley, video journal: JOVE
 - Nature: <https://www.nature.com/%0A>
 - BMC <https://www.biomedcentral.com/>
 - PLOS <https://www.plos.org/>, DOAJ <https://doaj.org/>, etc.
4. **New routes: Open Science, Open Access**
 The dangers of publishing on Open Access https://lib.semmelweis.hu/nav/open_access_general_information Support for Open Access Communication at Semmelweis University https://lib.semmelweis.hu/nav/open_access_tamogatas
 The Semmelweis repository <https://repo.lib.semmelweis.hu/>
 The concept of plagiarism, its forms of appearance, Plagiarism Search: Turnitin, Copyright questions

5. **NLM databases:** history, Open! <https://openi.nlm.nih.gov/>
PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>
value added services: registration, advances search.
MeSH, PMC, etc.
Dictionary: <https://www.merriam-webster.com/>
6. OVID databases, online books, electronic periodicals, Evidence Based Medicine databases: the role of the EBM in research, full text journals in Ovid databases MEDLINE, PsycINFO, subject heading systems, value-added services, access to the full text version, WHO <https://www.who.int/>
7. Bibliographic and citation databases, search engine: Web of Science platform, Google Scholar; citations, general searching in the databases, bibliographic and citation searching on keywords, using Boolean operators, value-added services
Scientometrics: quality of journals: Clarivate Analytics InCites JCR (Science Edition and Social Science Edition), IF: calculating Impact factor; SCImago: SJR
8. **Reference Manager:** EndNote, EndNote Online; the role of reference softwares in modern publishing, Literature searching: Importing and exporting records (from Web of Science, OVID Medline, PubMed) creating own records search facilities within our records and from PubMed; data handling: creating groups, filtering duplicates
Semmelweis Knowledgebase, Scientific Discovery of the Internet: find medical information you can trust, Building search strategies, Google Scholar, Medworm
9. **Summary of the course, Test writing**
10. **Consultation, Retake the 1st/2nd test OR Renewal opportunity for each tests**

INTRODUCTION TO CLINICAL ANATOMY

This elective course is for medical students having finished successfully three semesters in Anatomy.

Course Director: **Prof. Dr. Tibor Wenger**

Time and location: Every second year in spring semester 2 hours weekly in the lecture hall of the Department of Human Morphology and Developmental Biology (district 9, Tűzoltó u. 58.)

Exam: written

Value of the course: **2 credit points**

Subject:

The proposed subjects are the followings (the order is subject to possible changes).

- General introduction, surface anatomy.
- Slide anatomy I-II.
- Application of slide anatomy in CT and MRI pictures.
- Psychiatric neuroanatomy.
- Neuroanatomy and cannabis.
- Anatomical relations of the endoscopy pictures, particularly in lesser pelvis.
- Anatomical changes in hypertonia.
- Applied anatomy in family medicine and daily practice.
- Special anatomical relations in premature and newborn children.
- Anatomical changes during pregnancy.
- Anatomical bases of the traditional eastern medicine.

CLINICAL GENETICS

1st Dept. of Obstetrics and Gynecology

First Semester

- The fundamentals of classical genetics
- Polygenic inheritance, multifactorial determination
- General cytogenetics
- Basic principles of embryology and teratology
- Clinical molecular genetics
- Amniotic fluid cell culture for cytogenetic analysis
- Alpha-fetoprotein (AFP)
- Genetic amniocentesis
- Pathology of multiple pregnancy
- Genetic counseling
- General aspects of decision making regarding the fate of pregnancy
- Elements of phenotype analysis
- Embryopathology and fetal pathology
- Sphingolipidoses
- Mucopolysaccharidoses and mucopolipidoses
- Disorders of carbohydrate metabolism
- Diseases of amino acid metabolism
- Haemophilia and other bleeding disorders. Congenital immunodeficiencies. Congenital hypothyroidism. Cystic fibrosis
- Hereditary muscular and neurological diseases
- Congenital disturbances of ossification
- Neural tube defects (NTDs). Hydrocephalus. Other craniospinal malformations
- Thoracic and abdominal malformations
- Cystic kidney disease. Obstructive uropathies
- Down syndrome. Further autosomal trisomies
- Duplication and deficiency (deletion) syndromes
- Fragile X mental retardation syndrome (Martin-Bell syndrome)
- Disturbances of sex differentiation.
- Intrauterine bacterial infections. Congenital rubella syndrome. Further viral and chlamydial infections. Congenital toxoplasmosis
- Prenatal screening for fetal malformations and trisomies

ANESTHESIOLOGY AND INTENSIVE THERAPY

Dept. of Anesthesiology and Intensive Therapy

First Semester

Lectures

1. Central venous access and other invasive procedures: indications, performance and pitfalls
2. Advanced cardiac and hemodynamic monitoring. Swan-Ganz catheter, PiCCO, measured and calculated parameters, relevancies (45')
Advanced antiarrhythmic therapy: decision between electric and pharmacological treatment (45')
3. Polytrauma, head trauma, chest trauma
4. Ultrasound: stethoscope of the 21st century (45')
Ultrasound in regional anesthesia (45')
5. Acute pancreatitis (45')
The confused patient: principles of management (45')
6. Pathophysiology of thermoregulation: malignant hyperthermia, NMS, hyper- and hypothermia syndromes, fever in the ICU (45')
Anesthesia for one-day-surgery (45')
7. Principles of antibiotic therapy in the ICU (45')
8. Principles of antibiotic therapy in the ICU (45')
9. Difficult airway management (45')
Special respiratory therapy: high frequency and jet ventilation (45')
10. Organ transplantation. End stage organ failure, long term mechanical support, organ transplantation, donor management
11. (Respiratory) Physiotherapy in the ICU
12. CRM: aviation safety and human factors in healthcare
13. Obstetrical intensive therapy: toxemia, HELLP, Mendelson's syndrome, pulmonary embolisation, amniotic fluid embolisation (35')
Pediatric anesthesia (35')
MCQ test (compulsory!) (20')

Topics may change depending on lecturers' availability.

NEONATOLOGY

Course Director: **Prof. Dr. Istvan Seri**

Second Semester

Credits: 2

Lessons: 28

- Principles of patient care in the NICU
- Resuscitation of the newborn
- Neonatal respiratory pathology: Pathophysiology
- Neonatal respiratory pathology: Diagnosis/Treatment
- Neonatal shock: Diagnosis and treatment
- Complications of severe prematurity: P/IVH & PVL
- Perinatal asphyxia/Neonatal Follow-up
- Congenital heart disease: Diagnosis and treatment
- Surgical conditions of the neonate
- Fluid-electrolyte & acid-base homeostasis
- Neonatal imaging
- Closing Session/Exam

Aim of the subject and its place in the curriculum: The Neonatology Elective course introduces basic information on neonatal physiology, pathophysiology and the diagnosis and clinical management of the most common neonatal conditions. The course deepens the knowledge-base of the students in pediatrics in general and neonatology in particular.

Competencies gained upon the successful completion of the subject: Recognition of the most common neonatal conditions based on clinical, laboratory and imaging information and gaining a basic knowledge on neonatal resuscitation.

Prerequisite(s) for admission to the subject: Ongoing enrollment in or completed session of the pediatric curriculum.

Minimum and maximum number of students registering for the course: 8-30

Requirement for acknowledging the semester (signature): Attendance of 60% of lectures.

Type of the examination: Multiple-choice written test exam at the end of the course.

Type and method of grading: Pass (60% of questions correctly answered) or fail (<60% of questions correctly answered) at the final exam. Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material): Uploaded presentation slides on the university website following the lectures.

COURSE ON HUMAN LACTATION & BREASTFEEDING – THEORY, SUPPORT AND PROMOTION

Credits: 2

Lessons: 28

Requirement: Medical Physiology II.

Academic teachers:

Miklos Szabo MD, PhD, Med Habil Neonatologist, Chief of neonatal services

Erzsébet Várady MD Neonatologist, IBCLC

Background and importance of the topic

Optimal infant feeding is one of the most efficient interventions to improve child health and psychosocial wellbeing of mother and child. The gold standard of infant feeding is exclusive breastfeeding/human milk feeding for the first 6 months and while introducing complementary feeding at around 6 month, continuing breastfeeding at least in the first year of life, preferably until 2 years of age.

To achieve this goal, it is paramount, that *all* health professionals, regardless of their subspecialty are equipped with sufficient knowledge, competence and skills to help families in their decision on infant feeding, establishment, maintenance and support of breastfeeding and treatment of breastfeeding complications. The WHO, UNICEF and the Academy of Breastfeeding Medicine has called for action, that theory and evidence-based practice of breastfeeding should be incorporated into the medical school curricula.

Topics of the 14 session course

1. The importance of breastfeeding/human milk feeding for the child, the mother and the society. Risks of not breastfeeding and less than optimal breastfeeding. Definitions related to breastfeeding. Hungarian data on breastfeeding rates, international goals. Communication skills from the aspect of the breastfeeding mother.
2. Anatomy of the breast, physiology of breastmilk production and secretion. The effect of hormones related to breastfeeding on the mother and child. Delayed lactogenesis II. Mechanism of breastfeeding. Difference in the mechanism of breast and bottle feeding. The changing composition of breastmilk (colostrum, transitional milk, mature milk, change during the day, the breastfeeding session and the course of lactation). Biochemical and immunological properties of breastmilk. Special properties and advantages of breast milk for preterm infants.
3. Breastfeeding positions, latching on the breast, milk transfer. Signs of good latch and suckling. Breastfeeding observation. Signs, that breastfeeding is going well. Special issues about the support of mothers after caesarean section. Physiological parameters of breastmilk intake and elimination (stool, urine) during the first week of life. The normal course of breastfeeding during the first year of life. Normal weight gain of the breastfed infant. Continuing breastfeeding after the introduction of complementary feeding. Long term breastfeeding (in the second year).
4. Baby-friendly Hospital Initiative – Ten steps to successful breastfeeding. Supporting breastfeeding after hospital discharge – the role of health professionals, family, community.
5. The golden hour – skin to skin (S2S) contact between mother and infant immediately after birth. Facilitation of S2S care in the delivery room or operating room. Beneficial effects and safety issues. Observation during the golden hour. Sudden unexpected postnatal collapse (SUPC) – risk factors, prevention.
6. Responsive feeding and care – importance and practice. Rooming-in (couplet) care in birthing facilities. Safe sleeping after discharge home.
7. Consultation, in small groups and elaboration of homework mini reviews.
8. Family-friendly maternity care. International Childbirth Initiative. Non-pharmacological pain management during childbirth. Impact of intrapartum procedures and medications on breastfeeding and lactation. Support of mothers after caesarean section.
9. Biological, sociological, psychological and cultural aspects of breastfeeding. Breastfeeding protection. International Code of Marketing Breastmilk Substitutes (The Code).
10. Contraindications to breastfeeding/human milk feeding. Conditions and illnesses of concern. Breastfeeding and drugs. Evidence-based resources on drugs for the lactating mother. Caffeine, alcohol consumption, and smoking of the breastfeeding mother. Acceptable medical reasons for supplementing breastfeeding. Breastfeeding-friendly methods of supplementation. At breast supplementers. Nipple shields. Pacifiers- pros and cons.
11. Obtaining medical and feeding history. Breastfeeding-related examination of the mother and child. Common breastfeeding problems (engorgement, mastitis, flat, inverted, painful, cracked nipples, breast edema, not enough breastmilk, jaundice, etc.). Prevention and treatment.

12. Maintenance of lactation during separation (illness, returning to employment/school). Methods of breast milk expression (hand expression, using breast pump, “hands on pumping”, “power pumping”). Cleaning breast pump kits and infant feeding items. Handling and storage of breastmilk.
13. Preparing to breastfeed during pregnancy. Topics to share with the mother (individual counseling by health professional and breastfeeding class). Contraception for the breastfeeding mother. Lactation amenorrhea method – conditions of efficacy. Other methods of contraception suitable for the breastfeeding mother. Advise on interpregnancy interval. Breastfeeding during pregnancy and tandem breastfeeding.
14. Consultation, in small groups and elaboration of homework mini reviews and virtual practical session: online participation in streaming of lactation consultation with patients

Aim of the course: the student acquires the following theory and practice-based competencies:

Theory based competencies

1.	Knowledge about the basic anatomy (normal and pathological) and physiology (including hormones related to breastfeeding) of the breast and the mechanism of breast milk production and secretion.
2.	Describe contraception related to breastfeeding.
3.	Describe the mechanism of sucking on the breast and compare the mechanism of breast and bottle feeding.
4.	Understand, what is the role of breastfeeding and human milk feeding in maintaining health and prevention of illnesses in the mother and child and the potential problems related to artificial (formula) feeding.
5.	Understand, why exclusive breastfeeding is important and what is its association with optimal health outcome.
6.	Understand the advantages of S2S contact immediately after birth. Describes preventive measures for SUPC.
7.	Knowledge about the existence and aims of the Code (International Code on Marketing Breast milk Substitutes).
8.	Knowledge about potentially adverse outcomes of the infant, mother and society in those cases, when the infant is not breastfeeding.
9.	Understand the meaning of the Baby-friendly Hospital Initiative 10 steps.
10.	Understand the possible impact of medical interventions and drugs during labor and childbirth on the outcome of breastfeeding. The student is aware of it, how to support the mother in breastfeeding after caesarean section.
11.	Understand the role of behavioral, social, cultural and environmental factors in the breastfeeding-related decision and practice.
12.	Knowledge about the evidence-based contraindications of breastfeeding/human milk feeding.

Skill based competencies

1.	Obtain detailed breastfeeding history and perform breastfeeding-related examination of the breast.
2.	Describe the effect of intrapartum interventions and drugs on breastfeeding. Advise the mother on breastfeeding after caesarean section.
3.	Facilitation and support of the golden hour.
4.	Recognize the correct position, attachment on the breast, the signs of milk transfer and can suggest corrections, if needed.
5.	Counsel mothers about establishing and maintaining lactation in case of separation (illness, returning to school/employment).
6.	Counsel mothers on the normal course of lactation and on the prevention of potential complications (not enough breast milk, painful nipple, jaundice, etc.).
7.	Discuss family planning options with the breastfeeding mother.
8.	Describe signs of adequate milk intake by the infant and guide the mother, in case she has the perception not to have enough milk.
9.	Understand the need to encourage the mother to breastfeed after introduction of complementary feeding and after one year of age.
10.	Understand the normal growth pattern of the breastfed infant.
11.	Discuss with the pregnant women the beneficial effects of breastfeeding for baby and mother, share with her information on the expected care in the birthing facility and give practical advice on breastfeeding.
12.	Explain, why is the Code protecting breastfeeding and how to follow the Code in the birthing facility.

Exam:

Written – Test

Grading:

88 % – 100 % Excellent

76 % – 87 % Good

64 % – 75 % Satisfactory

51 % – 63 % Pass

Under 51% – Fail

We intend to check the efficacy of the course with pre and posttest.

Resources:

1. Meek, J. Y., & Academy of Breastfeeding Medicine. (2019). Educational objectives and skills for the physician with respect to breastfeeding, Revised 2018. *Breastfeeding Medicine*, 14(1), 5-13.
2. WHO. (2009). Infant and young child feeding. Model Chapter for textbooks for medical students and allied health professionals.
3. Gary, A. J., Birmingham, E. E., & Jones, L. B. (2017). Improving breastfeeding medicine in undergraduate medical education: A student survey and extensive curriculum review with suggestions for improvement. *Education for Health*, 30(2), 163.
4. Wambach, K., & Riordan, J. (Eds.). (2016). *Breastfeeding and human lactation*. 5th ed. Jones & Bartlett Learning. Magyar fordításban: Szoptatás és humán laktáció, Semmelweis Kiadó, 2019

CLINICAL ENDOCRINOLOGY

2nd Department of Internal Medicine

Second Semester

Lectures

- Introduction to clinical endocrinology. Case Presentations.
- Use of hormone measurements in the diagnosis of endocrine diseases.
- Molecular genetics of endocrine diseases.
- Radiological imaging methods of endocrine organs.
- New developments in surgical treatment of endocrine tumors.
- Case presentations: pituitary gland disorders.
- Case presentations: adrenal gland disorders.
- Case presentations: thyroid gland disorders.
- Case presentations: parathyroid gland disorders.
- Sex determination and its disorders.
- Hormone-replacement therapy
- Inherited disorders presenting with endocrine tumors.
- Osteoporosis.
- Endocrine hypertension.

EMERGENCY IN SURGERY

Course Director: **Prof. Dr. Pál Ondrejka**

Second Semester

Purpose of the subject: In the practice of surgery is very important the early detection of emergency cases. For this reason the collaboration with the representatives of other medical professions is indispensable. The goal of our lectures is to present the appropriate procedures of physical examination, laboratory and radiological findings in order to recognize the correct diagnosis; to know what is necessary, **what is possible and what is enough** to do in a case of surgical emergency; when to ask for a consultation for adequate therapy.

The inborn errors, injuries, inflammations and tumors of the organs are also presented. In order to make the lectures more interesting we are going to review the relevant episodes in history of medicine and final arts.

Main topics:

- Introduction, life threatening disorders in surgery, emergency in gastrointestinal surgery, acut abdomen.
- Gastric, duodenal, small bowel emergencies.
- Peritonitis acuta.
- Abdominal trauma.
- Surgery of the wound, infections, anaerob infections in surgery (MRSA, Furnier, tetanus, anaerob)
- Small bowel obstruction, large bowel obstruction.
- Esophageal emergencies.
- Biliary emergencies.
- Complications of peptic ulcer.
- Gastrointestinal bleeding.
- Pancreatitis acuta.
- Pancreatitis chronica.
- Appendicitis, diverticulitis, sigmoiditis, typhlitis.
- Surgical intections.

Minimum 80% attendance rate for getting the signature is obligatory.

CLINICAL HEMATOLOGY

2nd Dept. of Internal Medicine

Course Director: **Prof. Dr. Tamás Masszi**

Second Semester

Topics of interest in the field of hematology, state of the art of various hematological and hemato-oncologic diseases

2 hours per week

Main topics:

1. Place and significance of hematology. Normal blood production, basics of hematologic diagnosis.
2. Classification of anemias, diagnosis.
3. Myelodysplastic syndromes.
4. Diagnosis and treatment of acute leukemias.
5. Acute leukemias of the childhood.
6. Classification and treatment of lymphomas I.
7. Classification and treatment of lymphomas II.
8. Clinical picture and diagnosis of hemorrhagic diatheses.
Prophylaxis and treatment of venous thrombosis.
9. Gastroenterological complications of hematological diseases.
10. Dermatologic manifestations of hematological diseases and hematological symptoms of dermatologic diseases.
11. Immunocytopenias.
12. Hematological emergencies.
13. Stemcell transplantation.
14. Infectious complications of hematological diseases

HISTORY OF MEDICINE

Institute of Public Health

Lecturer: **Dr. Judit Forrai**

The history of medical science, considered as a part of the general history of civilization. The study of the history of medicine helps us to describe and understand how people in different times and cultures experienced and dealt with these fundamentals of human existence. This knowledge can inform debate about the present and the future, and help to bring medicine and science to a wide audience. All human societies have medical beliefs that provide explanations for birth, death, and disease. Many cultures in ancient times treated illnesses with magic and herbal remedies. Ancient Egyptians thought that their gods healed them. The ancient Greeks pursued medicine as a science. Hippocrates, the most famous physician of the time (c. 400 B.C.), believed that diseases had natural causes, not supernatural ones. By the Middle Ages, Europe was hit with a terrible epidemic that killed millions of people called the plague, or Black Death. The Renaissance marked a new period of interest in art and science throughout Europe. Despite new medical discoveries, many doctors still practiced old ways. Most sick people could not afford to see a trained physician. Instead, they consulted midwives who assisted with childbirths and made herbal remedies to treat illnesses. Minor surgeries were not done in the hospital but at the local barbershop. Medical research and training improved in the 18th century but there were still no cures for diseases like smallpox, a disease that killed millions of people over thousands of years. Middle Eastern doctors gave people mild doses of the smallpox to combat the disease. The portrayal of the history of medicine becomes more difficult in the 19th century. Discoveries multiply, and the number of eminent doctors is so great that the history is apt to become a series of biographies. Nevertheless, it is possible to discern the leading trends in modern medical thought. In the beginning of 20th century the research and technology have expanded medical knowledge and improved medical practices like surgery. Today, doctors are able to perform less invasive surgical procedures. The science of medicine has progressed dramatically in just the last 50 years. Career opportunities in health care have also expanded. There is a need for more skilled medical professionals, not only in hospitals, but in dentist and doctors' offices, research labs, rehabilitation centres, mental health clinics, nursing homes and even schools.

Topics/week

1. Introduction. What is Medicine? Methods and sources of Medical History. The birth of paleomedicine (bones teeth, mummies). Prehistoric medicine. Far East.
2. Far East Medicine. Chinese civilization, Japan, India.
3. Medicine of ancient civilizations, rivers valley's culture: Mesopotamia, Egypt, and the medicine knowledge. Medicine - in the Bible time - Heritage of the empirical knowledge. Practitioners. Theories of diseases.
4. Greco-Roman Medicine. Homeric medicine. Asclepius, Hippocrates. Corpus Hippocraticum- the concept and doctrine of his theories about the nature and diseases (the four humors). The Oath. Hygiene and health education. Post-Hippocratic schools – the golden heritage in the school of Alexandria. The roman physicians, diseases. Advance of public health. Water supply and sanitation, climate, soil and health, diseases, endemics. The workers' health, provision of medical care. (Celsus, Galenus)
5. Medieval medicine. Byzantine Healers, Arabian Hakims, Monks, Crusaders and medieval „doctors.“ The Arabian medicine: chemistry, pharmacy, hospitals. Razes, Avicenna, Abulcasis. The medieval Monasteries (Monte Cassino). The growth of European cities, sanitary problems of urban life. The first religious medical school in Salerno. Medieval Universities, medical humanists, and Christian caritas.
6. Medicine in the Renaissance. The Arts and the humanism. The new mentality of medicine: Paracelsus. The revolution of anatomy: Vesalius and his contemporaries. The first step toward the specialization. Botany and mineralogy. The printing of book's role in medicine. Foundation of the administration of Public Health. Epidemic diseases: communicable and non-communicable diseases. Theories, therapies, and medical care, hospital. Quarantine.
7. Experimenters, Teachers and Theoreticians in the Sixteenth and Seventeenth Centuries. Body as machine -old schools: iatrochemical, iatrophysical theories. New schools: animism, tonus, vitalism, stimulation, homeopathy. The circulation of the blood. Harvey's methodology Malpighi. Microscopy. Birth of modern clinical medicine: Sydenham. Boerhaave and his pupils.
8. Industrialism in the Eighteenth Century. Clinical medicine- schools of clinical (French, English, German, and Habsburg). The first Vienna School: van Swieten. surgery (Hunter, Valsalva), pathology (Morgagni, Bichat). Public health and hygiene. Occupational health, prison reform, general health (death rate, statistics), Ramazzini, Frank. Smallpox. Infant mortality. Nursing, dispensaries and hospitals, development of obstetrics. Sanitary conditions – filthy towns.
9. Clinical medicine in the second half of the nineteenth Century. Bacteriology a new science in medicine. Revolution, concepts and theories under the microscope. New discoveries Pasteur, Koch. Social revolution, industrialism, public health. National and international movements and health reforms, and medical care. Period of great epidemics. International health organization. The Red Cross.

10. Development of surgery and gynaecology. The man-midwife (Smellie, Hunter), History of anaesthesia. General and local possibilities. Wells, Morton, Simpson, Jackson). Asepsis and antisepsis. Early efforts to develop aseptic techniques. Semmelweis, Lister. Progress in surgery, Billroth. Cholecystostomy, appendectomies.
11. Emergence of specialism. Logical outgrowth of locality pathology, new instruments. Initially the medical professions: Paediatrics, Psychotherapy, Ophthalmology, Otology, Rhinology and Laryngologist, Dentistry, Neurology and Psychiatry, Dermatology and Venerology.
12. From the black death to the AIDS. The history of epidemics. The theories and therapies. Tropical medicine. The development of epidemics, the bacteriology and immunology. The new medicaments. Ehrlich and the chemotherapy, sulphonamides, antibiotics. Virology. Salk and Sabin. New diseases and screenings methods.
13. Consultation

Important: 3 absences are allowed. Doctor's certificate is required to certify absence from the exam.

Exam requirement: written test

Textbook:

Chrestomathy on the History of Medicine. Ed. Dr. Forrai J., Dr. Ballér P., Budapest, 1992. SOTE

CLINICAL CARDIOVASCULAR PHYSIOLOGY

AOVKIK102_1A

Elective course for medical students in the 3rd, 4th and 5th years.

The purposes of the course:

- To refresh and extend – in selected topics – the basic knowledge related to normal and pathological functions of the human circulatory system
- To integrate the latest scientific results related to different organization levels – from molecular physiology to system physiology – of the cardiovascular system.
- To discuss and demonstrate measurement principles and techniques, as well as physiological and pathophysiological mechanisms related to the application of modern non-invasive cardiovascular diagnostic procedures in the clinical practice.

Program:

1. Investigation of blood pressure regulation by use of transgenic technologies
2. **Complement-related immunological and cardiopulmonary responses (CARPA).** Modern methods for measuring and monitoring arterial blood pressure
3. Hemodynamic background of normal and pathological cardiovascular functions
4. Pathophysiology of chronic venous insufficiency
5. Physiological mechanisms supporting venous return of blood; orthostatic tolerance
6. Recent results in control of cerebral blood supply, physiological and clinical aspects
7. Clinical physiology of the microcirculation
8. Interventional radiological procedures on arteries and veins
9. Age related changes in the vascular system, role of sexual hormones
10. Role of endothelial mechanisms in clinical symptoms
11. The cardiovascular risk and the protection of menopausal women. Coronary circulation
12. Biomechanical properties of cerebral aneurisms, their computer modeling
13. Visit to the MRI cardiovascular diagnostic unit of the Semmelweis University Heart Center
14. Ultrasonic investigation of the human heart: theoretical background; 2D-, M-, Doppler-mode, color Doppler imaging, echocardiography; diagnostics of valve insufficiency and coronary diseases. Duplex ultrasonic investigation of large vessel function: measurement of vessel wall elasticity, Doppler-indexes

Students who meet the following criteria will receive 2 credit points: regular attendance of classes and successful written exam. Material for the exam includes lecture topics and textbooks suggested by the lecturers.

CARDIORESPIRATORIC AND NEUROPHYSIOLOGICAL MEASURING METHODS

AOSKIK151_1A

Elective course for medical students in the 3-6th years

Course director: *Dr. Habil. László Dézsi*, Private Professor of Physiology, Semmelweis University

The purpose of the course: To review the theory and practice of modern measuring methods in experimental and clinical medicine, and providing practical knowledge to medical students on cardiorespiratoric and neurophysiological measurements. The course is based on but further extends the material delivered during the course of Medical physiology. Throughout the lectures we put an emphasis on potential methodological errors of measurements and examinations, as well as how to avoid them.

Detailed Program:

1. Introduction. Biomedical engineering. Design and safety requirements of biomedical equipments
2. Computerized data acquisition and analysis. Telemetry systems
3. General metrology. Basics of measurement and control theory
4. Home monitoring of cardiovascular health status. Determination of blood glucose and tissue glucose concentrations
5. Sampling of continuous signals. Digitizing analogue signals
6. Direct and indirect methods to determine cardiac output and peripheral blood flow
7. Experimental study of pulmonary function. Measurements of blood gases and the acid-base balance.
8. Significance of objective studies in the practice of audiology. Neurophysiological measurements (action potentials, brain stem evoked potentials)
9. Investigation of adaptive processes in the cardiovascular system. Investigative methods of experimental angiology
10. Measuring blood pressure in the lab and clinics (invasive and noninvasive methods)
11. Complement-related immunological and cardiopulmonary responses
12. Studying brain function by functional imaging systems
13. Experimental methods to study nociception
14. Investigating the electrical activity of the heart. Design of ECG amplifiers

Acknowledgement of the course: Prerequisite of the course is the completion of the first 2 years (Theoretical module). Regular attendance (maximum 3 absences) is required. Signature in the Index and 2 credit points will be awarded after successful exam. Source: material of the lectures, supplementary literature will be provided by the lecturers.

Applications: via Neptun system. Contact person: Dr. László Dézsi (e-mail: dezsi.laszlo@richter.hu; phone: 06-1-431-4823; phone/fax: 06-72-536-019). The application of min. 5 students is required.

CLINICAL PHYSIOLOGY OF RESPIRATION AND RESPIRATORY DISEASES

AOVKIK099_1A

Elective course for medical students in the 3rd, 4th and 5th years.

The aims of the course are to strengthen knowledge on basic physiological principles related to respiration, summarize the most important aspects of cardiorespiratory adaptation in sport activities and also its changes in respiratory diseases and to provide integrated information about the physiological and pathophysiological background of the most important respiratory disorders in light of results from cutting edge research.

Program:

1. Physiological function of the respiratory system
2. Smoking, e-cigs, supporting cessation
3. Lung development
4. Inhalation therapy
5. Sleep related respiratory disorders.
6. COPD and COPD exacerbation
7. The lung in systemic diseases
8. Cystic fibrosis
9. Pulmonary circulation
10. Bronchoscopy
11. Cardiovascular exercise testing, COPD
12. Asthma bronchiale
13. Non-invasive ventilation
14. Chest imaging

Acknowledgement of the course: regular attendance (maximum 3 absences) is required; signature in the Index, and 2 credit points will be provided

MEDICINAL, EPIDEMIOLOGICAL, AND SOCIAL ASPECTS OF DRUG ABUSE

Department of Pharmacology and Pharmacotherapy

Course director: *Prof. Dr. Susanna Fürst*

Second semester

Credit: 2

Topics:

Introduction, general concepts. Non-medical use of drugs. Drugs of abuse. Classification of scheduled drugs under WHO control. Vulnerability. Tolerance, physical and psychological dependence. Molecular basis of drug addiction.

Opioids. Pharmacological action of opioid agonists and antagonists. Opioid receptors, endogenous ligands. Characteristics of opioid dependence.

Psychomotor stimulants. Pharmacological action of amphetamine, its derivatives (methamphetamine, MDMA-“Ecstasy”, etc.) and cocaine. Role of the dopaminergic transmission in the drug abuse.

Hallucinogens. Ethanol. Pharmacological action of hallucinogens, (LSD, mescaline, phencyclidine, etc.). Role of the serotonergic transmission in hallucination. Characteristics of ethanol dependence.

Marihuana (hasis, THC) Pharmacological action of cannabinoids. Cannabinoid receptors and their endogenous ligands.

Sedative-hypnotics. Pharmacological action of benzodiazepines, barbiturates, other sedative-hypnotics. Characteristics of prescription drug dependence. Polydrug-abuse.

Epidemiological data. Significance of epidemiological data collection. Forms of questionnaires. Tendency of drug abuse, national (Hungarian) and international data. High risk groups.

Pharmacological treatment. Traditional medicinal treatment and new methods. Medical treatment of withdrawal symptoms, replacement therapy. Treatment of overdose. Prevention of relapse.

Psychotherapy. Individual and group therapy. The problems of long-term rehabilitation. Counselling.

Drug abuse and society. Legal issues. Statutory rules and regulations. Human rights.

Role of public and civil rystalline. Role, task and potential of governmental and non-governmental rystalline in the prevention of drug abuse.

Detection of drug consumption. Laboratory analysis of blood and urinary samples. The role of objective laboratory control in prevention and reduction of drug abuse.

Prevention and harm-reduction. Primary, secondary and tertiary prevention. Demand-reduction and harm-reduction. Early recognition. Rehabilitation, social reintegration.

Psychosocial questions of drug abuse. Psychosocial aspects. Self-destructive attitudes. Psychological and social background. Role, task and possibilities of the medical doctor.

Absence: Maximum number of absences is 25 percent of the lectures in the semester

Absence justification: Medical certificate is accepted

There is no midterm

Requirement: Participation at the lectures

Evaluation: On the base of the scores of the written test

Exam: written test

The written test is on the last lecture, registration has to be done through the NEPTUN system

How to modify the exam date: Personal discussion for another appointment

Exam absence justification: Medical certificate is accepted

BASICS OF FAMILY MEDICINE

Department of Family Medicine

Director: **Dr. Péter Torzsa**

Family medicine as a speciality

Past and present of family medicine in Hungary

Daily routine of family doctor

Dr. Kalabay László

Doctor-patient relationship in family practices. Communication skills

Dr. Torzsa Péter

Emergency care in family practice

Dr. Szabó János

Cardiology and prevention in family practice

Dr. Simon Judit

Diabetes mellitus in family practice

Optimal treatment of diabetes mellitus

Dr. Dani Vilmos

Prevention program in family practice

Optimal treatment of hypertension

Dr. Torzsa Péter

Primary care in cities

Dr. Torzsa Péter

Primary care in the countryside

Dr. Szabó János

Care of gipsy patients

Dr. Horváth Péter

Medical ethics and law

Dr. Vajer Péter

Continuing home care

Rehabilitation

Terminal illnesses

Summary

Prof. Dr. László Kalabay

Dr. Péter Torzsa

HISTORY OF THE MEDICAL PROFESSIONALISM

Lecturer: **Dr. Péter Balázs**

Class Sessions: Medical professionalism as an ethical norm is an ancient behavioural pattern and theoretical construction alike based on sacral calling. Consequently, roots of the modern professional mythology may be traced back to the late Neolithic age, but the whole framework was systematized as soon as in the old Egyptian and Mesopotamian culture. Since the Hippocratic age, the medicine of craftsmen was based on teachings of natural sciences and the Middle Age supported the medicine with mythology of sciences, but only the Enlightenment provided the social environment for a de-sacralized professionalism, nevertheless it followed exactly the ancient religious patterns.

General part of the topic is concerning the onset of professionalism while discussing different manifestations and transitions related to ideologies, socio-economic circumstances and scientific teachings from the Neolithic age down to the latest market economies. Specific part demonstrates milestones and historic ages, which were decisive in this proceeding: Old Egypt, Mesopotamia, old age Judaism, early and consolidated Christianity, impact of Islam on Europe, Reformation of the Roman Catholic church, Enlightenment, the Communist ideology and the social market economy.

Attendance at lectures, options for additional lectures:

Basic requirement: attendance at 8 sessions. In case of justified non-attendance of more students at a specific session, additional lecture is available.

Justification for non-attendance at lectures

Up to 2 sessions no need for justification, in case of more than 3 sessions missed no confirming of the course.

Justification for non-attendance at the exam

Only certificates of administrative authorities.

Control of knowledge acquired within the time-frame of sessions

No control during the session period

Requirements for confirming the session attendance

Having attended less than 8 sessions no confirming of the course. Additional sessions, if organized, are parts of the 10 session contingent.

Preliminary and final marks

Type of marks: five degree evaluation (1-5). Preliminary mark on the written work, which becomes a final mark automatically except additional questions answered (see below).

Type of exam

Base of exam: homework written about the history of medical professionalism sent by e-mail to the lecturer (deadline: 7 days before the exam, 5-6 A4-pages, margins, fonts, space agreed at the first session) Type of exam: each student will get several questions based on his/her own homework to determine the final mark.

Entering for examination

Student Administration System (NEPTUN)

Modification of data entered for examination

When registered in NEPTUN only after consulting the lecturer

Justification for non-attendance at the exam

Only certificates of administrative authorities.

Note on readings

Handout of Power Point presentations at the beginning of each relevant session.

HEALTH INFORMATICS

Institute of Digital Health Sciences

Credit: 2

Lecture: 2 hours/week

Themes	
1.	Classification and Coding Systems
2.	ICD-10 Coding System
3.	Electronic patient's Record
4.	Electronic patient's Record
5.	DRG System
6.	Hospital Information Systems
7.	WEB 2.0
8.	WEB 2.0 Solutions in Health Care
9.	Introduction to Health Databases
10.	Oncology Database
11.	Evaluation of Country data. Presentation
12.	Evaluation of Aggregated data
13.	Principles of Documentation Making
14.	Documentation of Breast cancer: case study
	Self work: Stomach Cancer Documentation (data collection, evaluating, presentation, documentation) Deadline: half semester. Sending: via Internet

JEWISH MEDICAL ETHICS I - II.

Institute of Behavioral Sciences

Course Director: **Rabbi Baruch Oberlander**

Credit: 4 credits (2 credits for each semester; I and II)

Attendance at 75% of lectures is compulsory. Missed lectures cannot be made up for. In case of missing more than 25% of lectures (3 lectures) a note from a healthcare professional is required.

Semester grade requirement: A written report (paper) based on list of topics and recommended reading material.

Successful completion of semester I is the prerequisite of signing up for semester II.

Obligatory: Handouts given during lectures

Recommended: Dr. Avraham Steinberg (Translated by Dr. Fred Rosner): *Encyclopedia of Jewish Medical Ethics*, Feldheim Publishers, Jerusalem-New York, 1988, ISBN: 1-58330-592-0

Fred Rosner: *Pioneers in Jewish Medical Ethics*, Jason Aronson, New Jersey, 1997

Fred Rosner: *Medicine in the Bible and the Talmud: Selections from Classical Jewish Sources*, Ktav Publishing House, New York 1977

Rabbi Moshe Tendler–Fred Rosner: *Practical Medical Halachah*, Association of Orthodox Jewish Scientists, New Jersey 1990

David J. Bleich: *Judaism and Healing: Halakhic Perspectives*, Ktav Publishing House, New York 1981

Faitel Levin: *Halacha, medical science, and technology: Perspectives on contemporary Halacha issues*, Maznaim Publishing Corporation, New York-Jerusalem, 1987

Fred Rosner: *Medicine and Jewish Law II*, Jason Aronson, New Jersey, 1993

Semester I.

- 1-2. Lecture: The religious orders and the duty of saving a life
- 3-4. Lecture: Doctors and God – The function of healing and prayer in Jewish ethics
- 5-6. Lecture: Euthanasia – The questions of death and dying in society
- 7-8. Lecture: Smoking and use of light drugs from the aspect of Judaism
- 9-10. Lecture: Medical malpractice in the light of Jewish law and ethics
- 11-12. Lecture: The possibilities for artificial insemination in Jewish law
- 13-14. Lecture: The advantages, disadvantages and conditions of cloning

Semester II.

- 1-2. Lecture: Genetics and Jewish law – What rights do we have over our gene pool?
- 3-4. Lecture: Genetics and Jewish law – The problem of the gene manipulated food products
- 5-6. Lecture: Siamese twins – The question of valuation between two living persons
- 7-8. Lecture: Parasolvency – What is the best method to compensate the doctor?
- 9-10. Lecture: Contraception in Jewish law
- 11-12. Lecture: Permitted and prohibited methods of organ transplantation
- 13-14. Lecture: The questions of DNA identification in Jewish law

CLINICAL ONCOLOGY

– elective for students in the 4th and 5th year

Course Director: **Prof. Dr. Zsolt Tulassay**

2 hours/week, 2 credits

2nd Department of Internal Medicine

- Basic principles of clinical application of chemotherapy, principles of immunotherapy and endocrine therapy.
- Cancer prevention: tobacco dependence and its treatment, chemoprevention, role of surgery in cancer prevention.
- Cancer screening: principles, gastrointestinal, gynecologic, breast, lung.
- Specialized techniques in cancer management: vascular access, interventional radiology, RFA photodynamic therapy, molecular imaging and functional imaging of cancer.
- Cancer of head and neck: molecular epidemiology, treatment and rehabilitation.
- Cancer of the lung: molecular biology, NSCLC, SCLC.
- Cancer of esophagus and stomach: stage directed multimodality treatment.
- Pancreatic cancer: clinical presentation, evaluation, treatment of resectable and advanced diseases.
- Cancer of the liver: etiology, screening populations, clinical management, systemic therapy, regional therapy, radiotherapy.
- Colorectal cancer: molecular biology, screening, staging and prognosis, stage dependent treatment of colon cancer, combined modality treatment of rectal cancer.
- Kidney cancer: molecular biology of cancer, histologic types, localized and metastatic kidney cancer.
- Cancer of the breast: molecular biology, risk factors, diagnosis, prognostic and predictive factors, multimodality primary adjuvant treatment.
- Cancer of unknown primary site: histologic types of CUPS, management of CUPS.
- Immunosuppression related malignancies: AIDS, transplantation, chemotherapy.

The lecturers of the elective are the oncologists of Semmelweis University.

ORGAN TRANSPLANTATION

First Semester

Department: Faculty of Medicine, Department of Transplantation and Surgery

Time: 14x90 minutes

For semesters: 7, 9

Type of exam: written

Credits: 2

Minimum/maximum number of students: 20/140

Course thematic:

1. Introduction - History, Terminology, Organ Donation
2. Pediatric Kidney Transplantation
3. Histocompatibility, Immunologic Aspects and Immunosuppression
4. Kidney Transplantation Indication, Operation, Results, Complications
5. Liver Transplantation
6. Pediatric Liver Transplantation, Hepatocyte Transplantation
7. Follow-up of the Transplant Patient
8. Small Bowel and Multiorgan Transplantation
9. Pancreas and Islet Cell Transplantation
10. Lung Transplantation
11. Heart Transplantation
12. Radiological Aspects of Transplantation
13. Ethics of Transplantation - Case reports
14. Terminal Examination

Sign up: through the Neptun system

Deadline of sign up: September 1

INFLAMMATION BIOLOGY

Department of Genetics, Cell and Immunobiology

Course director: **A. Kristóf Fülöp**, PhD

Prerequisite subject: Immunology, Molecular Cell Biology II.

Credits: 2

In Every Second Academic Year

Lectures (2 hours per week):

- The place of inflammatory processes in the immune response and in the health science
- Molecular mechanisms in the induction of acute inflammation
- Inflammatory cells I.
- Inflammatory cells II.
- Chemotaxis and chemokines in the inflammation
- The systemic acute phase reaction and the termination of inflammation
- Histaminology
- The systemic inflammation
- Chronic inflammatory diseases I.
- Chronic inflammatory diseases II.
- Genomics of inflammation and asthma bronchiale
- Inflammation, regeneration and tumorigenesis
- Inhibition of inflammation, biological therapies
- Review and consultation

Attendance of a minimum of 75% of the lessons is necessary for the end-term signature.

Exam: written test in the exam period.

Literature: see on the homepage

Homepage: <http://gsi.semmelweis.hu>

GENETICS OF SEX

Department of Genetics, Cell and Immunobiology

Course director: **Dr. Sára Tóth**

No Prerequisites

Credits: 2

Second Semester

Lectures (2 hours per week):

1. Genetic background of sex determination; asexual and sexual reproduction; reproductive strategies.
2. From sex determining gene to sex chromosome
3. Male and female sex determination
4. Abnormalities in sex determination I.
5. Abnormalities in sex determination II.
6. Abnormalities in sex determination III.
7. Mechanism and role of X inactivation
8. Epigenetic effects; genome imprinting.
9. Causes of male infertility. Y chromosome mutations and ICSI.
10. Importance of Y chromosomal and mitochondrial polymorphisms in population genetics
11. Influence of sex on heredity
12. Aggressivity and sex
13. Genetics of sexual orientation
14. Ecology and sex; role of endocrine disruptors

Attendance of a minimum of 75% of the lessons is necessary for the end-term signature. No possibility to make up of absences.

Exam: no midterms, practice grade

Core texts: Chapters from Strachan & Read: Human Molecular Genetics 2nd Ed. and Gilbert: Developmental Biology 8th Ed. Both are downloadable from Pubmed Bookshelf.

Lecture presentations and additional texts are available on the homepage: www.dgci.sote.hu

Homepage: <http://gsi.semmelweis.hu>

EPIGENETICS

Department of Genetics, Cell and Immunobiology

Course directors: **Dr. Sára Tóth**

Credits: 2

First Semester

Lectures (2 hours per week):

1. Timeline of epigenetics; levels of epigenetic changes; targets of epigenetics
2. DNA methylation; de novo and maintenance methylation; Dnmt interactions
3. Histone modifications; histone code; histone modifying enzymes
4. Polycomb and trithorax complexes; Methylated DNA binding proteins
5. Transposons, and non-coding RNAs in epigenetic regulation; RNAi
6. Genome imprinting; skewed X inactivation their connection to DNA methylation
7. Epigenetic changes during early development and gametogenesis; Epigenetic consequences of cloning and ART
8. Transgenerational epigenetics; epigenetics of endocrine disruptors; maternal behaviour and its epigenetic consequences
9. Paramutation, transvection and mitotic bookmarking
10. Role of epigenetics in carcinogenesis; epigenetic therapy in cancer
11. Epigenetics in aging and autoimmunity
12. Epigenetic changes in diseases of the central nervous system
13. Methods used for the detection and analysis of epigenetic alterations.

Important notes:

Only for third and upper year students. There are no midterm exams. Attendance of 75% of lectures is necessary for the end-term signature.

Exam: Written or oral exam (depending on the number of students).

No possibility to make up of absences.

Core texts: CSHL Epigenetics textbook 2006. Downloadable from http://www-nmr.cabm.rutgers.edu/academics/biochem694/reading/Allisetal_2006.pdf

Lecture presentations and additional texts are available on the homepage: www.dgci.sote.hu

Homepage: <http://gsi.semmelweis.hu>

CHEMOTAXIS – its significance in biology and clinical sciences

Department of Genetics, Cell and Immunobiology

Course director: *Dr. László Kóhidai*

Credits: 2

Second Semester

Lectures (2 hours per week):

Week	Lecture	Lecturer
1.	Migratory responses of cells – General significance of chemotaxis in biology	Kohidai László, MD, PhD
2.	Phylogeny of signaling molecules and their receptors with special respect to chemotaxis	Kohidai László, MD, PhD
3.	Chemotaxis in invertebrates and vertebrates	Kohidai László, MD, PhD
4.	Chemotaxis in Inflammatory cells I.: Antigen presenting cell, monocytes-macrophages, eosinophils and neutrophils	Kohidai László, MD, PhD
5.	Chemotaxis in bacteria - A well studied signaling pathway	Kohidai László, MD, PhD
6.	Genetical backgrounds of bacterial chemotaxis	Kohidai László, MD, PhD
7.	Inflammation and chemotaxis	Kohidai László, MD, PhD
8.	Immunological aspects and their clinical implications in general	Kohidai László, MD, PhD
9.	Phagocytosis: the target reaction of chemotaxis	Szabó Rita, PhD
10.	Chemotactic ligands – Characterization of their genomics and proteomics	Kohidai László, MD, PhD
11.	Chemokines	Kohidai László, MD, PhD
12.	The optimal chemotactic ligand	Kohidai László, MD, PhD
13.	Clinical approaches – Tumor biology	Láng Orsolya, MD, PhD
14.	Does persist 'Life' without 'Chemotaxis'?	Kohidai László, MD, PhD

Important notes:

Prerequisite: Medical Chemistry.

Max. allowed absences: 3. Attendance of 75% of lectures is necessary for the end-term signature.

One individual oral presentation (not for grade) is compulsory.

Exam: oral for practice mark

Possibility to make up of absences from the material on the website:

www.chemotaxis.usn.hu and www.dgci.sote.hu

Homepage: <http://gsi.semmelweis.hu>

NEUROSURGERY – Introduction to neurosurgery with case presentations and operating room visit

Department of Neurosurgery

For 5th and 6th year students

Program Locations: Department of Neurology (1086 Bp. Balassa u. 6.) & National Institute of Neurosurgery (1145 Bp. Amerikai út 57.)

Length of course: 14 weeks, 2 hours (lectures)/week

Credit: 2

Final exam: multiple choice test

Detailed program (weeks): Every lecture includes a summary of the topic, 2-3 relevant case presentations and if possible video presentation of surgeries.

- Introduction to neurosurgery: history of neurosurgery
- Basics of micro-neurosurgical anatomy
- Neurological investigation of the neurosurgical patient
- Increased intracranial pressure. Hydrocephalus
- Head injury and neurotrauma basics
- Spine and spinal cord injuries
- Spinal tumours
- Brain tumours, neurooncology
- Vascular malformations of CNS
- Degenerative spine diseases
- Epilepsy surgery and investigations
- Functional neurosurgery and stereotactic procedures
- Radiosurgery
- Visiting the operating theatre and examination

Note: 2 absences are allowed. No possibility to make up of absences.

SOCIAL MEDIA IN MEDICINE

Institute of Behavioural Sciences

Course leader: **Prof. Dr. Ferenc Túry**

Presenter of the course: **Dr. Bertalan Mesko**

credit: 2 credits; elective course

Second Semester

Course objectives:

To present the role of web 2.0 or social media, the new generation of web services, in a medical practice, medical education and communication through specific examples, case studies and practical solutions.

Course Syllabus:

- Week 1: Introduction: Web 2.0 or social media
The role of social media in medicine
- Week 2: Medical search engines
The Google phenomenon
- Week 3: Being up-to-date with RSS
How to follow your field of interest online?
- Week 4: Medical communities online
Facebook from the physician's perspective
- Week 5: Patients on the web
The era of e-patients
- Week 6: The medical blogosphere
From the first comment to blog carnivals: Step by step
- Week 7: Everything you have to know about Wikipedia
Medical wikis
- Week 8: Second Life: Virtual medicine I.
Second Life: Virtual medicine II.
- Week 9: Managing a medical practice online
Should medical professionals use social media?
- Week 10: Education online: medical resources
- Week 11: Podcasts and medical videos
The era of new media
- Week 12: A new way of collaboration: Google Docs
- Week 13: Dangers of social media
Describing topics requested by the students
- Week 14: Future: is there a web 3.0?
The results of the surveys

Participation and making up for absences:

A signature will be given with the prerequisite of participation (minimum 75% of the lectures and seminars). It is possible to make up for an absence by participating in another seminar group the same week. One absence can be overlooked by the teacher if the student writes an essay. The topic of the essay must be discussed with the seminar leader in advance.

Justification of the absence in the lectures and examinations:

Participation list will be recorded at the end of every lecture/seminar. In case of absence medical certificate has to be presented within three workdays to the course leader.

Checks during the semester (reports, written checks) :

One written exam on week 12. It can be made up during the semester.

Requirements for the signature at the end of the semester:

Regular participation on the lectures and seminars, filling in two surveys online (week 2 and 12). One written exam (week 12)

Method of the calculation of marks:

- Written exam: 60 points
- Two surveys: 30 points
- Work during classes: 10 points

Categories:

- 5: 85-100 points
- 4: 75-84 points
- 3: 65-74 points
- 2: 50-64 points
- 1: 50 points

Requirements for the exam: fulfilment of the requirements of the semester

Application for the exam: Through the Neptun system.

Changing the application for the exam: Through the Neptun system.

Justification of the absence from the exam: Medical certificate has to be presented within three workdays to the course leader.

Course and recommended text books:

Pilling János (szerk.) (2011): Medical communication, Medicina Könyvkiadó, Budapest.

<http://www.med20course.com>

<http://www.sciencerooll.com>

CULTURE IN MEDICINE, CULTURE OF MEDICINE – Popular Themes of Current Clinically Applied Medical Anthropology

Institute of Behavioral Sciences

Course Director: Prof. Dr. Ferenc Túry

Lecturer: Dr. László Lajtai

Credit: 2

Second Semester

Weekly topics of the seminars:

1. „We have never been modern?” – An initiation to critical approaches to evidence base in medicine – How to respond? - / - Discussion of the semester: Requirements and timescale.
2. Alternatives 1: Narratives and explanatory models – Confusions and the lay perspective
3. Alternatives 2: Complementary medicine – Competition at our doorstep
4. Alternatives 3: Healing and folk medicine – Wisdom or beliefs?
5. Alternatives 4: Biomedicine for anthropology, or the twist of perspectives
6. Challenges 1: Migrants, refugees and minorities
7. Challenges 2: Reproduction, sex, age, death and other trends in „western” medicalization
8. Challenges 3: Nutrition and taboos - biopower and social body
9. Challenges 4: Placebo, pharmaceuticals and the rule of pharmaceutical industry
10. Challenges 5: Public medicine, private medicine and the reproduction of inequities
11. Favourite themes 1: Alcohol, drug, and AIDS at crossroads of culture and law
12. Favourite themes 2: Shrinks and madness – CBS and the mirage of the normal
13. Fieldworks: Discussion 1.
14. Fieldworks: Discussion 2.
Recapitulation, feedback and evaluation.

ART OF LEARNING

Institute of Behavioral Sciences

Course Leader: *Dr. János Kollár*

First and Second Semester

Objectives of the subject, its place in the medical curriculum:

Improving students' learning and presentation skills, increasing their performance in the acquisition of study materials.

Place where the subject is taught (address of the auditorium, seminar room, etc.):

Seminar room.

Successful completion of the subject results in the acquisition of the following competencies:

- knowledge of creativity development practices,
- increase in educational and presentation skills (including the development of individual skills and knowledge of technical innovations),
- knowledge of mnemonic methods,
- knowledge of the wide application of the possibilities offered by the Internet (information search, communication),
- knowledge of the theory and practice of relaxation.

Course prerequisites:

None.

Number of students required for the course (minimum, maximum) and method of selecting students:

Minimum: 3, maximum: 10.

How to apply for the course:

By using Neptun.

Detailed curriculum:

1. Meeting 1: Keys of Originality - participants can learn simple but effective methods that can be used on a daily basis to develop their creativity.
2. Meeting 2: Lecturing technique - mastering the basic rules of presentation, acknowledging modern presentation methods developed in recent years and their application. Rules for developing and exercising confident performing skills.
3. Meeting 3: Learning technique - Acquiring mnemonic methods and appropriate time management to support learning.
4. Meeting 4: Advantages on the Internet - learning the application of RSS, doing own research by using RSS. Mapping Internet resources that can be used for learning and research. Relaxation: Learning the basics of relaxation, mastering the creation of body-soul-spirit harmony.
5. Meeting 5: Exam - Participants present their own presentation by using their knowledge acquired in the course, receive feedback from each other and from the course leader.

Lecturer: Dr. János Kollár

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

None.

Special study work required to successfully complete the course:

Not required.

Requirements for participation in classes and the possibility to make up for absences:

Out of the 20 hours of the 5 meetings, a maximum of 4 hours of absence is accepted.

Methods to assess knowledge acquisition during term time:

The course ends with an exam at the 5th meeting.

Requirements for signature:

1. Making a presentation at an appropriate level.
2. Active participation, respect for the work of fellow students and active support.

Type of examination:

Practical grade based on the above mentioned requirements.

Requirements of the examination:

Preparing a presentation based on the topics discussed during the course at an appropriate level.

Method and type of evaluation:

5 grade evaluation.

Excellent: Active and constructive participation, high quality performance of tasks. Completing the exam presentation to a high standard.

Good: Active and constructive participation, good performance of tasks. Completing the exam presentation to a good standard with minor errors.

Satisfactory: Passive participation, completion of the exam presentation at an appropriate level.

Pass: Passive participation, preparation of a poor-quality exam presentation.

Failed: Passive participation, failure to present or failure to complete the exam presentation.

How to register for the examination?:

The exam is a part of the course. Special registration is not required.

Possibilities for exam retake:

In case of failure, the student will be given a one-time opportunity to improve his/her presentation.

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

Books:

15. Kermani, K. 1990. Autogenic Training. Souvenir Press Ltd. London.
16. Herkert, R.. 1993. Die 90-Sekunden Pause. Integral Verlag, Wessobrunn.
17. Tracy, B. 2005. Focal Point. Amacom, American Management Association International, New York.
18. O'Connor, J., Seymour, J. 1993. Introducing NLP. Thorsons Publisher Ltd. London.
19. Metzsig, W., Schuster, M. 1996. Lernen zu lernen. Springer-Verlag Berlin Heidelberg.
20. Burke, J. 2001. The Knowledge Web. Simon & Schuster. New York.

DISRUPTIVE TECHNOLOGIES IN MEDICINE

Supervisors: **Dr. Mária Judit Molnár**
Dr. Bertalan Meskó

Code: AOSGRI374_1A

Credit: 1

Disruptive technologies bring groundbreaking changes to medicine and healthcare. While medical students are being prepared for the present conditions, medical technology is going to add different values and require new skills by the time students graduate, therefore modern medical education must prepare them for a world they will have to face in their professional lives. This course was designed to present and analyze today's medical challenges with tomorrow's technologies in a meaningful way addressing skills that students will be able to implement in their everyday practices.

Second Semester

Topics

- I. Introduction
- II. Personalized medicine and point of care diagnostics
- III. Personalized medicine- Genomic health
- IV. Personalized medicine - Imaging health
- V. Social Media and Medicine - Introduction
- VI. Social Media and Medicine - Filtering online
- VII. Social Media and Medicine - Sharing information
- VIII. Harnessing big data in healthcare
- IX. Mobile health and telemedicine
- X. Biotechnology and gene therapy
- XI. Regenerative medicine
- XII. Medical robotics, bionics, virtual reality
- XIII. Future of medical technologies

Textbooks:

Social Media in Clinical Practice, Springer, 2013

The Guide to the Future of Medicine <http://sciencereoll.com/2013/10/30/whitepaper/>

INTRODUCTION TO PHARMACOLOGICAL RESEARCH

Department of Pharmacology and Pharmacotherapy

Supervisors: *Dr. Péter Ferdinandy*
Dr. Tibor Zelles

HEALTHCARE MANAGEMENT

Course Leader: Dr. habil. Éva Belicza Ph.D.

Prerequisite: Internal Medicine I.

Credit: 2

Lecture: 2 hours / week

Subject code: AOVEMK444_1A

Thematics:

- 1st week: Introduction: the role of management in healthcare, basics
- 2nd week: Healthcare economics I.
- 3rd week: Healthcare economics II.
- 4th week: Healthcare financing
- 5th week: Healthcare system models and their international comparison
- 6th week: Organisational management
- 7th week: Organisational behavior
- 8th week: Human resource management in healthcare
- 9th week: Change management in healthcare
- 10th week: Patient safety in practice
- 11th week: Quality management and development in healthcare
- 12th week: Health politics
- 13th week: Project and time management
- 14th week: Summary

MATHEMATICAL AND PHYSICAL BASIS OF MEDICAL BIOPHYSICS

Lecturer: **Dr. Miklós Kellermayer**

Credit: 1

14 hours lecture in the first four weeks of the semester.

Thematics:

1. Mathematics necessary for understanding biophysical laws
2. Physical quantities and units
3. Kinematics – physics of motion
4. Statics – changes of shape, forces, mechanical stress, pressure
5. Dynamics – work, energy
6. Oscillations, waves
7. Fluid mechanics
8. Thermodynamics
9. Electricity – charges in rest and in motion
10. Magnetism, magnetic induction

The presence in at least 75 % of the lessons is obligatory.

The grade is based on the result of test written on the 5th week. This test should be written by all students irrespective of taking this elective subject. The result of test is expected to be at least satisfactory (2) as a condition for signature in Medical biophysics 1. The elective subject helps in the preparation for this test.

Evaluation: practical grade based on the result of test written on the 5th week.

Textbook: Lecture notes on the homepage of the department.

High school physics textbooks.

MEDICAL GENOMICS

Department of Genetics, Cell and Immunobiology

Lecturer: **Prof. Dr. Csaba Szalai**

Medical genomics introduces the basic knowledge in medical and human genomics and the associated genomic methods. The main topic of the course is the genetic and genomic background of the most common multifactorial diseases, like asthma, allergy, type 1 diabetes mellitus, type 2 diabetes mellitus, obesity, high blood pressure, atherosclerosis, Alzheimer disease and Parkinson disease. The lectures show the most important genes and genetic variations in these diseases which can influence the susceptibility to the them and how these knowledges can be used to get to know the pathomechanisms of these diseases and to reveal novel therapy and drug targets. There are also lectures about pharmacogenomics and how our genes influences our responses to different environmental effects. As genomics belongs to systems biology, a lecture introduces to basic terms of systems biology, and concentrating on diseases, some examples of the application and utilization of this scientific field are also be shown.

Planned lectures:

- Introduction to genomics, the human genom
- Multifactorial diseases
- Genomic methods
- Asthma, allergy
- Type 1 diabetes mellitus
- Type 2 diabetes mellitus
- Obesity
- High blood pressure
- Atherosclerosis
- Alzheimer and Parkinson diseases
- Gene-environmental interactions
- Pharmacogenomics
- Systems biology

Prerequisite subjects: Medical Biochemistry, Molecular and Cell Biology I, II and III.

SYSTEMS NEUROSCIENCE I–VI.

Faculty of Medicine, Department of Anatomy, Histology and Embryology

Type of course: optional course-unit

credit: 2

Name of the responsible person: *Dr. Gábor Gerber*

Second Semester

Role of the course in the training of the Department:

The Systems Neuroscience program follows the approach of systems theory in understanding the brain. The aim is to provide students a view of the brain as a whole via unfolding, at least in part, its immense complexity. This is a major challenge of all time, but the right answer should be one that can integrate actual knowledge. As we are in the fortunate period of time when high performance tools (both hardware and software) and large datasets are getting more and more available, systems thinking is inevitable in brain research. Therefore, throughout the course students will learn how different approaches - reductionist, holist and functionalist – are all useful and necessary in understanding the brain.

In one way the course is structured by introducing the students the different levels of organization all being complex systems themselves. After an introductory about the systems science approach of the brain (course 2) we discuss the molecular machineries at the subcellular level (course 3) then turn into the cellular level by learning why and why not the neuron is considered as the unit of brain organization (course 4). In the next step it is shown how billions of neurons make up the cerebral cortex and how this evolutionarily new structure can perform diverse cognitive and other functions (course 5). Finally, whole brain functions and functioning will be approached via its role in behavior (course 6).

In other way, each course will show how the brain functions at lower organizational levels such that synaptic and neuronal populations of different structures as well as a whole. Such holistic approaches have high importance in recent efforts made in deciphering the neurobiological basis of neuropsychiatric and neurological diseases (courses 5,6). Finally, with the closing series of lectures (course 7,8) we aim to provide tools, rules and examples, which help integrating knowledge acquired throughout the courses and also provide an outlook whereby the brain can be compared to other complex systems (course 2). Another notable feature of the Systems Neuroscience program is its interdisciplinary nature: it will introduce the students into several state of the art methods both experimental (molecular biology, cellular and extracellular physiology, different kinds of imaging) and theoretical (data and network analyses, simulation and modelling).

Each course includes visiting the lecturers' lab.

The course will start with an introductory about the history and culture of the geopolitical region thought as Central Europe.

The program of the course:

Weekly schedule of the Courses

1. Central European Culture
2. Introduction to Systems Neuroscience
3. Genomic analysis of single neurons. Neuronal proteomics.
4. Single neurons and beyond
5. Neocortex: from structure to function
6. Neural rhythms: normal and pathological. Brain imaging: from normal to pathological.
7. Neuroelectricity
8. Statistics and the Brain

Practical courses: introduction into cutting edge research techniques during the lab visits

Consultations: personally with the actual course leader

Requirements of course participation and options to recover missed hours:

1. Total absence allowed: 10% of the total course hours
2. Recovering missing hours: studying the material provided by the course leaders, consultation

Eligibility: US grade point average (GPA) of 3.0. Students with a GPA lower than 3.0 should inquire with the Directors on the possibility of a waiver.

Justification of absence from course hours or exams:

Hungarian medical certificate

Number and schedule of the examinations:

The course is divided into eight blocks each covering different fields and scheduled in a weekly basis. Each block ends with an exam in the last teaching day of the actual week.

Requirements of the successful completion of the program:

written or oral test in each course material

Marks:

In case of a written test grades are given after obtaining points as follows: 0-50% fail, 51-60% pass, 61-75% fair, 76-90% good, above 90% excellent.

Types of exam: test, essay, verbal

Requirements of the examinations:

Verbal and electronic etc. material provided by the lecturers. Syllabus is available upon opening the program on the web page.

Registration for exams: NEPTUN

Rescheduling the tests:

N/A

Each student has to take an examination in each block of the course.

Justification of absence from the exam:

Hungarian medical certificate (see above).

List of useful literature (books, papers etc):

It is made available for the students two weeks before the first lecture

PRECLINICAL AND CLINICAL NEUROPSYCHOPHARMACOLOGY AND PSYCHOPHARMACOGENETICS

(Hungarian: Preklinikai és klinikai neuropszichofarmakológia és pszichofarmakogenetika)

Name of the Programme: Medicine, uninterrupted graduate programme

English name of the course: Preclinical and clinical neuropsychopharmacology and psychopharmacogenetics

Neptun-Code (planned): AOVGYH198_1A

Institute: Department of Pharmacodynamics

Name of the tutor/lecturer: Dr. György Bagdy PhD, Dsc.

Phone: +36-1-4591495, +36-1-2104411, +36-1-2102927

E-Mail: bagdy.gyorgy@pharma.semmelweis-univ.hu

Further tutors: Juhász Gabriella Associate Professor, PhD, Lévy György PhD, CSc, Gyertyán István PhD, Gonda Xénia PhD, Ujváry István PhD, Tamási Viola PhD, Vas Szilvia PhD, Eszlári Nóra researcher psychologist (MA)

Number of lectures /week:

blocked course (2X7 lessons)

Credit points: 1

Brief course summary:

The aim of this course is to introduce the function of the central nervous system (CNS), diseases that impact the CNS as well as the (psychiatric, neurological, neurosurgical and addictological) way of their treatment for the interested students. The course creates a bridge between theoretical and clinical subjects. During the course, genetics, molecular sciences, animal models and human investigating methods are demonstrated as well as the possibilities and limits of their application using concrete examples.

Course data

Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
from the 4 th semester	14				14	Spring semester* Winter semester* Both semesters*	

Semester program

I. Lecture topics/week

1. week:	Principles of the function and pharmacological modification of the central nervous system. (György Bagdy) (I-III.) Animal models of diseases affecting the central nervous system (György Lévy) (IV-V.) The dopamine theory of schizophrenia. Antipsychotic drug research (István Gyertyán) (VI-VII.) Experimental studies in learning and memory (István Gyertyán) (VIII.) Genetics of behavioural characteristics influencing psychiatric disorders (Nóra Eszlári) (IX.)
2. week:	Application of neuroimaging techniques in the neuropsychopharmacology (Gabriella Juhász) (X.) Pharmacogenetics (Xénia Gonda) (XI.) Sleep and behaviour. The neurotransmitter regulation of sleep (Vas Szilvia) (XII.) The phenomenon of hallucination: from tribal customs to chemical structures (Ujváry István) (XIII.) The role of "omic" methods in the innovation of psychopharmacocons (Viola Tamási) (XIV.)

Course requirements

Prerequisites: previous attendance of courses in Biology, Physiology and Biochemistry

Semester acceptance conditions: (*successful course attendance, mid-term tests, absence, etc.*)

Attendance of 11 of 14 lectures is required.

Knowledge testing during the semester: -

Requirements of the signature at the end of the semester:

Attendance of 11 of 14 lectures. Repetition of the lessons during the course is not possible.

Individual activity of the student during the semester (*protocol, etc.*) -

Performance control in the examination period (*final, semi-final*) final examination

Performance control in the examination period (*written, oral, written and oral*) written, correction examination: oral

Prescribed external practice: -

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.)

21. Kirilly E., Gonda X., Bagdy G.: CB1 receptor antagonists: new discoveries leading to new perspectives. ACTA PHYSIOLOGICA 205:(1) pp. 41-60. (2012)
22. Lazary J., Juhasz G., Hunyady L., Bagdy G.: Personalized medicine can pave the way for the safe use of CB(1) receptor antagonists. TRENDS IN PHARMACOLOGICAL SCIENCES 32:(5) pp. 270-280. (2011)
23. J.M. Monti, S.R. Pandi-Perumal, B.L. Jacobs and D.J. Nutt (Eds): Serotonin and Sleep: Functional, and Clinical Aspects, Birkhauser, Basel, 2008.
24. J.N. Crawley: What's Wrong with my Mouse? Wiley-Liss, New York, 2000.

List of course materials: classroom, projector

Scientific, course related researches, publications/essays:

1. Juhasz G, Hullam G, Eszlari N, Gonda X, Antal P, Anderson IM, Hökfelt TG, Deakin JF, Bagdy G. Brain galanin system genes interact with life stresses in depression-related phenotypes. Proc Natl Acad Sci U S A. 2014 Apr 22;111(16):E1666-73. doi: 10.1073/pnas.1403649111. Epub 2014 Mar 24. PubMed PMID: 24706871.
2. Bagdy G, Juhasz G. Biomarkers for personalised treatment in psychiatric diseases. Expert Opin Med Diagn. 2013 Sep;7(5):417-22. doi: 10.1517/17530059.2013.821979. Epub 2013 Jul 22. PubMed PMID: 23875948; PubMed Central PMCID: PMC3786517.
3. Kátai Z, Adori C, Kitka T, Vas S, Kalmár L, Kostyalik D, Tóthfalusi L, Palkovits M, Bagdy G. Acute escitalopram treatment inhibits REM sleep rebound and activation of MCH-expressing neurons in the lateral hypothalamus after long term selective REM sleep deprivation. Psychopharmacology (Berl). 2013 Aug;228(3):439-49. doi: 10.1007/s00213-013-3046-4. Epub 2013 Mar 21. PubMed PMID: 23515582.
4. Lazary J, Juhasz G, Hunyady L, Bagdy G. Personalized medicine can pave the way for the safe use of CB₁ receptor antagonists. Trends Pharmacol Sci. 2011 May;32(5):270-80. doi: 10.1016/j.tips.2011.02.013. Epub 2011 Apr 16. Review. PubMed PMID: 21497918.
5. Adori C, Low P, Andó RD, Gutknecht L, Pap D, Truszka F, Takács J, Kovács GG, Lesch KP, Bagdy G. Ultrastructural characterization of tryptophan hydroxylase 2-specific cortical serotonergic fibers and dorsal raphe neuronal cell bodies after MDMA treatment in rat. Psychopharmacology (Berl). 2011 Feb;213(2-3):377-91. doi: 10.1007/s00213-010-2041-2. Epub 2010 Oct 30. PubMed PMID: 21052985.

PATIENT SAFETY

Lecturer: **Zsolt Baranyai MD, Ph.D**

The patient safety course with the code number BBSEB1 in the Moodle system, in the course category Independent from Faculty with the title „Patient safety from Semmelweis until today“.

The late Ignaz Philipp Semmelweis is the best-known Hungarian physician in the world. Confirming this truth, Semmelweis is among the twelve most innovative individuals commemorated in the Hall of Immortals at the International Museum of Surgical Science (Chicago, IL, USA). In 2013, his discovery was inscribed on the list of the UNESCO Memory of the World Register, where it will remain with us until the end of human history. Tribute is even more important for a university named after Semmelweis; the heritage of our famous ancestor is a source of even greater pride for us. At the same time, however, it also requires us to live up to everything his name signifies for Hungary and the whole world. The value of his life's work cannot be overstated, because he succeeded – through perseverant work and major conflicts – in discovering the underlying cause the most serious obstetrical infection of his era on one hand, and in its prevention on the other. His achievement is a classical example of eternity and furthermore, his accomplishments have contributed greatly to the improvement of patient safety.

The Elearning course can be studied after registration. The course is successfully accomplished if the online test is solved with at least 60%. Students have 5 opportunities to take the test. At least 3 days have to be passed between each attempt, the system won't let students enter the interface.

After former request (email: baranyai.zsolt@med.semmelweis-univ.hu) there is a possibility for consultation in groups. Students are welcome who had difficulties to fill in the test or have questions regarding the course.

ULTRASONOGRAPHY IN OBSTETRICS AND GYNECOLOGY

Department: Department of Obstetrics and Gynecology

AOVNO1554_1A

Study time: In every second Semester 2x45 minutes. Advised Semester: between 6. und 12. Semester

Exam: Written test and practical note

Credit: 1

Minimal/maximal participants: (1/5 person)

Application deadline: 1. December

Prerequisite: Completion of second year

The knowledge gained in theoretical basic subjects (anatomy, physiology) can be used by medical students as practical knowledge in the clinic. As a result of more than four decades of experience, ultrasound examination has a fundamental role in modern obstetrical and gynecological diagnostic. The course helps you to acquire skill in this field. Performing obstetrical-gynecological ultrasound tests and assessment of findings can only be learned through appropriate training. This non-invasive procedure is also safe for patients. The modern ultrasound equipment of the Department and the wide range of patients and diseases provide the opportunity for learning. Not only obstetricians and gynecologists, but also other associate colleagues such as clinical genetics, radiologists, gynecological cancer surgeons, anesthetists, and intensive therapists can utilize the knowledge provided by the subject

Themes:

Physical basics of ultrasound examination. Parts of the ultrasound device. Application modes (amplitude, motion, brightness, Doppler). Gynecological ultrasound examination. Early pregnancy tests. Ectopic pregnancy. Standard planes of the first ultrasound screening during the 11-13th week of pregnancy. Neurosonography and fetal echocardiography. Standard planes of the second ultrasound screening during the 18-22th week of pregnancy. Ultrasound examinations in the third trimester. Amniotic fluid index and fetal Doppler examinations. 3-4-dimensional ultrasound examinations and their practical application.

György Bagdy

CARDIAC ELECTROPHYSIOLOGY

Gestor Institute: **Department of Physiology**

Credits: 2

Total number of hours (semester): 28 lectures: 28 practices: – seminars: –

Type of the course (mandatory/elective): elective

II. semester

Code of the course: AOVLT694_1A

Course director (tutor): András TÓTH, DSc.

Contact details: Semmelweis University, Department of Physiology; phone: +36-1-459-1500/60436

Position: External lecturer

Date of habilitation and reference number: 2009; **reference number:**

Aim of the subject and its place in the curriculum:

The course is intended to provide up-to-date and extended knowledge based on the latest literature for practically all medical students, especially those planning to be cardiologists or internists in order to meet a predictable future requirement of a strongly established knowledge related to the electrophysiological background and ion channel dependent pathomechanisms of severe, often lethal heart diseases and to facilitate their better understanding of the corresponding scientific literature. Their expected competent knowledge on cardiac electrophysiological mechanisms will significantly help young MDs to introduce novel, highly effective cardiopharmacological agents and/or to select optimal clinical therapeutic strategies. Via providing a detailed introspection into molecular and cellular basis of the electric activity of the heart the course is willing to offer the students an opportunity to collect an important section of these competences during their student years.

During the course the motivated students may collect a comprehensive knowledge on:

- the biophysical basis of cardiac electrophysiology; the principles of operation and regulation of major cardiac ion channels
- the kinetic properties and regulation of ion currents generating cardiac action potentials; the significance of the repolarization reserve; the molecular background of substantial differences between atrial and ventricular and among various ventricular action potentials; and the basic pathomechanisms of arrhythmogenesis
- the principles of intracellular Ca^{2+} homeostasis in cardiomyocytes; the major mechanisms of excitation/contraction coupling; functional adaptation of the Ca^{2+} -cycle; pathomechanisms of Ca^{2+} -dependent and Ca^{2+} -facilitated heart diseases and several therapeutic strategies
- common genetic disturbances leading to malfunction of cardiac ion channels
- most important experimental techniques and animal models applied in experimental cardiac electrophysiology and the human/clinical relevance of the collected data

Finally a practical demonstration (13-th week) based on the material of the lectures is organized in order to help realistic, problem-oriented application of the theoretical knowledge via jointly processing experimental data derived from a few running scientific projects.

Location of the course (lecture hall, practice room, etc.):

Semmelweis University; EOK; H-1094 Budapest, Tűzoltó u. 37-47.

Competencies gained upon the successful completion of the subject:

Understanding of the human physiology which is foundation of medical practice.

Prerequisite(s) for admission to the subject:

Medical Physiology 1 (the course is suggested for 2-4 year students)

Minimum and maximum number of students registering for the course: Minimum 5 and maximum 80 students

Student selection method in case of oversubscription: chronology of registration in the NEPTUN system.

How to register for the course:

Registration must be recorded through the NEPTUN system.

BIOMEDICAL INNOVATION FOR THE 21st CENTURY

We would like to bring to the attention of Semmelweis University students a newly started English course on the topic of engineering innovation in medical research and patient care. By Béla Merkely Rector, the course is being promoted with the Pázmány Péter Catholic University Faculty of Information Technology and Bionics. The course does not require any engineering previous experience. This course was designed for medical student with basic biophysical knowledge.

The aim of the course is to introduce those interested in areas where engineering opportunities are becoming increasingly important in patient care. Each lecture converges on a theme that is presented by a medical and an engineering specialist based on their own perspectives. This allows the audience to learn about the engineering and medical aspects of the same topic. On the other hand, this course provides a deeper insight into the specific field of medical engineering to facilitate the development of research collaboration between the two fields. We strive to promote medical developments and facilitating a safe but rapid transfer of research results into clinical practice.

Language English.

Exam: 2-page essay on a selected topic.

Held by Medical and Engineering specialists

Thematics

- Recent advances in biomedical engineering.
- Microfluidics for diagnostics and therapy.
- Robotics for healthcare: robotics surgery from minimal invasive surgery to DaVinci.
- Ultrasound diagnostics and therapy.
- Advances in bioimage processing.
- Deep learning algorithms in medical imaging.
- Proteomics: the new era of microbiology.
- 3D printing and 3D planning in medicine.
- Prosthetics in medical and engineering field.
- *Biosignal processing for personalized treatment.*
- Gene Therapy from the perspective of Systems Biology.
- Organ-on-a-chip, and investigation and development of stem cell based therapies.
- From patents to university spin-off companies.

CLINICAL HUNGARIAN from the second semester of the 3rd year

Division of Foreign Languages and Communication – Faculty of Health Sciences

H-1088 Budapest, Vas u. 17., room 130

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1) 486-4960 Fax: +(36-1) 486-4962 Bakó

Head of the Division: **Katalin Zöldi Kovács Ph.D.**

PHYSICAL EDUCATION IX-X.

Practice: 1 hour per week

OBLIGATORY ELECTIVE AND ELECTIVE SUBJECTS – SCHEDULE OF THE CLINICAL MODULE

OBLIGATORY ELECTIVE SUBJECTS					
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
Anesthesiology and Intensive Therapy	2	–	2	pract. mark	Surgery II.
Medicinal, Epidemiological, and Social Aspects of Drug Abuse	2	–	2	pract. mark	Pre-clinical module
Clinicopathology II.	2	–	3	pract. mark	Pathology final
Clinical Endocrinology	2	–	2	pract. mark	Basic module
Clinical Hematology	2	–	2	pract. mark	Pre-clinical module
Clinical practice	–	1	1	pract. mark	Pre-clinical module
Clinical Oncology	2	–	2	pract. mark	Internal Medicine II.
Health Informatics	2	–	2	pract. mark	Pre-clinical module
Neonatology	2	–	2	pract. mark	Pre-clinical module
Clinical cardiovascular physiology	2	–	2	pract. mark	Pre-clinical module
Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.
Healthcare Management	2	–	2	pract. mark	Internal Medicine I.
Ultrasonography in Obstetrics and Gynecology	2	–	2	pract. mark	
Methodology of Clinical Experiments – Observational Experiments	2	–	2	pract. mark	

ELECTIVE SUBJECTS					
Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
Antibiotic therapy & infectology	2	–	2	pract. mark	Pre-clinical module Pharmacology and Pharmacotherapy II.
Cardiorespiratorical and neurophysical measuring techniques	2	–	2	pract. mark	Medical Physiology II.
Social media in medicine	2	–	2	pract. mark	Medical Communication
Emergency Surgery	2	–	2	pract. mark	Surgery I.
Neurobehavioral assessment of infants	2	–	2	pract. mark	Pre-clinical module
Neurosurgery	2	–	2	pract. mark	Neurology
Traditional Chinese Medicine	2	–	2	pract. mark	For 3rd year students and up
Introduction to Epigenetics	2	–	2	semi-final	Immunology
Clinical Hungarian	–	4	2	pract. mark	Hungarian Medical Terminology V.
Inflammation Biology	2	–	2	pract. mark	Immunology, Molecular Cell Biology II.
Introduction to Pharmacological Research	2	–	2	pract. mark	Molecular Cell Biology II., Medical Biochemistry
Clinical work - Radiology	2	–	1		
Clinical Gastroenterology	2	–	3	pract. mark	Internal Medicine – Propedeutics
Patient Safety	e-learning course				
Medical and Dental Terminology on advanced level I-II.	2	–	2	pract. mark	
Hungarian Medical Terminology in semesters 6-12 on B2 level					
Cardio Electrophysiology	2	–	2		for 2-4 year students
Network, Management, Career Building	2	–	2		for 3-5 year students
Course on Human Lactation and Breastfeeding – Theory, Support and Promotion	2	–	2		for 5 year students



Faculty of Medicine
6th year

COMPULSORY INTERNSHIPS AND RESPONSIBLE DEPARTMENTS

Internal Medicine

Department of Internal Medicine and Oncology

(former 1st Department of Internal Medicine)

Budapest VIII., Korányi Sándor u. 2/A Phone: 459-1500 / ext 51465

Head of the Department: **Dr. István Takács**

Tutor: **Dr. Péter Studinger**

Department of Internal Medicine and Hematology

(former 2nd and 3rd Department of Internal Medicine)

Budapest, VIII. Szentkirályi u. 46. Phone: 459-1500

Head of the Department: **Prof. Dr. Tamás Masszi**

Tutor: **Dr. Katalin Keltai**

E-mail: keltaikati@gmail.com

Infectology

Department of Internal Medicine and Hematology, Division of Infectology at Szent László Hospital

Budapest, Albert Flórián u. 5-7.

Head of the Department: **Prof. Dr. Gergely Kriván**

Tutor: **Dr. János Sinkó**

E-mail: infectology.hun@gmail.com (Ms. Júlia Nagy)

Surgery

1st Department of Surgery and Interventional Gastroenterology

Budapest VIII., Üllői út. 78. Phone: 459-1500 / ext. 52120

Head of the Department: **Prof. Dr. Attila Szijártó**

Tutor: **Dr. Ákos Szűcs**

E-mail: kovacs.zsanett@med.semmelweis-univ.hu (Ms. Zsanett Kovács)

2nd Department of Surgery

Budapest VIII., Üllői út 78/B Phone: 06-20-666-2154, 06-20-666-2155

Head of the Department: **Prof. Dr. Gábor István**

Tutor: **Dr. György Ledniczky**

Department of Transplantation and Surgery

Budapest VIII., Baross u. 23. Phone: 267-6000, 459-1500/ ext. **60857**

Head of the Department: **Prof. Dr. László Kóbori**

Tutor: **Dr. Gábor Telkes**

Traumatology**Department of Traumatology**

Budapest VIII., Fiumei út 17. Phone: 461-4723

Budapest XIV., Uzsoki u. 29. Phone/fax: 467-3851

Mobile: 06-20-825-8680

Head of the Department: **Prof. Dr. László Hangody**

Tutor: **Dr. Tamás Gál**

Vascular surgery**Department of Vascular Surgery**

Budapest, XII., Városmajor u. 68. Phone: (+36-1) 458-6700

Head of the Department: **Prof. Dr. Péter Sótónyi**

Tutor: **Dr. Péter Banga**

Pediatrics**1st Department of Pediatrics**

Budapest VIII., Bókay J. u. 53. Phone: +36-1-313-8212

Head of the Department: **Prof. Dr. Attila Szabó**

Tutor: **Dr. Ádám Balogh**

E-mail: education.ped1@med.semmelweis-univ.hu (Ms. Enikő Stolmár) ☎: 52656

2nd Department of Pediatrics

Budapest IX., Tűzoltó u. 7-9. Phone: 215-1380 / ext. 52976

Head of the Department: **Dr. Gábor Kovács**

Tutor: **Dr. Erdélyi Dániel**

Obstetrics and Gynecology**Department of Obstetrics and Gynecology**

Budapest VIII., Baross u. 27. Phone: 266-0473

Head of the Department: **Prof. Dr. Nándor Ács**

Tutor: **Dr. Gyula Richárd Nagy**

E-mail: szlaby.emese@med.semmelweis-univ.hu (Ms. Emese Szlaby)

Neurology**Department of Neurology**

Budapest VIII., Balassa u. 6. Phone: 210-0330

Head of the Department: **Prof. Dr. Dániel Bereczki**

Tutor: **Dr. Róbert Debreczeni** (debreczeni.robert@med.semmelweis-univ.hu)

E-mail: kovacs.andrea@med.semmelweis-univ.hu (Ms. Andrea Kovács)

Psychiatry

Department of Psychiatry and Psychotherapy

Budapest VIII., Balassa u. 6. Phone: 210-0330 / ext. 51100

Head of the Department: **Dr. János Réthelyi**

Tutor: **Dr. Erika Szily**

E-mail: szecsi.tunde@med.semmelweis-univ.hu (Ms. Tünde Szécsi)

Family Medicine in Daily Practice

Department of Family Medicine

Budapest VIII., Stáhly u. 9. Phone: 355-8530

Head of the Department: **Dr. Péter Torzsa**

Tutor: **Dr. Krisztián Vörös**

E-mail: fekete.ilona@med.semmelweis-univ.hu (Ms. Ilona Fekete)

Prehospital Emergency Medicine

National Ambulance Service

Budapest XIII., Róbert Károly krt. 77. Phone: 350-6720

Director: **Dr. Gábor Göbl**

E-mail: szabados.agnes@mentok.hu (Ms. Ágnes Szabados)

Transfusion Course

Department of Transfusion Medicine

Budapest VIII., Nagyvárad tér 4.

Phone: 210-2940

Head of the Department: **Prof. Dr. Attila Tordai**

E-mail: kristof.szilvia@med.semmelweis-univ.hu (Ms. Szilvia Kristóf)

STUDY PROGRAM

6th Year in the 2021/2022 academic year

NEW CURRICULUM

course name	hours		credit	prerequisite(s)	examination
	lecture (h/week)	practice (h/week)			
Internal Medicine (final year's practice)	8 weeks (incl. 1 week Infectology and 1 week Family Medicine)		8	Internal Medicine II., Medical Imaging, Pulmonology and Thoracic Surgery	final
Surgery (final year's practice)	6 weeks (incl. 1 week Vascular Surgery, 1 week Traumatology)		6	Traumatology, Urology, Ophthalmology	final
Pediatrics (final year's practice)	6 weeks		6	Internal Medicine II., Pediatrics, Clinical Genetics	final
Obstetrics and Gynecology (final year's practice)	4 weeks		4	Clinical Genetics, Obstetrics and Gynecology	final
Neurology (final year's practice)	3 weeks		3	Neurology	final
Psychiatry (final year's practice)	3 weeks		3	Psychiatry and Psychotherapy	final
Ambulance	2 weeks		2	Anaesthesiology and Intensive Therapy, Emergency Medicine and Oxyology, Traumatology	pract. mark
Transfusion	1 week		1	Anaesthesiology and Intensive Therapy, Internal Medicine II.	pract. mark
Elective	6 weeks		6	Internal Medicine II., Surgery, Last course of the chosen field (announced in the 5th year at latest)	pract. mark
PE XI.	0	1	0	PE X.*	signature
PE XII.	0	1	0	PE XI.*	signature
Thesis work	In addition to individual student preparation, at least 20 contact hours with the supervisor.		20		
elective subjects in all in the 1-6 years					
Optional subjects **			min. 18	As determined at the relevant subject.	
Obligatory elective subjects	From the 2021/2022 academic year, minimum 4% of the total number of credits required.			As determined at the relevant subject.	
Complementary elective internship practice	5 weeks duration (2 "gap" weeks + 3 weeks in May) Practice time: 40 hours per week; Credits: 5			Internal Medicine II. Obstetrics-Gynecology Pediatrics	

* Simultaneous taking the courses is possible.

** 6 weeks of optional practice: It can be completed at any clinical department or clinic. Major subjects that end with a final exam are also eligible.

Comment:

Please read more about the rules concerning the criteria of selecting the foreign clinical practice positions and accepting the practice period spent abroad:

<https://semmelweis.hu/english/education/english-language-program/english-secretariat/official-forms/>
<https://semmelweis.hu/english/education/departments/>

Certificates can be downloaded at

<https://semmelweis.hu/english/education/english-language-program/english-secretariat/official-forms/>

Please note the followings:

1. When **not at Semmelweis University** the one week Traumatology is to be completed at a surgical department providing **neurochirurgia** as well.
2. It is strongly required to keep the instructions of Article 24 of the Examination and Studies Regulations concerning the requirements of the **diploma work** focusing especially on the **deadlines**.
3. The **final exams** can be done only on the exam **dates** published by the clinical departments of Semmelweis University.

Please note: there are no individual requests and the rule should be kept **strictly**.

INTERNAL MEDICINE

To be present for at least 7 hours per day (35 hours per week), **including 1 week Infectology and 1 week Family Medicine.**

Activities should include the following subjects: general survey of hospital/department organization, examination of patients in the Medical Department, with special emphasis to case history taking and full physical examination.

The students should gain practice in patient documentation, problem-oriented medical record keeping, taking of pulse, blood pressure of patients.

Participate in the preparation of diagnostic and therapeutic plan for patients.

Be present at invasive and semi-invasive interventions (taps of abdominal and chest fluid, preparation of bone marrow smear etc.).

To spend time at the outpatient department.

To practice basic laboratory techniques needed in bedside diagnosis (urinalysis, stool examination, use of dip sticks etc.).

To be on night duty once during the period.

Consultations in gastroenterology, diabetes, hematology, endocrinology, cardiology, sonography, X-ray, ECG etc.

Watch endoscopy performed.

See the intensive coronary care unit.

Regular consultations with the doctor responsible for the student.

All these activities should be carefully supervised by members of the medical staff.

The students should also practice communication with patients and their relatives, while giving them relevant medical information on the disease but avoiding conflicts with medical confidentiality.

Students should take an active part in medical consultations concerning their patients, as well as in the medical conferences in the department.

INFECTOLOGY IN INTERNAL MEDICINE

One week Infectology practice within sixth year's rotation in Internal Medicine

Subject: Infectious diseases (Infectology)

Head of Division: Dr. Gergely Kriván PhD

Location: Department of Internal Medicine and Hematology, Division of Infectology at Szent László Hospital
1097 Budapest, Albert Flórián u 5-7.

Time period: 30 hours a week

Registration: NEPTUN system

Program: a detailed program plan will be announced about locations and tutors of daily practice in time

Group size: Our institution can only accept a limited number of students (14 persons) at a time. In order to keep the program interactive and to avoid overcrowding at patients' departments we cannot accept your request to register above this quota. If the scheduled practice weeks do not match your plans you can: 1. Switch registration with a fellow student. 2. Collect at least 5 more persons having the same problem and apply to the English Secretariat to schedule an additional week for Infectology rotation. Our Division will do its best to fulfill these requests; however it cannot be granted that rotations will be organized at any desired time.

Overview

Knowledge on infectious diseases has been among the most ancient parts of medical practice and science. Epidemics, isolation of patients with communicable diseases, vaccinations and anti-infective therapy had a significant impact not only on the progress in healthcare but also on history and socio-cultural development of mankind. Although infectology is often considered being of marginal importance within internal medicine, it should be noted that an increasing number of diseases and conditions seem to have an infectious background. In addition, around a third of chapters within major medical textbooks deal with infectious diseases.

Currently development of infectology has two important directions that are complementary to each other. The traditional one will target classical and emerging infections often of global scope, like influenza, gastrointestinal infections, hepatitis or malaria etc. A newer branch of infectology is focusing on infections related to modern medicine, like nosocomial outbreaks caused by multiresistant organisms or infections occurring in immunocompromised hosts. Prophylaxis and therapy of infections as well as knowledge on antibiotic therapy is of significant importance in both fields.

Program details

During the infectology rotation you will be welcome to

- take part in rounds at Departments of Infectious Disease
- participate in round table discussions on current topics in infectology
- discuss real life cases especially in the immunocompromised host setting
- being updated on basic diagnostic and therapeutic approaches in stem cell transplant patients
- have an overview on developments in HIV/AIDS therapy.

Sessions are designed to be as interactive as possible, so you are encouraged to actively take part in discussions and feel free asking questions from tutors at all times.

Completion of rotation and signature: Registered students must attend all courses to receive their signature. We can only accept hospital discharge papers for verification of absences. The absence must be substituted at a later time period, assigned by the tutor. In the case of further absences, the practice cannot be accepted. Excuses like having been unable to locate the venue of practice are not acceptable. Students arriving later than 10 minutes past the scheduled start of the sessions will not be accepted to take part in the program.

SURGERY

- Acting as a HO or SHO under strict supervision, including administration and practical skills.
- Admitting of patients with full physical examination, including breast and PR examinations.
- Theoretical planning for examinations and treatments for the examined patients.
- Continuous observation and registration of the patient's condition with administration.
- Writing of discharge reports.
- Performing different injections (iv., im, sc), insertion of venflons, phlebotomies. To determine blood group, performing of transfusions under strict supervision. Completion of administration.
- Insertion of NG tubes.
- Catheterization (urethral and suprapubic).
- Removal of clips and stitches.
- Changing of dressings.
- Assistance at abdominal and thoracic wash-outs or punctures.
- Taking part in consultations with other specialists.
- Theoretical decisions about operations. Consenting.
- Taking part in operations, scrubbing in, stitching.
- Examination and treating of emergency patients.
- Taking part in anesthesiological preparation of patients.
- Observation of premedications.
- Assistance at several anesthesiological procedures, including spinal, peridural and GA.
- Assistance at intubations. If possible, independent intubation.
- Measurement of CVP.
- Assistance at jugular and subclavian venal punctures.
- Suction of the throat and trachea.
- Observation of ITU work.

HO	house officer
SHO	senior house officer
PR	per rectum
NG	nasogastric
GA	general anesthetic
CVP	central venous pressure
ITU	intensive therapy unit
- Observation of postoperative treatment.
- Observation of resuscitation and reanimation.
- Observation of autopsies of the ward.
- Being present at every medical discussion of the ward.
- Observation of outpatient work.
- Assistance in outpatient work including assistance at day surgical operations.
- Changing of dressings of outpatients.
- Treatment of infected wounds.
- Assistance at i.v. anesthesia.
- Performing and assisting at local anesthesia.
- Observation and assistance at ultrasound, endoscopies and X-ray examinations.
- As interns, students take part in the daily rounds and report on the patients examined by them or treated in their section. Interns examine the patients under the supervision of the ward chief or ward surgeon. Interns are required to be personally involved in the examinations and the evaluation of the findings.

Involvement in the preparation of the documentation of the patients.

Involvement in the preoperative preparations as well as in the postoperative care and treatments.

Take part in the operations as second assistants.

Take part in on-call duty without numerical limitations. During on-call (night) duty, interns should-under the supervision of the ward chief or authorized surgeon – be involved in solving all problems caused by either acute or chronic diseases.

Interns are required to take part in all consultations organized for them.

Interns will be eligible for the final examination if the above conditions have all been met and their academic achievements during their internship proved.

TRAUMATOLOGY

Department of Traumatology

Subject: Traumatology

Type of subject: Mandatory

The work hours of the practice are 30 hours/week

Head of Department: **Prof. Dr. Hangody László**

Dear Students,

In order to begin your 6th year practice at Semmelweis University, Department of Traumatology – **in Uzsoki Hospital or Péterfy Traumatology Center** – the following certificate is required to show on the first day of your 1 week traumatology practice: Occupational suitability health examination results.

Purpose of subject:

Traumatology as a specialty deals with the treatment of injured patients, independent of the injured organ, patient's age or previous diseases. In developed countries, the 4-5th leading cause of death is injury, while in the actively working population, the rate of death is even higher. Morbidity in children and in the elderly is also high. Since the patient examination and therapeutic algorithm somewhat differ from the previously taught examination and treatment methods in the curriculum, our aim is to offer a general and practical approach to treating trauma patients for students. The prerequisite for 6th year Traumatology is the material and exam from 5th year in Traumatology, to be used in a more practical manner. Beside this, familiarization and active participation in the daily routine of a Traumatology department play a role in the students' curriculum.

Syllabus: 6th year students – 1 week practice

The student may attend this practice at one of the following institutions: 1. Semmelweis University Department of Traumatology, 2. in the Member States of the European Union (and in Switzerland and Norway), clinical practice is accepted and recognized if it is earned at a Traumatology or Orthopedic-Traumatology department at state-accredited university clinics or teaching hospitals – the legal ground for this is the mutual recognition of diplomas issued by the accredited institutions, or 3. abroad at a Traumatology or Orthopedic-traumatology department of an accredited teaching hospital accredited by the Hungarian Accreditation Committee – HAC (this can be checked on the following website: http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101 under the link: Approved Health Institutes for 6th year Rotations).

1. Daily attendance of morning conference. After becoming acquainted with the introduced cases, students will have the opportunity to examine the hospitalized patients and familiarize themselves with patient's documentation.
2. Assisting or observing in the operative theater, depending on the operative program.
3. Students shall participate in patient admission, examination, follow and help in the evaluation of the diagnostic examinations, and take part in the acute treatment of traumatized patients during on duty shifts.
4. Participating in grand rounds, patient presentation, and following up on referrals.
5. Consultation with attending tutor of actual clinical cases, planning the treatment and the course of patient follow up.
6. Taking part in patient follow up examinations. Examining the range of motion, function, evaluating x-rays and CT scans. Identification and treatment of complications

Detailed syllabus:

1. First Aid
2. Evaluation of the mental-stage/orientation with the Glasgow-score
3. Evaluating and management of external wounds
4. Termination of bleeding
5. Transportation of trauma patient
6. Transient fixating bandage of traumatic part of body
7. Preparation of the surgical area
8. Surgical scrub-in and clothing
9. Infiltrational anaesthesia
10. Incision and drainage
11. Management of infected, necrotic wound
12. Closure
13. Stitch removal
14. Applying pressure-bandage
15. Reuniting closed fractures
16. Fracture stabilization
17. Reduction of dislocation
18. Transient fixation of broken extremities
19. Insertion of Foley's catheter in men
20. Insertion of Foley's catheter in women
21. Venous-cannulating
22. Pain management
23. Assisting surgical procedures

Attendance criteria and absences:

The complete attendance of the one week practice as well as the completion of the syllabus signed by the tutor is mandatory. The syllabus must be handed in at the Traumatology Department upon completion of the practice with the certificate (if practice is spent abroad) and student index. During the course of the one week, 6 hour work days are mandatory.

Verification of absences from practices of from the exam:

We can only accept hospital discharge papers for verification of absences, with a maximum of 3 days. The absence must be substituted at a later time period, assigned by the tutor. In the case of further absences, the practice cannot be accepted.

The topics and monitoring of practices:

Regular attendance is taken during the one week practice on an attendance sheet. The traumatology student syllabus contains the topics and requirements the student must fulfill during the practice.

Students who spend their Traumatology practice abroad must hand in a Letter of Acceptance form (For obligatory internship in Traumatology as part of the student's sixth year's curriculum) signed by the professor in charge/Head of Department at least one month prior to beginning their practice at that hospital/clinic. We cannot accept the practice of a student, if the "letter of acceptance" is handed in later than one month prior to starting the practice.

Students who spend their Traumatology practice at the Traumatology Department of Semmelweis University must do so at one of the allotted time periods on the Neptun program.

Criteria for the signature at the end of the semester:

Attendance of the one week of traumatology practice, as well as the completion of the syllabus (which can be downloaded from the Semmelweis University Traumatology Department's website) signed by the tutor. Traumatology must be attended and signed separately from the general surgery practice in the 6th year. Participation is only accepted, if the department has a trauma care unit, which is qualified according to Semmelweis University guidelines.

Grading: One topic is a traumatology topic, which is part of the surgery oral exam.

Type of exam: Oral exam. One traumatology topic within the surgery exam.

Exam requirements:

The knowledge of the given textbook, lecture and practice material including that of V. year. One topic is chosen from a topic list.

Exam registration: Neptun program

Modification of exam registration: Neptun program

Absence from the exam:

We can only accept hospital discharge papers for verification of the absence from the exam, proving the student was continuously hospitalized during that time period.

List of textbooks, notes, study-aids and references:

The Trauma Manual: TRAUMA AND ACUTE CARE SURGERY Third edition Editors: Andrew B. Peitzman, Michael Rhodes, C. William Schwab, Donald M. Yealy, Timothy C. Fabian, Publisher: Wolters Kluwer / Lippincott Williams & Wilkins

VASCULAR SURGERY

Department of Vascular Surgery

Type of the subject: mandatory

Code: AOKSBE066_SA

Credits: 0

Interval of practice: 1 week

Time of practice: 30 hours a week.

SYLLABUS OF THE SUBJECT

- I: Reception, assignment, and tutor appointment
The 6th grade students who registered themselves to the certain term, should appear on the first day of the practice (usually on Monday) at 8 am at the English course coordinator (Zsuzsanna Jaranyi M.D., associate professor). They can get information of the meeting point at the reception. From 8 am till 8:30 the students get their coats and their lockers. After this, they are assigned to their tutor. Our aim is the „one tutor-one student” principle, but this is not possible often, due to the numerous students at same time (4-5 students have 1 tutor). During the practice course it is the tutor’s task to introduce the whole range of the vascular surgical procedures to the students: like the morning ward round – physical examination of the patients – diagnostical steps of vascular diseases – treatment strategy – knowledge of operative techniques – early control, medical therapy, recognition and treatment of adverse events, long term prognosis of patients who underwent vascular surgical operations and the activities of the outpatient clinic.
- II: Activities in wards
The student participates in the ward rounds with the tutor’s guidance, where he can get acquainted with the admitted patients’ history, the type of the previously performed operations, or even with the planned operative opportunities. The tutor involves the student in the features of the arterial and venous patient examination: like recording the patient history, listing the risk factors of the vascular diseases, palpation, auscultation, and examination with mini Doppler, performing special tests (Trendelenburg-, Perthes probe, postural-, capillary refill test), including or excluding cardiac co morbidities (ECG, ECHO, history findings), and finding other co morbidities, which affect with the surgical treatment.
- III: Diagnostic possibilities of patients with vascular diseases
Students should spend at least one day in the angiography, carotid duplex scan, and CT/MRI laboratories, where they could get acquainted with the most common invasive and non-invasive diagnostical opportunities, and with the endovascular therapy.
- IV: Activity in the Operating Theatre
The student participates in the patients’ operations, following all the stations, and in some of these he/she could take a hand in: anesthesia, narcosis, intubation or local anesthesia, catheter usage, canulation, giving injection, disinfection, isolation, surgical techniques, wound drainage, closing, and dressing change, and following the operated patient to the ward or to the intensive care unit. It is recommended for the student to scrub in, and to assist to the surgeon. During the operation he/she should get a possibility to touch the ill and the reconstructed vessels and the tutor should explain the specialties of the actual type of the operation.
- V: Outpatient clinic
The student should participate in his/her tutor’s outpatient clinic, where he/she could learn the examinations of the vascular patients. The student should perform patient examination also (palpation, auscultation, Doppler, and evaluating the test results), and should follow the treatment decision strategy, and the aspects of the patient controlling
- VI: Practice oriented theoretical training
The students get a grouped theoretical training, which involves the whole range of vascular surgery. These are one and a half – two hours long discussions which are all practice oriented.
- VII: On the last day of the practice course the students give back their coats and their locker keys, and they get the signature in their index, which certificates the successfully fulfilled practice.

PEDIATRICS

According to the curriculum, 6th year medical students should complete a **6-week Pediatric practical (including 1 week Infectology)**.

- During one half of the practical, students work in infants' wards, in the other part in children's wards. This way they can acquire and practice the following activities on both infants and children:
 - Taking of pulse and blood pressure, correct weight and height measurement (also of infants) (use of percentile tables).
 - Under the supervision of the ward physician, active participation in blood sampling, taking throat swab etc.
 - Under the supervision of the ward physician, practice of various injection techniques (venous, im, sc and Mantoux test).
 - Preparation and control of infusion and transfusion accessories and performing these activities under the supervision of the ward physician. Determination of blood group.
 - To assist to special diagnostic or therapeutic interventions and learning eventually to perform them under the supervision of the ward physician (bonemarrow sampling, lumbar puncture).
 - Based on the knowledge of the necessary physiological studium: blood counting and urine analysis (also the sediment).
 - Taking of case records and temperature charts.
 - Participation in the daily rounds for students, where simpler differential diagnostic questions are discussed with the instructions of a full or associate professor.
 - Participation in tutorials held on the most important theoretical subjects, enabling students to get acquainted with the standpoint of the hospital in debated questions.
 - In addition to the above, students are expected to be able to contact children patients of various ages (to win the patients for the examination), to do basic nursing duties (feeding, drinking, bathing, changing of infants' diapers, administering of medicaments).
- Working in the wards:
 - a) ward round (physical examination, discuss about illnesses, therapy, different diagnoses, etc.)
 - b) follow up on patients
 - c) paperwork (status of physical findings, decursus, discharge report, etc.)
 - d) diagnostic procedures (venapuncture, urine collection, etc.)
- Ward round participation

Note: Only legibly, completely and accurately filled out, institutionally sealed, original acceptance letters are recognized by the I. Department of Pediatrics!

OBSTETRICS AND GYNECOLOGY

Essential Requirements in Obstetrics

- Prenatal care (anamnesis, lab tests, screening during pregnancy, obstetrical examinations, Leopold's manoeuvres)
- Cardiotocography (NST, OCT)
- Ultrasonography (evaluation)
- Abnormal pregnancy (diagnosis and therapy), intercurrent diseases (diabetes, heart diseases, renal diseases). Preeclamptic toxemia, hypertension, twins, hemorrhages, abortions
- Normal labor
 - fetal and maternal monitoring, management of the stages of labor (examinations during labor)
- Abnormal labor
 - breech delivery, transverse lie (diagnosis)
- Obstetric operations (assistance at labor and delivery)
- Obstetric operations (vacuum extraction, forceps, cesarean section, episiotomy)
- Postnatal care
 - Evaluation of the premature, dysmature and eutrophic newborns
 - Fundamentals of neonatal management
- Essential Requirements in Gynecology
- Gynecologic anamnesis
- Gynecologic examinations (to be carried out)
 - vaginal examination
 - colposcopy – cytology (basic knowledge, how to take a PAP smear)
 - examination of the breast
- Gynecologic operations (assistance)
 - bartholin abscess, cyst
 - D and C
 - abdominal hysterectomy
 - vaginal hysterectomy
 - colporrhaphy
- Postoperative management (basic knowledge)
- Outpatient clinics (to take part in the office work of outpatient clinics for gynecology, genetic counseling, adolescent gynecology, menopause, endocrinology, etc.)
- Bleeding disorders
- Cervical, corporal, ovarian, vulvar cancer (etiology, screening, diagnosis, therapy)
- Inflammation of the genital tract (PID)
- Urinary incontinence
- Contraception

NEUROLOGY

General information

Tutor: **Dr. Róbert Debreczeni**

Tel.: 210-0330, Fax: 210-1368

Office hours at the Department of Neurology:

Monday 13,00-14,00 Friday 10,00-12,00

Responsible Secretary: Andrea Kovács (Andi)

Rotation periods: set by the English Secretariat, but for individual changes one might apply at the Department of Neurology. To ease the scheduling of other 6th year practices the Department shall organize “early rotations” right after taking the 5th year semifinal exam.

Neurology rotation is 3 weeks long. Students receive their schedule and assignments on the first day of practice. During the training students must write one neurological case report. It is also obligatory to spend one day at our Outpatient Clinic and to take part in one nightduty (no sleep in). Students’ activity in the wards, at the Outpatient Clinic and during duty, and also the case report is evaluated by the student’s tutor on an assessment sheet. The assessment form and the case report must be presented at the final exam. During the training period two days of absence are allowed.

Final examination

One can register for the exam only through the Neptun-system.

The final examination consists of:

1. practical part: neurological examination skills, decision making, tested at the bedside;
 2. theoretical part: 3 theoretical questions.
- Examinations start at 10 a.m. Students must present their index book, assessment form, case report and in case of retake the permission from the Office of Dean.
- On event of failing the earliest possible retake is 10 days later.

Official textbooks:

1. Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients
2. Adams: Principles of Neurology. McGraw-Hill
3. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

Other suggested books:

1. Marsden, Fowler: Clinical Neurology. Raven Press
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
3. Gilroy: Basic Neurology. Pergamon Press
4. Weiner- Lewitt: Neurology of House Officer. Williams and Wilkins
5. Bannister: Brain an Bannister’s Clinical Neurology. Oxford University Press
6. Mumenthaler: Neurology. Georg Thieme Verlag.

6th year Medical Student Clinical Neurology Learning Objectives

Neurologic History and Examination

1. Perform a competent history, noting the following factors:
 - A. Establish the onset, progression and character of the disorder identifying all related symptoms.
 - B. Perform a standard neurologic review of symptoms with regard to personality, memory, headaches, pain, seizures, impairments of consciousness, vision, hearing, language function, swallowing, coordination, gait, weakness, sensory alterations, sphincter disturbance, and involuntary movements.
2. Perform a neurologic examination
 - A. Perform a screening mental status examination to include: level of consciousness assessment, and aphasia assessment.
 - B. Examine for meningismus, straight leg raising maneuver.
 - C. Cranial nerve examination
 - D. Motor examination including: tone, strength and bulk, pronator drift, abnormal movements.
 - E. Perform a reflex examination (muscle stretch reflexes, superficial reflexes, pathologic reflexes)
 - F. Coordination examination including finger-to-nose- test, heel-to-shin test, rapid alternating movements.
 - G. Gait examination: stance and Romberg test, gait, tandem gait, ability to rise from sitting, toe walking and heel walking.
 - H. Perform sensory examination including primary modalities(pain, temperature, position, vibration)and secondary/cortical modalities (stereognosis, graphesthesia, double simultaneous stimulation).
- I. Acquire the following skills:
 - A. Anatomic and physiologic basis of the neurologic examination.
 - B. Competent history, physical and neurologic examination.
 - C. Localize the lesion using the clinical database.
 - D. Develop a differential diagnosis of the clinical problem.
 - E. Assess the acuteness of neurological diseases, recognize neurological emergencies.
 - F. Formulate a plan of investigation and management.
- II. Describe the indications, techniques, results, contraindications and risks of the followings:
 - A. Lumbar puncture (investigation of CSF)
 - B. EEG, EMG, ENG, Transcranial magnetic stimulation
 - C. CT, MRI, SPECT, PET
 - D. Carotid and transcranial ultrasound
- III. Disorders of motor function
 - A. Differentiate between upper and lower motor neuron lesion (UMN, LMN).
 - B. UMN facial weakness and LMN facial weakness.
 - C. Disorders of coordination. Recognize symptoms of cerebellar disorders. Define ataxia, dysmetria, wide-based gait, and discuss the localization.
 - D. Define and differentiate involuntary movement disorders:tremor, rigidity, spasticity, athetosis, chorea, dystonias, myoclonus, tics. Discuss the findings and treatment of: Parkinson's disease, essential tremor, tardive dyskinesia, Huntington's chorea, Wilson's disease.
- IV. Disorders of sensation
 - A. Differentiate central sensory disorders from peripheral sensory disorders.
- V. Disorders of vision
 - A. Localize the lesions causing vision disorders and visual field defects.
 - B. Differentiate papilledema from papillitis.
 - C. The innervation deficit of the ocular muscles.
 - D. Recognize gaze problems and nystagmus.
 - E. Assess rystalli abnormalities.

- VI. Episodic disorders
 - A. Seizure disorders: generalized and partial seizures, distinguish seizure from syncope.
 - B. Describe Todd's postictal phenomenon.
 - C. Evaluation of a patient for new-onset seizure.
 - D. The anticonvulsants, their indications and side effects.
 - E. Management of a patient in status epilepticus.
 - F. Narcolepsy and obstructive sleep apnea.
- VII. Cerebrovascular diseases
 - A. Define the following: asymptomatic carotid bruit, TIA, amaurosis fugax, ischemic infarct, lacunar infarct, hemorrhagic infarct, parenchymal hemorrhage, SAH.
 - B. The clinical features of various territorial infarcts.
 - C. Treatment options to prevent infarction in atrial fibrillation and carotid stenosis.
 - D. The clinical features for hypertensive parenchymal hemorrhage.
 - E. The clinical picture and diagnosis of SAH. Early medical/surgical management of a patient with a SAH.
- VIII. Multiple sclerosis (MS)
 - A. The criteria for the clinical diagnosis of MS.
 - B. The treatment of MS.
- IX. Head trauma
 - A. Define the temporal profile, symptoms and treatment of: commotion, concussion, anterograde and retrograde amnesia, subdural hematoma, epidural hematoma, contusion or hemorrhage, liquorrhea.
- X. Dizziness and disorders of hearing
 - A. Define vertigo, and contrast it with other type of dizziness.
 - B. Describe nystagmus, hanging head test (Hallpike maneuver), calorics.
 - C. Identify the clinical features of: benign paroxysmal positional vertigo, vestibular neuronitis, Meniere's disease, brainstem TIA with vertigo, acoustic neuroma.
- XI. Disorders of higher cognitive functions
 - A. Define and assess: dementia, delirium, amnesia, confabulation, hallucination.
 - B. Define normal-pressure hydrocephalus.
 - C. Define the anatomical basis for aphasia and dysarthria.
 - D. Differentiate the aphasias on the basis of ability to produce speech, comprehension, naming, repetition.
- XII. Disorders of altered consciousness
 - A. Define hypnoid and non-hypnoid unconsciousness.
 - B. The anatomic basis of consciousness.
 - C. Assess the comatose patient, evaluation and treatment.
 - D. Localize the following: decorticate and decerebrate rigidity, conjugately deviated eyes, pathologic respiration, pinpoint pupils, anisocoria, intact versus absent oculocephalic response, intact versus disconjugate ice water calorics.
 - E. Diagnosis and management of increased intracranial pressure (ICP).
 - F. Symptoms of uncal and other herniations.
- XIII. Headaches and facial pain
 - A. Clinical features of migraine, cluster headache, tension headache, trigeminal neuralgia, "organic" headache.
 - B. Treatment for common headaches.
- XIV. Brain tumors
 - A. Clinical presentation and diagnosis of primary brain tumors.
 - B. Metastatic tumors to the brain in adults.

- XV. Infections
 - A. Bacterial meningitis, viral meningitis, encephalitis including herpes simplex, chronic meningitis, brain abscess. Neurosyphilis. Lyme disease.
 - B. HIV and the nervous system.
- XVI. Spinal cord disorders
 - A. Neurological symptoms caused by compression, transection and hemisection of the spinal cord.
 - B. Autonomic deficits caused by spinal cord lesion.
 - C. Clinical presentation of vitamin B12 deficiency.
- XVII. Peripheral nervous system disorders
 - A. Clinical syndromes of neuropathy, neuromuscular junction disorders, myopathy.
 - B. Describe: radicular pain, radiculopathy, mononeuropathy, meralgia paresthetica, mononeuropathy multiplex, polyneuropathy, paresthesia, fasciculation.
 - C. Clinical findings in root lesions at C5, L4, L5, S1.
 - D. Herniated nucleus pulposus.
 - E. The tunnel syndromes.
 - F. The acute inflammatory demyelinating polyneuropathy (Guillain-Barre synd.)
 - G. The motoneuron disease.
 - H. The myasthenia gravis.
 - I. Duchenne muscular dystrophy, myotonic dystrophy, polymyositis.
- XVIII. Alcohol related disorders
 - A. Wernicke-Korsakoff syndrome, dementia.
 - B. Delirium tremens, alcohol withdrawal seizure.
 - C. Cerebellar degeneration, peripheral polyneuropathy.

Neurology Examination Question List for 6th year Students

1st series *Priority questions*

1. Brainstem reflexes
2. The facial nerve
3. Differential diagnosis of vertigo and dizziness
4. Localisation of paresis syndromes
5. Symptoms of upper and lower motroneuron lesion
6. Types and localisation of aphasia
7. Classification of unconscious conditions
8. Examination of the unconscious patient
9. Unconsciousness due to metabolic origin
10. Neurological emergencies
11. Clinical manifestation of increased intracranial pressure. Herniations.
12. Traumatic intracranial bleedings
13. Trauma of the spine and spinal cord
14. Clinical syndromes of impaired circulation of the internal carotid artery
15. Clinical syndromes of impaired circulation of the vertebro-basilar system
16. Emergency in cerebrovascular disorders
17. Diagnostic procedures in cerebrovascular disorders.
18. Disturbance of cerebral venous circulation.
19. Intracerebral bleedings.
20. Diagnosis, treatment and prognosis of subarachnoid hemorrhage
21. Status epilepticus
22. Meningitis, encephalitis
23. Multiple sclerosis
24. Signs of brain tumors
25. Signs of tumors of the spine and spinal space
26. Brain edema
27. Diagnostic criteria of dementia
28. Diagnosis of Parkinson's disease
29. Wernicke-Korsakow syndrome
30. Guillain-Barre syndrome
31. Disturbance of micturition and defecation
32. Myasthenia gravis

2nd series

1. Neurological causes of impaired visual acuity. Visual field defects.
2. Ocular movement and gaze disorders
3. Disorders of the vestibular system.
4. Syndromes of lower cranial nerve dysfunctions.
5. Syndromes of pons and mesencephalon lesions
6. The muscle tone control
7. Neuroanatomical basis of sensory disturbances
8. Functional systems of cerebellum. Signs of cerebellar disorders.
9. Gait disorders
10. Symptoms of frontal lobe damage
11. Symptoms of temporal lobe damage
12. The limbic system
13. Symptoms of parietal lobe damage
14. Symptoms of occipital lobe damage
15. Classification of aphasia
16. Agnosia, apraxia, alexia, agraphia

17. The basal ganglia
18. Disorders of the thalamus
19. Localisation of memory disturbances
20. Imaging techniques (angiography, CT, MR, PET, SPECT)
21. Investigation of cerebral circulation
22. EEG in the diagnostic workup
23. EMG, nerve conduction studies, transcranial magnetic stimulation and evoked potentials (BAEP, VEP, SSEP)
24. The lumbar puncture and the examination of cerebrospinal fluid
25. The cerebral circulation, and its regulation
26. Classification of cerebrovascular disorders
27. TIA
28. Causes of cerebral ischaemia in young adults
29. Treatment and prevention of cerebral ischemia
30. Classification of epilepsy
31. Diagnostic workup of epilepsy
32. Differential diagnosis of syncope and other types of disturbed consciousness
33. Treatment of epilepsy

3rd series

1. Neurological disorders caused by viral infections
2. Neurological disorders caused by Herpes virus
3. Prion-diseases, slow virus infections
4. Neurological consequences of AIDS
5. Clinical types and treatment of multiple sclerosis
6. Hystopathological classification of brain tumors
7. Metastatic tumors of the brain
8. Paraneoplasias of the nervous system (PML, neuropathies, cerebellar deg., Lambert-Eaton sy.)
9. Disorders associated with parkinsonian syndrome
10. Treatment of Parkinson's disease
11. Hyperkinetic movement disorders
12. Hyperkinesias
13. Classification of encephalopathies
14. Primary degenerative dementias
15. Multiple system atrophy
16. Disturbed cerebrospinal fluid circulation (hydrocephalus)
17. Syndrome of brachial plexus damage
18. Syndrome of radial, ulnar and median nerve damage
19. Syndrome of lumbosacral plexus damage
20. Etiology of polyneuropathies
21. Neuropathies in diabetes mellitus
22. Inherited neuropathies (Charcot-Marie, Dejerine-Sottas)
23. Low back pain, and cervical disk disease
24. Malformation of the spine and spinal cord
25. Symptoms of the disorder of spinal cord
26. Motoneuron diseases
27. Muscular dystrophies
28. Muscle disorders
29. Primary headache syndromes
30. The neuralgias
31. The physiological sleep and the sleep disorders
32. Genetic disorders in neurology (Huntington chorea, fragile X, dystrophia myotonica)

PSYCHIATRY

Department of Psychiatry and Psychotherapy

Tutor: *Dr. Erika Szily*

Teaching Psychiatry for the sixth-year students at the Department of Psychiatry and Psychotherapy at Semmelweis University

The goals of the psychiatric practices (3 weeks)

The goal of our Clinic is to teach medical students about the most important signs and symptoms of the most common diseases as psychiatric disorders have a relatively high prevalence in the population. Considering the high prevalence and the last but not least economic consequences, psychiatric disorders can be a burden for every society. Every medical student must be familiar with the high prevalence of depressive and anxiety disorders. Hungary was once one of the leading countries among those with high suicide rates; therefore, we require them to get acquainted with important details of the main causes and therapeutic possibilities of suicide, as well. As many psychiatric disorders can mask somatic diseases, medical students have to learn about the differentiation of these conditions.

In the 5th year students must base their knowledge on lectures and materials of practice where they have an opportunity to talk to a psychiatric patient, so they can learn how to detect the most important signs and symptoms of diseases. During the 6th year, they need to explore patients and write a case report according the sample that is available on the website of our Clinic. Before the oral exam they have to discuss this case report with the responsible tutor who will give a mark for it. Students are not allowed to take their final exam without a marked case report. We have a certificate form on our website containing all the details students must bring from the hospital where they have completed their rotation.

The link is: <http://semmelweis.hu/pszichiatria/oktatas/the-english-version-can-be-found-here/>

Objectives/target abilities:

- The ability how to obtain a complete and reliable history
- The method of asking about specific psychiatric symptoms or how to evaluate the information provided by the patients including:
 - orientation and attention
 - affect
 - thought disorder
 - memory
 - psycho-motor abilities
 - perception
 - motivation, intellect and personality
- The ability of noticing states of potential psychiatric emergency
- The ability to recognize specific symptoms that can refer to any hidden psychiatric problem which is not told by the patients
- The ability of summarizing all the gained information in a detailed case report
- The ability of establishing a tentative diagnosis and to know what kind of tests (either laboratory or psychological or neuro-radiological, etc) are needed for the correct diagnosis
- Being aware of the most important effects and side/adverse effects of drugs used in psychiatry
- To learn that the practitioner must always consider the possible existence of psychiatric disorders even when there are a lot of somatic symptoms, since they can also appear as a result of psychiatric diseases

We have 5 wards with different profiles in our Clinic. Students must join these wards according to their schedule made by our training coordinator. Everybody has a tutor within the ward he or she is scheduled to. The tutor presents the specific profile of that particular ward, but they also have the opportunity to go and see other wards, too. They spend a day at the out-patient department of our Clinic, which is very useful because there are many patient examinations referred from other departments of Semmelweis University. Thus, they can gain insight into the most important psychiatric features of internal medicine, neurology, surgery etc. Students must join for one all-night-duty and they have to participate in the emergency treatment performed during this period.

Under the supervision of an appointed physician students have to:

Participate in the work of one unit;

Evaluate patients independently;

Write a detailed case history of one patient which has to be presented at the exam;

Participate in consultations.

The internship in Psychiatry has to be completed at a Department of a University or in a Teaching Hospital which has a contract with a University. Students completing the internship abroad have to present a document of evaluation (i.e. Certificate downloadable from our website) indicating their performance during the internship and a grade from 5 (excellent) to 1 (failure).

Requirements

1. The 6th year includes a 3-week-long rotation in Psychiatry in a hospital or clinic which is accredited for teaching by Semmelweis University.
2. If you want to complete your rotation abroad, then before you start it, you must present at our department an officially stamped statement of acceptance issued by the teaching hospital abroad where you intend to spend your rotation.
BE AWARE: The Letter of Acceptance for the 4-week-long Psychiatry internship requested from practice places abroad must state:
 - a) The training place abroad is a teaching hospital
 - b) A brief description of how Psychiatry is taught in that institution
 - c) The name of the responsible tutor (name, e-mail)
3. The Psychiatry practice must consist of 6 hours on 20 (4×5) workdays at psychiatric wards. Students participate in the everyday work of the ward(s), in patients' admission, in ward rounds and in therapeutic decisions. One all-night-duty is compulsory within the rotation period.
4. Writing a case report during the rotation period is a task for every student. A sample case report is available on the website of our department
<http://semmelweis.hu/pszichiatra/oktatas/the-english-version-can-be-found-here/>
5. Case reports should not include patients' personal data (name, birth date, national insurance number, etc). Only those practice places are acceptable where the release of the case report is not forbidden by law. Students completing the internship abroad have to present at the exam the CERTIFICATE in which the tutor has indicated their performance during the internship on the scale: excellent-satisfactorily-unsatisfactory and commented on their strengths and weaknesses.

Without these documents students are not allowed to take their final exam in Psychiatry.

Please note that the Final Examination in Psychiatry cannot be taken within the 4th week of the rotation, just after the completion of 4 full weeks.

Sign-up for the exams: through the NEPTUN SYSTEM.

7. **It is important to bring to the final exam this signed Certificate of the practice the case report (or a detailed report of the case report by the tutor on a separate sheet of paper)** the mark for the case report, the filled-in **Register of observed psychiatric conditions** that was signed continuously by the tutors during the 5th and 6th year. The form is available on our website:
<http://semmelweis.hu/pszichiatra/oktatas/the-english-version-can-be-found-here/>

FAMILY MEDICINE IN DAILY PRACTICE within Internal Medicine

One week Family Medicine practice within sixth year's rotation in Internal Medicine

Department of Family Medicine

Head of the Department: *Dr. Péter Torzsa M.D. Ph.D.*

Contact details: H- 1085 Budapest, Stáhly u. 7-9. Phone: +36-1-355-8530

Tutor: *Dr. Krisztián Vörös*

Total number of hours: 40 lectures: – practices: 5×8

Type of the course (mandatory/elective): mandatory

Academic year: 2021/2022

Code of the course: AOKCSA154_SA

Aim of the subject and its place in the curriculum:

Family practice training is based on a one-to- one model involving a tutor and a medical student. The training is practice oriented. Medical students can gain experience about what kind of work a family practice involves while taking an active part in managing the consulting hours and being involved in patient treatment and care and screening.

Location of the course (lecture hall, practice room, etc.):

Accredited tutorial practices

Competencies gained upon the successful completion of the subject:

Medical students working together with the family practice team are involved in patient care during the consulting hours as well as in the patients' home.

During the training they learn how to

- do physical examination
- make a diagnosis
- make a differential diagnosis
- set up a therapeutic plan
- write a case study
- manage paperwork and patient data recording
- manage expert activity

The medical students' communicative skills develop and they get to know the statistical characteristics of the practice as well as the patient flow, morbidity and mortality data of the practice they are trained at.

During the training medical students are expected to keep a practice training diary and to shortly document the cases they meet (and to make detailed documentation of one particular case).

Prerequisite(s) for admission to the subject:

Internal medicine, Pharmacology, Laboratory medicine, Family Medicine, Public Health

Minimum and maximum number of students registering for the course:

Student selection method in case of oversubscription:

Where they are assigned

How to register for the course:

To register for the course in the 'Neptun' system

Detailed thematic of the course:*In a one-week training:*

- Paperwork and data management
- Registration of a new patient and setting up a patient care summary for them
- Making out a prescription by hand
- Writing a referral (to hospital or to consultation)
- Compiling a therapeutic sheet and updating it
- Expert activity
- Judging whether the patient is fit for work and managing sick leave documentation
- Compiling patient data for official rehabilitation and social assessment
- Examining patients, diagnosis/therapy
- Recognising and treating upper and lower respiratory infections
- Recognising and treating urogenital infections
- Recognising and treating gastrointestinal infections
- Therapy/care
- Therapy, care and rehabilitation of cardiovascular and hypertonic patients
- Therapy, care and rehabilitation of diabetic patients and patients with metabolic diseases
- Therapy, care and rehabilitation of cancer patients
- Therapy, care and rehabilitation of patients with musculoskeletal diseases
- Therapy, care and rehabilitation of patients with cardiorespiratory diseases

Potential overlap(s) with other subjects:

Internal medicine – Diagnosing and treating symptoms

Public health issues and preventive medicine – communicable diseases, diseases to notify

Surgery – acute abdominal symptoms, treatment of wounds

Policy regarding the attendance and making up absences:

It's compulsory for the student to attend 75 percent of the training sessions.

Means of assessing the students' progress during the semester:

During the short training period there is no assessment.

Requirement for acknowledging the semester (signature):

Attending the training sessions, a completed diary and an assessment sheet filled in by the tutor.

TRANSFUSION COURSE

Department of Transfusion Medicine

Course Director: **Prof. Dr. Attila Tordai**

- 1 Introduction, the history of transfusion medicine
- 2 Immunological introduction: basic mechanisms important in transfusion medicine
- 3 Immune response to incompatible transfusion: antigen (protein, carbohydrate) recognition, primary/secondary immune response
- 4 The molecular structure and physiological role of red cell antigens
- 5 Plasticity of stem cells, regenerative medicine
- 6 Introduction of the HLA system, diagnostics in transplantation immunogenetics
- 7 Platelet, granulocyte antigen systems
- 8 The blood group serology compatibility
- 9 Immunomodulation effects of transfusion
- 10 Blood donors, blood letting for donation, donor screening, risk assessment and reduction, international trends
- 11 Red cell, platelet, granulocyte and plasma blood products: manufacturing, storage, quality parameters
- 12 Generation and clinical use of albumin and immunoglobulin blood products
- 13 Challenges and approaches of blood supply management, international examples
- 14 Steps and practices of transfusion execution, international outlook
- 15 Indications of red cell, platelet and granulocyte transfusion
- 16 Alternatives to red cell transfusion: stimulation of red cell formation
- 17 Apheresis and extracorporeal photopheresis
- 18 Transfusion aspects of hematology patient care, application of special blood products
- 19 Options for blood saving, peri-operative blood collection
- 20 Solid organ transplantation and its transfusion aspects (complications, case reports)
- 21 Infectious diseases transmitted by transfusion, epidemiology, screening, prevention
- 22 Transfusion aspects of the coagulation system, generation and clinical application of coagulation factor products
- 23 Treatment and long term care in inherited coagulation disorders
- 24 Effects of massive transfusion, factor substitution in acquired bleeding disorders
- 25 Transfusion aspects of cardiac surgery (complications, case reports)
- 26 Immunological complications of transfusions: hemolytic and non hemolytic
- 27 Non immunological complications of transfusions: circulatory and iron overload
- 28 Hungarian and international legal aspects of transfusion medicine
- 29 Test examination

AMBULANCE PRACTICE (Prehospital Emergency Medicine)

National Ambulance Service

Lecturer: **Dr. Gábor Göbl**

Syllabus

During the 2 weeks practice students will join the staff of an ALS (Advanced Life Support) Unit. They will experience the acute, in-field presentation of emergencies, occasionally urgencies, as well as the special viewpoints of interhospital transfer.

- Goal of the ambulance practice is to gain insight into
- Patient's assessment in the prehospital setting (primary and secondary survey)
- Recognition of critically ill condition and the emergent interventions required (airway management, CPR, IV. line, volume substitution, pain relief, etc).
- Recognition of several emergencies (ACS, stroke, hypertensive emergencies, bronchial asthma, poisoning, psychiatric disorders, etc).
- Patient's mobilization, immobilization, special viewpoints of extrication
- Monitoring patient en route to the hospital, transportation trauma.

The certification of the practice should contain the

- period of time spent at the ambulance station
- list of cases the student participated at
- signature of the local director of the Ambulance Service

Note: Absence in 25% of practice time is possible, however informing the coordinator in advance and discussion of the new term of the practice are required.

Mode of certifying absences: oral

Evaluation: "completed" or "not completed"

Important information: Solely in the Neptun registered students are welcome at the Central Ambulance Station (1055 Budapest, Markó u. 22) on the first day of the term at 9 in the morning. All the information concerning the location of the practice, schedule of work, information about safety at work, etc. will be announced at this time. Without getting these information nobody will be allowed to start the practice, and there will be no opportunity for replacement.

We ask the students not to turn directly to us with their wish to change schedule.

CARDIORESPIRATORIC AND NEUROPHYSIOLOGICAL MEASURING METHODS

AOSKIK151_1A

Elective course for medical students in the 3-6th years

Course director: **Dr. Habil. László Dézsi**,
Private Professor of Physiology, Semmelweis University

The purpose of the course: To review the theory and practice of modern measuring methods in experimental and clinical medicine, and providing practical knowledge to medical students on cardiorespiratoric and neurophysiological measurements. The course is based on but further extends the material delivered during the course of Medical physiology. Throughout the lectures we put an emphasis on potential methodological errors of measurements and examinations, as well as how to avoid them.

Detailed Program:

1. Introduction. Biomedical engineering. Design and safety requirements of biomedical equipments
2. Computerized data acquisition and analysis. Telemetry systems
3. General metrology. Basics of measurement and control theory
4. Home monitoring of cardiovascular health status. Determination of blood glucose and tissue glucose concentrations
5. Sampling of continuous signals. Digitizing analogue signals
6. Direct and indirect methods to determine cardiac output and peripheral blood flow
7. Experimental study of pulmonary function. Measurements of blood gases and the acid-base balance.
8. Significance of objective studies in the practice of audiology. Neurophysiological measurements (action potentials, brain stem evoked potentials)
9. Investigation of adaptive processes in the cardiovascular system. Investigative methods of experimental angiology
10. Measuring blood pressure in the lab and clinics (invasive and noninvasive methods)
11. Complement-related immunological and cardiopulmonary responses
12. Studying brain function by functional imaging systems
13. Experimental methods to study nociception
14. Investigating the electrical activity of the heart. Design of ECG amplifiers

Acknowledgement of the course: Prerequisite of the course is the completion of the first 2 years (Theoretical module). Regular attendance (maximum 3 absences) is required. Signature in the Index and 2 credit points will be awarded after successful exam. Source: material of the lectures, supplementary literature will be provided by the lecturers.

Applications: via Neptun system. Contact person: Dr. László Dézsi (e-mail: dezsi.laszlo@richter.hu; phone: 06-1-431-4823; phone/fax: 06-72-536-019). The application of min. 5 students is required.

COMPLEMENTARY ELECTIVE INTERNSHIP PRACTICE

Heart and Vascular Center
 Department of Internal Medicine and Hematology
 Department of Internal Medicine and Oncology
 1st Department of Pediatrics
 2nd Department of Pediatrics
 Department of Neurology
 Department of Psychiatry and Psychotherapy
 1st Department of Surgery and Interventional Gastroenterology
 2nd Department of Surgery
 Department of Transplantation and Surgery
 Department of Obstetrics and Gynecology

Credit: 5

Duration: 5 weeks (2 “gap” weeks + 3 weeks in May)

Practice time: 40 hours per week

Lecturers: *Dr. Béla Merkely*
Dr. Tamás Masszi
Dr. István Takács
Dr. Attila Szabó
Dr. Gábor Kovács
Dr. Dániel Bereczki
Dr. János Réthelyi
Dr. Attila Szijártó
Dr. Gábor István
Dr. László Kóbori
Dr. Nándor Ács

Topic of the subject:

During the practice the student is assigned to a Tutor or to a Medical Team and is shadowing the work of them. Student can work only under the continuous careful supervision of a tutor who is responsible for the student. Daily work hours for the student: 8 hours
 Activities during the practice should include the following:

- examination of patients in the department, with special emphasis to case history taking and full physical examination
- gain practice in patient documentation, problem-oriented medical record keeping
- participate in the preparation of diagnostic and therapeutic plan for patients, differential diagnosis of the case
- take an active part in medical consultations concerning their patients, as well as in the medical conferences in the department
- participate actively or as an observer at invasive and semi-invasive interventions, diagnostic or imaging procedures
- evaluation of routine laboratory results
- evaluation of imaging results
- possible participation on night or weekend duties
- get to know the work of the special sections of the department
- regular consultations with the doctor responsible for the student
 students should also practice communication with patients and their relatives, while giving them relevant medical information on the disease but avoiding conflicts with medical confidentiality.

Prerequisite of the course: Completion of the first 10 semester’s subjects.

Special academic work required for completion of the course: Under the supervision of the Tutor(s) the student takes part of the management of out- and inpatients of the Dept thereby obtaining competence in the subdiscipline.

Type of exam: Bedside practical exam

Suggested print, electronic, online material: Material given by the hosting subject for the final year.

PHYSICAL EDUCATION XI-XII.

Practice: 1 hour per week

The subjects taken into consideration when calculating the average of the diploma are the following:

- all subject with final exam
- list of the subjects ending with a semifinal:
 - Medical biology
 - Medical chemistry
 - Genetics and genomics
 - Immunology
 - Otorhinolaryngology
 - Dermatology
 - Clinical Genetics
 - Oncology (from 2025)
 - Orthopedics
 - Pulmonology (from 2025)
 - Radiology
 - Urology
 - Forensic Medicine
 - Ophthalmology
 - Oral surgery and dentistry
 - grade of the thesis
 - grade of the written part of the final board examination
 - grade of the oral part of the final board examination
 - grade of the practical part of the final board examination

GENERAL INFORMATION

Deadline of paying the tuition fee in the 6th year: the first part is to be paid between **August 30 - September 3, 2021**, the second part between **January 24 – January 28, 2022**.

The professor responsible for the student's instruction during the clinical rotation outside Hungary is requested to give a detailed certificate of the student's performance. It is requested to be done in the Student Handbook! This certificate in the Student Handbook must be signed by the professor, the Head of the Department as well as by the director of the hospital or the Dean of the University the hospital is affiliated to. ***Semmelweis University reserves the right to accept a certificate or refuse it in justified cases.*** Students have to present these certificates to the concerned departments. After the departments have accepted them, students have to retain the originals and hand them in at the English Secretariat.

Tuition fee reduction:

In case the student completes all the rotations regardless whether the 1 week Transfusion course is completed at Semmelweis University or abroad, he/she has to pay 80% of the tuition fee valid in the academic year. The relevant acceptance letters should be handed in latest until December 15, 2021. Otherwise the student is not entitled for the reduction!

Please write a letter of request addressed to the Academic Program Director when applying for the 20% reduction!

Please note:

that you have to sign up for the General Board Examination held in June latest until April 30, 2022! For the August exam latest until July 15, 2022 and for the November exam latest until October 15, 2022!

FACULTY OF DENTISTRY

**Study Programs since the 2010/11
academic year**



Faculty of Dentistry

Study program for students started studies in the 2010/11 academic year

BASIC MODULE			
1st semester			
	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3,5	semifinal
compulsory	Medical Biology (Cell Biology)	C3L2P1	final
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Terminology	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	Total Credit	25	

BASIC MODULE				
2nd semester				
	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics	C5L2,5P3	final#	Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	Total Credit	30		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE				
3rd semester				
	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	Total Credit	29		

BASIC MODULE				
4th semester				
	subjects	credit code	examination	prerequisites
compulsory	Anatomy(Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology II.	C5L0P5	practice mark	Odontotechnology I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	Physical Education IV.	C0L0P2	signature	
	Total Credit	32		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C= Credit point
L= Lecture (hours/week)
P= Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L1P2	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Oral Pathology I.	C2L2P0	semifinal	BASIC MODULE
compulsory	Pathology I.	C5L3P2	semifinal	BASIC MODULE
compulsory	Preventive Dentistry II.	C3L1P2	practice mark	BASIC MODULE
compulsory	Prosthodontics (Pre-clinical course)	C4L1P3	final#	BASIC MODULE
	Total Credit	33		

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II.
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology
compulsory	Oral Pathology II.	C3L2P1	final#	Oral Pathology I.
compulsory	Pathology II.	C3L1P2	final#	Pathology I.
compulsory	Preventive Dentistry III.	C1L1P0	final#	Preventive Dentistry II.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Prosthodontics, Pre-clinical Course
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	Total Credit	32		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology I.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	practice mark	PathologyII.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
Total Credit		39		

CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	practice mark	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	practice mark	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	General Dentistry practice (summer, 4weeks)	C0L0P30	signature	
Total Credit		25		

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Prosthodontics III.
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV.	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology II.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology II.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine III.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
	Total Credit	42		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.*	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Clinical Dentistry II.**	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III.
obligatory elective	Diploma Work	C20		9th semester's subjects
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Oral Medicine	C1L1P0	final#	Periodontology III.
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I.
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV.
	Total Credit	54		

* at the Dept. of Prosthodontics
** at the Dept. of Conservative Dentistry
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C= Credit point
L= Lecture (hours/week)
P= Practice (hours/week)

Study Program for students started studies in the 2011/12 academic year

BASIC MODULE

1st semester				
subjects code	subjects	credit code	examination	
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal	
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal	
compulsory	Medical Chemistry	C6L3P3,5	semifinal	
compulsory	Medical Biology (Cell Biology)	C3L2P1	final	
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark	
obligatory elective	Medical Terminology I.	C2L0P2	practice mark	
compulsory	Physical Education I.	C0L0P1	signature	
	Total Credit	25		

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics	C5L2,5P3	final#	Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	Total Credit	30		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE				
3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C8L3P5	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	Total Credit	30		

BASIC MODULE				
4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C3L0P3	practice mark	Odontotechnology and Prosthodontics Preclinical I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P2	signature	
	Total Credit	34		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C= Credit point
L= Lecture (hours/week)
P= Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L1P2	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Pathology	C6L3P2	final#	BASIC MODULE
compulsory	Preventive Dentistry I.	C3LP2	practice mark	BASIC MODULE
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	BASIC MODULE
	Total Credit	31		

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology, General and Oral Microbiology
compulsory	Genetics and Genomics	C3L2P1	final	Biochemistry, Molecular and Cellbiology III.
compulsory	Oral Pathology	C4L2P2	final#	Pathology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Prosthodontics, Pre-clinical Course or Odontotechnology and Prosthodontics and Preclinical III.
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	1-6 semesters compulsory subjects
	Total Credit	33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	pract. mak	Pathology
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
	Total Credit	39		

CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	practice mark	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	practice mark	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	1-8 semesters compulsory subjetcs
	Total Credit	25		

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology and Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1G1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Oral and Maxillofacial Surgery I.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
	Total Credit	38		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.*	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV
obligatory elctive	Dermatology	C1L1P0.5	final#	Internal Medicine I.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III.
obligatory elctive	Diploma Work	C20		9th semester's subjects
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Oral Medicine	C1L1P0	final#	Periodontology III..
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV.
	Total Credit	50		

*at the Dept. of Prosthodontics
*at the Dept. of Conservative Dentistry
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C= Credit point
L= Lecture (hours/week)
P= Practice (hours/week)

Study Program for students started studies
in the 2012/13 academic year

BASIC MODULE			
1st semester			
subjects code	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3,5	final#
compulsory	Medical Biology (Cellbiology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Terminology I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	Total Credit	28	

BASIC MODULE				
2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C4L2P2	final#	Biophysics I.
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	Total Credit	29		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

BASIC MODULE

3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C8L3P5	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	Total Credit	30		

BASIC MODULE

4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C3L0P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P2	signature	
	Total Credit	34		

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

PRE-CLINICAL MODULE				
5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L2P1	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Pathology	C5L3P2	final#	BASIC MODULE
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	BASIC MODULE
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	BASIC MODULE
	Total Credit	30		

PRE-CLINICAL MODULE				
6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology
compulsory	Genetics and Genomics	C3L2P1	final#	Biochemistry, Molecular and Cellbiology III.
compulsory	Oral Pathology	C4L2P2	final#	Pathology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics, Pre-clinical Course III.
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	1-6 semesters compulsory subjects
	Total Credit	33		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	practice mark	Pathology
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
Total Credit		41		

CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer,4weeks)	C0L0P30	signature	
Total Credit		25		

The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C3L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Oral and Maxillofacial Surgery I.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
compulsory	Oral Medicine	C1L1P0	Semifinal	Pharmacology and Toxicology II.
	Total Credit	38		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry II.*	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Internal Medicine I.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	Semifinal	
obligatory elctive	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I.
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics V.
	Total Credit	48		

*at the Dept. of Prosthodontics
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study Program for students started studies in the 2013/14 academic year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
Total Credit		28	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials, Biophysics I.
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
Total Credit		31		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE				
3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prostodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	28		

BASIC MODULE				
4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III.,
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	35		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	Anatomy (Maxillofacial Anatomy) IV.
				Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology IV.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
	Total Credit	30		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	Total Credit	33		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection ,Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I. , Pathology
	Total Credit	40		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1G0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer,4weeks)	C0L0P30	signature	1-8 semesters compulsory subjets
	Total Credit	24		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.*	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elctive	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	50		

* at the Dept. of Prosthodontics
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study Program for students started studies in the 2014/2015 academic year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	Total Credit	26	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials, Biophysics I.
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	Total Credit	33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE				
3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	26		

BASIC MODULE				
4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III.,
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	36		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV.
				Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology IV.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/semester	signature	
	Total Credit	30		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II.
				Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology
				General and Oral Microbiology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III., Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/semester	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	Total Credit	33		

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection, Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I. , Pathology
	Total Credit	40		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	1-8 semesters compulsory subjets
	Total Credit	24		

#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	50		

* at the Dept. of Prosthodontics
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study Program for students started studies
in the 2015/2016 academic year

BASIC MODULE			
1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	Total Credit	26	

BASIC MODULE				
2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	Total Credit	33		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

BASIC MODULE

3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Medical Latin II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I., Biophysics II.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	26		

BASIC MODULE

4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Biochemistry, Molecular and Cellbiology II.
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II., Medical and Dental Physiology I.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Biochemistry, Molecular and Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	36		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C = Credit point,

L = Lecture (hours/week),

P = Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/sem	signature	Anatomy IV.
	Total Credit	30		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Prosthodontics I.	C4L1P3	practice mark	Preventive Dentistry I., Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/sem	signature	The Medical Basis of Disaster Management I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	Total Credit	33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	Total Credit	38		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	
	Total Credit	26		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I., Prosthodontics IV., Conservative Dentistry and Endodontics IV.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III. , First Aid
obligatory elctive	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	50		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study Program for students started studies in the 2016/2017 academic year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	Total Credit	26	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
	Total Credit	33		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE

3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Medical Latin II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I., Biophysics II.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	26		

BASIC MODULE

4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Biochemistry, Molecular and Cellbiology II.
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II., Medical and Dental Physiology I.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Biochemistry, Molecular and Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	36		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point, L = Lecture (hours/week), P = Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	Medical Aspects of Disaster Preparedness and Response I.	C0L2 hours/sem	signature	
	Total Credit	30		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	Medical Aspects of Disaster Preparedness and Response II.	C0L2 hours/sem	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	prerequisite of registering to the 7th semester
	Total Credit	33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I. , Pathology
	Total Credit	38		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	prerequisite of registering to the 9th semester
	Total Credit	26		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Pharmacology and Toxicology II.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during th 5-year studies.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elctive	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P4	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P4	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	50		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

Study Program for students started studies in the 2017/2018 academic year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
Total Credit		26	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cell Biology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Dental Biochemistry I.	C3L2P1,5	practice mark	Medical Chemistry, Medical Biology (Cell Biology)
compulsory	Molecular Cellbiology I.	C4L2,5P2	semifinal	Medical Chemistry, Medical Biology (Cell Biology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First Aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II.	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
obligatory elective	History of Medicine	C2L2P0	practice mark	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
Total Credit		35		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE

3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Molecular Cellbiology I., Medical Latin II.
compulsory	Dental Biochemistry II.	C4L3P1,5	semifinal	Dental Biochemistry I., Molecular Cellbiology I.
compulsory	Molecular Cellbiology II.	C3L3P0	final#	Dental Biochemistry I., Molecular Cellbiology I.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Molecular Cellbiology I., Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	28		

BASIC MODULE

4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Dental Biochemistry II.
compulsory	Dental Biochemistry III.	C3L2P1,5	final#	Dental Biochemistry II., Molecular Cellbiology II.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Molecular Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	34		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point, L = Lecture (hours/week), P = Practice (hours/week)

PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II., General Dental Preclinical Practice
compulsory	Medical Aspects of Disaster Preparedness and Response I.	C0L2 hours/sem	signature	
	Total Credit	30		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	Medical Aspects of Disaster Preparedness and Response II.	C0L2 hours/sem	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	prerequisite of registering to the 7th semester
	Total Credit	33		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	Total Credit	38		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	prerequisite of registering to the 9th semester
	Total Credit	26		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Pharmacology and Toxicology II.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elctive	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P4	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P4	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	50		

Explanation
15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program
The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study program for students started studies in the 2018/2019 academic year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
Total Credit		26	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Dental Biochemistry I.	C3L2P1,5	practice mark	Medical Chemistry, Medical Biology (Cell Biology)
compulsory	Molecular Cell Biology I.	C4L2,5P2	semifinal	Medical Chemistry, Medical Biology (Cell Biology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First Aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
obligatory elective	History of Medicine	C2L2P0	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
compulsory	Dental Assistance Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
Total Credit		35		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE

3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Molecular Cellbiology I., Medical Latin II.
compulsory	Dental Biochemistry II.	C4L3P1,5	semifinal	Dental Biochemistry I., Molecular Cell Biology I.
compulsory	Molecular Cell Biology II.	C3L3P0	final#	Dental Biochemistry I., Molecular Cellbiology I.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Molecular Cellbiology I., Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	28		

The grade influences the qualification of the diploma
 C = Credit point
 L = Lecture (hours/week)
 P = Practice (hours/week)

BASIC MODULE

4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Dental Biochemistry II.
compulsory	Dental Biochemistry III.	C3L2P1,5	final#	Dental Biochemistry II., Molecular Cellbiology II.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Molecular Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	34		

The grade influences the qualification of the diploma
 C = Credit point
 L = Lecture (hours/week)
 P = Practice (hours/week)

PRE-CLINICAL MODULE				
5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV.
				Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Dental Biochemistry III.
				Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/sem	signature	Anatomy (Maxillofacial Anatomy) IV.
	Total Credit	30		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II. Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Dental Biochemistry III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III., Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/sem	signature	The Medical Basis of Disaster Management I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	prerequisite of registering to the 7th semester
Total Credit		33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C3L1,5P1,5	semifinal	Pathology, Dental Biochemistry III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurorology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
compulsory	The Medical Basis of Disaster Management III.	C0L2 hours/sem	signature	The Medical Basis of Disaster Management II.
	Total Credit	38		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE				
8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L1,5P1,5	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II., Periodontology I.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I., Diploma criteria subject
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	prerequisite of registering to the 9th semester
elective	Basic Restorative Digital Dentistry	C1L1P0	semifinal	
compulsory	The Medical Basis of Disaster Management IV.	C0L2 hours/sem	signature	The Medical Basis of Disaster Management III.
Total Credit		26		

The grade influences the qualification of the diploma
 C = Credit point
 L = Lecture (hours/week)
 P = Practice (hours/week)

CLINICAL MODULE				
9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Pharmacology and Toxicology II.
	Total Credit	32		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE				
10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V.	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III. , First Aid
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II.	C6L1P5	final#	Orthodontics I.
compulsory	Pedodontics II.	C6L1P5	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	30		
	Diploma work	C20		

The grade influences the qualification of the diploma
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

Study Program from the 2020/2021 academic year

BASIC MODULE

subjects code	subject	1st semester				prerequisite(s)	examination
		credit code	credit	lecture	practice		
Compulsory	Macroscopic anatomy I.	C6L1P5	6	1	5		Semifinal
Compulsory	Biophysics I.	C3L1.5P2.5	3	1.5	2.5		Semifinal
Compulsory	Physical Bases of Dental Materials	C2L2P0	2	2	0		Semifinal
Compulsory	Cell Science	C3L1P2	3	1	2		Semifinal
Compulsory	Medical Chemistry	C4L2P2	4	2	2		Semifinal
Compulsory	Physical Education I.	C0L0P1	0	0	1		Signature
Obligatory elective	Medical Terminology	C0L0P2	0	0	2		Practice mark
Obligatory elective	Introduction to the Hungarian language	C0L0P4	0	0	4		Practice mark
			18				

BASIC MODULE

subjects code	subject	2nd semester				prerequisite(s)	examination
		credit code	credit	lecture	practice		
Compulsory	Macroscopic anatomy II.	C8E2G6	8	2	6	Macroscopic anatomy I.	Final#
Compulsory	Microscopic anatomy and embryology I.	C4E2G2	4	2	2	Cell Science	Semifinal
Compulsory	Biophysics II.	C3E1.5G2.5	3	1.5	2.5	Biophysics I., Physical Foundations of Dental Materials Science	Final#
Compulsory	General Dental Materials	C1E1G0	1	1	0	Macroscopic anatomy I., Physical Foundations of Dental Materials Science	Semifinal
Compulsory	Dental Biochemistry I.	C4E2G2	4	2	2		Semifinal
Compulsory	Physical Education II.	C0E0G1	0	0	1		Signature
Obligatory elective	Dental Psychology	C1L2P0	1	2	0		Semifinal
Obligatory elective	Dental Medical Terminology	C0E0G2	1	0	2	Medical Terminology	Practice mark
Obligatory elective	Medical Sociology	C1L1P1	1	1	1		Semifinal
Compulsory	Hungarian for Dental Medical Purposes I.	C0L0P4	0	0	4	Introduction to the Hungarian language	Practice mark
Obligatory elective	History of Medicine	C1L2P0	1	2	0		Semifinal
Obligatory elective	Medical Informatics	C2L0P2	2	0	2		Practice mark
Compulsory	First Aid	C1L0P1	1	0	1		Practice mark
Criterion requirement	Dental Laboratory Practice	60 hours					Signature
	Summer Practice of Dental Assistance						Signature
			27				

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

BASIC MODULE

3rd semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Microscopic anatomy and embryology II.	C4L2P2	4	2	2	Microscopic anatomy and embryology I., Macroscopic anatomy II.	Final#
Compulsory	Dental Biochemistry II	C3L2P1	3	2	1	Dental Biochemistry I.	Final#
Compulsory	Basic Immunology	C2L2P1	2	2	1	Cell Science , Dental Biochemistry I.	Semifinal
Compulsory	Molecular Cell Biology I.	C3L1P2	3	1	2	Medical chemistry, Dental biochemistry I.	Semifinal
Compulsory	Odontotechnology and Prosthodontics Pre-clinical I.	C3L1P2	3	1	2	General Dental Materials, Macroscopic anatomy II.	Practice mark
Compulsory	Medical and Dental Physiology I.	C8L5P3.5	8	5	3.5	Microscopic anatomy and embryology I., Macroscopic anatomy II., Biophysics II.	Semifinal
Compulsory	Physical Education III.	C0L0P1	0	0	1		Signature
Compulsory	General Dental Preclinical Practice	C4E1P3	4	1	3	Physical Foundations of Dental Materials Science, Macroscopic anatomy I.	Semifinal *
Compulsory	Hungarian for Dental Medical Purposes II.	C0L0P4	0	0	4	Hungarian for Dental Medical Purposes I.	Practice mark
			27				

BASIC MODULE

4th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	General and Oral Microbiology	C3L2P2	3	2	2	Microscopic anatomy and embryology II., Molecular Cell Biology I., Medical and Dental Physiology I.	Semifinal *
Compulsory	Genetics and Genomics	C2L1.5P1	2	1.5	1	Microscopic anatomy and embryology II., Basic Immunology, Molecular Cell Biology I.	Semifinal
Compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	4	1	3	General Dental Preclinical Practice Microscopic anatomy and embryology II., Odontotechnology and Prosthodontics Pre-clinical I.	Practice mark
Compulsory	Molecular Cell Biology II.	C4L2P2	4	2	2	Dental Biochemistry II., Molecular Cell Biology I.	Final#
Compulsory	Odontotechnology and Prosthodontics Pre-clinical II.	C4L1P3	4	1	3	Macroscopic anatomy II., Odontotechnology and Prosthodontics Pre-clinical I.	Practice mark
Compulsory	Medical and Dental Physiology II.	C8L5P3.5	8	5	3.5	Microscopic anatomy and embryology II., Molecular Cell Biology I., Medical and Dental Physiology I.	Final#
Compulsory	Physical Education IV.	C0L0P1	0	0	1		Signature
	Hungarian for Dental Medical Purposes III.	C0L0P4	0	0	4	Hungarian for Dental Medical Purposes II.	Practice mark
			25				

Semifinal * = Counted in the average, similarly

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRECLINICAL MODULE

5th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	General and Oral Pathophysiology	C3L2P2	3	2	2	General and Oral Microbiology, Molecular Cell Biology II., Medical and Dental Physiology II.	Semifinal *
Compulsory	The Medical Basis of Disaster Management I	C0L2P0	0	2	0		Signature
Compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	4	1	3	Microscopic anatomy and embryology II., Molecular Cell Biology I., Medical and Dental Physiology I.	Final#
Compulsory	Public Health	C2L1.5P2	2	1.5	2	General and Oral Microbiology, Molecular Cell Biology II, Medical and Dental Physiology II.	Semifinal
Compulsory	Odontotechnology and Prosthodontics Pre-clinical III.	C3L0P3	3	0	3	Odontotechnology and Prosthodontics Pre-clinical II. Conservative Dentistry and Endodontics, Pre-clinical I. Molecular Cell Biology II.	Final#
Compulsory	Pathology	C4L3P2	4	3	2	Genetics and Genomics, Molecular Cell Biology II, Medical and Dental Physiology II.	Semifinal *
Compulsory	Preventive Dentistry	C3L2P2	3	2	2	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.	Semifinal *
Compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	2	0	2	General and Oral Microbiology, Molecular Cell Biology II, Medical and Dental Physiology II.	Practice mark
Compulsory	Physical Education V.	C0L0P1	0	0	1		Signature
Compulsory	Hungarian for Dental Medical Purposes IV.	C0L0P4	1	0	4	Hungarian for Dental Medical Purposes III.	Practice mark
			22				

Semifinal * = Counted in the average, similarly

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRECLINICAL MODULE

6th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Prosthodontics I.	C4L1P3	4	1	3	Conservative Dentistry and Endodontics, Pre-clinical II., Odontotechnology and Prosthodontics Pre-clinical III., Preventive Dentistry	Practice mark
Compulsory	Conservative Dentistry and Endodontics I.	C3L1P3	3	1	3	Conservative Dentistry and Endodontics, Pre-clinical II., Odontotechnology and Prosthodontics Pre-clinical III., Preventive Dentistry	Practice mark
Compulsory	The Medical Basis of Disaster Management II	C0L2P0	0	2	0	The Medical Basis of Disaster Management I.	Signature
Compulsory	Oral Biology	C4L2P2	4	2	2	General and Oral Pathophysiology, Pathology, Public Health	Semifinal *
Compulsory	Oral Pathology	C3L2P2	3	2	2	General and Oral Pathophysiology, Pathology, Public Health	Semifinal *
Compulsory	Oral and Maxillofacial Surgery I.	C3L1P3	3	1	3	General and Oral Pathophysiology, Pathology, Oral and Maxillofacial Surgery, Pre-clinical course	Practice mark
Compulsory	Physical Education VI.	C0L0P1	0	0	1		Signature
Criterion requirement	Dento-Alveolar practice	30 hours					Signature
Compulsory	Oral Medicine I.	C1L0P1	1	0	1	Conservative Dentistry and Endodontics, Pre-clinical I., Odontotechnology and Prosthodontics Pre-clinical II.	Practice mark
Compulsory	Oral Diagnostics	C3L1P2	3	1	2	Conservative Dentistry and Endodontics, Pre-clinical I., Odontotechnology and Prosthodontics Pre-clinical II.	Semifinal *
Compulsory	Radiation protection	C2L1.5P1	2	1.5	1	Biophysics II.	Semifinal
Compulsory	Hungarian for Dental Medical Purposes V.	C1L0P4	1	0	4	Hungarian for Dental Medical Purposes IV.	Final#
			24				

Semifinal * = Counted in the average, similarly

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

7th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Internal Medicine I.	C3L1P2	3	1	2	General and Oral Pathophysiology, Pathology, Public Health	Practice mark
Compulsory	Prosthodontics II.	C6L1P6	6	1	6	Conservative Dentistry and Endodontics I., Prosthodontics I., Radiation protection	Semifinal
Compulsory	Pharmacology I.	C4L2P2	4	2	2	Medical and Dental Physiology II., Dental Biochemistry II, Pathology	Semifinal
Compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	4	1	3	Conservative Dentistry and Endodontics I., Prosthodontics I.,	Practice mark
Compulsory	The Medical Basis of Disaster Management III	C0L2P0	0	2	0	The Medical Basis of Disaster Management II.	Signature
Compulsory	Periodontology I.	C2L1.5P0.5	2	1.5	0.5	Oral Biology, Oral Pathology, Oral and Maxillofacial Surgery I.	Semifinal
Compulsory	Emergency Dentistry I.	C0L0P1	0	0	1	Oral Pathology	Signature
Compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	4	1	3	Oral and Maxillofacial Surgery I., Oral Pathology, Radiation protection	Semifinal
Compulsory	Physical Education VII.	C0L0P1	0	0	1		Signature
Obligatory elective	Pediatrics	C1L1P0.5	1	1	0.5	Pathology, Oral Pathology	Semifinal
Compulsory	General and Dental Radiology I.	C3L1P2	3	1	2	Radiation protection	Practice mark
Compulsory	Gnathology	C3L1P2	3	1	2	Conservative Dentistry and Endodontics I., Prosthodontics I. Oral Diagnostics	Semifinal *
Obligatory elective	Neurorology	C1L1P0	1	1	0	Macroscopic Anatomy II.	Semifinal
Obligatory elective	Psychiatry	C1L1P0	1	1	0	Oral Biology, Oral Medicine I.	Semifinal
Obligatory elective	Dental Ethics	C1L0P2	1	0	2	Pathology, Oral Pathology	Semifinal
			33				

Semifinal * = Counted in the average, similarly

CLINICAL MODULE

8th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Internal Medicine II.	C2L1P1	2	1	1	Internal Medicine I., Pharmacology I.	Final#
Compulsory	Prosthodontics III.	C4L1P4	4	1	4	Conservative Dentistry and Endodontics II., Prosthodontics II., General and Dental Radiology I.	Practice mark
Compulsory	Orthodontics Pre-clinical	C1L0P1	1	0	1	General and Dental Radiology I.	Practice mark
Compulsory	Pharmacology II.	C4L2P2	4	2	2	Internal Medicine I., Pharmacology I.	Final#
Compulsory	Implantology I.	C1L1P0	2	1	1	General and Dental Radiology I., Oral and Maxillofacial Surgery II., Periodontology I.	Semifinal
Compulsory	Conservative Dentistry and Endodontics III.	C4L1P4	4	1	4	Conservative Dentistry and Endodontics II., Prosthodontics II., General and Dental Radiology I.	Practice mark
Compulsory	The Medical Basis of Disaster Management IV.	C0L2P0	0	2	0	The Medical Basis of Disaster Management III.	Signature
Compulsory	Periodontology II.	C4L1P3	4	1	3	General and Dental Radiology I., Oral and Maxillofacial Surgery II., Periodontology I.	Semifinal
Compulsory	Emergency Dentistry II.	C0L1P1.5	0	1	1.5	General and Dental Radiology I., Emergency Dentistry I.	Signature
Compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	4	1	3	General and Dental Radiology I., Oral and Maxillofacial Surgery II., Periodontology I.	Practice mark
Compulsory	Physical Education VIII.	C0L0P1	0	0	1		Signature
Obligatory elective	Ophthalmology	C1L1P0.5	1	1	0.5	Internal Medicine I., Pharmacology I.	Semifinal
Criterion requirement	General Dentistry practice	120 hours					Signature
Compulsory	General and Dental Radiology II.	C1L0P1	1	0	1	General and Dental Radiology I.	Final#
Obligatory elective	Otorhinolaryngology	C1L1P0.5	1	1	0.5	Pathology, Oral Pathology	Semifinal *
Obligatory elective	Surgery	C2L2P1	2	2	1	Pathology	Semifinal *
			30				

Semifinal * = Counted in the average, similarly

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

9th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Prosthodontics IV.	C3L0P4	3	0	4	Conservative Dentistry and Endodontics III., Prosthodontics III.	Practice mark
Compulsory	Orthodontics I.	C5L1P4	5	1	4	Orthodontics Pre-clinical, Conservative Dentistry and Endodontics III., Prosthodontics III.	Practice mark
Compulsory	Pedodontics I.	C5L1P4	5	1	4	Orthodontics Pre-clinical, Conservative Dentistry and Endodontics III., Prosthodontics III.	Practice mark
Compulsory	Implantology II.	C2L1P1	1	1	0	Implantology I., Periodontology II., Oral and Maxillofacial Surgery III.	Final#
Compulsory	Clinical Dentistry I.	C2L0P5	2	0	5	Conservative Dentistry and Endodontics III., Prosthodontics III.	Practice mark
Compulsory	Conservative Dentistry and Endodontics IV.	C3L0P4	3	0	4	Conservative Dentistry and Endodontics III., Prosthodontics III.	Semifinal
Compulsory	Oral Medicine II.	C1L1P0	1	1	0	Oral Medicine I., Oral Diagnostics Oral and Maxillofacial Surgery III.	Final#
Compulsory	Periodontology III.	C3L1P2	3	1	2	Implantology I., Periodontology II., Oral and Maxillofacial Surgery III.	Practice mark
Compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	5	1	5	Implantology I., Periodontology II., Oral and Maxillofacial Surgery III.	Practice mark
Compulsory	Physical Education IX.	C0L0P1	0	0	1		Signature
Obligatory elective	Forensic Dentistry	C1L1P0	1	1	0	Internal Medicine II., Pharmacology II. Pathology	Semifinal
Obligatory elective	Prehospital Emergency Medicine	C1L1P0	1	1	0	Internal Medicine II., Pharmacology II. First Aid	Semifinal
			30				

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

10th semester							
subjects code	subject	credit code	credit	lecture	practice	prerequisite(s)	examination
Compulsory	Prosthodontics V.	C3L0P3	3	0	3	Conservative Dentistry and Endodontics IV., Prosthodontics IV.	Final#
Compulsory	Orthodontics II.	C5L1P5	5	1	5	Orthodontics I.	Final#
Compulsory	Gerostomatology	C2L1P1	2	1	1	Prosthodontics IV., Gnathology, Oral Medicine II.	Semifinal *
Compulsory	Pedodontics II.	C5L1P5	5	1	5	Pedodontics I.	Final#
Compulsory	Clinical Dentistry II.	C3L0P5	2	0	5	Clinical Dentistry I., Conservative Dentistry and Endodontics IV., Prosthodontics IV.	Practice mark
Compulsory	Conservative Dentistry and Endodontics V.	C3L0P3	3	0	3	Conservative Dentistry and Endodontics IV., Prosthodontics IV.	Final#
Compulsory	Periodontology IV.	C3L1.5P2	3	1.5	2	Periodontology III.	Final#
Compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	4	1	3	Implantology II., Oral and Maxillofacial Surgery IV., Periodontology III.	Final#
Compulsory	Physical Education X.	C0L0P1	0	0	1		Signature
Obligatory elective	Obstetrics and Family Planning	C1L1P0	1	1	0	Internal Medicine II., Pharmacology II.	Semifinal
Obligatory elective	Dermatology	C1L1P0.5	1	1	0.5	Internal Medicine II., Pharmacology II.	Semifinal *
			29				
			265				

Semifinal * = Counted in the average, similarly

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

FACULTY OF DENTISTRY

BASIC MODULE



Faculty of Dentistry
1st year

BASIC MODULE

1st semester			
subjects code	subjects	credit code	examination
compulsory	Macroscopic Anatomy I.	C6L1P5	semi-final
compulsory	Physical Foundations of Dental Materials Science	C2L2P0	semi-final
compulsory	Medical Chemistry	C4L2P2	semi-final
compulsory	Cell Sciences	C3L1P2	semi-final
compulsory	Biophysics I.	C3L1.5P2,5	semi-final
obligatory elective	Introduction to the Hungarian Language	C0L0P4	practice mark
obligatory elective	Medical Terminology	C0L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
Total Credit		18	

BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Macroscopic Anatomy II.	C8L2P6	final#	Macroscopic Anatomy I.
compulsory	Microscopic Anatomy and Embryology I.	C4L2P2	semi-final	Cell Sciences
compulsory	Dental Biochemistry I.	C4L2P2	semi-final	
compulsory	Biophysics II.	C3L1.5P2	final#	Biophysics I., Physical Foundations of Dental Materials Science
compulsory	Hungarian for Dental Medical Purposes I.	C0L0P4	practice mark	Introduction to the Hungarian language
compulsory	General Dental Materials	C1L1P0	semi-final	Macroscopic Anatomy I., Physical Foundations of Dental Materials Science
compulsory	First Aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C2L0P2	practice mark	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Medical Terminology	C0L0P2	practice mark	Medical Terminology
obligatory elective	Dental Psychology	C1L2P0	semi-final	
obligatory elective	Medical Sociology	C1L1P1	semi-final	
obligatory elective	History of Medicine	C1L2P0	semi-final	
criterion requirement	Dental Assistant Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
criterion requirement	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
Total Credit		27		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

LIST OF TEXTBOOKS (The list may change!)

- 1 **Sobotta Atlas of Human Anatomy** (Package), 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
- 2 **Gray's Anatomy for students** with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel Elsevier; 2014; ISBN 9780702051319
- 3 **Gosling, Harris, Humpherson, Whitmore & Willan: Human Anatomy, Color Atlas and Textbook**, 6th Edition, Elsevier 2016.
- 4 **Stevens & Lowe's Human Histology** , Elsevier, 4th ed ISBN 978-0-723435020, 2015.
- 5 **The Developing Human – Clinically Oriented Embryology**, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
- 6 **Neuroanatomy An Illustrated Colour Text**, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864
- 7 **Oral Anatomy, Histology and Embryology**, 4th Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009
- 8 **McMinn's Color Atlas of Head and Neck Anatomy**, by Logan, Reynolds, Rice & Hutchings, 5th Edition, Elsevier 2016.
- 9 Ebbing, DD-Grammon, SD: General Chemistry. 9th ed. 2009. Houghton Mifflin Co. Boston ISBN 10: 0-618-85478-6 / 13: 978-0-618-85478-7
- 10 Harper's Illustrated Biochemistry, 30th edition, Lange, ISBN-10: 0071825347
- 11 Tóth: Concise Inorganic Chemistry for Medical Students. (SOTE) (Bp.)
- 12 Laboratory Manual I-II. (Bp.)
- 13 Hrabák: Selected Collection of Chemical Calculations (SOTE) (Bp.)
- 14 Sasvári: Bioorganic Compounds (Bp.) SOTE
- 15 Csermely P.-Hrabák A.: Principles of Organic Chemistry. Bp. 1999.
- 16 Harvey Lodish et al.: Molecular Cell Biology, 6th edition, ISBN-13: 978-0716776017, ISBN-10: 0716776014
- 17 Wilson, Mansfield, Heath, Spence: Dental Technology and Materials for Students. Blackwell Scientific Publications. ISBN 0632017635
- 18 Powers, Wataha: Dental Materials Properties and Manipulation. Mosby ISBN 9780323078368
- 19 Primary Preventive Dentistry. Ed.by Norman O.Harris, F.Garcia-Godoy. 5th ed. Appleton and Lange, Stamford. 1999. ISBN 0-8385-8129-3
- 20 Damjanovich – Fidy – Szöllősi (eds) Medical Biophysics, Medicine, Budapest, 2009. ISBN 978 963 226 127 0
- 21 Miklós Kellermayer: Medical Biophysics Practices. Semmelweis Publishers, Budapest, 2015. ISBN 978-963-331-349-7.
- 22 Alberts et al. Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546
- 23 McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access 7th Edition by Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 Publication Date: 22/03/2013
- 25 Andrea, Barta – Éva Katalin, Varga – Ákos, Zimonyi: Medical terminology for students of dentistry. Bp., 2019 (e-book, available at the Department for Languages for specific purposes).
- 26 Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 27 Andrea Weidinger: Nyelvtan. Bp., 2019 (e-book, available at the Department for Languages for specific purposes).

Recommended textbooks:

- 1 Stryer: Biochemistry. 4th ed. 1995. ISBN 0-7167-2009-4
- 2 Zumdahl: Chemical Principles. 3rd ed. 1998. Houghton-Mifflin Co. Boston. ISBN 0-395-83995-5
- 3 Sasvári-Müllner: Bioorganic Compounds 4 kötet. (Bp.)
- 4 McCabe J.F.: Applied Dental Materials. Blackwell Scientific Publications. ISBN 0-632-02826-2
- 5 First Aid manual. St Andrews' Ambulance Association and the British Red Cross St John Ambulance. Ed. Dorling Kindersley, 2002. ISBN: 0751337048.
- 6 Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford ISBN 9780702047473, Churchill Livingstone, Edinburgh, 2013.
- 7 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, ISBN13 978007178033,2013.
- 8 **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- 9 **Netter's Head and Neck Anatomy for Dentistry**, 3rd Edition, Elsevier, 2016.
- 10 **McMinn and Abrahams' Clinical Atlas of Human Anatomy** with STUDENT CONSULT Online Access 7th Edition by Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 2013.
- 11 **A.L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology** 3rd Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885 2012.
- 12 **Illustrated Dental Embryology, Histology, and Anatomy**, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.

MACROSCOPIC ANATOMY I – II.

Department of Anatomy, Histology & Embryology

Course Director: *Dr. Andrea D. Székely*

LEARNING OBJECTIVES

Aims of the lectures in anatomy: Presentation of the important and/or complicated chapters such as introductory chapters, thorax, pelvis, hand, foot, skull, heart, chapters of the visceral organs, central nervous system, organs of special senses, topographical anatomy.

Aims of the practical sessions in the dissecting room: Based on the weekly programs (see separate), students will both observe prosected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, embalmed cadaver. Students are supervised by the lab instructors. Bones, joints, muscles and peripheral nervous system will be primarily taught in the dissecting room.

LECTURES: First semester: 1×45 min; second semester: 2×45 min.

PRACTICAL CLASSES: First semester: 5×45 min; second semester: 6×45 min.

ECTS CREDITS: Altogether 14 (first semester: 6; second semester: 8).

MIDTERM TESTS: Oral and/or written

ACCEPTENCE OF THE SEMESTER:

Active participation in lectures, and dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in 25%. Attendance will be recorded in the lectures and in the dissection room classes.

To gain a signature proving the validity of the semester students should attend at least 75% of the scheduled practical hours as well as having a successful midterm result (at least a 2). In case the latter has not been fulfilled, there will be two make up dates offered during the last two weeks of the semester.

TYPE OF EXAMS: oral and written

First semester: semifinal examination, second semester: final exam

Semifinal and final examinations consist of written and oral (practical and theoretical) parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Macroscopic Anatomy (successful identification of structures on true anatomical specimens) including correct answers to relevant theoretical questions

LIST OF TEXTBOOKS

1. **Sobotta Atlas of Human Anatomy** (Package), 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
2. **Gray's Anatomy for students** with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319
3. **McMinn and Abrahams' Clinical Atlas of Human Anatomy** with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013
4. **Human Anatomy, Color Atlas and Textbook**, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.
5. **Fitzgerald's Clinical Neuroanatomy and Neuroscience**, 7th Edition, Elsevier, 2015.
6. **Oral Anatomy, Histology and Embryology**, 4th Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009
7. **McMinn's Color Atlas of Head and Neck Anatomy**, by Logan, Reynolds, Rice & Hutchings, 5th Edition, Elsevier 2016.

Recommended textbooks:

1. **Illustrated Dental Embryology, Histology, and Anatomy, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.**
2. **Netter's Head and Neck Anatomy for Dentistry**, 3rd Edition, Elsevier, 2016.
3. **Anatomy, A Photographic Atlas**, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2
4. **Bräuer: Sobotta Flashcards** (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
5. **KL Moore–AF Dalley: Clinically Oriented Anatomy**. 4th ed. Lippincott William and Wilkins, 1999.
6. **RMH McMinn: Last's Anatomy, Regional and Applied**. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
7. **Neuroanatomy An Illustrated Colour Text**, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864
8. **Functional Anatomy Anatomy, Histology and Embryology for medical and dental students** by M. Réthelyi and J. Szentágothai, Medicina, 2018.

COURSE DESCRIPTION

Macroscopic Anatomy I.

Lectures and dissection classes

Subject matter : Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system, i.e. osteology, arthrology and myology, together with the vascular and nervous supply of the limbs and the trunk. Skull (viscerocranium, neurocranium). Cavities, muscles of the head & neck region. Macroscopy of the brain and spinal cord, membranes (dura, arachnoid and pia mater).

Credits: 6

Prerequisite: none

Week	Lectures	Dissection room
Week 1	1. The role of anatomy in the medical curriculum. Terminology	General introduction to practical work in the dissection room, tools and rules Bones of the upper limb and the girdle, shoulder joint
Week 2.	2. General arthrology and myology. Joints, muscles and movements of the shoulder and the upper girdle	Muscles (flexors) of the upper limb/ girdle Elbow joint
Week 3.	3. Muscles and actions of the elbow joint	Upper limb, arm, forearm Muscles and joints of the hand
Week 4.	4. Joints, muscles and actions of the wrist and the hand	Dissection of the muscles, vessels and nerves of the upper limb (branches of the axillary a+v, brachial plexus)
Week 5.	5. Bones, joints, construction of the pelvis. Muscles and actions of the hip joint	Dissection of the muscles, vessels and nerves of the upper limb 1. Midterm test (oral): Upper limb including the girdle
Week 6.	6. Muscles and actions of the knee joint. Muscles and joints of the foot. Architecture of the foot	Lower limb, pelvis, hip joint Dissection of the muscles, vessels and nerves Cadaver and free limb dissection
Week 7.	7. Components, muscles, joints, ligaments and movements of the vertebral column. Intervertebral, atlantooccipital and atlantoaxial joints together with the muscles	Dissection of the limbs and superficial regions of the trunk (cadaver) Knee joint, bones of the leg and foot
Week 8.	8. Ribs, components and movements of the thorax. Diaphragm.	Dissection of the limbs and superficial regions of the trunk (cadaver) Femoral vessels, lumbar plexus
Week 9.	9. Components of the abdominal wall. Rectus sheath. Subinguinal hiatus. Inguinal canal. Adductor and femoral canals.	Sacral plexus Diaphragm Components of the body wall, rectus sheath, hernia canals
Week 10.	10. Bony framework of the skull. Ethmoid bone. Cavities and spaces of the viscerocranium.	Dissection of the lower limb and superficial regions of the trunk (cadaver) 2. Midterm test (oral): Lower limb including the girdle; bones, joints, muscles and fasciae of the trunk, hernia canals
Week 11.	11. Bony framework of the skull, neurocranium. Sphenoid and temporal bones.	Bones of the skull Internal and external skull bases Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa
Week 12.	12. Introduction to the study of the nervous system Meninges, hemispheres, CSF, lateral ventricles	Bones of the skull Internal and external skull bases Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa
Week 13.	13. Telencephalic hemispheres, lateral ventricle. Diencephalon, 3 rd ventricle.	Morphology of the brain and spinal cord Blood supply, meninges, sinuses CSF circulation, cisterns Cadaver dissection Demonstration of prosected specimens
Week 14.	14. Brain stem, cerebellum, 4 th ventricle, spinal cord	Telencephalic hemispheres, gyri and sulci, Diencephalon, lateral and 3 rd ventricles, Brain stem, cerebellum, 4 th ventricle Frontal sections of the brain Non-obligatory assessments I-II. : Topics of the semester

Midterm tests: The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Topic list for the semifinal examination:

Macroscopic Anatomy I.

Musculoskeletal Anatomy

- General osteology, classification of bones
- General arthrology
- Components and classification of joints
- General myology
- Joints and muscles of the shoulder girdle.
- Shoulder joint, movements and muscles.
- Axilla, the quadrangular and triangular spaces
- Muscle/fascial compartment of the arm (cross section)
- Elbow joint, the gross anatomy of the muscles acting upon it. Cubital fossa
- Muscle/fascial compartments of the forearm (cross section)
- Movements and muscles of the radiocarpal joint
- Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths
- Joints and muscles of the thumb and fingers
- Composition of the pelvis (bones, ligaments and membranes)
- External and internal muscles of the hip, supra- and infrapiriform hiatus
- Hip joint and the muscles concerned with the movements
- Osteofibrous compartments, muscles and cross section of the thigh
- Knee joint and the muscles concerned with the movements. Popliteal fossa
- Subinguinal hiatus, femoral trigone, adductor canal
- Osteofibrous compartments, muscles and the cross section of the leg
- Ankle joint, subtalar and talocalcaneonavicular joints together with the muscles acting upon them.
- Structure of the foot, arches of the foot
- Blood supply and innervation of the upper and lower limbs
- Blood supply and innervation of the trunk
- Brachial plexus, lumbar plexus, sacral plexus.
- Dorsal branches of the spinal nerves, intercostal nerves
- Structure of vertebrae
- Structure of the vertebral column together with the muscles acting upon it
- Back muscles
- Joints, movements and muscles of the head&neck
- Deep neck muscles (scalene and prevertebral muscles)
- Muscles of the nape (suboccipital trigone)
- Osteofibrous structure of the thoracic cage (bones, joints, ligaments, muscles, movements)
- Diaphragm
- Muscles and layers of the abdominal wall, rectus sheath
- Inguinal canal, femoral canal
- Bones, spaces and connections of the skull, external and internal skull bases
- Neurocranium, components and cavities (anterior, middle and posterior cranial fossae)
- Viscerocranium, components and cavities (walls and connections of the nasal cavity, orbit, oral cavity, pterygopalatine and infratemporal fossae)

Macroscopy of the nervous system

- Intracranial topography
- Dura mater, dural sinuses
- Arachnoid mater, pia mater, cisterns, CSF circulation
- Description of the spinal cord. Spinal nerves
- Meninges and blood supply of the spinal cord
- IV. ventricle
- Medulla oblongata
- Pons
- Midbrain
- Cerebellum
- Diencephalon (parts, blood supply).
- Thalamus, hypothalamus
- III. ventricle
- Telencephalon, blood supply. Hemispheres
- Basal ganglia
- Lateral ventricles
- Internal carotid artery (course, parts and branches)
- Vertebral artery (course and branches)
- Circle of Willis
- Veins of the brain
- Cranial nerve exits (brain, dura and skull)

Macroscopic Anatomy II. including Maxillofacial Anatomy

Lectures and dissection classes

Subject matter: Morphology, topography and clinically oriented anatomy of the internal organs (i.e. cardiovascular, gastrointestinal, respiratory and urogenital systems).
Morphology and topography of the intracranial spaces. Course and branches of cranial nerves. Autonomic nervous system. Maxillofacial Anatomy

Credits: 8

Prerequisite: Macroscopic Anatomy I.

Week	Lectures	Dissection room
	MAXILLOFACIAL ANATOMY	
1	1. Muscles of facial expression. Muscles, fasciae and muscular trigones of the neck. 2. Temporomandibular joint, muscles of mastication	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck
2	3. Composition and part of the oral cavity, palate, faucial isthmus and pharynx 4. Anatomy of teeth	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck Anatomy of teeth
3	5. Nasal cavity, paranasal sinuses 6. Larynx	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck
4	7. Topography of the salivary glands. 8. Vessels of the head&neck region. Cutaneous innervation, lymphatic drainage.	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck
5	9. Imaging anatomy of the jaws, teeth and the maxillary sinus (Radiology lecture) 10. Olfactory nerve (CN 1), optic nerve (CN 2). Orbit, extraocular muscles and eye movements. Protective and lacrimal apparatus of the eye	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck
6	10. Oculomotor nerve (CN 3), trochlear nerve (CN 4), abducent nerve (CN 6), facial nerve (CN 7) 12. Trigeminal nerve (CN 5). Innervation of the teeth and the gingiva, the anatomy of dental local anaesthesia	Cadaver dissection Demonstration of prosected specimens Organs of the head and neck
7	13. Glossopharyngeal nerve (CN 9), vagus nerve (CN 10), accessory nerve (CN 11), hypoglossal nerve (CN 12) 14. Sympathetic and parasympathetic nervous systems (cranial, thoracic and abdominal parts)	Cadaver dissection Demonstration of prosected specimens Organs of the thoracic and abdominal cavities
8	15. Thoracic cavity, mediastinum and lymphatic drainage. Trachea and the lungs. Esophagus. 16. Chambers of the heart, external features. Structure of heart wall, myocardium, valves, anuli fibrosi	Cadaver dissection Demonstration of prosected specimens Organs of the thoracic and abdominal cavities
9	17. Vessels, conducting system of the heart. Surface projection of the heart, pericardium. Auscultation points 18. Stomach and small intestines (duodenum, jejunum, ileum)	Cadaver dissection Demonstration of prosected specimens Organs of the thoracic and abdominal cavities
10	19. Liver, gall bladder, pancreas, spleen. 20. Large intestine, rectum, porto-caval anastomoses	Cadaver dissection Demonstration of prosected specimens Organs of the thoracic and abdominal cavities

Week	Lectures	Dissection room
11	21. Peritoneum, peritoneal recesses, peritoneal relations of abdominal organs. 22. Morphology of the kidney, capsules of the kidney, ureter, urinary bladder	Cadaver dissection Demonstration of prosected specimens Abdominal, retroperitoneal and pelvic organs
12	23. Morphology and coats of the testicle. 24. Morphology of the epididymis, spermatic cord, seminal vesicle and prostate	Cadaver dissection Demonstration of prosected specimens Abdominal, retroperitoneal and pelvic organs Genitourinary system
13	25. Morphology and histology of penis and male urethra. Male perineum 26. Ovary, Fallopian tube and uterus	Cadaver dissection Demonstration of prosected specimens Abdominal, retroperitoneal and pelvic organs Genitourinary system
14	27. Vagina, female perineum, external genital organs 28. Blood supply and lymphatic drainage of the abdomen and lesser pelvis	Cadaver dissection Demonstration of prosected specimens Abdominal, retroperitoneal and pelvic organs Genitourinary system Non-obligatory assessments I-II. : Topics of the first and second semesters

Midterm tests: The time and topics of midterm tests will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

Topic list for the final examination:

Macroscopic Anatomy I.

(see there)

Macroscopic Anatomy II.

- Muscles of facial expression. Superficial muscles of the neck, muscle triangles
- Orbit. Extraocular muscles. Eye movements.
- Eyelids, conjunctiva, fasciae of the orbit, lacrimal apparatus
- Cranial nerve nuclei (classification and locations)
- CN 1 Olfactory nerve
- CN 2 Optic nerve
- CN 3 Oculomotor, CN 4 Trochlear, CN 6 Abducent nerves
- CN 10 Vagus, CN 11 Accessory, CN 12 Hypoglossal nerves
- Sympathetic nervous system, cervical and thoracic parts (sympathetic trunk)
- Sympathetic nervous system, abdominal and pelvic parts
- Sacral parasympathetic nervous system

Cardiovascular system

- Shape, external features of heart
- Chambers of heart
- Endocardium, valves of heart
- Skeleton of heart, anuli fibrosi
- Structure of heart wall
- Pulse generating and conducting system of heart
- Private vessels of the heart

- Pericardium
- Position and surface projections of heart, radiology of heart, auscultation points
- Pulmonary circulation
- Ascending aorta, arch of aorta and its branches
- Subclavian artery, axillary artery together with the branches
- Blood supply of the thoracic wall (including the mamma), venous and lymphatic drainage
- Thoracic duct, right lymphatic trunk
- Thoracic aorta and its branches
- Abdominal aorta and its branches
- Celiac trunk and its branches
- Superior mesenteric artery and its branches
- Inferior mesenteric artery and its branches
- External and internal iliac arteries together with the branches
- Internal pudendal artery and its branches
- Superior vena cava and its tributaries
- Inferior vena cava and its tributaries
- Azygos and hemiazygos veins and their tributaries
- Portal vein and its tributaries, portocaval anastomoses
- Cutaneous veins and lymphatic vessels of trunk

Alimentary tract

- Pharynx, para- and retropharyngeal spaces
- Esophagus (anatomy and topography)
- Stomach (shape, position, parts)
- Peritoneal relations of stomach

- Blood supply and innervation of stomach
- Duodenum (shape, position, divisions, vessels)
- Jejunum-ileum (shape, position, vessels)
- Rectum, anal canal (shape, position, vessels)
- Liver (shape, position)
- Liver (peritoneal relations, vessels)
- Gall bladder and biliary passages (anatomy)
- Pancreas (shape, position, vessels)
- Peritoneum, greater and lesser omentum, mesentery, omental bursa

Respiratory system

- Nose, nasal cavity (boundaries, nasal meatus, vessels)
- Paranasal sinuses (connections, vessels)
- Skeleton and joints of larynx. Muscles of larynx, innervation
- Laryngeal ligaments (fibroelastic membranes, mucous membrane)
- Trachea
- Lung (shape, parts, surfaces, hilum, position, topography, vessels, nerves)
- Pleura
- Divisions of mediastinum, contents

Urogenital system

- Kidney (shape, position, hilum, sinus, capsules, vessels)
- Ureter. Urinary bladder (shape, position, muscles, vessels)
- Female urethra
- Testis (shape, position, vessels)
- Epididymis, vas (ductus) deferens, spermatic cord
- Scrotum, coats of testis
- Seminal vesicle
- Prostate
- Male urethra, bulbourethral gland
- Penis (shape, position, mechanism of erection, vessels, nerves)
- Ovary (shape, position, vessels)
- Uterine tube (shape, position, vessels)
- Uterus (shape, parts, wall, cavity)
- Uterus (position, supporting structures, vessels)
- Broad ligament (lig. latum) and its components
- Vagina,
- External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)

- Topography of the female pelvic organs (connective tissue spaces, peritoneal relations)
- Topography of the male pelvic organs (connective tissue spaces, peritoneal relations)
- Pelvic floor
- Male perineum, female perineum

MAXILLOFACIAL ANATOMY: *macroscopy questions*

- Oral cavity (divisions, boundaries)
- Frontal section of the oral cavity, sulcus lateralis linguae
- Palate, palatine muscles. Isthmus of fauces
- Tongue (parts, vessels, innervation)
- Floor of the mouth (morphology and topography)
- Types and morphology of teeth
- Dentition, eruption of teeth, exfoliation
- Blood supply and innervation of the upper teeth and gingiva
- Blood supply and innervation of the lower teeth and gingiva
- Temporomandibular joint
- Mechanism of mastication, reflex arc of mastication
- Muscles concerned with the opening and closing of the mouth.
- Muscles of mastication, muscles of facial expression
- Anatomy of the submandibular gland, submandibular region
- Anatomy of the sublingual gland, sublingual region
- Anatomy of the parotid gland, parotid nest
- Branches of the ophthalmic nerve (CN 5/1)
- Branches of the maxillary nerve (CN 5/2)
- Branches of the mandibular nerve (CN 5/3)
- Branches of the facial nerve (CN 7)
- Branches of the glossopharyngeal nerve (CN 9)
- Lymph nodes of the head and neck, lymphatic drainage
- Branches of the external carotid artery
- Branches of the maxillary artery
- Course and branches of the internal carotid artery
- Veins of face and neck
- Cervical plexus
- Sympathetic system (cranial part)
- Parasympathetic system (cranial part)

MICROSCOPIC ANATOMY AND EMBRYOLOGY I (– II).

Department of Anatomy, Histology & Embryology

Course Director: Dr. Andrea D. Székely

LEARNING OBJECTIVES

Aims of the lectures in embryology: Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (general embryology). Presentation of the development of organs and functional systems parallel with the gross anatomical and histological lectures including the frequently occurring malformations.

Aims of the lectures in histology: Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic (epithelial, connective, muscle and nervous) tissues. Complementing gross anatomy with a detailed presentation of the fine structure of organs, including the ultrastructural details together with the molecular background. Important chapters: basic tissues, viscera, central nervous system.

Aims of the practical sessions in the histology room: Facilitate the understanding of ground (epithelial, connective, muscle and nervous) tissues and the fine structure of the organs through the observation and interpretation of histological specimens.

LECTURES: 2 × 45 min in both semesters

PRACTICAL CLASSES: I.: 2 × 45 min; II.: 2 × 45 min.

ECTS CREDITS: Altogether 8 (I.: 4; II.: 4).

MIDTERM TESTS: written (e-learning type)

ACCEPTANCE OF THE SEMESTER:

Active participation in lectures, and dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled practical classes to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the Histology classes.

Students are obliged to participate in the midterm test or their semester would not be accepted. Missed midterms should be retaken at the given retake timepoints the department offers during the last two weeks of the semester.

TYPE OF EXAMS: oral and written

I.: semifinal examination, II.: final exam

Semifinal and final examinations consist of written and oral parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Oral test in Microscopic Anatomy: identification of structures on virtual histological specimens including relevant theoretical questions

LIST OF TEXTBOOKS

1. **The Developing Human – Clinically Oriented Embryology**, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
2. **Histology: A Text and Atlas: With Correlated Cell and Molecular Biology**; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
3. **Wheater's Functional Histology, A Text and Colour Atlas**, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
4. **Oral Anatomy, Histology and Embryology**, 4th Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009

Recommended textbooks:

1. **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
2. **Junqueira's Basic Histology: Text and Atlas**; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033
3. **Wheater's Functional Histology, A Text and Colour Atlas**, 6th Edition by B Young, G O'Dowd and P Woodford ISBN 9780702047473, Churchill Livingstone, Edinburgh, 2013.
4. **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
5. **Illustrated Dental Embryology, Histology, and Anatomy**, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.

COURSE DESCRIPTION

Microscopic Anatomy and Embryology I.

Lectures in Histology and Embryology; practical classes in Histology

Subject matter

Histology: Microscopy of the ground (basic) tissues (epithelia, glandular tissues, connective and supporting tissues, types of muscle tissues. Histology of the corpuscular elements of the blood, cells of the red bone marrow. Microscopical strucure of the internal organs (cardiovascular, gastrointestinal, respiratory and the urogenital systems)

Embryology: Basic principles of human development, introduction to the clinical embryology. General embryology, including spermatogenesis, oogenesis, fertilization, cleavage, blastulation, formation of germinal layers, body axes, molecular basis of right-left asymmetry, Hox genes, formation of the placenta, fetal membranes. Organ development including the early on-set of fetal circulations. and the development of the limbs, together with the trunk and the skull. Factors inducing congenital malformations. Development of the internal organs together with their malformations

Credits: 5

Prerequisite: Cell Sciences

Week	Lectures	Histology laboratory
1	1. Epithelial tissues, cell contacts, intercellular connections 2. Glandular epithelium	Simple and stratified epithelial tissues, Glandular epithelium
2	3. Connective tissue cells and fibres. Extracellular matrix 4. Blood. Corpuscular elements. Red bone marrow, erythropoiesis, Formation of leukocytes	Connective tissues Cells and fibrous elements Blood and red bone marrow
3	5. Supporting tissues (cartilage, bone) 6. Ossification, bone remodelling	Supporting tissues Cartilage, bone Types of ossification
4	7. Muscle tissues 8. Histology of vessels	Smooth,skeletal and cardiac muscle types Blood vessels
5	9. Histology of the tongue and teeth 10. Histology of the esophagus and stomach	Gastrointestinal tract Lip, tongue, lingual papillae. Respiratory system Larynx, trachea, lung
6	11. Gametes, fertilization, cleavage, blastulation 12. Implantation. Molecular basis for gastrulation. Formation, differentiation and derivatives of the germinal layers	Gastrointestinal tract Esophagus, stomach
7	13. Microscopical anatomy of the small and large intestines 14. Histology of the liver and pancreas	Gastrointestinal tract Duodenum, jejunum, ileum, colon
8	15. Molecular basis for gastrulation. Formation, differentiation and derivatives of the germinal layers 16. Neurulation, folding of the embryo. Body axes, left-right lateralization, asymmetry	Gastrointestinal tract Liver, gall bladder, pancreas
9	17. Microscopical anatomy of urinary organs Development of the urinary system. 18. Histology of the male genital system	Urinary system Kidney, ureter, urinary bladder
10	19. Histology of the female genital system 20. Development of the genital system	Midterm test : Histology and Embryology

Week	Lectures	Histology laboratory
	Easter break	
11	21. Development of the heart. Fetal circulation 22. Development of arteries and veins	Male genital system I. Testis, epididymis, spermatic cord Seminal vesicle, prostate, penis, glans penis
12	23. Histology of the airways. Pharyngeal arches, development of the foregut, midgut and hindgut 24. Histology of teeth I.	Female genital system I. Ovary, corpus luteum, uterine tube Uterus (proliferation, secretion), vagina, placenta
13	25. Histology of teeth II. 26. Tooth development, malformations	Tooth development, salivary glands
14	27. Development of the face, malformations 28. Parodontal tissues	Histology of the oral cavity Maxillofacial Histology and Embryology

Topic list for the semifinal examination

Microscopic Anatomy and Embryology I.

General Histology

- Concept of basic tissues
- Definition and classification of epithelial tissue
- Simple epithelia
- Stratified epithelia
- Glandular epithelia
- Pigment epithelium, sensory neuroepithelium
- Cells of connective tissue
- Ground substance and fibres of connective tissue
- Types of connective tissue
- Blood and the corpuscular elements of blood
- Histology of the bone marrow, maturation of erythrocytes and platelets
- Differentiation of granulocytes, lymphocytes and monocytes
- Histology of cartilage and bone tissue
- Intramembranous ossification. Endochondral ossification. Growth and remodeling of bone
- Smooth muscle and myoepithelial cells
- Skeletal muscle tissue
- Cardiac muscle tissue
- Histology of arteries and arterioles
- Histology of veins and capillaries

Histology of organs

- Wall structure of hollow organs
- General composition of parenchymal (solid/compact) organs
- Histology of the lip and tongue
- Histology of the respiratory tract. Larynx. Trachea. Lung
- Histology of the esophagus and stomach
- Histology of the small and large intestines. Fine structure of the intestinal vili, enteroendocrine system
- Histology of the liver. Gall bladder, biliary ducts

- Histology of the pancreas
- Histology of kidney. Ureter. Urinary bladder
- Histology of the male and female gonads and genital organs/ducts
- Histology of the uterus (proliferative, secretory phases) menstrual cycle, vagina

General Embryology

- Spermatogenesis, spermiogenesis
- Oogenesis
- Fertilization, cleavage of the zygote
- Blastocyst formation; the bilaminar embryonic disc
- Implantation
- Formation of body axes
- Formation of the intraembryonic mesoderm; the notochord
- Neurulation (neural tube and neural crest)
- Derivatives of ectoderm
- Derivatives endoderm
- Differentiation of the intraembryonic mesoderm
- Folding of the embryo
- Development of the primitive cardiovascular system
- The structure and function of the placenta
- Development of the fetal membranes (chorion and amnion) and the umbilical cord

Development of internal organs

- Development of the heart, looping of the heart tube
- Formation of atria, development of the interatrial septum
- Formation of ventricles, development of the aorticopulmonary septum
- Development of arteries
- Development of the inferior vena cava

- Development of the portal vein
- Development of the superior vena cava, azygos and hemiazygos veins
- Fetal circulation
- Development and differentiation of the midgut
- Development and differentiation of the hindgut
- Formation of the liver and pancreas
- Development of the lower airways including the lungs
- Kidney development
- Development of the urinary passages
- Gonadal development
- Development of the male genital tract
- Development of the female genital tract
- Development of the male/female external genitals
- Development and divisioning of the body cavities
- Development of the peritoneum

Maxillofacial Histology and Embryology

- Enamel
- Amelogenesis
- Dentin
- Dentinogenesis
- Structure of the dental papilla
- Cementum (two types)
- Parodontium
- Gingiva – subdivisions and histology
- Tooth development
- Tooth eruption
- Development of the mandible and maxilla
- Development of the face. Formation of the nasal cavity and paranasal sinuses
- Microscopic Anatomy and development of the primary and secondary palates
- Microscopic Anatomy and development of the tongue
- Microscopic Anatomy and development of salivary glands
- Derivatives of pharyngeal pouches and grooves
- Derivatives of pharyngeal arches

GENERAL DENTAL MATERIALS

Lecturer: **Dr. Judit Borbély D.M.D., PhD – associate professor**

Second Semester

Lectures (1 hour/week)

Topics of the lectures (weekly, numbered):

1. History of dental education
2. Impression materials I
3. Impression materials II
4. Casts, models and dies
5. Metals, technologies
6. Investment materials, flasking methods
7. Precious alloys, non precious alloys
8. Dental resins
9. Dental ceramics
10. Dental cad/cam technology
11. Implant materials
12. Luting materials
13. Restorative materials
14. Tooth whitening materials

Department of Prosthodontics, Faculty of Dentistry, Semmelweis University
Detailed information on the subject is available on our website under
<https://semmelweis.hu/fogpotlastan/en/angol/>

PHYSICAL FOUNDATIONS OF DENTAL MATERIALS SCIENCE

Tutor: **Dr. István Voszka**

First Semester

Lecture (2 hours/week)

1. Basic forms of material, atoms, interactions, bonds
2. Multiatomic systems. Gases. Interpretation of temperature. Boltzmann-distribution. Fluids. Interface phenomena. Liquid crystals.
3. Solid materials.
4. Methods for structure examination (diffraction, microscopic, spectroscopic methods)
5. Crystallisation. Metals, alloys.
6. Ceramics, polymers, composites.
7. Mechanical properties of materials 1. Elasticity.
8. Mechanical properties of materials 2. Plasticity, hardness.
9. Mechanical properties of materials 3. Rheological properties, viscoelasticity.
10. Other physical (optical, electrical, thermal) properties of materials
11. Comparison of the properties of dental materials
12. Bases of biomechanics. Structure, mechanical and other properties of tissues.
13. Physical bases of implantology.
14. Physical bases of orthodontics.

MEDICAL CHEMISTRY

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Detailed information on the subject is available on our website under <http://semmelweis.hu/orvosi-vegylan/en/students/medchem/>

Cell Sciences

Department of Genetics, Cell- and Immunobiology

Address: NET Building, H-1089 Budapest, Nagyváradi tér 4.

Course director: Edit Buzás MD, DSc

Course coordinator: Orsolya Láng MD, PhD

Credit: 3

Lectures (1 hour per week):

1. Cell theory. Model cells in medicine
2. Cell membrane
3. Structure and function of the nucleus
4. Endoplasmic reticulum
5. Golgi complex, vesicular transport and secretion
6. Endocytosis. Autophagy
7. Cell adhesion and cell junctions
8. Cytoskeleton
9. Cellular movement
10. Structure and function of mitochondria and peroxisomes
11. Cell communication. Extracellular vesicles.
12. Cell cycle and mitosis
13. Stem cells and differentiation
14. Cellular ageing and cell death

Practices (2 hours per week):

1. The light microscope
 2. The general cell structure. Light microscopic microtechnique
 3. The electron microscope. Cell membrane
 4. The interphase nucleus. Cyto(histo)chemistry
 5. Immunohistochemistry. Super-resolution microscopy
 6. Cell and tissue culture
 7. Endoplasmic reticulum
 8. Golgi complex and secretion
 9. Endocytosis and lysosomes
 10. Cell surface differentiation, enzyme-histochemistry
 11. Store and supply of energy. Mitochondria. Peroxisome.
 12. Mitosis
 13. Meiosis
 14. Cell death (necrosis and apoptosis)
- The order of topics may vary

Course requirements: Students must participate at least 75% of the classes. More than three absences from the practice or more than three absences from the lecture invalidate the semester, no signature is given. There are no extra practices.

The course ends with an exam consists of an oral test (preparations, electron micrographs, methods applied in cell biology) and a written test (multiple choice, essays, drawings, etc. covering theoretical part of the subject). Further details will be announced on the website of the department (<http://gsi.semmelweis.hu>).

Core text: Alberts et al. Essential Cell Biology (4th edition) Garland Science ISBN-13: 978-0815344544 ISBN-10: 0815344546

Lecture and practice presentations and additional texts are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

DENTAL BIOCHEMISTRY I.

Department of Medical Biochemistry

Credits: 4

Total number of hours: 56; **lectures (hours):** 28; **practices (hours):** 28

Type of the course: obligatory

Academic year: 2021/2022

Code of the course FOKOBMT305_1A

Course Director: *Dr. Krasimir Kolev*

Contact details: H-1094 Budapest, Tűzoltó u. 37-47. Phone: +36-1-459-1500#60010 e-mail : Kolev.Krasimir@med.semmelweis-univ.hu

Position: Professor

Date of habilitation: 2008 **Ref.:** 266

Aim of the course:

The aim of this course is to examine biologically important molecules – namely amino acids, carbohydrates, lipids and nucleotides - identify their contributions to metabolic processes emphasized from a medical point of view, examine the structure and function of proteins, and address mechanisms of catalysis performed by enzymes. Furthermore, three basic biochemistry modules are outlined: The enzymology module, encompassing general principles of enzyme kinetics and how enzymes influence efficiency and controllability of chemical processes in biological systems, as well as how they affect structure and regulation of metabolic pathways; the bioenergetics module, addressing the relationships between mass-energy conversions in the human body emphasizing nutritional aspects, also elaborating on thermodynamic aspects of metabolism; and the 'first' intermediary metabolism module, presenting the salient features of carbohydrate and lipid metabolism which are essential for understanding physiological and pathological processes of the human body. During practices, students apply the theoretical knowledge acquired at lectures as part of case-oriented discussions in an effort to interpret – from a molecular point of view – relevant conditions.

Location of the course (lecture hall, practice room, etc.):

Premises located in the Basic Medical Sciences building (laboratory rooms located on the first floor and lecture halls located on the ground floor).

Upon the successful completion of the curriculum, the student should be able to:

Identify biochemical structures, know and understand the reactions in which medically important molecules participate; know and understand inter-organ biochemical processes; know and understand integrated metabolic functions of the human body. Overall, such knowledge is essential for understanding physiological and pathological processes and, consequently, for making sound professional decisions.

Prerequisite (s) for admission to the course: None

Terms and Conditions for Starting Student Course (Minimum, Maximum), Student Selection Method: Not applicable for compulsory subjects

How to apply for the course: Application is through the Neptun online system

The course in thematic details:

Lectures: weekly 1×90 min (2 hours)

Practices (P): 2 hours every week

Lecturers: Dr. Komorowicz Erzsébet (KE), Dr. Szöllősi András (SZA), Dr. Bak Judit (BJ), Dr. Iordan Iordanov (II)

Week	Lectures: weekly 1×90 min (2 hours)	Practices (P): 2 hours every week
1	The chemical structure of proteinogenic amino acids. The peptide bond. The primary, secondary and tertiary structure of proteins. (SZA)	P: Structural and chemical characteristics of amino acids; pH and temperature dependent properties.
2	The quaternary structure of proteins. Covalent modifications of proteins. Comparison of the structure-function aspects of myoglobin and haemoglobin. (SZA)	P: Structural and chemical characteristics of amino acids; pH and temperature dependent properties. Gel electrophoresis of LDH subunits.
3	Thermodynamic and structural aspects of enzyme function. Fundamentals of enzyme kinetics. Regulation of enzyme activity. Enzymes as components of physiological systems. Mechanisms of serine proteases. (SZA)	P: Interpretation of pathological conditions stemming from alterations in protein structure, elucidated by atomic resolution techniques.
4	Kinetic models of enzymatic function. Michaelis-Menten kinetics. Significance of the Michaelis constant (Km). Inhibition of enzymatic reactions. Allostery and cooperativity in enzymatic reactions. Levels of regulation of enzymatic reactions: compartmentalization, altering gene expression, reversible modification of the catalytic activity of enzymes. Enzymatic control by proteolytic activity. (SZA)	P: Determination of kinetic parameters of trypsin
5	The thermodynamics of biochemical pathways. Reversible and irreversible reactions. The coupling of endergonic and exergonic reactions in the human body. High energy compounds. The central role of ATP in the energetics of cells. Reducing equivalents. (BJ)	P: Regulation of enzyme activity. Identification of metabolic pathways.
6	Reactions and control of the citric acid cycle. Sources of citrate. The pyruvate dehydrogenase complex. The synthesis of ATP. ATP production by oxidative phosphorylation in mitochondria. Redox reactions of terminal oxidation (electron transport chain, ETC). The enzyme complexes of ETC. (BJ)	P: Bioenergetics. Determination of P/O ratio
7	Carbohydrates. Digestion and absorption of carbohydrates, cellular glucose uptake, glucose transporters. Glycolysis. (BJ)	P: Carbohydrates in the diet. Food fibers and additives.
8	Gluconeogenesis. Regulation of glycolysis and gluconeogenesis. Cori-cycle. Metabolism of glycogen. Mobilization of glycogen in liver and muscle. (BJ)	P: Lactic acidosis
9	Blood glucose level and its regulation: hyperglycaemia. Insulin release, insulin receptors. Phosphorylation cascade. Lactate synthesis. Effects of glucagon. Biochemistry of diabetes mellitus. (BJ)	P: Determination of blood glucose level.
10	Metabolism of lipids – overview. Absorption of lipids. Metabolism of chylomicrons. (SZE)	P: Structure and function of the most important lipids in the body and in the diet.
11	Mobilization of fatty acids in adipose tissue, its regulation. Transport in the circulation. Free fatty acids, VLDL, IDL. (SZE)	P: Membrane-forming lipids and their pathologies. Precursor molecules for signal transduction.
12	Oxidation of fatty acids. Ketone bodies. Synthesis of fatty acids. Biosynthesis of triacylglycerol, phospholipids, their regulation. (SZE)	P: Tissue-specific aspects of lipoprotein lipase (LPL); LPL deficiency.
13	Metabolism of cholesterol, cholesterol transport in circulation. (KE)	P: Determination of triglycerides and cholesterol in blood plasma.
14	Biosynthesis and metabolism of bile acids, the importance of bile acids in lipid digestion. Cholesterol uptake and release by cells. (KE)	P: Signal transduction of insulin

Potential overlap(s) with other topics: none

Requirement for special study: not applicable

Policy regarding attending practice; policy regarding absences:

Practices are mandatory. It is not possible to make up for missed practices. In case of absences amounting to more than 3 practices, the semester is not acknowledged. Arriving to a practice with a delay of more than 10 minutes is considered an absence. Practice/seminar participation performance will be evaluated by the tutors: as such, maximum 10 points per semester can be obtained that may count towards the semi-final grade, see under "Grading system" for further details.

Means of assessing acquired knowledge during the semester:

Midterms: A midterm will take place in the 6th and another in the 11th week, during the practice/seminar (allocated time per midterm: 20 minutes). Midterms may only be taken in person and not through Zoom, unless otherwise indicated. Each midterm will consist of multiple choice questions (MCQs) from which max 20 points can be obtained (10 points per midterm).

It is obligatory to gather ≥ 10 points from both midterms in order to be allowed to sit for the semi-final exam. For those students who fail to amass ≥ 10 points from both midterms, one or both midterms can be retaken in the last week during the practice/seminar (allocated time per midterm: 20 minutes). The midterm points will be added as "points" to the result of the semi-final exam, as detailed in "Grading system", see below.

Lectures: At the end of each lecture, there will be a Kahoot on the topic of the lecture, consisting of 5 questions; 20 secs are allocated per question. Points can be earned by correctly responding to at least 4 out of 5 Kahoot questions. Maximum 1 point can be earned per lecture, as outlined by the lecturer. Through the Kahoots, students may obtain points that will be added to the points earned at the semi-final exam, as detailed in "Grading system", see below.

Requirement for acknowledging the semester, and for allowing the student to take the semi-final exam: Attendance of at least 75 % of the practical classes and at least 10 points from both midterms.

Competition: The competition is held on the last week during the practice/seminar (allocated time: 35 minutes) and consists of 70 multiple choice questions (MCQs). The competition may only be taken in person and not through Zoom, unless otherwise indicated. Only students who amass 14 or more points from the midterms (not the retakes) can participate in the competition. Top 10% scorers (from those students enrolled in the Dental Biochemistry I course that participated in the competition) will be invited for an oral exam on the last day of that week. Points obtained from midterms, Kahoot quizzes, or practice/seminar performance (see below), do not count in the competition. Winners will be announced later in the same day, and will be exempted from the semi-final exam.

Exam Type: Colloquium (semi-final), Form: written test and oral exam, based on material of the official textbook, lectures and practices published at the department's Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

Exam Requirements: The material for the written test exam is the material of the lectures and practices in the subject, with the corresponding textbook chapters.

Types and modes of grading:

Grading system: The grade of the final exam is based on the points obtained i) in Kahoot quizzes at the lectures, ii) during the seminars/practices, iii) at the two midterms, iv) at the written MCQ semifinal exam, v) during an oral exam. The written MCQ exam and the oral exam will take place in the same day of the examination period.

The grading system is as follows:

(i) Kahoot: maximum 1 point per lecture.

(ii) Seminar/practice points: maximum 10 points.

Total points from (i) and (ii) cannot exceed 20 points

(iii) Two midterms: maximum 20 points.

(iv) Written MCQ exam: This test consists of multiple choice questions (MCQs) from which max 100 points can be obtained (allocated time: 100 minutes).

If the score of the MCQ exam is 49 or below, then the grade of the final exam is 'fail'.

If students reach 50 points on the MCQ exam, the midterm points, practice/seminar performance points and lecture Kahoot points (total max. 40 points) will be added to the MCQ score.

Grade calculation of the final exam from the total points (MCQ+semester):

95- 140: grade 5 (excellent)

86- 94: grade 4 (good)

71- 85: grade 3 (satisfactory)

50- 70: grade 2 (pass)

(v) Oral exam: Only those students who obtained at least 50 points at the semifinal MCQ test will be invited for an oral exam. For those who scored 49 and below, a final mark of "1" will be registered in the Neptun, and points obtained during the semester will not count. During the oral exam, the examiner will pick five questions from those MCQs that were correctly answered by the student. If the student will not elaborate properly on 2 or 3 MCQs, his/her MCQ mark will be decreased by one grade (i.e. if MCQ Moodle exam is 3 and the student does not elaborate adequately on 2 or 3 MCQs picked by the examiner, the MCQ grade will be $3-1=2$). If the student will not elaborate properly on 4 or 5 oral MCQs, his/her MCQ mark will be decreased by two grades (i.e. if MCQ Moodle exam was 3 and the student does not elaborate adequately on 4 or 5 oral MCQs picked by the examiner, the MCQ mark will be $3-2=1$, i.e. "fail"). If MCQ Moodle exam is 2 and the student does not elaborate adequately on 3 or more MCQs picked by the examiner, the MCQ mark will be "fail". The points from Kahoot and midterms will be added only if the student obtained from MCQ+oral exam a grade of ≥ 2 .

How to apply for the exam: The exam dates are announced on the 12th week of the semester. We provide at least one exam date each week. Applications are made in the Neptun system in accordance with the University Study and Exam Rules.

Opportunities to repeat the exam: A retake is possible on the closest announced exam date at least one day after an unsuccessful exam.

Printed, electronic and online notes, textbooks, tutorials, and literature for online learning (html for online material):

Harper's Biochemistry (30th edition, or latest)

Online material published in the department's Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

BIOPHYSICS I.

Tutor: *Dr. István Voszka*

First Semester

Week	Lecture (1.5 hours per week)	Laboratory (2.5 hours per week)
1	Radiations (basic concepts)	Laboratory safety rules
2	Properties of electromagnetic radiations; wave and corpuscular nature	Resonance
3	Attenuation of radiation	Emission spectroscopy. Light sources
4	Luminescence and its applications	Spectrophotometry
5	Lasers and their medical applications	Statistics
6	Thermal radiation, thermography. Biological effects of light	Detection of nuclear radiations
7	Production and spectrum of X-radiation Cyclotron; Linear accelerator;	Dosimetry
8	Attenuation of X-radiation, interactions	Special light microscopes X-ray diagnostics
9	Atomic structure; Radioactive decay law Gamma-radiation and its detection	Optics of the eye
10	Radiotherapy, radiosurgery; Isotope diagnostics	Polarimeter
11	SPECT, PET Beta-radiation, beta-decay	Coulter counter
12	Alpha-radiation, alpha-decay Interaction with matter	Determination of skin-impedance
13	Dosimetry	Concentration determination with refractometer
14	Radiation protection; estimation of risk	Repetition

BIOPHYSICS II.

Second Semester

Week	Lecture (1.5 hours per week)	Laboratory (2.5 hours per week)
1	Bonds and their significance in macromolecular structure; Boltzmann distribution, examples	The attenuation of gamma-radiation
2	Liquid crystals, membranes	
3	Electronic properties of condensed materials (solids, macromolecules)	Amplifier
4	Ultrasound properties, generation of ultrasound	Gamma energy determination
5	Ultrasonography, Doppler methods	Pulse generators (e.g. pacemaker, defibrillator)
6	Methods for structure examination heat	Ultrasound
7	Basic concepts of Thermodynamics, First law	Audiometry
8	General description of transport phenomena, Onsager's equation, examples	Isotope diagnostics
9	Diffusion; transport across membrane	Densitography (CT)
10	Resting potential and its local changes	Flow of fluids.
11	Action potential, properties, interpretation	Electrocardiography
12	General characteristics of sensory function, hearing, vision	Diffusion
13	Biophysics of muscle function	Sensory function
14	Motor proteins	Repetition

DENTAL PSYCHOLOGY

Institute of Behavioral Sciences

Code: FOKVMAG019_1A

Credit: 2

Head of the Department: **Prof. Dr. József Kovács**

Tutor: **Dr. Gyöngyvér Salavecz**

Second Semester

Course objectives:

- to introduce the concepts of stress, emotions, states of consciousness, and their role in pain perception
- to emphasize suggestive communication and therapeutic methods that may be used to improve doctor-patient relationship in dental practice
- to enable students to recognize and understand psychological and psychopathological issues when encountered in everyday dental practice

Topics:

- 1-2. Control problems and their relations to dental practice
- 3-4. Principles of perception, pain, consciousness, emotions and communication -and their relations to dentistry.
- 5-6. Stress and stress management in dental practice
- 7-8. Psychological crisis, presuicidal syndrome, and burn-out prevention
- 9-10. Role of psychological factors in producing and enhancing pain.
Psychological interventions for pain suppression.
- 11-12. National holiday
- 13-14. Psychotherapeutic methods
- 15-16. Fables and imagination in dental practice
- 17-18. Substance misuse and surrounding areas in dentistry
- 19-20. Dental consequences of eating disorders
- 21-22. Hypnosis and relaxation therapies, and their possible use in dental practice
- 23-24. Conscious states, sleep, dreaming, general anesthesia
- 25-26. Affects, emotion and motivation
- 27-28. Review

Department:

Institute of Behavioral Sciences

Department of Psychology

NET Building, 20th floor

1089. Budapest, Nagyvárad tér 4.

Phone: 210-2953

Secretary: NET Building, 20th floor, Room-2005. Phone: 2102930/ 56114.

Lecturers:	Dr. György Purebl	e-mail: purgyor@net.sote.hu
	Dr. Róbert Bódizs	e-mail: bodrob@net.sote.hu
	Dr. Adrienne Stauder	e-mail: staadr@net.sote.hu
	Dr. László Harmat	e-mail: laszloharmat@yahoo.com
	Éva Pollák	e-mail: evipoll@yahoo.com
	Gabor Suhai	e-mail: shgabor@gmail.com

Participation and making up for absences:

Participation list will be recorded at the end of every lecture. To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. Maximum number of absences in a semester is 3.

Certifying absence from lesson and exam:

Medical certificate presented to the course leader.

Semester requirements:

Course will conclude with a written **semi-final examination** in the examination period.

Requirement of semester signature:

A signature will be given with the prerequisite of participation. One absence can be overlooked by the teacher if the student writes an essay. The topic of the essay must be discussed with the course leader in advance.

Method of granting grade: The result of the **semi-final**.

Type of exam: written **semi-final examination**

Exam requirements: Content of the lectures

Sign up for exam: through the Neptun system

Modifying sign up for exam: through the Neptun system

Certifying absence from exam:

A telephone message to the secretary of the Institute or an email message to the course leader.

Recommended text books:

- 1 Behavioral dentistry. Mostofsky DI, Forgione AG, Giddon DB (eds.), Blackwell Munksgaard, 2006.
- 2 Behavior & Medicine. 4th Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.
- 3 Fadem B: Behavioral Science, Lippincott Williams & Wilkins, 5th ed., 2008.
- 4 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6th ed., New York, Wiley, 2008.
- 5 Kopp M. - Skrabski Á.: Behavioral Sciences Applied in a Changing Society, Corvina, 1996.

MEDICAL SOCIOLOGY (Dentsoc)

Second Semester

Hour/semester: 28
Credit: 1
Code: FOKVMAG235_1A
Lecturer of the course: *Prof. Dr. Purebl György*
Contact details: SE ÁOK Magatartástudományi Intézet, 1089. Nagyvárad tér 4, (36-1)210-2930/ext.56199, or (36-1) 210-2940/ext.56199; or (36-1)210-2953; purebl.gyorgy@med.semmelweis-univ.hu
Position: Professor, Director of the Institute of Behavioral Sciences, Semmelweis University—Budapest.
Date of habilitation and reference number: 05/2019 Semmelweis University, Budapest
Course leader: Bence Döbrössy dobrossy.bence @med.semmelweis-univ . hu
Teachers: Bence Döbrössy e-mail: dobrossybence@gmail.com Dr. Edmond Girasek email: girasek.edmond@gmail.com

Location of the course (address of lecture hall, seminar room etc.):
Nagyvárad téri Elméleti Tömb, 1089 Budapest Nagyvárad tér 4.
Elméleti Orvostudományi Központ 1094 Budapest Tűzoltó utca 37-47
FOOC, 1088 Budapest, Szentkirályi u. 47.

Goals of the subject:
The aim of this course is to help students realise that social factors have a considerable influence on oral/ dental health and dentistry. Social, economic and cultural factors have a great effect on the dentist-patient relationship, the way people make sense of their symptoms and seek dental help, their oral/ dental health related behaviour as well as on the aetiology of oral and dental conditions.
By understanding how different societies are structured and organised and how the categories people belong to (gender, ethnicity, occupation, educational level, financial situation to name but a few) shape all aspects of their lives and opportunities, our hope is that students will better comprehend the social reality influencing the dental health status of people and the practice of dentistry for dentists.

Syllabus of the subject:

Week		
1	Introduction to sociology, basic concepts and principles.	Practice
2	General health and oral health status through history	Lecture
3	Social determinants of oral health and oral health related behaviour	Lecture
4	Intercultural dentistry	Lecture
5	Patient expectations regarding dentistry: the theory and practice of dental patient satisfaction studies.	Lecture
6	Socio-cultural aspects of pain	Lecture
7	The profession of dentistry, dentist patient relationship	Lecture
8	Introduction to practicals. Project work discussion	Practice
9	Social inequality and health inequality	Practice
10	Health Care Systems workshop	Practice
11	21st century dentistry technological and socio-cultural changes	Practice
12	Dental help seeking behaviour, illness behaviour	Practice
13	Medicalisation in dentistry, cosmetic detistry	Practice
14	Project reports	Practice

Courses (obligatory and elective) which in part or entirely overlap the topics of above course:
Public Health
The Basics of Digital Healthcare

Special academic work required for completion of the course:

Project work done in the practicals

Attendance on practices and lectures, replacement in case of missed sessions:

75% of practicals must be attended. One practical absence can be made up by undertaking an extra task set by the practical leader or by participating in the practical with another group

Consequences of absence from sessions and exams:

No signature is given if 75% of the practicals is not attended, the project work is not done

Method of checking acquired knowledge during the study period:

Completion of project work is required for getting a signature. The project work is graded and makes up 40% of the final grade.

Requirements of an accepted semester (signature of the lecturer):

Completion of project work and 75% practical attendance is required for getting a signature

Type of the exam:

written semi-final in the examination period (60% of the final grade)

Requirements of the exam:

- The written exam will consist of multiple choice questions and an essay type case analysis where students are required to understand, explain and apply to the given case concepts and knowledge acquired in the course.
- In order to undertake the exam successfully, students must know the material made available to them on the departmental home page as well as the textbook.
- The material covered in the exam:
 - 21st century dentistry technological and socio-cultural changes
 - Dental help seeking behaviour
 - Intercultural aspects of dentistry
 - Medicalisation in dentistry, cosmetic dentistry
 - Patient expectations regarding dentistry
 - Social determinants of oral health and oral health related behaviour
 - Social inequalities and inequalities in dental health
 - Socio-cultural aspects of pain
 - Systems of dental health care provision

The profession of dentistry

Grading of courses :

40%- project work

60% -written semi-final

Grades:

0-50 points – 1

51-60 points – 2

61-74 points – 3

75-84 points – 4

85 points and over 5

All lecture notes and slides are made available on Moodle (<https://itc.semmelweis.hu/moodle/>)

textbook: Graham Scrambler (ed) Sociology as Applied to Health and Medicine, Palgrave Macmillan 2018

Exam sign up: Through the Neptun System

Modifying: Through the Neptun System

Absence from the exam: With medical document submitted to the course director

HISTORY OF MEDICINE

Institute of Public Health

Lecturer: **Dr. Judit Forrai**

The history of medical science, considered as a part of the general history of civilization. The study of the history of medicine helps us to describe and understand how people in different times and cultures experienced and dealt with these fundamentals of human existence. This knowledge can inform debate about the present and the future, and help to bring medicine and science to a wide audience. All human societies have medical beliefs that provide explanations for birth, death, and disease. Many cultures in ancient times treated illnesses with magic and herbal remedies. Ancient Egyptians thought that their gods healed them. The ancient Greeks pursued medicine as a science. Hippocrates, the most famous physician of the time (c. 400 B.C.), believed that diseases had natural causes, not supernatural ones. By the Middle Ages, Europe was hit with a terrible epidemic that killed millions of people called the plague, or Black Death. The Renaissance marked a new period of interest in art and science throughout Europe. Despite new medical discoveries, many doctors still practiced old ways. Most sick people could not afford to see a trained physician. Instead, they consulted midwives who assisted with childbirths and made herbal remedies to treat illnesses. Minor surgeries were not done in the hospital but at the local barbershop. Medical research and training improved in the 18th century but there were still no cures for diseases like smallpox, a disease that killed millions of people over thousands of years. Middle Eastern doctors gave people mild doses of the smallpox to combat the disease. The portrayal of the history of medicine becomes more difficult in the 19th century. Discoveries multiply, and the number of eminent doctors is so great that the history is apt to become a series of biographies. Nevertheless, it is possible to discern the leading trends in modern medical thought. In the beginning of 20th century the research and technology have expanded medical knowledge and improved medical practices like surgery. Today, doctors are able to perform less invasive surgical procedures. The science of medicine has progressed dramatically in just the last 50 years. Career opportunities in health care have also expanded. There is a need for more skilled medical professionals, not only in hospitals, but in dentist and doctors' offices, research labs, rehabilitation centres, mental health clinics, nursing homes and even schools.

Topics/week

1. Introduction. What is Medicine? Methods and sources of Medical History. The birth of paleomedicine (bones teeth, mummies). Prehistoric medicine. Far East.
2. Far East Medicine. Chinese civilization, Japan, India.
3. Medicine of ancient civilizations, rivers valley's culture: Mesopotamia, Egypt, and the medicine knowledge. Medicine - in the Bible time - Heritage of the empirical knowledge. Practitioners. Theories of diseases.
4. Greco-Roman Medicine. Homeric medicine. Asclepius, Hippocrates. Corpus Hippocraticum- the concept and doctrine of his theories about the nature and diseases (the four humors). The Oath. Hygiene and health education. Post-Hippocratic schools – the golden heritage in the school of Alexandria. The roman physicians, diseases. Advance of public health. Water supply and sanitation, climate, soil and health, diseases, endemics. The workers' health, provision of medical care. (Celsus, Galenus)
5. Medieval medicine. Byzantine Healers, Arabian Hakims, Monks, Crusaders and medieval „doctors.“ The Arabian medicine: chemistry, pharmacy, hospitals. Razes, Avicenna, Abulcasis. The medieval Monasteries (Monte Cassino). The growth of European cities, sanitary problems of urban life. The first religious medical school in Salerno. Medieval Universities, medical humanists, and Christian caritas.
6. Medicine in the Renaissance. The Arts and the humanism. The new mentality of medicine: Paracelsus. The revolution of anatomy: Vesalius and his contemporaries. The first step toward the specialization. Botany and mineralogy. The printing of book's role in medicine. Foundation of the administration of Public Health. Epidemic diseases: communicable and non-communicable diseases. Theories, therapies, and medical care, hospital. Quarantine.
7. Experimenters, Teachers and Theoreticians in the Sixteenth and Seventeenth Centuries. Body as machine -old schools: iatrochemical, iatrophysical theories. New schools: animism, tonus, vitalism, stimulation, homeopathy. The circulation of the blood. Harvey's methodology Malpighi. Microscopy. Birth of modern clinical medicine: Sydenham. Boerhaave and his pupils.
8. Industrialism in the Eighteenth Century. Clinical medicine- schools of clinical (French, English, German, and Habsburg). The first Vienna School: van Swieten. surgery (Hunter, Valsalva), pathology (Morgagni, Bichat). Public health and hygiene. Occupational health, prison reform, general health (death rate, statistics), Ramazzini, Frank. Smallpox. Infant mortality. Nursing, dispensaries and hospitals, development of obstetrics. Sanitary conditions – filthy towns.
9. Clinical medicine in the second half of the nineteenth Century. Bacteriology a new science in medicine. Revolution, concepts and theories under the microscope. New discoveries Pasteur, Koch. Social revolution, industrialism, public health. National and international movements and health reforms, and medical care. Period of great epidemics. International health organization. The Red Cross.

10. Development of surgery and gynaecology. The man-midwife (Smellie, Hunter), History of anaesthesia. General and local possibilities. Wells, Morton, Simpson, Jackson). Asepsis and antisepsis. Early efforts to develop aseptic techniques. Semmelweis, Lister. Progress in surgery, Billroth. Cholecystostomy, appendectomies.
11. Emergence of specialism. Logical outgrowth of locality pathology, new instruments. Initially the medical professions: Paediatrics, Psychotherapy, Ophthalmology, Otology, Rhinology and Laryngologist, Dentistry, Neurology and Psychiatry, Dermatology and Venerology.
12. From the black death to the AIDS. The history of epidemics. The theories and therapies. Tropical medicine. The development of epidemics, the bacteriology and immunology. The new medicaments. Ehrlich and the chemotherapy, sulphonamides, antibiotics. Virology. Salk and Sabin. New diseases and screenings methods.
13. Consultation

Important: 3 absences are allowed. Doctor's certificate is required to certify absence from the exam.

Exam requirement: written test

Textbook:

Chrestomathy on the History of Medicine. Ed. Dr. Forrai J., Dr. Ballér P., Budapest, 1992. SOTE

FIRST AID

Department of Oxyology and Emergency Care

Faculty of Health Sciences

1088 Budapest, Vas u. 17., room 145

Phone: +(36-1)486-5840

Head of the Department: **Andrea Szekely**, MD, PhD, DEAA

Teacher: **Istvan Hornyak** associate professor

Second Semester

Topics

Principles of first aid. Recognition of an emergency. Assessment of the scene.

Dangerous scene. Safety measurements on the scene. Call for an ambulance.

Emotional viewpoints of managing emergencies.

Assessment of the patient with ABCDE approach. Responsiveness – unresponsiveness. Assessment of the responsive patient: complaints, signs for the severe condition. Positioning of the patient in specific conditions.

The unconscious patient. Airway management. Assessment of the vital signs.

Recovery position.

Heart attack. Sudden death. Chain of survival.

BLS (Basic Life Support)

BLS

AED (Automated External Defibrillator). PAD (Public Access Defibrillation)

BLS + AED

BLS + AED

Chocking. Drowning. Electrocution.

Injuries. Extrication of the patient: Emergency lifting. Helmet removal. Mobilization and immobilization of injured patients.

Bleeding control. Bandages. Burns. Fractures, dislocation, sprain.

Fainting. Shock. Allergy

Stroke. Convulsions. Diabetes mellitus: Hypoglycaemia. Shortness of breath.

Poisoning. Drugs. Drunkenness.

Note: Participation at 75% of practices is necessary. Compensation of absences is possible in subsequent practices.

Development in learning skills will be controlled all the time during the practices in the semester.

Mode of certifying absences: oral – referring to practices

Requirements: The student should be able to

recognize emergencies, and call for help

start with BLS + AED

provide airway management in unconscious patients

provide first aid for patients complaining for chest-pain, shortness of breath, signs for hypoglycaemia and having suffered from fainting, shock condition, convulsion, injuries.

The practical exam on the last practical lesson is evaluated with 5 grades method.

MEDICAL INFORMATICS

Name of the educational organizational unit: SE EKK Institute of Digital Health Sciences

Name of the subject: Medical Informatics

Type of the subject: 1 theory, 2 practice / week

code: FOKVIN009_1A

credit value: 3

Name of the lecturer of the subject: *Dr. Miklós Szócska*

Teachers: *Dr. Ádám Zoltán Tamus* (PhD, associate professor)

Tamás Tóth (assistant lecturer)

Zoltán Sándor (assistant lecturer)

Péter Dombai (lecturer)

Administrator: Ms. Dóra Bacsa

Term: spring

The exercise of the subject in the in the realization of the aim of the education:

To introduce the students to the medical application of informatics, the characteristics of modern, integrated information systems with respect to quantitative aspects and to decision demands of the modern sciences.

The medical informatics leans on methods of mathematics, statistics and computer sciences and it also includes from the different engineering, management and informatics procedures.

Topics of the subject:

Topic of the theoretical lectures (broken down into weekly figures): 2x7 lectures = 14 lectures

1. Introduction: disruptive technologies in the healthcare
2. Medical data – definitions, their collection and use on the individual and population level
3. Medical information on the Internet
4. Informatics background of the ambulance care – mobilcommunication
5. The background of basic healthcare informatics – integrated healthcare systems
6. The active aging – lifestyle supported by informatics
7. Clinical evidences – Scientific proofs and their data sources

Topic of the practical practices: 2x14 practices = 28 practices

- | | |
|--|-------------|
| 1. Application of MS Excel in the pharmacist practice
(functions, diagrams, advanced level) | 4x2 lessons |
| 2. Application of MS Word in the pharmacist practice | 2x2 lessons |
| 3. Execution of individual complex exercise | 1x2 lessons |
| 4. Database management (PuPha (MS Access)) | 3x2 lessons |
| 5. Practice with data representation and data visualisation
(MS Powerpoint, Prezi) | 3x2 lessons |
| 6. Execution of individual complex exercise | 1x2 lessons |

Requirements of participation of the lessons and the possibility of substitution of the absence:

According to rules of the Studies and Exam Code. Attendance at min. 75% of the classes (both lecture and practice). Max. 2 absence allowed from lectures. Max. 3 absence allowed from practices. Practices and lectures are evaluated separately!

The mode of the certificate in case of absence from the lessons and from the exams:

According to rules of the Studies and Exam Code. No certificate accepted.

The requirements of signature at the end of the term:

Suitable percentage of participation and solution of a computer test

Type of the exam:

Colloquium.

Exam requirements:

Exam: solution of a computer test (five-grade valuation).

Mode of the application for the exam:

Via Neptun system.

Mode of the certification in case of absence from the exam:

By a medical certification within three days.

List of lecture notes, course books, study-aids and literature which can be used to acquisition of the syllabus:

The educational materials are available at <http://dei-cloud.semmelweis.hu>

Username and password is announced at the lecture/first practice.

LANGUAGE COURSES – Medical Terminology

Department of Languages for specific purposes

Lecturer: **Dr. Fogarasi-Nuber Katalin**

Subject name: Medical Terminology; Dental Medical Terminology

Code: FOKVNYE227_1A; FOKVNYE234_1A

Credit value: 0

Thematics:

The aim of this course is to help students understand English, Latin and Greek medical and dental medical terms used in Hungary and worldwide. The material implies anatomical and clinical vocabulary adjusted to the schedule of the anatomy course. Terms for diagnoses and procedures are demonstrated by authentic medical documents. In addition, students get acquainted with the basic linguistic phenomena required for diagnostic skills.

Attendance and absence:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. once a semester).

Certifying absence:

A medical certificate is required if the student has been absent more than 3 times.

Requirements:

midterms (week 7 and 13)

Topics of midterms: vocabulary, construction of Latin phrases, used in anatomy, pathology, pharmacology

Students who fail a midterm have to retake it.

Semester signature:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. once a semester). Students have to pass the two midterms.

Evaluation:

The evaluation of student performance is based on the marks for the 2 written papers as well as the active participation in classes.

- 0–50% = 1
- 51–60% = 2
- 61–75% = 3
- 76–89% = 4
- 90–100% = 5

Textbooks:

Teaching material

Andrea, Barta – Éva Katalin, Varga – Ákos, Zimonyi: Medical terminology for students of dentistry. Bp., 2019 (e-book, available at the Department for Languages for specific purposes).

Excerpts of the following optional textbooks (chapters containing the basic vocabulary of dentistry):

1. Donáth Tibor (szerk.): Anatómia szótár - Lexicon Anatomiae - Anatomical dictionary - Anatomisches Wörterbuch. Budapest, Semmelweis Kiadó.
2. Paulsen F. - Waschke J.: Sobotta Atlas of Human Anatomy. Munich-Jena.

Medical Terminology

Week	Topics
1.	Skills: Communication between medical professionals, distinguishing medical English and Latin-Greek medical terminology Vocabulary: parts of the human body, anatomical planes and directions Linguistic phenomena: pronunciation, alphabet, basic form and dictionary entry of medical nouns and adjectives
2.	Skills: Part-whole theory in anatomical nomenclature Vocabulary: general terms of skeletal system Linguistic phenomena: possessive phrases in anatomy and in elemental diagnostics
3.	Skills: Part-whole theory in diagnostics adjusted to anatomical studies Vocabulary: bones of the upper and lower extremities Linguistic phenomena: nouns and their adjectives in anatomy
4.	Skills: Attribution in anatomical nomenclature and maxillofacial diagnoses Vocabulary: bones and joints of skull, terms used in maxillofacial surgery Linguistic phenomena: nouns and their adjectives
5.	Skills: Attribution in dental and clinical diagnostics adjusted to anatomical studies Vocabulary: oral and nasal cavity, related clinical terms Linguistic phenomena: nouns and their adjectives in possessive phrases
6.	Skills: Understanding complex anatomical and diagnostical phrases Vocabulary: tooth names, parts of teeth Linguistic phenomena: nouns and their adjectives in possessive phrases of anatomy and elemental dental and clinical diagnostics
7.	1 st midterm Skills: Distinguishing types of medical and dental medical documentation Vocabulary: pectoral girdle Linguistic phenomena: common endings of anatomical and clinical terms
8.	Skills: Understanding plural forms in anatomy and in clinical documentation Vocabulary: bones, joints and muscles of hand and elbow, Greek and Latin endings of clinical terms Linguistic phenomena: plural phrases in anatomy
9.	Skills: Describing symptoms and locations in dental and clinical diagnoses Vocabulary: pelvic girdle Linguistic phenomena: possessive phrases of anatomy and dental diagnostics
10.	Skills: Understanding plural forms in clinical diagnostics Vocabulary: joints and muscles of lower extremity, Linguistic phenomena: complex phenomena of anatomical phrases and accident surgical diagnoses
11.	Skills: Describing common facial and dental lesions Vocabulary: muscles of neck and face Linguistic phenomena: complex phenomena of diagnostic phrases
12.	Revision
13.	2 nd midterm
14.	Evaluation of student performance; retake of the midterms

Dental Medical Terminology

Week	Topics
1.	Skills: Distinguishing pharmaceutical products Vocabulary: musculoskeletal system, composition, diseases and injuries Linguistic phenomena: gramma, litra, gutta; numerals
2.	Skills: Understanding medical prescriptions, factory products Vocabulary: circulatory system, composition, diseases Linguistic phenomena: Using Genitive and Accusative in prescriptions
3.	Skills: The use of anatomical and clinical word stems, pre-and suffixes Vocabulary: gastrointestinal tract, composition, symptoms, diseases Linguistic phenomena: splitting terms in pre-and suffixes and stems
4.	Skills: Understanding terms related to caries; ICD-10 in use Vocabulary: respiratory system, composition, significance, symptoms and diseases, terms used in conservative dentistry Linguistic phenomena: Prepositional phrases in diagnostics and prescriptions
5.	Skills: Use of terms pertaining to diseases of pulp and periapical tissues, phrases on surgical procedures due to a condition, conditions after a procedure Vocabulary: urinary passages, pelvis, ureter, and bladder, endodontic terms Linguistic phenomena: instructions in prescriptions (Imperative, passive and active voice)
6.	Skills: Use of terms related to the developmental disorders of dentition and craniofacial malformations, phrases on surgical procedures due to a condition, conditions after a procedure Vocabulary: urogenital apparatus, terms used in oral pathology Linguistic phenomena: instructions in prescriptions; packaging materials used in pharmacology
7.	Midterm test
8.	Skills: Understanding terms of drugs types, prescribing magistral products Vocabulary: terms of drug types and effects Linguistic phenomena: Greek and Latin roots of pharmacological terms, prepositional phrases in diagnostics and prescriptions
9.	Skills: Use of terms related to gingival, tongue and periodontal diseases, terms pertaining to sensory organs Vocabulary: anatomical and clinical terms of sensory organs in medical documentation, parodontological terms, terminology of maculopapular rash Linguistic phenomena: Analysis of metaphorical terms describing sensory organs
10.	Skills: Understanding terms related to salivary gland disorders, writing diagnoses and prescriptions Vocabulary: endocrinological terms, terms pertaining to endocrine and exocrine glands Linguistic phenomena: complex phenomena of medical terminology
11.	Skills: Understanding terms related to diseases of the lips and oral mucosa. Infectious diseases Vocabulary: nomenclature of microorganisms, terms describing forms of cheilitis and stomatitis Linguistic phenomena: Latin terms and constructions used in clinical and dental infectology
12.	Skills: Use of terms describing tumour diseases of the oral cavity, dental lesions Vocabulary: histopathological findings, attrition of teeth Linguistic phenomena: Latin-Greek terms combined in complex diagnoses
13.	Endterm test
14.	Evaluation of student performance; retake of the midterms

Introduction to the Hungarian Language, Hungarian for Dental Medical Purposes I.

Department of Languages for specific purposes

Lecturer: *Dr. Fogarasi-Nuber Katalin*

Subject name: Introduction to Hungarian Language, Hungarian for Dental Medical Purposes I.

Code: FOKONYE268_1A; FOKONYE269_1A

Credit value: 0

Thematics:

The subject prepares students for the most important everyday communication situations in Hungary. Students get acquainted with the basics of the Hungarian language necessary for everyday communication. In the 2nd semester students expand their communication skills in language basics and become familiar with simpler terms used in conversations in the pharmacy and dental office and in the medical records of internal medicine.

Attendance and absence:

Attendance of lessons is obligatory. Students are allowed to have maximum 7 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester).

Certifying absence:

A medical certificate is required if the student has been absent more than 7 times.

Requirements:

midterms (week 7 and 13), oral test (week 14)

Topics of midterms: see detailed course description

Students who fail a midterm or the oral test have to retake it.

Semester signature:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester). Students have to pass the two midterms and the oral test.

Evaluation:

The evaluation of student performance is based on the marks for the 2 written midterms, the oral test as well as the active participation in classes. . Tests under 50% must be retaken. In the latter case, the mark fail will also be calculated towards the final mark. For the oral examination two teachers evaluate separately the grade of the student.

0–50% = 1

51–60% = 2

61–75% = 3

76–89% = 4

90–100% = 5

Curriculum and detailed course requirements

Term 1 Introduction to the Hungarian Language

Hungarian Language is a course for students in the first year without any previous exposure to Hungarian. Students will be introduced to the basic vocabulary of general Hungarian. Topics of the course are arranged into 14 teaching units (weeks), with special attention to the most important expressions. Each text is linked to vocabulary, grammar issues and tasks. The course consists of 56 hours (4 hours per week).

Week	Topics
1.	Hungarian alphabet, greeting „lenni” (to be) verb in present tense adjectives: hungry, thirsty, tired, sad, happy, ... (plus „lenni”)
2.	nationalities: Hungarian, English, German, Iranian, Canadian, Russian, etc.... occupation names: eg. dentistry student, student, dentist, doctor, teacher, assistant, dental technician Verbs 1: introduction
3.	Verbs 2: to stand, sit, read, look, ask, talk, cook, relax, walk, dance, like, can, study their use in simple sentences (s. lesson 10)
4.	Verbs 3: -ik Verbs
5.	„szeretek olvasni, tudok táncolni, fogorvos szeretnék lenni,” (I like to read, I can dance, I’d like to be a dentist) „tílos” -ni, „szabad” -ni (enni, inni, dohányozni) (forbidden to ..., allowed to ...) (eat, drink, smoke) When? parts of the day (s. greetings), days (s. lesson 12.) With who? to live, study
6.	Numbers + How much is it? How old are you? What time is it? Bus, tram line nr. ... (“hányas”), which district / floor? (“hányadik”) With what? (with metro, ...)
7.	Summary, 1st written test
8.	course book pp. 50-51, hot, cold, sensitive to hot, cold (What is it sensitive to?) Practicing verbs Where do you live?
9.	course book: lessons 7. and 8. „I’d like” + -t other foods and drinks Repetition from 8th week: Where do you live? (in detail, which district, floor)
10.	course book: lessons 9., 11. three-directedness in detail a.) library, school, restaurant, bank, cafe, shop, hospital, surgery, pharmacy b.) university, square, clinic What is the flat like?
11.	course book: lesson 13. practice: three-directedness (with pictures)
12.	course book: lessons 14., 16. What do we do from morning to night?
13.	Summary, 2nd test
14.	Oral test

Textbooks

L. Gyöngyösi – B. Hetesy: *Jó reggelt kívánok!*
A. Weidinger: *Nyelvtan*

Term 2 Hungarian for Dental Medical Purposes I.

Hungarian for Dental Medical Purposes I. is a course for students who completed the course Introduction to the Hungarian Language in the first term.

Course objectives are to acquire basic knowledge and skills in order to understand general medical communication, apply the acquired skills freely and creatively to minimize communication problems with Hungarians and use medical language correctly in practice.

Week	Topics
1.	Repetition, conversations (important verbs, questioning pronouns)
2.	Expression of ownership in Hungarian language; body parts. Adjectives: healthy, sick, weak, having a cold ("náthás), having fever ("lázás") Verbs: to cough, sneeze, stay, examine, take
3.	At the pharmacy 1.
4.	At the pharmacy 2. Since when? ("Mióta?"), How long? ("Mennyi ideje?")
5.	Medical record (Internal Medicine) 1. (patient records, family history, social history) Past tense
6.	Medical record (Internal Medicine) 2. (medications, allergies, surgeries, present complaints) speech understanding: coherent, longer text narrated in singular 3rd person.
7.	Summary, 1st written test
8.	Introduction to dental vocabulary, terms for teeth. Which tooth hurts? Where exactly does it hurt?
9.	Questions about pain 1., practice (pronunciation, grammatical explanations)
10.	Questions about pain 2, practice (pronunciation, grammatical explanations)
11.	Questions about pain 3., practice (discussing possible answers, practicing listening skill, targeted questions)
12.	Reading and discussing a sample dialogue Incomplete dialogue: writing or saying the dentist's sentences based upon the answers of the patient and writing or saying the patient's sentences based on the dentist's questions. Case history-taking (questions of the medical record->complaint, pain)
13.	Summary, 2nd written test
14.	Oral test

Textbooks

L. Gyöngyösi – B. Hetesy: *Jó napot kívánok!*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

A. Weidinger: *Nyelvtan.*

Syllabus of Physical Education

Department of Physical Education

Subject: Physical Education I.

Type of Subject: Compulsory

Code of Subject: FOKOTSI007_1A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

I. St. year I. semester:

1 – 2 weeks:	General information Accident, fire and environmental education. The mid-year adoption requirements, the construction of classes and the presentation of the university recreational and sports opportunities for extra – curricular activities. The purpose and practice of the warm-up, such as preventing sport injuries. Common warm-up. Free exercises.
3 – 4 weeks:	Stamina Development Preferably outdoors, on grass ground running, with the aim of developing good running and breathing techniques.
5 – 6 weeks:	Coordination enhancing exercises Various arm and leg exercises in place and in motion (walking, running, jumping, etc.)
7 – 8 week:	Balls skill development Introducing the most popular ball-games (football, basketball, handball, volleyball). Exercising technical and tactical elements of the games.
9 – 10 weeks:	Strengthening exercises Hand-wait exercises in walking, running and jumping stationary.
11 – 12 weeks:	Posture improving exercises Core muscle strengthening exercises in various positions.
13 – 14 weeks:	Stretching exercises and it's relaxing effects The physiological background of stretching and it's practical role and importance in everyday activities.

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

Subject: Physical Education II.

Type of Subject: Compulsory

Code of Subject: FOKOTSI007_2A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

I. St. year II. semester:

1 – 2 weeks: **General information**

Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra -curricular activities. Theory and practical application of the warm-up as a sports injury risk significantly reducing factor. Common to the bench. Free exercises.

3 – 4 weeks: **Stamina Development**

Moderate – intensity continuous running load. Skipping exercises, practice free base form of gymnastic exercises.

5 – 6 weeks: **Coordination enhancing exercises**

The Floorball – learning the basic technical and tactical aspects of the game to improve hand-eye coordination.

7 – 8 week: **Strengthening exercises**

Using medicine-balls focusing on different muscle groups.

9 – 10 weeks: **Ball games**

Basketball – skill improving exercises (dribblings, throws, passes, etc.)

11 – 12 weeks: **Posture improving exercises**

Wall-bar exercises (pull-ups, crunches, etc)

13 – 14 weeks: **Stretching exercises**

Stretching exercises in pairs using sitting, standing, recumbent positions.

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons.

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

COMPULSORY SUMMER PRACTICE

I.

Dental Assistant Practice – 2 weeks (60' hours)

Week 1

- Introduction of the summer assistant practice, Fire and job sec. Rules, code of conduct
- Introduction of the Dental Clinical Training Centre, patients check in and patient pathway, dental departments in the Centre

Lecture: General tasks of a dental assistant, the most important parts of their profession in the different departments.

Lecture: The basic structure of the patient registration system.

Visit of the main sterilization unit

Lecture: Contamination, surface-, and instrument disinfection. Basic rules of sterilisation, and assistant tasks besides the dental chair

Lecture: Infectioncontrol, documentation and quality control

Lecture: Hand hygiene, prevention of the pinprick accidents

Presentation of manual and machine driven mixing of impression materials, different types of material mixing practices: silicone, polyether, alginate.

Lecture: Basic and auxilliary materials used in the dental office: Impression-, filling-, luting materials, endodontic desifenctants

Mixing practice of phosphate-, carboxilate-, and glass ionomer cements

Introduction of four-handed treatment

Lecture: Basic rules of four-handed treatment and patient positions during the dental treatment

Week 2 (practicing the things learnt the previous week)

Clinical assistant practice in the clinical Department

II.

Dental Laboratory Technical Practice (60 hours)

Topics of the practical sessions:

1. week: visiting of a dental laboratory

- Introduction of the laboratory, of its structure. Demonstration of the cast making, metall casting and porcelain veneering.
- Getting acquainted with the making of fixed and removable dental appliances.
- Presentation of a specific odontotechnological workphase, as a group assignement (8 minute ppt presentation).

2. week:

- Introduction to the training laboratory, handing out of the instruments, demonstration of the instruments
- Cast making
- Wax pattern making of and incisor and a praemolar tooth.
- Waxing up of an occlusal surface.
- Artificial teeth

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

BASIC MODULE



Faculty of Dentistry
2nd year

STUDY PROGRAMME

BASIC MODULE				
3rd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Microscopic Anatomy and Embryology II.	C4L2P2	final#	Macroscopic Anatomy II., Microscopic Anatomy and Embryology I.
compulsory	Dental Biochemistry II.	C3L2P1	final#	Dental Biochemistry I.
compulsory	Molecular Cell Biology II.	C3L1P2	semifinal	Dental Biochemistry I., Medical Chemistry
compulsory	Medical and Dental Physiology I.	C8L5P3.5	semi-final	Microscopic anatomy and Embryology I., Macroscopic anatomy II., Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Macroscopic anatomy II.
compulsory	Basic Immunology	C2L2P1	semi-final	Cell Science, Dental Biochemistry I.
compulsory	General Dental Preclinical Practice	C4L1P3	semi-final*	Physical Foundations of Dental Materials Science, Macroscopic Anatomy I.
compulsory	Hungarian for Dental Medical Purposes II.	C0L0P4	practice mark	Hungarian for Dental Medical Purposes I.
compulsory	Physical Education III.	C0L0P1	signature	
	Total Credit	27		

BASIC MODULE				
4th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Medical and Dental Physiology II.	C8L5P3.5	final#	Medical and Dental Physiology I., Microscopic anatomy and Embryology II., Molecular Cell Biology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I. Macroscopic anatomy II.
compulsory	General and Oral Microbiology	C3L2P2	semi-final*	Microscopic Anatomy and Embryology II., Molecular Cell Biology I., Medical and Dental Physiology I.
compulsory	Genetics and Genomics	C2L1.5P1	semi-final	Microscopic Anatomy and Embryology II., Basic Immunology, Molecular Cell Biology I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I., General Dental Preclinical Practice
compulsory	Hungarian for Dental Medical Purposes II.	C4L0P4	signature	Hungarian for Dental Medical Purposes II.
compulsory	Molecular Cell Biology II.	C4L2P2	final#	Dental Biochemistry II., Molecular Cell Biology I.
compulsory	Physical Education IV.	C0L0P1	signature	
	Total Credit	25		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

15 credits should be gained from the elective subjects during the 5-year studies.

C = Credit point, L = Lecture (hours/week), P = Practice (hours/week)

LIST OF TEXTBOOKS (The list may change!)

- 1 Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition).
- 2 Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss, 2017)
- 3 Harper's Illustrated Biochemistry (30th edition). ISBN-13: 978-0071825344
- 4 Wilson, Mansfield, Heath, Spence: Dental Technology and Materials for Students. Backwell Scientific Publications. ISBN 0-632-01763-5
- 5 A.Newbrun: Cariology Quintessence. ISBN 0867152052
- 6 C.M.Sturdevant: Operative Dentistry. Mosby ISBN 0-80166366-0
- 7 Walton-Torabinejad: Principle and Practice of Endodontics. W.B.Saunders Co. 2nd ed. 1996. ISBN 0-7216-4924-6
- 8 Herbert T. Shillingburg: Fundamentals of Fixed Prosthodontics – Quintessence 4th ed. 2012. ISBN 931386500
- 9 R.M. Basker, J.C. Davenport: Prosthetic Treatment of the Edentulous Patient – McMillan Press Ltd 5th ed. 2011. ISBN 978-1405192613

Recommended textbooks:

- 1 Monos E.: Physiology of the Venous systems. Bp. 1999.
- 2 Monos E: Hemodynamics: Biomechanics of the Blood Circulation. Semmelweis Univ. KODK. Bp. 2002.
- 3 Lodish et al.: Molecular Cell Biology. 3rd ed. Scientific American Books Inc. 1995.
- 4 Murray,Robert K.-Granner,Daryl K-Mayes,Peter A.-Rodwell,Victor W: Harper's Illustrated Biochemistry. 26th Ed. McGraw-Hill. ISBN 0-07-138901-6 (Online version: www.lib.sote.hu)
- 5 G.Nikiforuk: Understanding Dental Caries (1-2) Karger. ISBN 3-8055-3906-1(set)
- 6 Biochemistry Laboratory Manual. Ed.Gy.Szabados. Bp. Semmelweis Univ.
- 7 Field, James: PreClinical Dental Skills at a Glance, Blackwell Publishers (Wiley) ISBN-13: 9781118766675
- 8 Hermann Péter, Szentpétery András: Gnatológia (Semmelweis Kiadó, 2018)

MICROSCOPIC ANATOMY AND EMBRYOLOGY (I –) II.

Department of Anatomy, Histology & Embryology

Course Director: *Dr. Andrea D. Székely*

LEARNING OBJECTIVES

Aims of the lectures in embryology: Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (general embryology). Presentation of the development of the organs and functional systems parallel with the gross anatomical and histological lectures including the frequently occurring malformations.

Aims of the lectures in histology: Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic (epithelial, connective, muscle and nervous) tissues. Complementing gross anatomy with a detailed presentation of the fine structure of organs, including the ultrastructural details together with the molecular background. Important chapters: basic tissues, viscera, central nervous system.

Aims of the practical sessions in the histology room: Facilitate the understanding of ground (epithelial, connective, muscle and nervous) tissues and the fine structure of the organs through the observation and interpretation of histological specimens.

LECTURES: 2 × 45 min in both semesters

PRACTICAL CLASSES: I.: 3 × 45 min; **II.:** 2 × 45 min.

ECTS CREDITS: Altogether 9 (**I.:** 5; **II.:** 4).

MIDTERM TESTS: written (e-learning type)

ACCEPTANCE OF THE SEMESTER:

Active participation in lectures, and dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled practical classes to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the lectures and in the histology classes.

Students are obliged to participate in the midterm test or their semester would not be accepted. Missed midterms should be retaken at the given retake timepoints the department offers during the last two weeks of the semester.

TYPE OF EXAMS: oral and written

I.: semifinal examination, II.: final exam

Semifinal and final examinations consist of written and oral parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Oral test in Microscopic Anatomy: identification of structures on virtual histological specimens including relevant theoretical questions

LIST OF TEXTBOOKS

1. **The Developing Human – Clinically Oriented Embryology**, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
2. **Histology: A Text and Atlas: With Correlated Cell and Molecular Biology**; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
3. **Wheater's Functional Histology, A Text and Colour Atlas**, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
4. **Oral Anatomy, Histology and Embryology**, 4th Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009

Recommended textbooks:

5. **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
6. **Junqueira's Basic Histology: Text and Atlas**; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033
7. **Wheater's Functional Histology, A Text and Colour Atlas**, 6th Edition by B Young, G O'Dowd and P Woodford ISBN 9780702047473, Churchill Livingstone, Edinburgh, 2013.
8. **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
9. **Illustrated Dental Embryology, Histology, and Anatomy**, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.

COURSE DESCRIPTION

Microscopic Anatomy and Embryology II.

Lectures in Histology and Embryology; practical classes in Histology

Subject matter

Histology: Microscopical structure of the CNS and PNS (cerebrum, cerebellum, brain stem, spinal cord, ganglia) organs of special senses (apple of eye, inner ear), endocrine glands (pineal, pituitary, thyroid, suprarenal glands) skin and appendages, lymphatic system and the mammary gland.

Embryology: Development of the central and peripheral nervous systems, development of the organs of senses together with their malformations

Credits: 4

Prerequisites: Macroscopic Anatomy I-II.
 Microscopic Anatomy I.
 Cell Biology

Week	Lectures	Histology laboratory
Week 1	1. Cellular components of lymphatic tissue. Thymus, tonsils, MALT 2. Structure and circulation of lymph nodes and spleen	Thymus, tonsils
Week 2	3. Microscopy of the CNS – fine structure of the spinal cord 4. Microscopy of the CNS – spinal reflexes, receptors, effectors, monosynaptic/ proprioceptive reflexes	Lymph node, spleen
Week 3	5. Microscopy of the CNS – Nociceptive (withdrawal) and autonomic reflex arcs 6. Microscopy of the CNS – Fine structure of the cerebral cortex. Cortical fields, Brodmann areas	Histology of the peripheral nervous system (peripheral nerve, motor end plate, spinal cord)
Week 4	7. Microscopy of the CNS – Cranial nerve nuclei 8. Microscopy of the CNS – Cross section of the brain stem	Histology of the central nervous system
Week 5	9. Microscopy of the CNS – Thalamic nuclei 10. Microscopy of the CNS – Sensory systems, epicritical and protopathic pathway arising from the brain stem	Endocrine system
Week 6	11. Microscopy of the CNS – Motor systems, pyramidal tract. Structure and connections of the basal ganglia. 12. Microscopy of the CNS – Motor pathways	1. Midterm test (Histological slides of weeks 1-5)
Week 7	13. Microscopy of the CNS – Microscopy of the cerebellum, pathways. Functional considerations 14. Microscopy of the CNS – Hypothalamus, the hypothalamo-hypophyseal system	Microscopy of the CNS - consultation
Week 8	15. Microscopy of the CNS – Brainstem monoaminergic systems. 16. Microscopy of the CNS – Limbic system	Microscopy of the CNS - consultation
Week 9	17. Development of the neural tube. Cranio-caudal and dorso-ventral differentiation. 18. Differentiation of the brain vesicles	2. Midterm test Microscopy of the CNS Development of the nervous system
Week 10	19. Formation and derivatives of the neural crest and placode ectoderm 20. Development of the skull Development of the vertebral column, limb development	Histology of palm skin, scalp skin Mammary gland
Week 11	21. Skin and appendages. Mammary gland 22. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation.	Organs of special senses I. Eyeball, retina, lacrimal gland
Week 12	23. Inner coat of the eyeball, retina. Optic nerve, visual pathway, visual cortex, disorders. Visual reflexes 24. Development of the eye	Organs of special senses II. Organ of Corti
Week 13	25. Organ of hearing (external ear, middle ear, auditory ossicles) 26. Spiral organ of Corti. Auditory pathway, auditory cortex	Revision
Week 14	27. Bony and membranous labyrinth. Vestibular system 28. Microscopy of the CNS – Olfactory and gustatory systems	Histology test

*The topics of the Histology laboratories together with the accurate time and topics of the MIDTERM tests are going to be announced in the departmental homepage (as well as in the Handbook)

TOPICS OF THE FINAL EXAMINATION

Topic list for the final examination:

Microscopic Anatomy and Embryology I. (see there)

Microscopic Anatomy and Embryology II.

Lymphatic organs

- Histological structure of lymph nodes
- Spleen (fine structure and circulation)
- Thymus
- Tonsils, MALT

Development of the nervous system and organs of special senses

- Development and primary differentiation of the neural tube
- Development of brain vesicles
- Development of the peripheral nervous system (neural crest, placodes)
- Development of the organ of vision
- Development of the organ of hearing&equilibrium

Development of the locomotor system

- Membranous and cartilaginous neurocranium and viscerocranium
- Development of the limbs and vertebral column
- Development of the muscular system

Histology of the nervous system

- Histology of the neurons developing from the neural tube
- Glial cells
- Histology of the neurons and supporting cells developing from the neural crest
- Fine structure of peripheral nerves
- Receptors and effectors
- Interneuronal synapses

Microscopy of the central nervous system

- Fine structure (microscopy) of the spinal cord
- Proprioceptive reflexes
- Nociceptive reflexes
- Autonomic reflexes
- Fine structure of the medulla oblongata
- Fine structure of the pons
- Fine structure of the midbrain
- Classification of cranial nerve nuclei
- Tracts of the brain stem
- Reticular formation, monoaminergic systems
- Fine structure of the cerebellum
- Cerebellar afferents and efferents
- Fine structure of the thalamus
- Hypothalamo-hypophyseal system
- Fine structure of the basal ganglia

- Fine structure of the cerebral cortex, cortical fields
- Tracts of the protopathic sensibility (anterolateral system)
- Tracts of the epicritic sensibility (posterior funiculus/medial lemniscus)
- Corticospinal tract (pyramidal tract)
- Extrapyramidal system
- Limbic system (nuclei and tracts)

Endocrine organs

- Microscopical anatomy of the pituitary gland; development of the posterior lobe
- Microscopical anatomy and development of the anterior and intermediate lobes of the pituitary gland Blood supply of the pituitary gland
- Microscopical anatomy of the pineal gland
- Microscopical anatomy and the development of the thyroid gland
- Microscopical anatomy and the development of the parathyroid gland
- Microscopical anatomy and the development of the suprarenal gland
- Histology of the islands of Langerhans

Organs of special senses

- Microscopical structure and development of the skin (scalp and palm)
- Histology and development of skin appendages, mammary gland
- Coats of the eyeball
- Chambers of the eye, vitreous body
- Lens, accommodation
- Visual pathway, visual reflexes
- External ear, tympanic membrane. Tympanic cavity, auditory tube, hearing ossicles.
- Organ of Corti. Auditory pathway
- Vestibular system
- Bony and membranous labyrinth
- Cochlea and cochlear duct
- Organs of olfaction and taste

- External ocular muscles, eye movements
- Accessory and protective apparatus of the eye (palpebrae, conjunctiva, fasciae, lacrimal apparatus)
- External ear, tympanic membrane. Tympanic cavity, auditory tube. Hearing ossicles (joints, muscles)
- Organ of Corti. Auditory pathway. Vestibulocochlear nerve.
- Vestibular system
- Bony and membranous labyrinth, vestibulum
- Cochlea, cochlear duct
- Organ of olfaction, olfactory pathway, olfactory nerve
- Organ of taste, central processing of taste (tracts)

BASIC IMMUNOLOGY

Department of Genetics, Cell and Immunobiology

Course director: *Prof. Dr. Edit Buzás*

Tutor: *Dr. Marianna Csilla Holub*

Subject code: FOKGEN037_1A

Prerequisite subject: Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.; Medical and Dental Physiology II

Credits: 3

	Lectures (2 hr / week)	Practicals / Seminars (1 hr / week)
1.	The role, processes, organs and cells of the immune system	Basic terms, the immune system in the lab
2.	Principles of natural immunity	Methods based on antigen-antibody interactions I. Immunoserology
3.	The complement system; inflammation and acute phase reaction	Methods based on antigen-antibody interactions II.
4.	Antigen, antigen presentation and MHCs	Methods based on antigen-antibody interactions III.: Flow cytometry
5.	Antigen receptors and their formation	Complement assays
6.	T lymphocytes and cell-mediated immune response	HLA typing
7.	B lymphocytes and humoral immune response	Vaccination I.
8.	Mucosal immunity	Vaccination II.
9.	Immune response in infections	Biological therapies I.
10.	Immunodeficiencies	Biological therapies II.
11.	Hypersensitivity	Hypersensitivity I
12.	Tolerance and autoimmunity	Hypersensitivity II-IV.
12.	Antitumor immunity	Screening methods for autoantibodies
13.	Immunology of transplantation	Case studies
14.	Immunology of transplantation	Case studies II.

The sequence of lessons may change.

75% minimum attendance of both the lectures and practical lessons is necessary for the end-term signature. Retake for the midterm will be organized for those student, how miss the midterm because an acute disease, but they have to show up the medical record.

Midterm: written test once in the semester. The midterm is not a requirement for the validity of the semester. Retake (one make up day) will be organized for those student, who miss the midterm because an acute disease, but they have to show up the medical record.

Exam: written test in the exam period. The exam grade will be calculated from the sum of midterm scores and exam scores. For passing you have to reach more than 50 % of both the exam scores and total scores.

Literature:

KUBY Immunology • W. H. Freeman and Company • New York • 2013

Immunology seminars (e-book): <http://gsi.semmelweis.hu> (The user name and password is on the course datasheet of the Neptun.)

GENETICS AND GENOMICS

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. F. Ágnes Semsei**

Subject code: FOKGEN181_1A

Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III., Medical and Dental Physiology II

Credit: 2

Lectures (2 hours per week):

1. Introduction to human genetics, the human genome
2. Monogenic inheritance (Autosomal inheritance)
3. Role of sex in inheritance
4. Genetic variations
5. Chromosomal aberrations I.
6. Chromosomal aberrations II.
7. Epigenetics
8. Introduction to genomics. Methods in genomics
9. Genomic approach of complex inheritance
10. Pharmaco- and nutrigenomics
11. Midterm
12. Gene and genome manipulation
13. Genetics of biological processes
14. Population genetics and genomics; Genome and environment

Practices (1 hour per week):

1. Cytogenetics I.
2. Cytogenetics II.
3. Molecular genetic methods and applications in human genetics I.
4. Molecular genetic methods and applications in human genetics II.
5. Pedigree analysis: autosomal inheritance I. (AD)
6. Autosomal inheritance II. (AR)
7. Sex-linked inheritance I. (XR)
8. Sex-linked inheritance II. (XD, mitochondrial)
9. Complex inheritance
10. Consultation
11. Case studies
12. Genetic aspects of cell cycle and cell division disorders
13. Meiosis, gametogenesis; pre-implantation genetic testing
14. From genes to bedside

Important notes:

Students must visit at least 75% of the lessons. More than three absences from the practice or more than three absences from the lecture invalidate the semester, no signature is given. There are no extra practices.

There is one midterm during the semester. Spare midterm is organized for those students, who miss the midterm because an acute illness, but they have to show up the medical record to the tutor in one week. There is no opportunity to improve the midterm scores.

After the course there is a written exam (single choice and essay questions, family tree, karyogram, evaluation of molecular genetic studies etc.). The exam grade is calculated from the sum of midterm scores (maximum 40) and exam scores (maximum 60). Students have to reach more than 50 % of both the exam scores and total scores to pass the exam. In the third exam midterm scores are not calculated.

Core text: Medical Genetics and genomics (e-book)

Lecture and practice presentations and additional texts are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

DENTAL BIOCHEMISTRY II.

Department of Medical Biochemistry

Credits: 3

Total number of hours: 42; lectures (hours): 28; practices (hours): 14

Type of the course: obligatory

Academic year: 2021/2022

Code of the course FOKOMBT305_2

Course Director: Dr. Kraszimir Kolev

Contact details: H-1094 Budapest, Tűzoltó u. 37-47. tel: +36-1-459-1500#60010 email: Kolev.Krasimir@med.semmelweis-univ.hu

Position: Professor

Date of habilitation: 2008 Ref.: 266

Aim of the course:

The aim of the course is to comprehensively describe metabolic processes in the human body, from a medical point of view. The main theme of the semester is to elaborate further on carbohydrate and lipid metabolism commenced in Medical Biochemistry I, elaborate on amino acid and nucleotide metabolism, examine more thoroughly intermediary metabolism including the integration of processes throughout the organs and the human body as a whole. Furthermore, this course aims to afford to medical students the skills of being able to interpret complex physiological processes in the human body at a molecular level. During practices they discuss rapidly developing, promising areas of medicine („tomorrow's medicine"). The medical biochemical orientation of the course is based on the presentation of molecular bases of diseases that pose serious public health problems (cardiovascular, neurodegenerative, cancer states), with particular emphasis on discussing potential molecular targets of therapy.

Location of the course (lecture hall, practice room, etc.):

Premises located in the Basic Medical Sciences building (laboratory rooms located on the first floor and lecture halls located on the ground floor).

Upon the successful completion of the curriculum, the student should be able to:

Identify biochemical structures, know and understand the reactions in which medically important molecules participate; know and understand inter-organ biochemical processes; know and understand integrated metabolic functions of the human body. Overall, such knowledge is essential for understanding physiological and pathological processes and, consequently, for making sound professional decisions.

Prerequisite (s) for admission to the course: Medical Biochemistry I.

Terms and Conditions for Starting Student Course (Minimum, Maximum), Student Selection Method: Not applicable for compulsory subjects.

How to apply for the course: Application is through the Neptun online system.

The course in thematic details:

Lectures: weekly 1x90 min (2 hours)

Lecturers: Dr. Bartha Katalin (BK), Dr. Ambrus Attila (AA), Dr. Komorowicz Erzsébet (KE), Dr. Törőcsik Beáta (TB)

Week	Lectures: weekly 1x90 min (2 hours)	Practices (P): 2 hours every other week
1	Nitrogen balance. Digestion of proteins. Function of proteases, their regulation. Absorption of amino acids, amino acid transporters. (BK)	P: Determination of transaminases and creatine kinase activity
2	Catabolism of amino acids. Elimination of ammonia, reactions and regulation of ornithine cycle. Degradation of amino acids: fate of their carbon skeleton. The role of vitamins in amino acid metabolism. (BK)	P: Determination of transaminases and creatine kinase activity
3	Biosynthesis and degradation of heme. Iron homeostasis (BK)	P: Vitamin B12 deficiency and methylmalonic acidemias
4	Structure and function of nucleotides. The fate of nucleotides obtained through diet. Formation and elimination of uric acid; its metabolic role in humans. Synthesis and degradation of purine and pyrimidine nucleotides. Effects of cytostatic drugs on nucleotide metabolism. (AA)	P: Vitamin B12 deficiency and methylmalonic acidemias
5	Integration of metabolism. Metabolism of red blood cells. Red blood cell enzymopathies. Kidney metabolism, and dependence on fasting and acidosis. Metabolism of muscle and heart. Comparison of kidney and liver gluconeogenesis. Metabolic adaptation to physical effort. (TB)	P: Acute and chronic liver disease
6	The starvation-feeding cycle and its regulation. Regulation of hepatocyte metabolism in starvation. (TB)	P: Acute and chronic liver disease
7	General overview of blood clot formation and elimination. Fibrinogen and fibrin. Prothrombin activation and regulation of thrombin activity. Triggers of blood clotting, amplification of the initiation. (TB)	P: Tumor metabolism
8	Fibrinolysis. Activation of plasminogen. Inhibitors of plasmin. (KE)	P: Tumor metabolism
9	Inhibitors of blood coagulation and negative feedback mechanisms. (KE)	P: Prothrombin time and activated partial thromboplastin time. Molecular background of inherited thrombophilia
10	Cellular elements of the haemostatic system. Platelets and von Willebrand factor. Neutrophils and endothelial cells in haemostasis. Hemodynamic and biochemical interactions in haemostasis. The role of endothelial dysfunction in atherosclerosis. LDL oxidation and pattern-recognition receptors (TLR, scavenger receptors). (KE)	P: Prothrombin time and activated partial thromboplastin time. Molecular background of inherited thrombophilia
11	Membrane transporters. Na ⁺ /K ⁺ ATPase isoforms. (TB)	P: Measurement of fibrin stabilization and soluble fibrin monomers. Molecular background of acquired thrombophilia
12	Chemical neurotransmission. Cholinergic neurotransmission. Biosynthesis of acetylcholine. receptors, acetylcholine esterase. Molecular mechanism of exocytosis. (TB)	P: Measurement of fibrin stabilization and soluble fibrin monomers. Molecular background of acquired thrombophilia
13	Noradrenergic neurotransmission. Synthesis and metabolism of norepinephrine. Synaptic uptake. Adrenergic receptors. Molecular mechanism of epinephrine and norepinephrine effects on various organs. (TB)	P: The relationship between metabolism and the functions of the nervous system
14	Glutamatergic and GABA-ergic neurotransmission. (TB)	The relationship between metabolism and the functions of the nervous system

Potential overlap(s) with other topics: none

Requirement for special study: not applicable

Policy regarding attending practices; policy regarding absences:

Practices are mandatory. It is not possible to make up for missed practices. In case of absences amounting to more than 2 practices, the semester is not acknowledged. Arriving to a practice with a delay of more than 10 minutes is considered an absence. Practice/seminar participation performance will be evaluated by the tutor: as such, maximum 10 points per semester can be obtained that may count towards the final grade, see under "Grading system" for further details.

Lectures: At the end of each lecture, there will be a Kahoot on the topic of the lecture, consisting of 5 questions; 20 secs are allocated per question. Points can be earned by correctly responding to at least 4 out of 5 Kahoot questions. Maximum 1 point can be earned per lecture, as outlined by the lecturer. Through the Kahoots, students may obtain points that will be added to the points earned at the final exam, as detailed in “Grading system”, see below.

Means of assessing the students’ progress during the semester:

A midterm will take place in the 6th and another in the 11th week, during the practice/seminar (allocated time per midterm: 20 minutes). Midterms may only be taken in person and not through Zoom, unless otherwise indicated. Each midterm will consist of multiple choice questions (MCQs) from which max 20 points can be obtained (10 points per midterm).

It is obligatory to gather ≥ 10 points from both midterms in order to be allowed to sit for the final exam. For those students who fail to amass ≥ 10 points from both midterms, one or both midterms can be retaken in the last week during the practice/seminar (allocated time per midterm: 20 minutes). The midterm points will be added as “points” to the result of the final exam, as detailed in “Grading system”, see below.

Requirement for acknowledging the semester, and for allowing the student to take the final exam: Attendance of at least 75 % of the practical classes and at least 10 points from both midterms.

Competition: The competition is held on the last week during the practice/seminar (allocated time: 35 minutes) and consists of 70 multiple choice questions (MCQs). The competition may only be taken in person and not through Zoom, unless otherwise indicated. Only students who amass 14 or more points from the midterms (not the retakes) can participate in the competition. Top 10% scorers (from those students enrolled in the Dental Biochemistry II course that participated in the competition) will be invited for an oral exam on the last day of that week. Points obtained from midterms, Kahoot quizzes, or practice/seminar performance (see below), do not count in the competition. Winners will be announced later in the same day, and will be exempted from the final exam.

Exam Type: Final. Form: written test and oral exam, based on material of the official textbook, lectures and practices published at the department’s Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

Exam Requirements: The material for the written test exam is the material of the lectures and practices in the subject, with the corresponding textbook chapters.

Types and modes of grading:

The competition is held on week 13, and the structure of the competition is the same as that of the final.

Grading system: The grade of the final exam is based on the points obtained i) in Kahoot quizzes at the lectures, ii) during the seminars/practices, iii) at the two midterms, iv) at the written MCQ semifinal exam, v) during an oral exam. The written MCQ exam and the oral exam will take place in the same day of the examination period.

The grading system is as follows:

(i) **Kahoot:** maximum 1 point per lecture.

(ii) **Seminar/practice points:** maximum 10 points.

Total points from (i) and (ii) cannot exceed 20 points.

(iii) **Two midterms:** maximum 20 points.

(iv) **Written MCQ exam:** This test consists of multiple choice questions (MCQs) from which max 100 points can be obtained (allocated time: 100 minutes).

If the score of the MCQ exam is 49 or below, then the grade of the final exam is ‘fail’.

If students reach 50 points on the MCQ exam, the midterm points, practice/seminar performance points and lecture Kahoot points (total max. 40 points) will be added to the MCQ score.

Grade calculation of the final exam from the total points (MCQ+semester):

95- 140: grade 5 (excellent)

86- 94: grade 4 (good)

71- 85: grade 3 (satisfactory)

50- 70: grade 2 (pass)

(v) Oral exam: Only those students who obtained at least 50 points at the semifinal MCQ test will be invited for an oral exam. For those who scored 49 and below, a final mark of “1” will be registered in the Neptun, and points obtained during the semester will not count. During the oral exam, the examiner will pick five questions from those MCQs that were correctly answered by the student. If the student will not elaborate properly on 2 or 3 MCQs, his/her MCQ mark will be decreased by one grade (i.e. if MCQ Moodle exam is 3 and the student does not elaborate adequately on 2 or 3 MCQs picked by the examiner, the MCQ grade will be $3-1=2$). If the student will not elaborate properly on 4 or 5 oral MCQs, his/her MCQ mark will be decreased by two grades (i.e. if MCQ Moodle exam was 3 and the student does not elaborate adequately on 4 or 5 oral MCQs picked by the examiner, the MCQ mark will be $3-2=1$, i.e. “fail”). If MCQ Moodle exam is 2 and the student does not elaborate adequately on 3 or more MCQs picked by the examiner, the MCQ mark will be “fail”. The points from Kahoot and midterms will be added only if the student obtained from MCQ+oral exam a grade of ≥ 2 .

How to apply for the exam: The exam dates are announced on the 12th week of the semester. We provide at least one exam date each week. Applications are made in the Neptun system in accordance with the University Study and Exam Rules.

Opportunities to repeat the exam: A retake is possible on the closest announced exam date at least one day after an unsuccessful exam.

Printed, electronic and online notes, textbooks, tutorials, and literature for online learning (html for online material):

Harper’s Biochemistry (30th edition, or latest)

Online material published in the department’s Moodle e-learning system (<https://itc.semmelweis.hu/moodle/>).

MOLECULAR CELL BIOLOGY I–II.

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Detailed information on the subject is available on our website under <https://semmelweis.hu/molekularis-biologia/en/students/>

MEDICAL AND DENTAL PHYSIOLOGY

Department of Physiology

Credit Points: 8 (I. semester) + 8 (II. semester)

Head of the Department: **Dr. László Hunyady, Full Professor**

Course Director: **Dr. Péter Várnai, Full Professor**

Tutor: **Dr. András Balla**

Aim of Medical and Dental Physiology course:

The goal of Medical and Dental Physiology course is to give the students the understanding of the concepts and principles of medical and dental physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.

First semester

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.
2. Signal transduction: receptors, G proteins, second messengers. Cellular calcium metabolism, receptors of growth factors and cytokines. Membrane trafficking and vesicular transport.
3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.
4. Neuromuscular junction and physiology of skeletal muscle. Autonomic neurotransmitters and physiology of smooth muscle.
5. Physiology of the blood.
6. Physiology of the heart I.: origin and spread of cardiac excitation Cardiac cycle. Regulation of cardiac output.
7. Electrocardiography (ECG). Physiology of blood circulation: introduction.
8. Hemodynamics, systemic circulation. Microcirculation.
9. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.
10. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.
11. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.
12. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.
13. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.
14. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. Acid-base balance: role of lungs and kidneys.

Second semester

1. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
2. Secretory functions of the gastrointestinal tract. Digestion and absorption of food.
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
4. Function of the adrenal cortex. Function of the thyroid gland. Energy balance, quality and quantity requirement of food.
5. Hormonal regulation of intermediary metabolism.
6. Calcium metabolism, bone tissue, growth. Function of the reproductive system: endocrinology of the sexual differentiation and development.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioral mechanisms, motivation; emotion.

Practices, I. semester:

- Typing of Blood Groups, Blood Coagulation Test
- Blood cell counting, determination of hemoglobin concentration and hematocrit.
- Leukocyte differential count on peripheral blood smear
- Recording and analyzing the human ECG
- Blood pressure measurement in humans
- Computer simulation: Skeletal and smooth muscle
- Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Practices, II. semester:

- Human pulmonary function tests
- Smooth muscle of rabbit small intestine
- Oral glucose tolerance test (OGTT)
- Electrooculography (EOG) and investigation of the vestibular system
- Reflex function
- Computer simulation: Studies on circulatory reactions of a virtual rat
- Computer simulation: Neuromuscular junction

Attendance on practices and lectures, replacement in case of missed sessions:

The lecture hours per week are 5; the practice hours per week are 3.5. The attendance of a minimum of 75% of practices (including “seminars”) is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Consequences of absence from sessions and exams:

No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken. Failing to certify absence from an exam causes registering “absence” = “nem jelent meg” in the NEPTUN system.

Method of checking acquired knowledge during the study period:

The knowledge of the students is tested in a written form on a weekly base. The written short tests cover the material of lectures of the previous week.

Semi-final and final exams:

In the examination period the students have to give semi-final exam in the first semester and final exam in the second semester.

Requirements of the exam:

Semi-final exam: material of the Medical and Dental Physiology I.

Final exam: material of the Medical and Dental Physiology I. and Medical and Dental Physiology II.

The semi-final exam is oral exam. The oral exam consists of two theoretical questions (I-II). The overall result of the oral exam is based on the two theoretical grades; a failed (1) theoretical question results in an overall failed (1) exam.

Lists of the theoretical questions can be found in the webpage of the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and coats should be placed next to the wall of the exam place; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Grading of courses:

Semi-final exam: The students need to bring ID card and the laboratory report book to participate in the exam. The oral exam consists of two theoretical questions (I-II). Grouping of questions, the topics of the semi-final exam can be found in the webpage of the Department of Physiology.

I: 1 and 2 topics of the semifinal exam

II: 3, 4 and 5 topics of the semifinal exam

The overall result of the oral exam is based on the two theoretical grades but a failed (1) theoretical question results in an overall failed (1) exam. The mathematical average of two oral exam grades gives the grade of the semi-final exam:

Excellent (5): 4.51 - 5.00

Good (4): 3.51 - 4.50

Satisfactory (3): 2.51 - 3.50

Pass (2): 2.00 - 2.50

Fail (1): below 2.00 or in case of failed (1) theoretical question.

The following rules will be enforced during the exam: electronic devices must be kept in the baggage; baggage and coats should be placed next to the wall of the lecture halls or the practice rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Failing to certify absence causes registering “absence” = “nem jelent meg” in the NEPTUN system.

Final exam: The final exam consists of a written and an oral part. The written and oral part of the final exam starts at 8:45 by showing up in the selected exam place. Your exam place and examiners are announced in written form at 8:30 (attached to the front door of the corridor of the Physiology Practice Rooms). The students need to bring ID card and the laboratory report book to participate in the exam. The written part consists of 30 questions and takes 45 minutes. Grading of the written part:

0-14	correct answers = 1
15-18	correct answers = 2
19-22	correct answers = 3
23-26	correct answers = 4
27-30	correct answers = 5

The oral exam starts at 9:45 and consists of two theoretical questions (I-II). Grouping of questions, the topics of the final exam can be found in <http://semmelweis.hu/elettan/teaching/second-semester>.

- I: 1, 2, 3, 4 and 5 topics of the final exam
- II: 6, 7 and 8 topics of the final exam

The overall grade of the final exam is the mean of three (written exam grade, two oral exam grades), but a failed (1) theoretical question results in an overall failed (1) exam.

Excellent (5):	4.51 - 5.00
Good (4):	3.51 - 4.50
Satisfactory (3):	2.51 - 3.50
Pass (2):	2.00 - 2.50
Fail (1):	below 2.00 or in case of failed (1) theoretical question.

The following rules will be enforced during the exam: electronic devices must be kept in the baggage; baggage and coats should be placed next to the wall of the lecture halls or the practice rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Failing to certify absence causes registering “absence” = “nem jelent meg” in the NEPTUN system.

Exam registration:

Registration for the exam must be recorded through the NEPTUN system.

Rules of repeating exams:

Repetition of the exam is possible at least three days after the unsuccessful trial.

Requirements of the exams:

Semi-final exam: material of the Medical and Dental Physiology I.

Final exam: material of the Medical and Dental Physiology I. and Medical and Dental Physiology II.

List of textbooks:

Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition). 2017. ISBN: 9780323393942

Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss). 2017. ISBN: 9789633314159.

CONSERVATIVE DENTISTRY AND ENDODONTICS, PRE-CLINICAL I.

Department of Conservative Dentistry

Head of Department: *Dr. Zsuzsanna Tóth D.M.D., Ph.D.*

Second Semester

Phantom-course (Pre-clinical laboratory course)

Lecture (1 hour/week)

Introduction to operative dentistry

Clinical dental anatomy, histology.

Occlusion

Cariology: the lesion (macromorphology, enamel caries, dentinal caries, advanced carious lesion). Fundamentals in cavity preparation (nomenclature/caries, cavity from, cavity classification/)

Steps in cavity preparation by Black.

Cutting instruments and mechanical and biological considerations.

Class I. Facial Pit Cavity preparation for amalgam.

Class I. Occlusal Cavity

Preparation for Amalgam. Class VI. Cavity preparation for Amalgam.

Class V. Facial Cavity preparation for amalgam and Tooth-Colored Material.

Class II. Cavity preparation for Amalgam.

Class III. Cavity preparation for Tooth-Colored Material.

Class IV. Disto-Incisal Cavity Preparation for Tooth-Colored Material.

Class II. Cavity preparation for Tooth Colored Material. Tunnel preparations for proximal Restorations.

Class II. Cavity preparations for Gold (metal) inlay and gold onlay restorations.

Class I, IV, V, VI. Cavity preparation for gold inlay restorations

Cavity preparations for Composit resin and porcelain inlay restorations.

Pin-retained restorations (type of pins, Indications and contraindications).

Preparation for Porcelain Veneers.

Note: The maximum number of absences in a semester is 3.
During the semester 3 midterm examinations should be passed.
Practical course grade.

Manual training (3 hours per week)

Introduction to practice: general

Department's policy. Rules of the house.

Distribution of instruments.

Handing over of instruments.

Discussion of drilling methods

Drilling practice I.

Drilling practice II.

Drilling practice III. Practical exam

Grinding of extracted carious human teeth

Black's class I. and V. cavity preparation for plastic restoration.

Preparation of class II. Cavities (I.)

Preparation of class II. cavities. (II.)

Preparation of class III. and IV. cavities

Cavity preparation by modified Black's principles. Practical exam

Class I. and V. cavity preparation for inlay

Class II. cavity preparation for metal inlay

Class II. inlay cavity preparation.

Practical exam

Complete of the works.

GENERAL DENTAL PRECLINICAL PRACTICE

Department of General Dental Preclinical Practice

Head: *Prof. Dr. Krisztina Márton D.M.D., Ph.D.*

Second Semester

Lectures (1 hour/week) **Practices** (3 hours/week)

The **Department of General Dental Preclinical Practice** is responsible for the preparation of dental students for the practical stages of the clinical practice requiring high precision and excellent manual skills. The aim of this special education is to provide the students with a professional preclinical conservative dentistry, prosthodontics, periodontology, oral surgery and orthodontics manual and theoretical training, which will be used in the clinical treatment procedures. It consists of the simulation of the clinical stages on phantom heads, but furthermore students also have the opportunity to study the basics of minimal- and micro invasive dentistry and the most important rules of infection control.

Theoretical lessons:

1. Oral diseases.
2. Establishment of the Dental Clinic. Instrumentation of the Dental Office.
3. Dentistry in the Field of the Life Sciences. Role of Dental Science in Human Medicine. The Dental Team.
4. Infection Control. Cross Infection.
5. Infection Control. Disinfection and Sterilization in Dentistry.
6. Organization of the Dental Team. Fluid Control, Four-handed Dental Treatment.
7. Macroscopic Anatomy of the Teeth, Guiding Planes and Nomenclature.
8. Preparation Techniques. Restorative Dentistry and Endodontics.
9. Preparation Techniques. Prosthodontics.
10. Operative Techniques. Oral Surgery.
11. Operative Techniques. Periodontology.
12. Operative Techniques. Paedodontics and Orthodontics.
13. Minimal Invasive and Micro Invasive Techniques in Dentistry.
14. Consultation.

Recommended textbook:

Field, James: PreClinical Dental Skills at a Glance, Blackwell Publishers (Wiley) ISBN13: 9781118766675

INTRODUCTION TO ODONTOTECHNOLOGY AND PROSTHODONTICS PRE-CLINICAL COURSE I-II.

Department of Prosthodontics

Head of Department: **Prof. Dr. Péter Hermann**

Lecturer: Dr. Ida Barbara Kispélyi

Since the creation of an independent training, the Stomatological curriculum has put great emphasis on a preclinical foundation course, the Prosthodontics Propaedeutic course, the syllabus of which has also included mastery of dental techniques, indispensable for a dentist. Until the visit of the EU Committee in the late 90s, the course was structured in such a manner that in the first and second semester of the second academic year students had 3 hours of practices and one hour of lecture per week; during the first semester treatment of complete edentulousness was simulated through fabrication of complete dentures, while in the second semester students prepared 3-unit bridges and single crowns on partial edentulous mouldages. During both semesters, medical and dental laboratory steps followed each other just like in real life, and students performed alternatively medical work phases and dental laboratory tasks, for one week each. After the proposal of the EU Committee on the amendment of several courses (including the Prosthodontics Preclinical course), dental laboratory and medical work phases had to be separated sharply, while an independent Odontotechnology course had to be included in the curriculum. According to the request, this Odontotechnology course was built into the theoretical module in order to provide the earliest possible recognition and consolidation of the chosen profession.

Taken more than ten years of experience into account, while maintaining the values that undoubtedly resulted from these changes, we wish to modify those controversial points that in our opinion can be still improved. A sharp separation of the two disciplines (dental techniques and dentistry) rather confuses students, thus they fail to get a grip of the process, and it is the essence that is lost, since these processes are based each on the other. The essence of the new syllabus is the integration of the two courses that are currently taught separately, and thus new and crucial areas (not taught so far) can be emphasized, with concomitant reduction of teaching hours and credit points.

The curriculum of the course concludes with a comprehensive examination at the end of the first semester of the third academic year.

Timing of the Odontotechnology and Prosthodontics Preclinical course:

3rd, 4th and 5th Semester

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module I:

General Dental Material Science, Macroscopic Anatomy II.

Preliminary studies requested for the course of Odontotechnology and Prosthodontics preclinical course module II:

Odontotechnology and Prosthodontics preclinical course module I, Macroscopic Anatomy II.

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module III:

Odontotechnology and Prosthodontics Preclinical course module II, Conservative Dentistry and Endodontics, Preclinical I, Molecular Cell Biology II.

Odontotechnology and Prosthodontics preclinical course I.

Topics of the lectures:

1. Primary impression, primary cast
2. Special trays
3. Labside and chairside steps of making complete denture
4. Types of casts, casting as a kind of information transfer
5. Secondary impression
6. The occlusal rim, centric occlusion
7. Articulators, jaw registration
8. Fabrication of the trial denture, and the try in procedure
9. Fitting of dentures, Short time and long time recall procedures.
10. Types of the prosthetic appliances
11. Gnatological aspects in making complete denture
12. Partial edentulousness, and partial dentures (RPD)
13. Labside and chairside steps of making partial and complex denture
14. Consultation

Topics of the Practices:

1. Introduction, Instrument Delivery
2. Impression Taking for Maxillary and Mandibular Complete Dentures
3. Impression Taking for Maxillary and Mandibular Complete Dentures
4. Outlining The Borders of The Special Trays,
5. Fabrication of Special Trays
6. Secondary Impressions. Fabrication of Maxillary and Mandibular Occlusal Rims
7. Fabrication of Maxillary and Mandibular Occlusal Rims
8. Jaw Registration
9. Mounting of Articulators
10. Setting Up Teeth
11. Setting Up Teeth
12. Setting Up Teeth
13. Processing Dentures, Insertion
14. Consultation

Odontotechnology and Prosthodontics Preclinical II.

Topic of the lectures (weekly, numbered):

1. Types of the fixed dental restorations
2. Labside and chairside steps of making fixed appliances
3. Fundamentals of tooth preparation, periodontal aspects
4. Impression taking for fix appliances, sectional models, and dies
5. Fabrication of wax pattern, casting of fix appliances , trial of the metal framework of the fix appliances
6. Dowel core restorations
7. Tooth Shade Determination
8. Temporary Dental Restorations
9. Veneering of fixed appliances
10. Metal free fixed restauration, CAD/CAM technology
11. History of implant dentures, labside and chairside steps
12. Explanation of different kind of implant systems. Impression methods of implant cases
13. Dental cements
14. Consultation

Practical sessions

1. Handing out of the instruments introduction
2. Tooth preparation 24 and 27 for fixed partial denture
3. Tooth preparation 24 and 27 for fixed partial denture
4. Tooth preparation 24 and 27 for fixed partial denture
5. Tooth preparation 24 and 27 for fixed partial denture
6. Two-phase impression
7. Antagonistic impression, bite-registration
8. Preparation of the sectional model, mounting of the average value articulator
9. Waxing up of the four-unit bridge: Adapta deep drawing
10. Wax pattern fabrication of the four-unit bridge: outlining and shaping of the occlusal surface
11. Wax pattern fabrication of the four-unit bridge
12. Spruing of the wax pattern, preparation for investing
13. Wax pattern fabrication for a four unit porcelain fused to metal four unit bridge
14. Instrument collection, consultation

ELECTIVE SUBJECT for Dentistry 2nd year

Title: CULTURE IN MEDICINE, CULTURE OF MEDICINE – Popular Themes of Current Clinically Applied Medical Anthropology

Institute of Behavioral Sciences

Course Director: Prof. Dr. Ferenc Túry

Lecturer: Dr. László Lajtai

Prerequisite: Dental Psychology

Second Semester

Weekly topics of the seminars:

1. „We have never been modern?” – An initiation to critical approaches to evidence base in medicine – How to respond? - / - Discussion of the semester: Requirements and timescale.
2. Alternatives 1: Narratives and explanatory models – Confusions and the lay perspective
3. Alternatives 2: Complementary medicine – Competition at our doorstep
4. Alternatives 3: Healing and folk medicine – Wisdom or beliefs?
5. Alternatives 4: Biomedicine for anthropology, or the twist of perspectives
6. Challenges 1: Migrants, refugees and minorities
7. Challenges 2: Reproduction, sex, age, death and other trends in „western” medicalization
8. Challenges 3: Nutrition and taboos - biopower and social body
9. Challenges 4: Placebo, pharmaceuticals and the rule of pharmaceutical industry
10. Challenges 5: Public medicine, private medicine and the reproduction of inequities
11. Favourite themes 1: Alcohol, drug, and AIDS at crossroads of culture and law
12. Favourite themes 2: Shrinks and madness – CBS and the mirage of the normal
13. Fieldworks: Discussion 1.
14. Fieldworks: Discussion 2.
Recapitulation, feedback and evaluation.

LANGUAGE COURSE

Department of Languages for specific purposes

Term 3 Hungarian for Dental Medical Purposes II.

Hungarian for Dental Medical Purposes II. is a course for students who completed the course Hungarian for Dental Medical Purposes I. Course objectives are to extend the range of basic knowledge and skills, as well as to improve the ability to use what has been learnt so far. Students are introduced to dental language to ensure that they use it correctly in practice.

Attendance and absence:

Attendance of lessons is obligatory. Students are allowed to have maximum 7 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester).

Certifying absence:

A medical certificate is required if the student has been absent more than 7 times.

Requirements:

midterms (week 7 and 13), oral test (week 14)

Topics of midterms: see detailed course description

Students who fail a midterm or the oral test have to retake it.

Semester signature:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester). Students have to pass the two midterms and the oral test.

Evaluation:

The evaluation of student performance is based on the marks for the 2 written midterms, the oral test as well as the active participation in classes. . Tests under 50% must be retaken. In the latter case, the mark fail will also be calculated towards the final mark. For the oral examination two teachers evaluate separately the grade of the student.

0–50% = 1

51–60% = 2

61–75% = 3

76–89% = 4

90–100% = 5

Detailed course/lecture description:

Week	Topics
1.	Revision: Medical record (Internal Medicine)
2.	Revision: complaint, pain (location, time, type, ...)
3.	The tooth. Parts and material of the tooth Terms for teeth What does DMF mean?
4.	Number of decayed, missing and filled teeth (based on listening or reading tasks); Dialogues
5.	Tooth decay 1.
6.	Brushing teeth
7.	Summary, 1st written test
8.	Basics of dentist-patient dialogues 1. Introducing oneself, short case history-taking
9.	Basics of dentist-patient dialogues 2. Instructions during examination, diagnosis
10.	Basics of dentist-patient dialogues 3. Treatment, saying goodbye
11.	Exercises on the topics above (eg. reading comprehension) Revision: types of teeth, caries, tooth cleaning
12.	Listening exercises on the topics above Improvised dialogues, vocabulary expansion based on possible responses, strategies for improving speech understanding
13.	Summary, 2nd test
14.	Oral test

Textbooks

1. I. Gera: Angol-magyar fogorvosi szótár
2. M. Putz: Magyar fogorvosi szaknyelv I.
3. A. Weidinger: Nyelvtan

Term 4 Hungarian for Dental Medical Purposes III.

Hungarian for Dental Medical Purposes III. is a course for students who completed the course Hungarian for Dental Medical Purposes II. Course objectives are to extend the range of basic knowledge and skills, as well as to apply creatively what has been learnt so far. Students focus on professional communication and learn expressions of dental documentation.

Attendance and absence:

Attendance of lessons is obligatory. Students are allowed to have maximum 7 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester).

Certifying absence:

A medical certificate is required if the student has been absent more than 7 times.

Requirements:

midterms (week 7 and 13), oral test (week 14)

Topics of midterms: see detailed course description

Students who fail a midterm or the oral test have to retake it.

Semester signature:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester). Students have to pass the two midterms and the oral test.

Evaluation:

The evaluation of student performance is based on the marks for the 2 written midterms, the oral test as well as the active participation in classes. . Tests under 50% must be retaken. In the latter case, the mark fail will also be calculated towards the final mark. For the oral examination two teachers evaluate separately the grade of the student.

- 0–50% = 1
- 51–60% = 2
- 61–75% = 3
- 76–89% = 4
- 90–100% = 5

Detailed course/lecture description:

- 1. week Revision: case history-taking, topics of the 3rd semester, dialogues
- 2. week Fillings (descriptive text, basic vocabulary; dialogues)
- 3. week Gingivitis (descriptive text, basic vocabulary; dialogues)
- 4. week Tooth decay 2. (descriptive text, basic vocabulary; dialogues)
- 5. week Initial steps in differential diagnosis, use of important verbs
- 6. week „General Health Questionnaire” (discussion, translation, practical use: based on listening and hearing tasks)
- 7. week Summary, 1st written test
- 8. week Sentences required by the Faculty of Dentistry 1. (symptoms, medications, medical treatment, heart murmur, hospital, ...)

Weeks 8-12: translating sentences and discussing them using grammatical explanations; searching for similar words, other terms, and making learning easier with vocabulary cards, dialogues, games and associations.

- 9. week Sentences required by the Faculty of Dentistry 2. (health, heart disease, haemorrhage, ...)
- 10. week Sentences required by the Faculty of Dentistry 3. (operations, blood pressure, fainting, hereditary diseases, ...)
- 11. week Sentences required by the Faculty of Dentistry 4. (pregnancy, lactation, infectious diseases, ...)
- 12. week Sentences required by the Faculty of Dentistry 5. (sensitive teeth, dental calculus, brushing, floss, smoking, alcohol ...)
- 13. week Summary, 2nd written test
- 14. week Oral test

Textbooks

- 1. M. Gyórfy: *Mi a panasz?*
- 2. R. Halász: *Anamnézis magyarul*
- 3. Á. Silló: *Szituációk*
- 4. A. Marthy – Á. Végh: *Egészségére!*
- 5. J. Kovács: *A fogászati szaknyelv alapjai*
- 6. I. Gera: *Doctor – Patient, Doctor – Assistant Communication*, compiled by Prof. Dr. I. Gera
- 7. M. Putz: *Magyar fogorvosi szaknyelv I.*
- 8. I. Gera: *Angol-magyar fogorvosi szótár*
- 9. A. Weidinger: *Nyelvtan*

Introduction to English Dental Terminology I-II – elective course

Library Informatics – AOVKPK088_1A

Lecturer: **Dr. Livia Vasas PhD.** – Central Library

Institute: Semmelweis University Central Library, 1088 Budapest

Duration: One semester, 30×45 minutes (10×3 lessons)

SUGGESTED SEMESTER 5-10.

Exam-form	Practical mark
Credit-value	3 credit-points
Minimum/maximum group-size	8/200
The aim of the subject:	Teaching students how to use/search in literature sources of medicine, analyse the result of their work supporting the proper competencies.
Thematic:	Medical e-catalogues, e-books, e-libraries, databases, scientific resources of internet
Assistant lecturer:	Anna Berhidi, Edit Csajbók, Skultéti Attila, Szluka Péter
Student records officer:	
Application deadline:	September 4 -8, 2019
Precondition:	There isn't.
Introduction, technical details, VPN access, technical details, about the history of the Central Library's Homepage:	www.lib.semmelweis.hu and its facilities,
UpToDate, ClinicalKey, HS talks:	Biomedical & Lifesciences Collections, EBSCOhost, ProQuest, Pharmacopoeia, Turnitin
Dissertations:	Dart Europe, Open dissertations, OATD,
Catalogs:	books, online books
Semmelweis University catalog Hunteka:	http://hunteka.lib.semmelweis.hu/search Online book catalog: https://lib.semmelweis.hu/nav/ekonyvek National Library of Medicine (Bethesda, USA) NLM catalog: https://www.ncbi.nlm.nih.gov/nlmcatalog Worldcat: https://www.worldcat.org/ Copac: https://copac.jisc.ac.uk/ Books PPT
Scientific publishers and periodicals:	printed/electronic/open access
Browser and matching searching, archive and the newest editions Characterization of periodicals/reviews/journals, ISSN, DOI, Crossmark,	
Article metrics - Online attention	
Publishers: Springer, LWW, Wiley, video journal: JOVE	
Nature: https://www.nature.com/%0A	
BMC https://www.biomedcentral.com/	
PLOS https://www.plos.org/ , DOAJ https://doaj.org/ , etc.	

New routes: Open Science, Open Access

The dangers of publishing on Open Access https://lib.semmelweis.hu/nav/open_access_general_information Support for Open Access Communication at Semmelweis University https://lib.semmelweis.hu/nav/open_access_tamogatas

The Semmelweis repository <https://repo.lib.semmelweis.hu/>

The concept of plagiarism, its forms of appearance, Plagiarism Search: Turnitin, Copyright questions

NLM databases: history, Openl: <https://openi.nlm.nih.gov/>

PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>

value added services: registration, advances search.

MeSH, PMC, etc.

Dictionary: <https://www.merriam-webster.com/>

OVID databases, online books, electronic periodicals, Evidence Based Medicine databases: the role of the EBM in research, full text journals in Ovid databases MEDLINE, PsycINFO, subject heading systems, value-added services, access to the full text version, WHO <https://www.who.int/>

Bibliographic and citation databases, search engine: Web of Science platform, Google Scholar; citations, general searching in the databases, bibliographic and citation searching on keywords, using Boolean operators, value-added services

Scientometrics: quality of journals: Clarivate Analytics InCites JCR (Science Edition and Social Science Edition), IF: calculating Impact factor; SCImago: SJR

Reference Manager: EndNote, EndNote Online; the role of reference softwares in modern publishing, Literature searching: Importing and exporting records (from Web of Science, OVID Medline, PubMed) creating own records search facilities within our records and from PubMed; data handling: creating groups, filtering duplicates

Semmelweis Knowledgebase, Scientific Discovery of the Internet: find medical information you can trust, Building search strategies, Google Scholar, Medworm

Summary of the course, Test writing

Consultation, Retake the 1st/2nd test OR Renewal opportunity for each tests

Syllabus of Physical Education

Department of Physical Education

Subject: Physical Education III.

Type of Subject: Compulsory

Code of Subject: FOKOTSI007_3A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

II. St. year I. semester:

1 – 2 weeks:	General information Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra -curricular activities. Theory and practical application of the warm-up as a sports injury risk significantly reducing factor. Common to the bench. Free exercises.
3 – 4 weeks:	Stamina Development Long-term (at least 45 – 60 minutes) running and skipping exercises.
5 – 6 weeks:	Balls skill development Practicing the fundamentals of volleyball (serves, over – and underhand touches, movements, etc.)
7 – 8 week:	Strength development Overall strength development using the circle-training method-setting up different stations working on different muscle groups.
9 – 10 weeks:	Coordination enhancing exercises Jumping rope exercises in place and in motion.
11 – 12 weeks:	Posture correction Stick exercises, in various position and motion.
13 – 14 weeks:	Stretching – relaxation exercises Stretching exercises using large medicine-balls in sitting, standing, kneeling and recumbent positions.

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons.

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

Subject: Physical Education IV.

Type of Subject: Compulsory

Code of Subject: FOKOTSI007_4A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

The objectives of Physical Education:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life. The syllabus reduced to bi-weekly scheduled double-classes (90 minutes).

The syllabus (preferably a week and numbered):

Reduced to bi-weekly scheduled double-classes (90min.).

II. St. year II. semester:

- | | |
|----------------|---|
| 1 – 2 weeks: | <p>General information</p> <p>Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra -curricular activities. Theory and practical application of the warm-up as a sports injury risk significantly reducing factor. Common to the bench. Free exercises.</p> |
| 3 – 4 weeks: | <p>Cardio – vascular system development</p> <p>The floorball: Using the basic elements of the game dribbling, passing, shooting, etc. Playing againts each other in the interval system on high intensity level.</p> |
| 5 – 6 weeks: | <p>Posture corrective exercises</p> <p>Exercises on floor mats, focusing on the core muscles in various body-positions.</p> |
| 7 – 8 week: | <p>Coordination enhancing exercises</p> <p>Special education and practice material for spatial vision, perception of body schema, right-left orientation, muscle development and perception of coordination at the technical skills of playing sports (tennis, badminton).</p> |
| 9 – 10 weeks: | <p>Strengthening exercises</p> <p>Using manual and other exercises equipment (dumbbells, boxes, bench, wall bars, etc.)</p> |
| 11 – 12 weeks: | <p>Balls skill development</p> <p>Exercise of basic technical elements of football. Learning and practicing tactical elements. During locomotion ball control exercises, skill development.</p> |
| 13 – 14 weeks: | <p>Stretching – relaxation exercises</p> <p>Various stretching relaxing exercises after the meditative practices and knowledge (yoga, tai chi, etc.)</p> |

Requirements to participate in the sessions and the potential for absences:

Active participation in sport classes.

The method of proof for the workshops and the exam absence:

The absence can not be proved, should make up for the lost lessons.

Requirements for signature at the end of semester (including the number of tasks to be solved learning outcomes and type):

Active participation in six classes approved by the staff.

How to prove absence regarding the exam:

Absence must be retaken!

IMPORTANT NOTE: You can only register to any third year subject after completing the Basic Module!

PRE-CLINICAL MODULE

New curriculum to be introduced

Please, follow the updated version on the home page



Faculty of Dentistry
3rd year

STUDY PROGRAMME

PRE-CLINICAL MODULE				
5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semi-final	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C4L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	Medical Aspects of Disaster Preparedness and Response I.	C0L2 hours/sem	signature	
compulsory	Physical Education V.	C0L0P14	signature	
	Total Credit	30		

Explanation

15 credits should be gained from the **elective subjects** during the 5-year

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

PRE-CLINICAL MODULE

6th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C3L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III., Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semi-final	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semi-final	Pathology, General and Oral Pathophysiology
compulsory	Medical Aspects of Disaster Preparedness and Response II.	C0L2 hours/sem	signature	Medical Aspects of Disaster Preparedness and Response I.
compulsory	Physical Education VI.	C0L0P14	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	prerequisite of registering to the 7th semester
	Total Credit	33		

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

IMPORTANT NOTE: Signing up for Physical Education (PE) V. in the 1st semester and for PE VI. in the 2nd semester is compulsory.

LIST OF TEXTBOOKS (The list may change!)

- 1 McCracken's Removable Partial Prosthodontics (10/e) Glen P.McGivney-Alan B.Carr. Hardback Mosby, 1999. ISBN 0323006787
- 2 Schillinburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 4th ed. 1997. ISBN 93 13 86 500
- 3 Craig,R.G.: Restorative dental material. Mosby, 10th ed.
- 4 R.M.Basker-J.C.Davenport: Prosthetic Treatment of the Edentulous Patient. 5th ed. McMillan Press Ltd. ISBN 978-1405192613
- 5 C.M.Sturdevant: Operative Dentistry. Mosby. ISBN 0-80166366-0
- 6 A.Newbrun: Cariology Quintessence. ISBN 0-867152052
- 7 Walton, Torabinejad: Principles and Practice of Endodontics. W.B. Saunders Co. 2nd ed. 1996. ISBN 0-7216-4924-6
- 8 Primary Preventive Dentistry. Ed.by:Norman O.Harris, F.Garcia-Godoy. 5th ed. Appleton and Lange, Stamford. 1999. ISBN 0-8385-8129-3
- 9 Samaranayake et al.: Essential Microbiology for Dentistry. Edinburgh, Churchill Livingstone. ISBN: 0443049890
- 10 Sibernagl S.-Lang F.: Color Atlas of Pathophysiology. Thieme, Stuttgart, 2000. ISBN 0-86577-866-3(TNY) ISBN 3-13-116551-0 (GTV)
- 11 Ferguson D.B.:Oral Bioscience. Churchill Livingstone, 1999. (Harcourt Publ.Ltd.) ISBN 0-443-05373-1
- 12 Heckner F: Practical Microscopic Hematology. 4th ed. Williams and Wilkins Trada Bldh. 1993. ISBN 0-8121-1711-5
- 13 Robbins: Basic Pathology, 2008. V. Kumar, A. K. Abbas, N. Fausto, R. Mitchell Saunders; 8 edition
- 14 Szende B.-Suba Zs: Introduction to histopathology. Bp. Medicina. 1999.
- 15 Szabó Gy: Oral and Maxillofacial Surgery. Bp. Semmelweis Publ. 2001.
- 16 Koesner K.R.:Manual of Minor Oral Surgery for the General Dentist. Blackwell Munsgaard, 2008
- 17 Worthington-Lang-LaVelle: Osseointegration in Dentistry. An Introduction. Quintessence, Chicago, 1994.
- 18 Sethi, A.-Kaus, Th: Practical implant dentistry. Quintessence, London. 2005.
- 19 Andreoli,T.E.-Bennett,J.C.-Carpenter,C.C.J.-Plum,F.: Cecil Essentials of Medicine. 4th ed. W.B. Saunders Co. 2000.
- 20 Medical Genetics and Genomics (e-book)
- 21 KUBY Immunology • W. H. Freeman and Company • New York • 2013
- 22 Immunology seminars (e-book)

Recommended textbooks:

- 1 Nikiforuk: Understanding Dental Caries.(1-2) Karger.
- 2 Murray, J.J.: The Prevention of Oral Disease. 3rd ed. Oxford Univ. Press 1996. ISBN 0 19 2624563 (Hbk) ISBN 0 19 2624571 (Pbk)
- 3 Fluoride in Dentistry. 2nd Ed.: Fejerskov,O.-Ekstrand,J.-Burt,B.A. Munksgaard, 1996. ISBN 87-16-11282-2
- 4 Preventív fogászat. Szerk. Bánóczy J.-Nyárády I. Bp. Medicina. 1999. ISBN 963-242-003-9
- 5 Pathophysiology and Disease. An Introduction to Clinical Medicine. Lange Medical Book. Prentice-Hall International Inc. ISBN 0-8385-8095-5
- 6 Jansen van Rensburg B.G: Oral Biology. Quintessence Publishing Co. Inc. 1995. ISBN 0-86715-271-0
- 7 Goldschlager N.:Principles of Clinical Electrocardiography. 3rd ed. Appleton and Lange, 1989. ISBN 0-8385-7951-5
- 8 Marsh, Ph.-Martin, M.V: Oral Microbiology. Oxford, Wright. ISBN: 0723610517
- 9 D.Tóth F.: Microbiology for Dentistry. Vol.I-II. University of Debrecen, 2002.
- 10 E.C.Combe: Notes on dental materials. Univ.Manchester, 1986.
- 11 J.F.McCabe: Applied dental materials. Univ. Newcastle, 1990.
- 12 Howe: A Minor Oral Surgery. Wright. 1987. ISBN 723608237.
- 13 Howe: The Extraction of Teeth. Wright. 1990. ISBN 723622310.
- 14 Seward et al.: An Outline of Oral Surgery. Wright. 1998. ISBN 0-7236-0735-4 és -0407-x
- 15 Hupp JR et al.: Contemporary Oral and Maxillofacial Surgery. Mosby, 2014
- 16 Peterson: Principles of Oral and Maxillofacial Surgery. Decker, 2004.
- 17 Robinson, Howe: Tooth Extraction. A Practical Guide. Oxford, 2000.
- 18 Harrison's Principles of Internal Medicine, Petersdorf, Adams, Braunwald, Isselbacher, Martin, Wilson, McGraw-Hill Book Company. 15th ed.
- 19 Ward Booth, Hausamen, Schendel: Maxillofacial Surgery, C.Livingston Elsevier, 2007
- 20 Neil-Nairne: Complete Denture Prosthetics. Wright. ISBN 72 36 20 636
- 21 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8
- 22 Moor UJ: Principles of Oral and Maxillofacial Surgery, 6th Edition, Wiley-Blackwell 2011.
- 23 Hermann Péter, Szentpétery András: Gnatológia (Semmelweis Kiadó, 2018)

GENERAL AND ORAL PATHOPHYSIOLOGY

Department of Oral Biology

Lecturer: **Prof. Dr. Gábor Varga**

Tutor: **Dr. Kristóf Kádár M.D.**

First Semester

Lectures (2 hours per week):

1. Pathophysiology of liver
2. Gastric secretion and exocrine pancreas function
3. Cardiac insufficiency
4. Hypertension
5. Shock
6. Pathophysiology of the kidney
7. Pathophysiology of acid base regulation
8. Impairment in fluid and electrolyte balance
9. Pathophysiology of respiration
10. Impaired glucose homeostasis
11. Disturbances of hypothalamus and pituitary gland
12. Effects of peripheral endocrine gland disorders
13. Atherosclerosis
- 14. Midterm** (1-12 lectures)
15. Disorders of lipid metabolism

Practicals (2 hours per week):

1. Liver – Laboratory diagnosis of hepatobiliary diseases
2. ECG – Normal ECG
3. ECG – Disorders impulse formation
4. ECG – Disorders of conductance
5. ECG – Myocardial infarction
6. ECG – Repolarisation abnormalities, hypertrophy, electrolyte abnormalities
7. ECG – **Midterm**
8. Salt and water metabolism, Acid base analysis
9. Laboratory tests in diabetes mellitus
10. Gastric function and exocrine pancreas
11. Clinico-chemical assays for endocrine disorders I.
12. Clinico-chemical assays for endocrine disorders II.
13. Urine analysis, renal function tests
14. Molecular laboratory diagnostic

Note: The maximum number of absences in a semester is 3 (practices)
 More than 3 absences invalidate the semester
 Theoretical demonstration from the material of the lectures in the 13th week (1-12 lectures material)
 ECG demonstration at week 7 (from ECG material)

During the semester all midterms (one theoretical midterm – from the lectures, one ECG midterm – on ECG practice) should be passed. In case of an unsatisfactory final grade (1), the semester will not be accepted.

PATHOLOGY

1st Department of Pathology

Course director and tutor: *Dr. Attila Zalatnai*

First Semester

Lectures

(3 hours per week)

Lecture

Introduction. Historical backgrounds.
Cell and tissue injury. Adaptive responses. Necrosis.
Acute inflammation. Vascular and cellular events.
Acute inflammation Morphological patterns.
Chronic inflammation.
Extracellular matrix. Repair. Wound healing.
Immunopathology. Cellular components. Immunologically mediate tissue injury.
Transplantation. Immunodeficiency. Autoimmune diseases.
Neoplasia. Classification. Histological diagnosis. Invasion and metastasis.
Growth patterns.
Carcinogenesis.
Epidemiology of malignancies. Preblastomatosis. Screening.
Tumor therapy. Tumor immunology.
Benign and malignant tumors of epithelial and mesenchymal origin.
Developmental and genetic diseases.
Environmental and nutritional pathology
Hemodynamic diseases. Water and electrolyte disturbances.
Edema. Shock.
Hyperaemia. Haemorrhage. Thrombosis.
Embolism. Infarct.
Infectious and parasitic diseases. Viral and bacterial diseases.
Tuberculosis. Syphilis. Leprosy. Diseases caused by fungi, nematodes, cestodes.
Blood vessels. Atherosclerosis. Hypertension. Inflammatory diseases.
Aneurysms. Tumors.
Heart diseases. Congenital, ischemic, hypertensive heart diseases.
Rheumatic heart disease. Inflammatory diseases. Cardiomyopathy.
Respiratory system. Pathology of larynx and trachea. Lung cancer.
Lesions affecting lung parenchyma.
Bronchitis. Asthma. Emphysema. Pneumoconiosis. Diseases of the pleura.
Gastrointestinal tract. Esophagus. Stomach.
Small and large intestine. Peritoneum.
Liver and biliary system. Mechanism of jaundice. Hepatic failure.
Acute and chronic hepatitis.
Liver cirrhosis. Toxic injury. Tumors
Kidney. Non-inflammatory lesions. Inflammatory glomerular lesions.
Tubulointerstitial diseases. Renal diseases associated with systemic conditions. Vascular diseases. Tumors.
Urinary tract and male reproductive system
Gynecologic pathology. Vulva. Cervix. Body of uterus and endometrium.
Fallopian tube. Ovary. Placenta and neonatal pathology.
Gestational trophoblastic disease.
Pathology of the breast.

Practices

(2 hours per week)

Laboratory

AUTOPSY
Schemical meditors.

AUTOPSY
HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY
Consultation.

AUTOPSY
AUTOPSY

AUTOPSY

Blood and lymphoid organs. Benign and malignant disorders of lymphoid cells. Hodgkin's disease. Disorders of the spleen.	AUTOPSY
Disorders of the mononuclear phagocyte system. Acute and chronic myeloproliferative syndromes.	AUTOPSY
Endocrine system.	AUTOPSY
Gallbladder and extrahepatic bile ducts. Pancreas. Diabetes.	HISTOLOGY
Head and neck pathology.	AUTOPSY
Bones and joints, skeletal muscles.	AUTOPSY
Pediatric oncology.	HISTOLOGY
Nervous system. Trauma. Circulatory and inflammatory diseases.	AUTOPSY
Demyelinating and metabolic diseases.	
Tumors of the nervous system. Peripheral nervous system.	AUTOPSY
Pathology of the skin.	AUTOPSY
Clinicopathological conference	HISTOLOGY

EXAMINATION (FINAL)

The semifinal examination at the end of the first semester will be a written test. Three different times for the test writing can be chosen. Students are requested to announce the time they have chosen to the tutor of the 1st Institute of Pathology and Experimental Cancer Research until mid – December. Students who have failed the exam on one occasion can retake the exam on the next test-writing day, at least one week from the first trial.

Note: Lectures will be held in the lecture hall of the 1st Institute of Pathology and Experimental Cancer Research.

Autopsy and Histopathology practices will be held in the 1st Institute of Pathology and Experimental Cancer Research.

During the histopathology exercises 100 slides will be studied.

The list of slides will be available at the beginning of the semester.

The maximum number of absences in a semester is 3.

More than 3 absences invalidate the semester.

During the semester two midterm examinations should be passed.

ORAL PATHOLOGY

1st Department of Oral, Dental and Maxillofacial Surgery

Lecturer: **Dr. Attila Zalatnai**

Second Semester

Lectures (2 hours/week) **Practices** (2 hours/week)

Developmental disturbances in number of teeth. Developmental disturbances in shape and size of teeth.
Developmental disturbances in structure of the teeth.
Growth disturbances of teeth. Premature eruption, delayed eruption.
Disturbances of situation of the teeth. Impacted and embedded teeth. Lobodontia.
Developmental disturbances of the jaws and the temporomandibular joint.
Developmental anomalies of the face and soft oral tissue.
Developmental disturbances of the salivary glands. Etiology of malformations.
Discoloration of the teeth. Dental plaque. Dental calculus.
Dental caries. Etiology and epidemiology. Contributing factors in dental caries.
Clinical aspects of dental caries. Histopathology of dental caries.
Microbiology and immunobiology of caries. Attrition. Abrasion. Erosion.
Hypercementosis. Resorption of the teeth.
Diseases of the pulp. Periapical lesions.
Periodontal diseases Implantation. Reimplantation. Transplantation. Homoiotransplantation.
Inflammation of the oral mucosa and tongue. Halitosis (Stink of the mouth.)
Cysts of jaws.
Cysts of the oral floor, neck and salivary glands.
Focal infection. Diseases of the jaws.
Physical, heat, chemical and electrical injuries of oral and paraoral structures.

Diseases of microbial origin of oral and paraoral structures.
Diseases of the blood and blood forming organs.
Injury from inorganic chemicals and disturbances of metabolism of oral and paraoral structures.
Avitaminosis. Mucocutaneous disorders.
Diseases of accessory nasal sinus. Diseases of the temporomandibular joint.
Diseases of the nerves and muscles, facial hemihyperplasia and hemihypoplasia.
Premalignant lesions
Benign oral epithelial tumors. Benign oral mesenchymal tumors.
Odontogenic tumors. Benign tumors of the jaws.
Malignant tumors of epithelial origin.
Malignant tumors of mesenchymal origin.
Malignant lymphomas.
Malignant odontogenic and non-odontogenic tumors of the jaws.
Metastatic tumors of the jaws. Biopsy technique. Healing of oral wounds.
Staging and grading of oral tumors. Spread of oral and paraoral tumors.
Regional and general metastases of oral and paraoral tumors.
Etiology of paraoral tumors.
Diseases of oral and paraoral lymphoid tissue. Joining of diseases.
Diseases of salivary glands.
Benign tumors of salivary glands.
Malignant tumors of salivary glands.
Oral and paraoral syndromes.
General manifestations of oral diseases.
Forensic oral pathology.

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester

GENERAL AND ORAL MICROBIOLOGY

Department of Medical Microbiology

Program Director: *Dr. Dóra Szabó*

Tutor: *Dr. Ágoston Ghidán*

First Semester

Lectures (2 hours per week)	Practices (2 hours per week)
Introduction to microbiology. General bacteriology (morphology, physiology and cultivation of bacteria) Bacterial genetics.	Introduction to basic microbiology. Microscopic examination of bacteria (staining procedures).
Infections and diseases (pathogenesis of bacterial infection, virulence, importance of biofilm formation). Specific and non-specific host defences. Active and passive immunization.	Cultivation of aerobic and anaerobic bacteria (culture media, colony morphology of bacteria).
Sterilization and disinfection. Antibacterial chemotherapy (mode of actions, resistance, side effects).	Methods used for sterilization and disinfections (physical and chemical possibilities).
Gram-positive facultative and obligate anaerobic cocci. Gram-negative facultative ananerobic, microaerophilic and obligate anaerobic cocci and coccobacilli.	Antibiotic susceptibility of bacteria
Gram-positive aerobic and anaerobic rods. Gram-positive spore-forming rods.	In vitro antigen-antibody reactions (serological methods).
Gram-negative facultative anaerobic rods. Gram-negative anaerobic rods.	Gram-positive and -negative cocci and coccobacilli
Mycobacteria. Rickettsia, Chlamydia. Mycoplasma.	Gram-positive rods (Corynebacterium, Lactobacillus, Actinomyces).
Spirochetes. Importance of bacterial infections involving the oral, perioral tissues and salivary glands.	Gram-negative rods (Enterobacteriaceae)
Medical importance of fungi (general mycology, chemotherapy of fungal infections). Importance of fungal infections involving the oral and perioral tissues.	Gram-negative anaerobic rods (Bacteroides, Prevotella, Porphyromonas, Fusobacterium, Leptotrichia). Gram-positive spore-forming aerobic and anaerobic rods (Bacillus, Clostridia)
Protozoa (general characterization and the most important human pathogenic protozoa). Helminths (general characterization and the most important human worms).	Mycobacteria. Spirochetes. Rickettsiae. Chlamydiae. Mycoplasma.
General properties of viruses. Antiviral chemotherapy. Adeno- and Poxviruses.	Medically important fungi
Important respiratory pathogen viruses. Important enterally transmitted viruses.	Medically important protozoa. Medically important helminths.
Hepatitis viruses. Retroviruses (AIDS). Viruses and cancer.	General virology (cultivation of viruses, cell-virus interactions, serological tests and molecular techniques used in laboratory diagnosis of viral diseases)
Arbo- and robovirus infection. Rabies. Slow viruses. Viral infections involving the oral, perioral tissues and salivary glands.	Pathogenesis and symptomatology of viral diseases.
Normal oral flora. Oral ecosystem and dental plaque. Microbiology of dental caries, periodontal diseases. Dentoalveolar infections.	Summary of microbiological laboratory techniques and diagnostic procedures. Consultation.

More than 3 semester absences invalidate the semester.

BASIC IMMUNOLOGY

Department of Genetics, Cell and Immunobiology

Course director: *Prof. Dr. Edit Buzás*

Tutor: *Dr. Marianna Csilla Holub*

Subject code: FOKGEN037_1A

Prerequisite subject: Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.; Medical and Dental Physiology II

Credits: 3

	Lectures (2 hr / week)	Practicals / Seminars (1 hr / week)
1.	The role, processes, organs and cells of the immune system	Basic terms, the immune system in the lab
2.	Principles of natural immunity	Methods based on antigen-antibody interactions I. Immunoserology
3.	The complement system; inflammation and acute phase reaction	Methods based on antigen-antibody interactions II.
4.	Antigen, antigen presentation and MHCs	Methods based on antigen-antibody interactions III.: Flow cytometry
5.	Antigen receptors and their formation	Complement assays
6.	T lymphocytes and cell-mediated immune response	HLA typing
7.	B lymphocytes and humoral immune response	Vaccination I.
8.	Mucosal immunity	Vaccination II.
9.	Immune response in infections	Biological therapies I.
10.	Immunodeficiencies	Biological therapies II.
11.	Hypersensitivity	Hypersensitivity I
12.	Tolerance and autoimmunity	Hypersensitivity II-IV.
12.	Antitumor immunity	Screening methods for autoantibodies
13.	Immunology of transplantation	Case studies
14.	Immunology of transplantation	Case studies II.

The sequence of lessons may change.

75% minimum attendance of both the lectures and practical lessons is necessary for the end-term signature. Retake for the midterm will be organized for those student, how miss the midterm because an acute disease, but they have to show up the medical record.

Midterm: written test once in the semester. The midterm is not a requirement for the validity of the semester. Retake (one make up day) will be organized for those student, who miss the midterm because an acute disease, but they have to show up the medical record.

Exam: written test in the exam period. The exam grade will be calculated from the sum of midterm scores and exam scores. For passing you have to reach more than 50 % of both the exam scores and total scores.

Literature:

KUBY Immunology • W. H. Freeman and Company • New York • 2013

Immunology seminars (e-book): <http://gsi.semmelweis.hu> (The user name and password is on the course datasheet of the Neptun.)

CONSERVATIVE DENTISTRY AND ENDODONTICS

Department of Conservative Dentistry

Head of Department: *Dr. Zsuzsanna Tóth D.M.D., Ph.D.*

CONSERVATIVE DENTISTRY AND ENDODONTICS, PRECLINICAL II.

First semester

1. Indirect restorations (inlay, onlay),
2. Tooth preparation for cast metal restorations. Cementation of cast metal restorations.
3. Tooth-coloured indirect restorations. (Ceramic, composite). Differences in preparation and cementation. Different luting materials.
4. Pathosis in consequence of caries. Pathology and therapy of the pulp.
5. Pathosis in consequence of caries. Pathology and therapy of the periapical region.
6. Indications, contraindications of endodontic therapy, urgency.
7. Trepanation, extirpation. Instruments of root canal treatment
8. Preoperative-working length determination (needle-control) and control x-ray. Using of electronic apex-locators.
9. Cleaning and shaping, chemical adjuncts, medication.
10. Midterm
11. Sealing of root canals. Lateral condensation. The problems of control x-ray.
12. Functional and esthetic restoration of root canal treated teeth.
13. Patient assessment and treatment plan.
14. Equipments of the dentist's office, orders of the clinical practical courses.

Manual training (3 hours/week):

Indirect restorations: inlays, onlays (metal and esthetic); preparation in artificial teeth.

Root canal treatment in extracted teeth (front, bicuspid, molar).

List of textbooks:

- 1 Sturdevant's Art And Science Of Operative Dentistry. Edited by T. Roberson, H. Heymann and E. Swift. Mosby, St Louis, 2006. ISBN 978-0-323-03009-0
- 2 Walton R.E., Torabinejad M. ed.: Principles and Practice of Endodontics. W.B. Saunders Co. Philadelphia, 2002.
- 3 Newbrun A.: Cariology Quintessence. ISBN 0867152052

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed. Practical exam and practical course grade. Final oral exam: questions from two topic groups and identification of an extracted tooth.

CONSERVATIVE DENTISTRY AND ENDODONTICS I.

Second semester

Lectures (1 hour per week):

1. Guidelines to case reports
2. Dental photography
3. Four-handed dental treatment
4. Cariesdiagnostic methods
5. Dental anaesthesia
6. Isolation in conservative dentistry and endodontic treatments
7. Dental materials: composites
8. Adhesive systems
9. Class I and II restorations and matrix systems
10. Demonstration (Midterm)
11. Therapy of caries: Class III and IV restorations
12. Lesions in the cervical area of the tooth
13. Glassionomer cements, compomer materials
14. Infection control, patients requiring special care

Clinical practice (3 hours per week).

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed. Practical grade: consists of midterm, „small tests“, and evaluation of work and knowledge presented at clinical practice.

PREVENTIVE DENTISTRY I.

Department of Conservative Dentistry

Tutor: *Dr. Károly Bartha*

First Semester

Lectures 1 (hour/week)

Detailed course/lecture description[i]: *(to facilitate credit recognition in other institutions)*

Lectures:

1.	Preventive dentistry- introduction	K. Bartha
2.	Dental caries, Etiology of caries. Dental plaque	K. Bartha
3.	Caries Epidemiology. Caries indices. Risk factors	K. Bartha
4.	Caries incipient and remineralization	K. Bartha
5.	Cervical sensitivity, dentinal hypersensitivity and erosion	K. Bartha
6.	The Role of diet in the caries prevention	K. Bartha
7.	Oral hygiene - Toothpaste	K. Bartha
8.	Oral hygiene - Toothbrush	K. Bartha
9.	Fluorides	Zs. Tóth
10.	Systemic and local fluoride-prevention	Zs. Tóth
11.	Fissure-sealing	K. Bartha
12.	The role of dental hygienists in the dental practice	K. Bartha
13.	Dental treatment and prevention in case of elderly patients	K. Bartha
14.	Dental prevention by patients with systemic disease	D. Végh

Practices/Seminars:

1.	Clinical workplace (Seminar, dr. Árendás)	
2.	Dental status, medical/dental history (Seminar, dr. Árendás)	
3.	Clinical workplace (113,111)	Practice
4.	Medical history, Dental status (113,111)	Practice
5.	Caries diagnostics (Seminar, dr. Árendás)	
6.	Cariesdiagn. (113,111)	Practice
7.	Cariesdiagn. (113,111)	Practice
8.	Oral hygiene indices (Seminar, dr. Árendás)	
9.	Plaque staining (113,111)	Practice
10.	Scaling (Seminar, dr. Árendás)	
11.	Periodontal Indexes, Scaling (113,111)	
12.	Caries risk determination (Seminar, dr. Árendás)	
13.	Caries Risk Tests	Practice
14.	Remineralisation (Seminar, dr. Bartha)	

PREVENTIVE DENTISTRY II.

Second Semester

Lectures 1 (hour/week)

Detailed course/lecture description[i]: (to facilitate credit recognition in other institutions)

Lectures:

1.	Group-prophylaxis, Design, Organization	K. Bartha
2.	Prophylaxis in the school	K. Bartha
3.	Prevention in pregnancy and from the intrauterine life to the age of three	K. Bartha
4.	Gingivitis and periodontal disease. Epidemiological characteristics. Pathogenesis and diagnosis	I. Gera
5.	Strategy for prevention of periodontal diseases	P. Nagy
6.	Integrated preventive dentistry – prosthodontics	P. Kivovics
7.	TDK conference	
8.	Integrated preventive dentistry – gnathology	M. Jász
9.	Possibilities in prevention of orthodontic anomalies	J. Horváth
10.	Oral cancer	Zs. Németh
11.	Integrated preventive dentistry – conservative dentistry	Zs. Lohinai
12.	Catastrophe medicine and the preventive dentistry. Environmental protection.	K. Bartha
13.	Infection control	K. Bartha
14.	Environmental and iatrogenic damaging factors in dentistry	K. Bartha

PROSTHODONTICS I.

Second Semester

- 1 The reasons and the consequences of tooth loss
- 2 Complaints, medical history, extra-oral and intra-oral examination, treatment plans and prognosis at edentulous patient
- 3 Infection control in dentistry. The upper and the lower denture bearing area
- 4 First impression, casting, outline of the special tray
- 5 Second (working) impression, mucostatic and mucodisplacive techniques. Beading and boxing, casting of working impression
- 6 Basic gnathology (OVD, RVD, freeway space, RCP, ICP, Posselt diagram)
- 7 Basic gnathology (canine guidance, unilateral and bilateral balanced occlusion)
- 8 Jaw registration (type of articulators, face bow registration)
- 9 Mounting in articulator, setting up the teeth
- 10 Try-in procedure, flasking and packing (processing) at complete denture
- 11 Fitting and advice to the patient. Short time and long time recall procedures
- 12 Complex functional approach. Implant techniques
- 13 Emergency denture. Immediate denture. Copy denture
- 14 Relining, rebasing, repairing of complete denture

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester During the semester two midterm examinations should be passed
Practical course grade.

INTRODUCTION TO ODONTOTECHNOLOGY AND PROSTHODONTICS PRE-CLINICAL COURSE III.

Department of Prosthodontics

Head of Department: **Prof. Dr. Péter Hermann**

Lecturer: Dr. Ida Barbara Kispélyi

Since the creation of an independent training, the Stomatological curriculum has put great emphasis on a preclinical foundation course, the Prosthodontics Propaedeutic course, the syllabus of which has also included mastery of dental techniques, indispensable for a dentist. Until the visit of the EU Committee in the late 90s, the course was structured in such a manner that in the first and second semester of the second academic year students had 3 hours of practices and one hour of lecture per week; during the first semester treatment of complete edentulousness was simulated through fabrication of complete dentures, while in the second semester students prepared 3-unit bridges and single crowns on partial edentulous mouldages. During both semesters, medical and dental laboratory steps followed each other just like in real life, and students performed alternatively medical work phases and dental laboratory tasks, for one week each. After the proposal of the EU Committee on the amendment of several courses (including the Prosthodontics Preclinical course), dental laboratory and medical work phases had to be separated sharply, while an independent Odontotechnology course had to be included in the curriculum. According to the request, this Odontotechnology course was built into the theoretical module in order to provide the earliest possible recognition and consolidation of the chosen profession.

Taken more than ten years of experience into account, while maintaining the values that undoubtedly resulted from these changes, we wish to modify those controversial points that in our opinion can be still improved. A sharp separation of the two disciplines (dental techniques and dentistry) rather confuses students, thus they fail to get a grip of the process, and it is the essence that is lost, since these processes are based each on the other. The essence of the new syllabus is the integration of the two courses that are currently taught separately, and thus new and crucial areas (not taught so far) can be emphasized, with concomitant reduction of teaching hours and credit points.

The curriculum of the course concludes with a comprehensive examination at the end of the first semester of the third academic year.

Timing of the Odontotechnology and Prosthodontics Preclinical course:

3rd, 4th and 5th Semester

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module I:

General Dental Material Science

Preliminary studies requested for the course of Odontotechnology and Prosthodontics preclinical course module II:

Odontotechnology and Prosthodontics preclinical course module I

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module III:

Odontotechnology and Prosthodontics Preclinical course module II

ODONTOTECHNOLOGY AND PROSTHODONTICS PRECLINICAL COURSE – practices

First Semester

Odontotechnology and Prosthodontics Preclinical III.

Topics of the practices:

1. Delivering of the instruments
2. Tooth preparation for solo crown, tooth 13
3. Tooth preparation for solo crown, tooth 13. Grading
4. Tooth preparation for porcelain veneer, tooth 21
5. Midterm. Tooth preparation for porcelain veneer, tooth 21, Grading
6. Wax pattern fabrication for acrylic crown, tooth 21.
7. Fabrication of light cured acrylic solo crown, tooth 13
8. Finishing and polishing of the acrylic crown, made for tooth 21
9. Grading
10. Midterm. Finishing and polishing of the light cured crown made for the 13 tooth. steps of constructing metal based removable partial dentures. Wax pattern fabrication a mandibular metal base plate.
11. Wax pattern fabrication for a maxillary metal base plate. Grading
12. Steps of making an implant retained dental prosthesis. Impression taking for an implant retained prosthesis (open special tray method)
13. Consultation. Practice course grade. Handing down the instruments.
14. Practical final examination

ORAL AND MAXILLOFACIAL SURGERY, PRE-CLINICAL COURSE

Tutor: **Dr. Kinga Körmöczy**

First Semester

Practices (2 hours per week)

Oral surgery as a part of general surgery, Anamnesis, patient examination

The surgical anatomy of the teeth

The splanchnocranium. The Maxillary Nerve

The mandible, the Mandibular Nerve

The injection (instrumentation, rules, techniques)

Midterm (written)

Surgical hygiene. The principle of antisepsis and asepsis

The operation theater

Oral surgical instrumentation

The removal of teeth/ practice on phantom

The removal of teeth/ practice on phantom

The removal of teeth/ practice on phantom

The removal of teeth/ practice on phantom

Semester closing midterm (oral + practical)

Practicing, repetition

ORAL AND MAXILLOFACIAL SURGERY I.

Second Semester

Lectures (1 hour per week)

The history of oral surgery
Clinical examination and diagnostics
Pain control. The physiologic and psychologic aspects of pain
The mode of action of local anaesthetics.
The pharmacological properties of local anaesthetic drugs
The technique of local anaesthesia Part I. (anaesthesia of teeth)
The technique of local anaesthesia Part II. (Matas, block of n. alv. sup. ant., anaesthesia of the tongue, the lip, the bucca)
The technique of local anaesthesia Part III. (Inflamed tissues, trismus)
Summarising clinical implications /video/
Complications of local anaesthesia.
Conscious sedation in dentistry
Indication and contraindication of tooth removal
Operation technique of dentoalveolar surgery Part I. (surg. tools, flaps, suturing)

Operation technique of dentoalveolar surgery Part II. (complications of tooth removal, surgical root removal) (video)
Problems with the eruption of teeth.
The removal of the impacted teeth
Guest speaker
Midterm exam
Consultation

Practices (3 hours per week)

Surgical anatomy of the jaws and teeth
Local anesthesia
Oral and maxillofacial surgical instruments
Clinical diagnosis, medical examination of the patients

Midterm demonstration

Practicing simple tooth extraction

Practicing simple tooth extraction

Practicing tooth extraction

Minor oral surgery

Minor oral surgery

Midterm Demonstration

Minor oral surgery
Minor oral surgery
Midterm Demonstration

Note: Lectures will be held in the lecture hall of the Department of Maxillofacial Surgery and Dentistry.
The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester.
During the semester three midterm examinations should be passed.
Practical course grade (five-scale).

ORAL BIOLOGY

Lecturer: **Prof. Dr. Gábor Varga**

Tutor: **Dr. Beáta Kerémi D.M.D.**

Second Semester

Lectures (3 hours per week):

Hard tissues

1. Ca homeostasis
2. Mineral composition of enamel and dentine. Bioapatites
3. Development of tooth germ
4. Fibres and extracellular matrix of hard tissues
5. Formation of primary-, secondary- and tertiary dentine, dentinogenesis and dentine permeability
6. Amelogenesis
7. Osteogenesis
8. Bone resorption and the osteoclasts
9. Nutrition and oral health, characterization of oral tissues and functions in elderly
10. Radiation, oral symptoms associated with radiotherapy
11. Cementogenesis

The oral cavity

12. Pathomechanism of bleeding and its relation to dentistry
 13. The morphology and function of the salivary glands
 14. Hypo-, and hypersecretory states, xerostomia
 15. Saliva as a diagnostic fluid
 16. Pathophysiology of chewing and deglutition
 17. Dental stem cells
 18. Gene therapy and gene polymorphisms in dentistry
 19. Pathomechanisms in oral cancer
 20. Metabolism of fluoride, hard tissues and fluoride, dental fluorosis
 21. Tooth eruption and tooth movement
 22. Pathophysiology of inflammation
 23. Structural and functional characteristics of dental pulp, blood supply to the oral tissues, pulpal pain and inflammation
 24. Periodontitis and systemic disorders
 25. Caries, the dental plaque and saliva
- Midterm** (1-24 lectures)
26. Gingival sulcus and crevicular fluid
 27. Oral sensation
 28. Wound healing

Practices (2 hours per week):

- | | |
|---|--------------------------------------|
| 1. Oral clearance | 8. Haematology MIDTERM |
| 2. Haematology Part 1 – Normal blood | 9. Chewing |
| 3. Haematology Part 2 – Reactive blood smears | 10. Mineralized tissues + fluoride |
| 4. Haematology Part 3 – Chronic Leukemias | 11. Analysis of dental plaque |
| 5. Haematology Part 4 – Acute Leukemias | 12. Salivary secretion |
| 6. Haematology Part 5 – Haemostasis | 13. PCR technique in dental research |
| 7. Haematology Part 6 – Anemias | 14. Oral defense mechanisms |

The maximum number of absences from practice in a semester is 3!
More than 3 absences invalidate the semester.

Theoretical demonstration from the material of the lectures in the 13th week (1-12 lectures material)
ECG demonstration at week 7 (from ECG material)

During the semester all midterms (one theoretical midterm – from the lectures, one ECG midterm – on ECG practice) should be passed. In case of an unsatisfactory final grade (1), the semester will not be accepted.

RADIATION PROTECTION

Department: Independent Division of Radiology

Lecturer: **Prof. Dr. Csaba Dobó Nagy**

prerequisites: basic module

Third year second semester

Lectures (1,5 hours per week)

Atomic structure, radioactivity

Ionization, Dosimetry

Health physics

Protection against external exposure

Measurement of exposure at work

General rules of application of ionization

Types and levels of exposure

Radiation protection legislation

Regulation of accident prevention at work

Controlling system of the radiation supervisory authority

Protection of patients

Dose limits

X-ray equipments

Consultation

Written exam

Practices (1 hour per week)

Measurement and calculation effective dose of the patient receiving intraoral x-ray

Importance of collimation, receptors

Operating the equipment

Notes: maximum number of absences in a semester is 3.
more than 3 absences invalidate the semester.
closing semi-final

ORAL DIAGNOSTICS I.

Department of Oral Diagnostics

Address: Bp. VIII., Szentkirályi u. 47. 1088

Phone: 459-1500/59161, 317-1044

Tutor: **Prof. Dr. Csaba Dobó Nagy**

E-mail: oral@fok.usn.hu

Third year 2nd semester

Week Lecture (1 hour/week) Practice (1 hour/week)

1. Introduction to Oral Diagnostics. Importance and rules of dental diagnostics and document .
2. Dental anamnesis. Difficulties of the general health status assessment. Indication and contraindication of dental treatment relating to the general health status. Risk patients.
3. Examination of oral mucosa. Stomato-oncological screening.
4. Oral diseases in general practice.
5. The diagnostics of disorders of TMJ, upper and lower jaws and dentures. Planning of the treatment.
6. Fábíán and Fejérdy Classification of partially edentulous arches.
7. Orthodontic Diagnostics and treatment plan.
8. Diagnostics of the caries. Methods and instruments. Dental disorders with non-caries origin.
9. Endodontic Diagnostics and emergency interventions
10. Examination methods of parodontium and oral hygiene. Influence of the results on the treatment plan. Examinations of oral hygiene, dental status and parodontium within screenings. Indices.
11. Diagnostics of the salivary glands and their function. Diagnostic procedures of halitosis.
12. Role of diagnostics in Esthetic Dentistry. Optical and formal characteristics of the teeth. Diagnostics and rehabilitation with the harmony of dentures and the face.
13. Diagnostic failures in general praxis.
14. Early diagnosis and preventive approach

Rules of practices

Activity of the students:

1. Clinical evaluation and registration of medical and dental conditions, extraoral and intraoral examination of the patients, stomato-oncological cheque-up. Registration of medical and dental history.
2. Documentation of the above, taking oral photos, and preparing diagnostic casts.
3. Making decisions about additional diagnostic methods, X-ray examinations, referrals and consultations.
4. Making diagnosis and complete preliminary treatment planning.
5. Preparing written case-demonstrations including history, clinical finding, diagnosis, preliminary treatment plan and conclusions.
6. Written case demonstrations should be made at home, with the use of the students notes in the practice. Students are responsible for and should take great care about the patients personal rights. No personal data, medical certificate, x-ray pictures or other relevant findings can be brought home, for preparation of the case demonstrations! (only the notes made by the student during the practice, containing no personal data, no official documentation.)

Written theoretical evaluation will be organized in one of the practices in this semester.

SEMMELWEIS UNIVERSITY / FACULTY OF DENTISTRY Faculty of Dentistry Exam:

Practical hours should be visited during 2 days. The time of practices is between 8.00 a.m – 1.00 p.m. Semifinal exam will be organized at the end of third year, second semester.

Minimal expectations: reaching the minimum level of the written theoretical evaluation (mark 2) presentation of three written case-demonstrations reaching the minimum quality level (mark 2) Non-performance of the minimal expectations invalidate the semester!

Textbook:

1. Bricker, Langlais, Miller: Oral Diagnosis, Oral Medicine and Treatment Planning (second edition) 2 BC Decker Inc Hamilton London 2002.

Recommended books:

- 1 Bengel, Veltman, Loevy,Taschini: Diff erential Diagnosis of Diseases of the Oral Mucosa Quintessence Publishing Co. Inc. Chicago, Illinois 1989
- 2 Manfred Strassburg/Gerdtn Knolle : Diseases of the Oral Mucosa A Color Atlas (Second Edition) Quintessence Publishing Co. Inc. Carol Stream Illinois 1994 3 “hand-outs” will be prepared and presented for the students by the lecturers

GENETICS AND GENOMICS

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. F. Ágnes Semsei**

Subject code: FOKGEN181_1A

Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III., Medical and Dental Physiology II

Credit: 2

Lectures (2 hours per week):

1. Introduction to human genetics, the human genome
2. Monogenic inheritance (Autosomal inheritance)
3. Role of sex in inheritance
4. Genetic variations
5. Chromosomal aberrations I.
6. Chromosomal aberrations II.
7. Epigenetics
8. Introduction to genomics. Methods in genomics
9. Genomic approach of complex inheritance
10. Pharmaco- and nutrigenomics
11. Midterm
12. Gene and genome manipulation
13. Genetics of biological processes
14. Population genetics and genomics; Genome and environment

Practices (1 hour per week):

1. Cytogenetics I.
2. Cytogenetics II.
3. Molecular genetic methods and applications in human genetics I.
4. Molecular genetic methods and applications in human genetics II.
5. Pedigree analysis: autosomal inheritance I. (AD)
6. Autosomal inheritance II. (AR)
7. Sex-linked inheritance I. (XR)
8. Sex-linked inheritance II. (XD, mitochondrial)
9. Complex inheritance
10. Consultation
11. Case studies
12. Genetic aspects of cell cycle and cell division disorders
13. Meiosis, gametogenesis; pre-implantation genetic testing
14. From genes to bedside

Important notes:

Students must visit at least 75% of the lessons. More than three absences from the practice or more than three absences from the lecture invalidate the semester, no signature is given. There are no extra practices.

There is one midterm during the semester. Spare midterm is organized for those students, who miss the midterm because an acute illness, but they have to show up the medical record to the tutor in one week. There is no opportunity to improve the midterm scores.

After the course there is a written exam (single choice and essay questions, family tree, karyogram, evaluation of molecular genetic studies etc.). The exam grade is calculated from the sum of midterm scores (maximum 40) and exam scores (maximum 60). Students have to reach more than 50 % of both the exam scores and total scores to pass the exam. In the third exam midterm scores are not calculated.

Core text: Medical Genetics and genomics (e-book)

Lecture and practice presentations and additional texts are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

MEDICAL ASPECTS OF DISASTER PREPAREDNESS AND RESPONSE I-II.

Directorate for Safety Technology
Department for Disaster Management and Education

Supervisor: *Pál Kocsik*

Lecturer: *Csaba Csendes*

Type of Course: indispensable

Credit value: 0

First and Second Semester

Purpose of the lecture:

The goal of the subject is to provide basic knowledge of the definition, mission, reasons and circumstances of establishment of civil protection/disaster management, on its place and role in the country's defense/protection system; to provide information on the types of disasters and their features. Based on experience gained in real incidents, to provide information on the peculiarities of disaster management and the tasks of medical authorities in this context.

The syllabus:

5th semester, 2 teaching hours: (M1) Concept, mission, tasks and establishment of civil protection and disaster management in Hungary. Types and features of disasters, the disaster vulnerability of Hungary, the organizational system of the protection against disasters, command and control of protection, the role of medical authorities.

6th semester, 2 teaching hours: (M2) The early warning system and signals of disaster management. The elimination of the consequences of disasters, the staff work applied during protection. Features and activities of Hungarian disaster management organizations and authorities, international possibilities of disaster management and the lessons learnt, demonstrated by examples.

Requirements and the potential for absences to participate in the sessions:

The subject consists of 4 modules. Module 1 does not have any prerequisites; module 2 anticipates the fulfillment of module 1. Students must register to attend the course announced as required. Those who are unable to fulfill module 1 or 2 (do not attend), may participate in a supplementary lesson in the 1st semester of the following year.

The method of certificate for the workshops and the exam absences:

Certificate of absence: medical, official – court of justice, local government, Students' Union, etc.

The mid-term controls' (reports, midterm) number, topic and date, replacements and repairs:

Method of making up for the absence justified by certificate: participation in a supplementary lesson.

Requirements for the signature:

Students must participate in the lesson announced to acquire signature, or in case of absence justified by certificate, in a supplementary lesson. Only registered students may participate in a supplementary lesson announced.

The method of grading: signature

Type of examination: none

Requirements: none, students must fulfill the obligation to attend the lessons.

Application for exam: none

Changing procedure for exam application: none

Absence from the examination: none

Notes, textbooks, study aids and literature list:

László Major PhD, Ronald Barham PhD, Dr. György Orgován PhD: Medical Aspects of Disaster Preparedness & Response

ELECTIVE SUBJECTS

Modern research methods in dentistry

Leader of the course: *Prof. Gábor Varga*
1st semester –2 credits
Wednesdays at 17.00-18.30 (2x45minutes)

Topics to be covered:

- | | |
|--|---|
| 1. Stem cells and scaffolds | 7. Investigation of epithelial transport |
| 2. Gingival blood circulation and inflammation – Laser Doppler Flowmetry | 8. Investigation methods of implant stability |
| 3. Isolation, maintenance, differentiation and in vitro functional assays of oral stem cells and progenitors | 9. Psychosomatics - examination of saliva samples |
| 4. CAD/CAM techniques and LASCA | 10. Clinical periodontal research |
| 5. Care for children having cleft lip and palate | 11. Dental epidemiological studies, saliva as a diagnostic factor |
| 6. Patch clamp electrophysiology technique | 12. Structural studies of non-decalcified hard tissues |
| | 13. Micro CT investigations |
| | 14. Real time 3D rendering of oral tissues |

Requirements:

- 1. Participation in the course compulsory, absences do not exceed 25% of the total number of hours.
- 2. The tasks to be fulfilled during the semester:
- 3. create a professional interview (3-5 pages, word doc) with one of the lecturer on the course

Challenges in modern dental research

Leader of the course: *Prof. Gábor Varga*
2nd semester – 2 credits
Wednesdays at 17.00-18.30 (2x45minutes)

Topics to be covered:

- | | |
|--|--|
| 1. Artificial organs and tissues; artificial salivary glands - biological regeneration of the human glands | 8. Medical and dental use of stem cells; isolation and possible use of tooth-derived stem cells in craniofacial regeneration |
| 2. Anesthesia in dentistry | 9. Gene polymorphism – SNP – dental genomics – what is the use? |
| 3. Saliva as diagnostic factor | 10. Bone loss – bone augmentation – craniofacial tissue regeneration – new directions |
| 4. Informatics – biology – dental research – practice dentistry | 11. Smile design – aesthetics and dental/medical ethics |
| 5. Gene therapy in dentistry | 12. GERD and dental erosion |
| 6. Laboratory animals for dental research - possible alternative methods; animal studies - pros and cons | 13. Implantology |
| 7. Homeopathy in dentistry | 14. Biodentin and alternatives in dentistry |

Requirements:

- 1. Participation in the course compulsory, absences do not exceed 25% of the total number of hours.
- 2. PowerPoint presentation, lecture and leading related discussion
- 3. critical written review of one Researcher Student Conference presentation

INTERDISCIPLINAR ASPECTS OF ORTHODONTICS

Department of Oral diagnostics

LANGUAGE COURSE

Language Communication Center

Term 5 Hungarian Dental Terminology III

Hungarian Dental Terminology III is a course for dental students who completed the course Hungarian Dental Terminology II and passed the examination. Students see and treat patients in the fifth term.

Topic

Students will be introduced to the most important topics of dentistry in Hungarian to help them with professional communication. Special emphasis is placed on communication. Grammar which has been acquired is practiced with dental vocabulary and in situations orally.

Vocabulary: teeth (name and structure), dental equipment, dental history (drugs and diseases), dental care, dental examination, etc.

The course consists of 56 hours (4 hours per week). Students receive 2 credit points for the course.

Evaluation is based on two written tests and active participation in classes.

Textbooks

J. Kovács: *A fogászati szaknyelv alapjai*

I. Gera: *Doctor – Patient, Doctor – Assistant Communication*, compiled by Prof. Dr. I. Gera,

M. Putz: *Magyar fogorvosi szaknyelv I.*

Supplementary Materials, compiled by staff members of the Centre for Languages and Communication.

Term 6 Hungarian Dental Terminology IV

Hungarian Dental Terminology IV is a course for students who completed the course Hungarian Dental Terminology III. The course concludes with a final examination at the end of the term.

Topic

Students will be introduced to further dental topics and situations to help professional communication in practical classes. In addition, they prepare for their final examination. Special emphasis is placed on communication with patients. Grammar which has been acquired is practiced with dental vocabulary and in situations orally.

Vocabulary: dental treatment (dental caries, root canal treatment, gingivitis and tartar), prosthodontics (tooth extraction and tooth replacement), oral hygiene, tooth whitening and orthodontic treatment.

The course consists of 56 hours (4 hours per week). Students receive 2 credit points for the course.

Evaluation is based on two written tests and active participation in classes.

Textbooks

J. Kovács: *A fogászati szaknyelv alapjai*

I. Gera: *Doctor – Patient, Doctor – Assistant Communication*, compiled by Prof. Dr. I. Gera

M. Putz: *Magyar fogorvosi szaknyelv I.*

Supplementary Materials, compiled by staff members of the Centre for Languages and Communication

COMPULSORY SUMMER PRACTICE

MINIMUM 1-WEEK (30 hours) – MAXIMUM 4-WEEK PROGRAM IN DENTO-ALVEOLAR SURGERY

Practicing tooth extractions

Practicing local anesthesia

Assisting at minor oral surgical procedures

Practicing post-surgical patients' management

Carrying out surgical tooth extraction under supervision

Carrying out minor dento-alveolar surgical procedures under supervision

Students should work at the assigned hospital or dental clinic 6 hours a day, five days a week.

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

Physical Education V.

Lessons (in hours): 14 lectures: 0 practicals: 14 seminars: 0

Lecturer of the course: Várszegi, Kornélia

Contact: Testnevelési és Sportközpont

Phone: +36-1/ 264-1408

Detailed course/lecture description*: *(to facilitate credit recognition in other institutions)*

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.
1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1x90 mins./week sessions:

women's football, ice hockey, beginner tennis, beginner tennis 2,

4x3 hrs. and 1x2 hrs. session packages:

Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only):

cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

mat the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

*Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors

Physical Education VI.

Lessons (in hours): 14 **lectures:** 0 **practicals:** 14 **seminars:** 0

Lecturer of the course: Várszegi, Kornélia

Contact: Testnevelési és Sportközpont

Phone: +36-1/ 264-1408

Detailed course/lecture description*: *(to facilitate credit recognition in other institutions)*

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.
1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1x90 mins./week sessions:

women's football, ice hockey, beginner tennis, beginner tennis 2,

4x3 hrs. and 1x2 hrs. session packages:

Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only):

cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

* Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors

CLINICAL MODULE

New curriculum to be introduced

Please, follow the updated version on the home page



Faculty of Dentistry
4th year

STUDY PROGRAMME

CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine I	C3L2P1	practice mark	General and oral pathophysiology
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	semi-final	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L1,5P0,5	semi-final	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C4L2P2	semi-final	Pathology, Biochemistry, Molecular and Cellbiology III.
compulsory	Prosthodontics II.	C6L1P6	semi-final	Medical and Dental Physiology II.
obligatory elective	Neurology	C1L1P0	semi-final	Prosthodontics I., Conservative Dentistry and Endodontics I., Radiation protection
obligatory elective	Psychiatry	C1L1P0	semi-final	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semi-final	Internal Medicine I.
compulsory	Gnathology	C3L1P2	final#	Pathology
obligatory elective	Public Health	C3L1,5P2	final#	Prosthodontics I.
compulsory	Emergency Dentistry I.	C0L0P1	signature	Conservative Dentistry and Endodontics I., Oral Diagnostics
compulsory	Physical Education VII.	C0L0P14	signature	General and Oral Microbiology
obligatory elective	Pediatrics	C1L1P0.5	semi-final	Oral Pathology
	Total Credit	38		Internal Medicine I. , Pathology

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
compulsory	Internal Medicine II.	C1L1P0	final#	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	practice mark	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semi-final	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C4L2P2	final#	Pharmacology, Internal medicine I
compulsory	Prosthodontics III.	C4L1P4	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II., General and Dental Radiology I.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semi-final	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Emergency Dentistry II.	C0L1P1,5	signature	General and Dental Radiology I., Emergency Dentistry I.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	prerequisite of registering to the 9th semester
compulsory	Physical Education VIII.	C0L0P14	signature	
	Total Credit	26		
elective	Basic Restorative Digital Dentistry	C1L1P0	semi-final	–

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

IMPORTANT NOTE: Signing up for Physical Education (PE) VI. in the 1st semester and for PE VIII. in the 2nd semester is compulsory.

LIST OF TEXTBOOKS (The list may change!)

- Katzung, B.: Basic and Clinical Pharmacology. 8th ed. Lange Medical Books/McGraw-Hill, 2001.
- Peter, E.S. Freund-Meredith B. McGuire.: Health, Illness and the Social Body. (A Critical Sociology.) Prentice Hall, Upper Saddle River, New Jersey.
- Conrad Fischer-Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141
- Mumenthaler: Neurology. Georg Thieme Verlag 1990. ISBN 3 13 523 909 3
- Kaplan&Sadock's Synopsis of Psychiatry. Tenth Edition. Eds: B.J. Sadock V.A. Sadock, Lippincott Williams, 2007
- Fuller G.: Neurological Examination Made Easy. 3rd ed. Churchill Livingstone. 2004. ISBN 0443074208
- Rajna Péter: Ideg- és elmegyógyászati szakkifejezések
- Hoag, Pawlak: Essentials of Periodontics. Mosby. ISBN 80162228x.
- Goaz, White: Oral Radiology. Mosby. ISBN 801618738.

- 10 T.G.Wilson-K.S.Kornman: Fundamentals of Periodontics Quintessence. 1996. ISBN 0-86715-303-2
- 11 The Washington Manual of Surgery. 3rd ed. 2002. Lippincott Williams & Wilkins. ISBN 0-7817-3389-8
- 12 Worthington-Lang-LaVelle: Osseointegration in Dentistry. An Introduction. Quintessence, Chicago, 1994.
- 13 Sethi, A.-Kaus, Th: Practical implant dentistry. Quintessence, London, 2013.
- 14 Bricker,S.L.-Langlais,R.P.-Miller,C: Oral Diagnosis, Oral Medicine and Treatment planning. 2nd ed. 2002. B.C.Decker Inc. Hamilton London
- 15 Essentials of Kumar and Clark's Clinical Medicine, Ed. Zammit, Sandilars. Elsevier, 7th ed., 2021. ISBN: 978070208280116
The New Public Health: An Introduction for the 21st Century. By: T.Tulchinsky, E.A.Varavikova. 2000. ISBN 0-12-703350-5
- 16 The New Public Health: An Introduction for the 21st Century. By: T.Tulchinsky, E.A.Varavikova. 2000. ISBN 0-12-703350-5
- 17 Gerry Humphris, Margaret S. Ling: Behavioural Sciences for Dentistry. Churchill Livingstone, London, 2005
Handouts for the lectures in Dentsoc will be accesible on the homepage of the Institute of behavioural Sciences: www.magtud.sote.hu.
- 18 McCracken's Removable Partial Prosthodontics (10/e) Glen P. McGivney-Alan B. Carr. Hardback, Mosby, 1999. ISBN 0323006787
- 19 Schillinburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 4th ed. 2012. ISBN 93 13 86 500
- 20 R.M.Basker-J.C.Davenport: Prosthetic Treatment of the Edentulous Patient. 5th ed. McMillan Press Ltd. ISBN 978-1405192613
- 21 Mohl, Zarb, Carlsson, Rugh. A Textbook of Occlusion. Quintessence. Chicago, 1988.
- 22 McNeill: Science and Practice of Occlusion. Quintessence. Chicago, 1997.
- 23 Niklaus P. Lang, Jan Lindhe (ed.): Clinical Periodontology and Implant Dentistry (Wiley Blackwell, 2015)
- 24 Proffit WR, Fields Jr Hw, Sarver DM: Contemporary Orthodontics 5th Edition, 2012; Elsevier Saunders, ISBN: 978032083171
- 25 Casamassimo PS, Fields HW, McTigue DJ, Nowak AJ: Pediatric Dentistry, Infancy through Adolescence 5th Edition, 2012, Elsevier Saunders, ISBN: 9780323085465.
26. Sethi A., Kaus Th.Practical Implant Dentistry: The Science and Art, Second Edition Quintessence, London 2013
- 3 Coleman,G.C.-Nelson,J.F.: Principles of Oral Diagnosis. Mosby-Year Book, Inc.St.Louis, Missouri, USA 1993. "hand-outs" will be prepared and presented for the students by the lecturers
- 4 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. Bp. SOTE. 1992.
- 5 Behavioral dentistry. Mostofsky DI, Forgione AG, Giddon DB (eds.), Blackwell Munksgaard, 2006.
- 6 Behavior & Medicine. 4th Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.
- 7 Fadem B: Behavioral Science, Lippincott Williams & Wilkins, 5th ed., 2008.
- 8 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6th ed., New York, Wiley, 2008.
- 9 Kopp M. - Skrabski Á.: Behavioral Sciences Applied in a Changing Society, Corvina, 1996.
- 10 Alan Stoudemire: Human Behaviour: An Introduction for Medical Students. Lippincott Company, 1994. ISBN 0-397-51337-2.
- 11 Gatchel R.J., Baum A., Krantz D.S.: An Introduction of Health Psychology. McGraw-Hill 1989. ISBN 0-07-100729-6
- 12 Principles of Oral Diagnosis. Ed.: Coleman,G.C.-Nelson, J.F. Mosby-Year Book, Inc. St.Louis, Missouri. 1993. ISBN 0-8016-1005-2
- 13 Rose,L.F.-Kaye,D.:Internal Medicine for Dentistry. 2nd ed. Mosby. 1990.
- 14 Surgery – Basic Science and Clinical Evidence. Ed. Norton, J.A. 1st ed. 2000. Springer. ISBN 0-387-9844-X
- 15 Baehr,M.M.D- Frotscher,M.M.D:Duus's Topical Diagnosis in Neurology: Anatomy, Physiology, Signs, Symptoms. Thieme. Medical Publ. 2005. ISBN 3136128044
- 16 Lindsay K.-Bone I.-Callender R.: Neurology and Neurosurgery. Illustrated. 4th ed. Churchill Livingstone, 2004. ISBN 0443070563
- 17 Szirmai I.-Kamondi A.-Arányi Zs.-Kovács T: Neurological examination. Bp. Semmelweis Publ. 2006. ISBN 963 9656062
- 18 J. Okeson: Management of Temporomandibular Disorders and Occlusion, 7th ed. 2012, Mosby
- 19 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8, 1984.
- 20 Neil-Nairne: Complete Denture Prosthetics. Wright. ISBN 72 36 20 636
21. Ward Booth, Hausamen, Schendel: Maxillofacial Surgery, C.Livingston Elsevier, 2007
22. DDS, MS, PhD Radi Masri, DMD Carl F. Driscoll (szerk.): Clinical Applications of Digital Dental Technology (2015 John Wiley & Sons Inc, Print ISBN:9781118655795 IOnline ISBN:9781119045564)
23. Alessandro Agnini, Andrea Agnini, Christian Coachman (szerk.): Digital Dental Revolution – The Learning Curve (Quintessence Publishing, Italy, 2015, ISBN 978-88-7492-017-4)
24. Hermann Péter, Szentpétery András: Gnatológia (Semmelweis Kiadó, 2018)

Recommended textbooks:

- 1 Bengel,Veltman,Loevy, Taschini: Differential Diagnosis of Diseases of the Oral Mucosa. Quintessence Publishing Co. Inc. Chicago, Illinois 1989.
- 2 Manfred Strassburg/Gerdtn Knolle: Diseases of the Oral Mucosa A Color Atlas 2nd ed. Quintessence Publ. Co.Inc. Carol Stream Illinois 1994.

PHARMACOLOGY, TOXICOLOGY I-II.

Department of Pharmacology and Pharmacotherapy

Obligatory

Credit: 4 (7th semester), 4 (8th semester)

Lecturer: László Köles, MD, PhD, Associate Professor

Pharmacology deals with the effects, mechanisms of actions, adverse effects, interactions and clinical administration of drugs used in the clinical practice as well as with their fate in the body. It also specifies the rules of prescription writing. It is based on and synthesizes the knowledge of basic, pre-clinical and clinical subjects such as physiology, biochemistry, oral pathology and internal medicine.

Thematics

First Semester

- | | |
|---|--|
| 1. Introduction to pharmacology. Pharmacodynamics I. | 10. Bronchodilators. Antiinflammatory agents used in bronchial asthma. Antitussive agents and expectorants. Histamin and antihistamines |
| 2. Pharmacokinetics. Pharmacodynamics II.- | 11. Corticosteroids. Pituitary hormones and hypothalamic hormones controlling their production. Hormonanalogs and hormone antagonists. Thyroid hormones and antithyroid drugs. |
| 3. Basics of the neurotransmission of autonomic nervous system. Parasympathomimetics. Parasympatholytics. | 12. Drugs affecting bone mineral homeostasis. Drugs acting on blood glucose control. Antidiabetics. |
| 4. Pharmacology of the adrenergic system. Sympathomimetics and sympatholytics | 13. Estrogens and antiestrogens. Progestins and antiprogestins. Contraceptives. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity. |
| 5. skeletal muscle relaxants. Pharmacology of the smooth muscles | 14. Biological Drugs. Orphan Drugs. Advanced Therapy Medicines. Nutrients, traditional plant medicines, vitamins, anorectic drugs. |
| 6. Drugs used in coagulation disorders, drugs against bleeding. Agents used in anemias. | |
| 7. Antiarrhythmic drugs. Positive inotropic agents. Treatment of acute and chronic heart failure | |
| 8. Diuretics and antidiuretics. Antihypertensive agents | |
| 9. Antihyperlipidemic drugs. Drugs used for treatment of angina pectoris. Drugs used for the treatment of peripheral vascular diseases. | |

2nd semester

- | | |
|---|--|
| 1. Immunosuppressive drugs (cytotoxic agents, inhibitors of cytokine gene expression, antibodies and fusion proteins) Retinoids | 8. Antiviral drugs. Antibacterial drugs inhibiting cell wall biosynthesis. |
| 2. Local anesthetics. NSAIDs. Drugs for gout. Antimigraine drugs | 9. Antifungal and antituberculous drugs. Antibacterial drugs inhibiting protein synthesis. |
| 3. Opioids. Adjuvant analgesics. Introduction to CNS pharmacology | 10. Anthelmintic and antiprotozoal and antiparasitic drugs. Antibiotics inhibiting bacterial nucleic acid synthesis. Miscellaneous other antibiotics. |
| 4. Nitrates and positive inotropic drugs. Antipsychotics. Drugs used for treatment of neurodegenerative disorders. Nootropic drugs. | 11. Disinfectants and antiseptics. Introduction to anticancer chemotherapy. Cytotoxic antitumor agents. |
| 5. Sedatives, hypnotics and anxiolytics. Antidepressants and antimanic drugs. | 12. Cancer chemotherapy: Small molecule signal transduction inhibitors, large molecule signal transduction inhibitors, drugs activating the immune system. |
| 6. General anesthetics. Antiepileptics | 13. Pharmacodynamic and pharmacokinetic drug interactions. Cancer chemotherapy: hormonal and other agents. |
| 7. Agents used for treatment of peptic ulcer and reflux disease. Antiemetic drugs. Laxatives and antidiarrheal drugs. Pharmacology of digestion, liver and biliary tract. | 14. Toxicology in the dental practice. Contrast agents |

Prescription writing continuously during the whole semester.

The attendance of a minimum of 75 % of lectures and practices is necessary for the end term signature of the semester (according to Examination and Studies Regulations). Replacement of classes is not offered by the department automatically. Nevertheless, if the number of absences exceeds the critical limit due to health problems (in this case medical certification is necessary), the student can ask for consultation once in a semester. If this request is accepted, this consultation can replace one not-attended regular class in a semester. The students exceptionally also can attend the classes of other seminar groups in the same week.

With the exception of ask for consultation in case of exceeding the critical number of absences (see above) no certification of the reason being absent from the practices and lectures is needed.

In case of not attending the exam we act according to the Examination and Studies Regulations.

Two midterm tests will be organized during both semesters. The results of the midterms may influence the final grade of the semifinal or final exam (\pm half grade). The participation is not obligatory, and so we do not offer the possibility to repeat or rewrite it. The students are informed about the detailed schedule and topics of the midterms at the beginning of the semester.

The attendance of a minimum of 75 % of lectures and practices is necessary for the end term signature.

The exam grade is determined by exam performance.

The oral semi-final exam is conducted by the lecturer of the practice. The final examination is conducted by leading instructors (Associate Professors and Professors), but the department chair may allow (by recommendation of the dean) the participation of senior lecturers. In both exams one question from each question list have to be drawn. A previous written prescription writing exam at the lecturer of the practice is the part of the final exam.

If the student fails at any parts of the exam, the evaluation (grade) of the whole exam is "failed".

Only in case of semi-final exam there is a possibility to offer the semifinal mark: (please, refer to The Study and Examination Policy Faculty of Medicine, Dentistry and Pharmacy (shortly Study Policy) Section 17 point 12): If the results of the first two midterms (written tests) reach minimum 80%, the student receives the possibility to take the third midterm (oral exam) during the last week of the study period. The topics of the third midterm cover the whole material of the semester. In case the result of this midterm is four or five the Head of Department may offer this mark as the acknowledgment of the student's performance during the semester.

Exam:

Oral **semi-final exam**, at the end of the 7th university semester (from the topics of Pharmacology I.).

Oral **final exam** (from the topics of the whole subject – Pharmacology I-II) at the end of the 8th university semester. A previous written prescription writing exam at the lecturer of the practice is the part of the final exam.

Semi-final exam (7th semester): testing of the student in a subject of the 1st Pharmacology semester.

Final exam (8th semester): testing of the student in a subject of both semesters – the entire subject of Pharmacology, including a previous written prescription writing exam.

Registration:

In the NEPTUN system.

Modifying:

In the NEPTUN system, according to the Examination and Studies Regulations.

A vizsgáról való távolmaradás igazolásának módja:

According to the Examination and Studies Regulations.

Textbook:

B. Katzung: Basic and Clinical Pharmacology, McGraw-Hill Education, 2018, ISBN: 978-1-259-64115-2

Further study material:

On the homepage of the department: <http://semmelweis.hu/pharmacology/graduate-education/faculty-of-dentistry/>

INTERNAL MEDICINE I.

Department of Internal Medicine and Oncology, 2/a Korányi S. u., Budapest, H-1083

Course director: *prof. István Takács*

Course coordinator: *dr. Péter Studinger*

Credits: 3

Lectures: 1 hour / week

Practices: 2 hours / week

Exam: No formal exam, signature and evaluation based on activity during practices: excellent (kiválóan megfelelt), pass (megfelelt) or fail (nem felelt meg).

Objective of the course: Primary objective of the course is to have the student to acquire the basic skills of obtaining a proper medical history, learn the bases of physical examination and other methods of patient evaluation, establishing diagnosis and treatment plan. Diseases of the endocrine, gastrointestinal and urogenital system will be reviewed, with special emphasis on their dental significance.

Lectures:

- Medical patient interview, comprehensive health history, techniques of physical examination. Alterations of the skin.
- Assessment of vital signs. Role of physical examination in emergency situations. Examination of a patient in shock, sudden dyspnea.
- Examination of the chest, common abnormal findings.
- Examination of the abdomen, common abnormal findings.
- Diagnosis treatment of thyroid diseases and their relevance to dentistry.
- Types, diagnosis and treatment of diabetes mellitus, relevance to dentistry.
- Diseases of the calcium metabolism, diseases with altered bone composition.
- Diseases of the upper gastrointestinal tract, malabsorption and their relevance to dentistry.
- Diseases of the lower gastrointestinal tract, gastrointestinal neoplasms.
- Diseases of the liver and biliary tract, their relation to dental diseases.
- Acute diseases of the urogenital system, electrolyte disturbances.
- Causes and management of chronic kidney disease.
- Causes of hypertension, treatment options. Management of hypertensive emergency.
- Diagnosis and management of the most common intoxications.

INTERNAL MEDICINE II.

1st Department of Internal Medicine

First Semester

Lectures (2 hours per week) **Practices** (1 hour per week)

Immunologic principles. Lymphocytic system.
Immunoglobulins. Types of immunologic reactions.
Polycythemia. Agranulocytosis. The leukemias.
Hodgkin's disease and non-Hodgkin's lymphoma.
Introduction to anemia and approach to patients with anemia. Iron deficiency anemia. Megaloblastic anemia. Aplastic anemia.
Hemolytic anemias.
Plasma cell disorders. Multiple myeloma.
Waldenström's macroglobulinemia.
Heavy-chain disease. Amyloidosis.
Hemostatic disorders. Thrombocytopenia.
Thrombocytosis. Vascular purpuras. Disorders of the coagulation mechanism.
Autoimmunity. Systemic lupus erythematosus.
Sjögren's syndrome.
Atopic diseases. Allergic rhinitis. Asthma of allergic etiology. Urticaria and angioedema. Serum sickness.
Drug allergy. Contact dermatitis.

Immunodeficiency diseases.
Rheumatoid arthritis. Juvenile rheumatoid arthritis.
Reiter's syndrome. Bechet's syndrome.
Systemic sclerosis. Polymyositis and dermatomyositis. Wegener's granulomatosis.
Hypothalamic and pituitary disorders. Hyperpituitary syndromes.
Anterior pituitary insufficiency.
Diabetes insipidus. The adrenal cortex.
Cushing's syndrome. Addison's disease.
Diabetes mellitus. Diagnosis and classification of diabetes mellitus.
Complication and treatment of diabetes mellitus. Gout.
Diabetes mellitus. Diagnosis and classification of diabetes mellitus.
Complication and treatment of diabetes mellitus. Gout.
The thyroid gland. Hypothyroidism. Hyperthyroidism.
Thyroiditis. Hypoparathyroidism. Hyperparathyroidism.
Viral diseases. Herpes simplex. Varicella-zoster virus.
Cytomegalovirus. Epstein-Barr virus. Influenza. AIDS.
Bacterial disorders. Tuberculosis. Diseases caused by fungi. Salmonellosis. Shigellosis.

Note: The maximum number of absences in a semester is 3
More than 3 absences invalidate the semester
Semi-final examination

CONSERVATIVE DENTISTRY AND ENDODONTICS II.

Department of Conservative Dentistry

Head of Department: *Dr. Zsuzsanna Tóth D.M.D., Ph.D.*

First semester

Detailed curriculum of lectures:

1. Preventive endodontics: significance of pulp protection. Diagnostics in endodontics
2. Endodontic microbiology
3. Endodontics: Access preparation and length determination
4. Endodontics: cleaning and shaping of root canals
5. Shaping of the Root Canal System: hand and rotary instrumentation techniques
6. Obturation techniques (cold and warm gutta-percha techniques)
7. Evaluation of Endontic Outcomes. Revision
8. Radiology in Conservative Dentistry
9. Endodontic management of traumatic dental injuries
10. Definitive restorations of root canal treated teeth, post and core build-up, single crowns
11. Surgical treatments related to Endodontics. Methods and indications.
12. Endodontic emergencies.
13. Planning complex dental treatment
14. Interactive treatment planning

Clinical practice (3 hours per week).

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed and one documented clinical case must be presented to validate the semester by earning the signature. Practical grade: consists of midterm, „small tests“, and evaluation of work and knowledge presented at clinical practice.

CONSERVATIVE DENTISTRY AND ENDODONTICS III.

Second semester

Detailed curriculum of lectures:

1. Evidence based dentistry
2. Microscope in endodontic treatments
3. Special cavity preparations
4. Post restorations
5. Preparing esthetic inlays and their cementation
6. Chairside CAD/CAM
7. Esthetics in dentistry and bleaching of teeth
8. Thesis defense
9. Indications and prepartions for veneers
10. Spring break
11. Treatment of non-carious cervical lesions: surgical and restorative approach
12. Difficulties during root canal treatment and their management
13. Endodontic and periodontal interrelationships
14. Surgical interventions in conservative dentistry (resection, crownlengthening)
15. Interactive endodontics: diagnosis, treatment planning. Removing separated instruments from the root canal

Clinical practice (3 hours per week).

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed and one documented clinical case must be presented to validate the semester by earning the signature. Practical grade: consists of midterm, „small tests“, and evaluation of work and knowledge presented at clinical practice.

PROSTHODONTICS II.

First Semester

Topic of the lectures (weekly, numbered):

1. The reasons and the consequences of tooth loss
2. Infection controll in prosthodontic
3. Preparation for fixed restorations
4. Fixed temporary restorations
5. Impression for fix restorations
6. Minimal invasive prosthodontic treatment
7. Removable partial dentures
8. Major connectors of upper and lower RPD
9. Indirect and direct retainers of RPD
10. Gnatological aspect of fix and removable partial dentures
11. Clinical and laboratirial steps of fixed partial dentures
12. Fix appliances, types of crown and bridges
13. Prosthetic aspects of implantology
14. Consultation

PROSTHODONTICS III.

Second Semester

Topic of the lectures (weekly, numbered):

- | | |
|---|--|
| 1. Diagnosis and treatment planning | 8. Treatment planning for the class 2A/l. and 3. dental arches |
| 2. Classification of the partially edentulous dental arches | 9. Maxillo – facial prosthetics |
| 3. Tooth sade determination | 10. Implants in prosthodontics |
| 4. Treatment planning for the class 0. dental arche | 11. Parodontologic aspects of Prosthodontic Treatments |
| 5. Treatment planning for the class IA. and 1B. dental arches | 12. Construction of Complex Dentures |
| 6. Treatment planning for the class 2A. dental arches | 13. Consultation |
| 7. Treatment planning for the class 2B. dental arches | |

BASIC RESTORATIVE DIGITAL DENTISTRY

Second Semester

Department of Prosthodontics

Head of Department: **Prof. Dr. Péter Hermann**

Lecturer: **Dr. Judit Borbély**

Lectures

1. Introduction to digital dentistry
2. Direct and indirect CAD CAM workflow
3. Standard Tessellation Language
4. Intraoral scanning systems with lab connection
5. Cad/Cam materials
6. Digital communication, shade selection
7. Virtual articulators

Practices

8. Intraoral scanning in vitro
9. Intraoral scanning in vivo
10. Prostho planning for navigated implant surgery
11. 3 D printing
12. Dental system Lab CAD fixed
13. Dental system Lab CAD removable
14. Summarizing Digital Course/Test

SURGERY

I. Department of Surgery Department Section of Surgery

Second Semester

Lectures (2 hours per week)

Surgery of the neck. Thyroid and parathyroid
Surgical treatment of the chest wall, breast, pleura, lung and mediastinum
Oesophagal surgery (injuries, diverticula, malignant diseases)
Gastric and duodenal surgery (benign diseases)
Gastric and duodenal surgery (malignant diseases)
Surgery of gall-bladder and extrahepatic biliary system
Surgery of the small intestines and colorectum (benign and malignant diseases)
Appendicitis
Surgery of the liver, pancreas and spleen. (injuries, inflammatory diseases and tumors)
Bowel obstructions
Hernias
Basic principles in vascular surgery
Shock. Cardiopulmonary resuscitation. intensive therapy
General principles of traumatology.
First aid.
Traumatological management of catastrophes.
Burned patients.
Urology Consultation

Practices (1 hour per week)

Visiting patients' ward
Visiting operating theater

Visiting patients' ward

Visiting patients' ward
Visiting operating theater
Visiting operating theater

Visiting patients' ward

Visiting patients' ward
Visiting patients' ward
Visiting operating theater

Visiting operating theater

Visiting patients' ward

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester
Practical course grade
Final examination

ORAL AND MAXILLOFACIAL SURGERY II.

Department of Oro-Maxillofacial Surgery and Stomatology

Tutor: *Dr. Kinga Körmöczy*

First Semester

Lectures (1 hour per week)

Odontogenic inflammation I.
 Pathology, pathophysiology and microbiology of pyogenic inflammation
 Work safety protection training.
 Odontogenic inflammation II.
 Clinical features, diagnostics, therapy. The question of dental foci.
 Odontogenic inflammation III.
 Maxillofacial inflammation
 Odontogenic cysts I.
 Clinical classification of odontogenic cysts, the pathogenesis of their formation. Diagnosis, differential diagnosis
 Odontogenic cysts II.
 The surgery of odontogenic cysts. Cystectomy, cystostomy, decompression methods
 Endodontic surgery
 Indications and operative technique of apicectomy.
 Retrograde root filling. The hemisection of teeth
 Oral surgical aspects of the maxillary sinus I.
 (Pathology, diagnostics)
 Oral surgical aspects of the maxillary sinus II.
 (Sinus apertus)
 Written midterm
 The surgery of impacted teeth I.
 Disorders of the eruption of third molars. Clinical aspects of the prognosis of third molars. Diagnostics of mandibular third molars
 The surgery of impacted teeth II.
 Surgical technique of the removal of mandibular third molars. Post operative follow-up treatment of mandibular third molars, complications of their removal.
 Clinical features of maxillary third molars
 The surgery of impacted teeth III.
 Disorders of the eruption of upper canines. Prognosis, diagnosis and surgical treatment. Clinical features of other impacted and supernumerary teeth.
 Special need dentistry

Practices (3 hours per week) Practising minor oral surgery

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester three midterm examinations should be passed.
 Semi-final examination

ORAL AND MAXILLOFACIAL SURGERY III.

Department of Oro-Maxillofacial Surgery and Stomatology

Second Semester

Lectures (1 hour per week)

1. Developmental anomalies I.
2. Complex therapy of cleft lip and palate. Craniofacial malformations.
3. Developmental anomalies II.
4. Surgical management of dysgnathia.
5. Dentoalveolar trauma.
6. Injuries of neighbouring soft tissues, principles of management.
7. Clinical aspects of tooth replantation: indication, technique, prognosis.
8. Maxillofacial surgical aspects of peripheral nerve disorders.
9. Diseases of the temporomandibular joint.
(Diagnosis and management)
10. Non-odontogenic cysts.
11. Developmental cysts. Pseudocysts. Soft tissue cysts.
12. Preprosthetic surgery I.
13. Principles.
14. Preprosthetic surgery II.
15. Edentulous jaws. Osteoplasty. Corrections of soft tissues.
16. Written midterm
17. Facial pain. The origin of different facial pain. Diagnosis and differential diagnosis of facial pain. Neuralgia.
18. Salivary gland diseases. Diagnostics and therapy
19. Emergency medicine in dental surgery. Emergencies in the dental practice. Management of "high risk patients".
20. Consultation

Practices (3 hours per week)

Practising minor oral surgery

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester three midterm examinations should be passed
Practical course grade

ORTHODONTICS PRE-CLINICAL

Department of Orthodontics and Pediatric Dentistry

Head of Department: *Dr. Noémi Katinka Rózsa D.M.D., Ph.D.*

tel: (1)-4591500/ 59268

E-mail: noemirozsa65@gmail.com

Tutor: *Dr. László Miklós Kaán D.M.D., PhD.*

Phone: (1)-4591500 / 59270

E-mail: kaanm@dent.semmelweis-univ.hu

First semester

The aim of training

Preparing the dental students for the practical education of orthodontic health care, focusing primarily on the development of the manual skills.

Training form and time frame

Practical education: 1 hour/week

Form of examination: practical mark based on the practical performance

Comment: The practical education takes place in 7x2 hours. Training starts in the spring semesters only.

The minimal conditions of participation

Successful final examination of oral biology subject

The used method

According to the detailed syllabus, presentation of the current appliance types on a sample, and/or with multimedia methods. The activation of the appliances, wire- and arch bending practiced individually. Individual practice of bracket bonding with the help of typodonts and phantoms. The students are working under the supervision and management of the instructor.

Detailed syllabus

1. The categorization of appliances, the basic principles of their functions, basics of the orthodontic biomechanics
2. The function of the discernible appliances, their activation, elements, wire bending practice
3. The characteristics of metallic alloys used in orthodontics, their usability, wire bending practice
4. The activation of the appliances, their elements, accessories, bracket bonding systems
5. The operation principle of the typodont, its application, the use of the ligatures
6. Arch bending on a model, using typodont
7. Friction-proof systems, loop bending methods

GENERAL AND DENTAL RADIOLOGY

Department of Prosthodontics

Lecturer: *Prof. Dr. Csaba Dobó Nagy*

First Semester

Lectures (2 hours per week)

Radiation physics
Dental caries
Pulp cavity
Extraction of the teeth

Root canal therapy

Periapical lesions

Periodontal disease

Cysts of the jaws

Hypercementosis
Excessive bone formation
Injuries to teeth
Osteomyelitis
Tumors
Apicoectomy

Anomalies
Salivary gland diseases
Resorption of the teeth
Radiation biology
Health physics
Long-cone paralleling technique
Traditional extraoral radiographic examinations
Panoramic technique I.

Panoramic technique II.

Practices (2 hours per week)

Normal radiographic anatomy: Tooth anatomy (lecture)
Normal radiographic anatomy: Anatomic landmarks of the maxilla (lectures)
Normal radiographic anatomy: Anatomic landmarks of the mandible (lecture)
Development of the teeth, Deciduous teeth (lect.)
Recognition of the teeth, anatomic landmarks and caries
Development of the teeth, deciduous teeth, extraction of the teeth
Periapical lesions
1st midterm
Periodontal disease
2nd midterm
Cysts of the jaws
3rd midterm

Hypercementosis
Excessivebone formation
Injuries to teeth
Osteomyelitis
Tumors, apicoectomy
Anomalies

Review

Review

Viewing of the examination radiographs I.
Viewing of the examination radiographs II.

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester three midterm examinations should be passed.
Final exam

PSYCHIATRY

Tutor: **Dr. János Réthelyi**

Department of Psychiatry and Psychotherapy

Lectures: 1/week

Examination: Semi-final

Textbook:

Kaplan&Sadock's Synopsis of Psychiatry. Tenth Edition. Eds: B.J. Sadock V.A. Sadock, Lippincott Williams, 2007

Schedule

Subject of psychiatry, classification of disorders, diagnostic methods

Case demonstration (psychiatric interview, signs and symptoms)

Affective disorders

Case demonstration (depression)

Anxiety, anxiety disorders, somatoform disorders

Case demonstration (anxiety disorder)

Organic psychiatry

Case demonstration (dementia)

Substance related disorders

Case demonstration (alcohol abuse)

Schizophrenia and associated disorders

Case demonstration (schizophrenia)

Emergency in psychiatry, legal aspects

Case demonstration, consultation

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. Semi-final exam: written exam (multiple choice)

NEUROLOGY

Tutor: **Dr. Sándor Illiczky**

First Semester

Classroom lectures:

Cranial nerves and the brainstem
The motor system
The sensory system, pain syndromes
Altered consciousness. Emergency in neurology
Diagnosis and treatment of cerebrovascular disorders
Epilepsy and sudden loss of consciousness
Movement disorders
Inflammatory disorders and tumors of the nervous system

Bedside practice, patient demonstration

Recognition of neurological symptoms – examination of cranial nerves
Examination of the motor system
Evaluation of neurological symptoms
Emergency in neurology
Demonstration of cerebrovascular patients
Diagnosis of epilepsies
Special investigation of patients with movement disorders

Requirements:

Attendance of the lectures
Participation on the patient demonstration (maximum 1 absence from 7 practices)
Semifinal exam: the written exam consists of 50 simple choice questions, including the topics of the lectures and the basic literature listed below. For those who are not able to be present at the written exam, or fail, we provide a date for oral exam.

Basic reading:

1 *Fuller G.* Neurological Examination Made Easy (3rd edition) Churchill Livingstone, Published April 2004. ISBN 0443074208

Suggested reading:

1 *Lindsay K., Bone I., Callender R.:* Neurology and Neurosurgery Illustrated., 4th edition Churchill Livingstone – Published February 2004. ISBN 0443070563

PERIODONTOLOGY I, II.

Department of Periodontology

First Semester

Lectures (1.5 hours per week)

Practices (0.5 hour per week)

Credit 2

Exam: semi-final

Second Semester

Lectures (1 hour per week)

Introduction to Periodontology
The morphology of the periodontium,
histology and embryology of the periodontium
The dental plaque. Its origin and role in the periodontal
diseases. Periodontal microbiology
Oral immunobiology
Oral immunopathology
Drugs and chemicals used in the periodontology
Pathomechanism of the periodontal disease
Clinical forms of periodontal diseases
Acute necrotizing ulcerative gingivitis
Pregnant gingitis, Periodontal diseases
with endocrine background.
Non-plaque related periodontal conditions
Oral mucous membrane diseases located on the gingiva
Periodontal diseases of the child and adolescents
Epidemiology of the periodontal diseases
Periodontal diseases and the patients' behavior
Periodontitis as a behavioral disease
Oral prophylaxis and prevention of periodontal diseases
Measures of individual and group education and motivation
Periodontal charting, periodontal indices
Medical and dental history of the periodontal patients
General appraisal of the etiology of periodontal disease
Rational for therapy.
Consultation

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester two midterm demonstrations should be passed.
Semi-final

Practices (3 hours per week)

Clinical practice
Clinical practice
Clinical practice
Clinical practice

Clinical practice

Midterm Demonstration
Clinical practice
Clinical practice
Clinical practice

Clinical practice

Clinical practice
Clinical practice

Midterm Demonstration

Clinical practice

Clinical practice

Clinical practice

PUBLIC HEALTH

Tutor: *Dr. András Terebessy*

English Dental

<i>Lectures</i> (1,5 hours per week)	<i>Practicals</i> (2 hours per week)
Definition of Public Health; Past, present and future of Public Health	Introduction Basic demographical data
Demography: International and Hungarian situation	Public Health Program of EU
General epidemiology Analytical and intervention methods on field of chronic non-communicable diseases	Visit into the Central Kitchen of the University
Lifestyle: smoking, alcohol consumption, drug-abuse	Practical aspects of epidemiological investigations: study-planning and analysis
Epidemiology and prevention of non-communicable diseases I	Dentist's task on prevention of non-communicable diseases I.: smoking, alcohol consumption and drug-prevention
Epidemiology and prevention of non-communicable diseases II	Dentist's task on prevention of non-communicable diseases II: HBP-prevention
Epidemiology and prevention of Cancer	Dentist's task on prevention of non-communicable diseases III: cancer-prevention Screening-screening programs
Environmental health : water, soil, air	Dentist's task on environmental health problems
Occupational health	Dentist's task on occupation diseases prevention
Basics of healthy diet; Nutrition disorders	Assessment of nutritional status; nutritional disorders;
Mother-, child and youth health care	Basics of healthy diet; Computer planning and controlling diet in public catering
General Epidemiology of communicable diseases – International and Hungarian aspects	Family planning, Youth health
Nosocomial Infections Reemerging, emerging and deliberately emerging infections	General epidemiology of communicable diseases Immunization, Vaccination programs
Ethic of Public Health	Sterilization, disinfection Laboratory investigations in case of communicable diseases Nosocomial infections
Structure and financing of Health Care Systems	Food-hygiene; food-borne diseases

DENTAL ETHICS

First Semester

Bioethics

Course Syllabus.

Institute of Behavioral Sciences

Course Director: **Prof. Dr. József Kovács**

(28 hours)

Course objectives:

- To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patient research subjects and fellow health care professionals
- To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

Lectures

1. week

Basic concepts of ethics.

Descriptive ethics, normative ethics, metaethics.

General ethics and applied ethics.

Bioethics, medical ethics, health care ethics. Similarities and differences.

The role of bioethics in a pluralistic society.

The relationship between law and ethics.

Reasoning in ethics. The most common mistakes.

2. week

Normative theories of ethics.

Deontological theories of ethics. (The Golden Rule, Kant and the categorical imperative, the principle of double effect, W.D. Ross and the prima facie duties.)

Teleological theories of ethics. (Act and rule utilitarianism.)

Theories of natural law.

Contractarian theories of ethics. (The theory of justice of John Rawls)

3. week

The basic principles of dental ethics.

The principle of respect for autonomy.

The principle of non-maleficence.

The principle of beneficence.

The principle of justice.

Arguments against „principalism“.

4. week

The concept of health and disease.

Naturalistic definitions of health.

The medical model of defining health.

Normativist definitions of health.

Some questions of psychiatric ethics.

5. week

Informed consent.

Simple consent and paternalism in medicine.

The emergence of the doctrine of informed consent.

Standards for information disclosure for patients.

When is informed consent not necessary?

Standards of competence and incompetence.

The right to refuse medical treatment.

Some psychological and communicational aspects of informed consent.

6. week

Information disclosure to terminally ill patients. Telling the truth to patients.

The history of information disclosure to terminally ill patients.

Pros and cons for lying to terminally ill patients.

The weaknesses of the arguments in favour of lying.

The dying process according to E. Kübler-Ross.

How to communicate the bad news to terminally ill patients.

The physician's relationship with the relatives of the deceased patient.

7. week

Justice in Health Care I. Ethical questions of macroallocation.

Higher and lower level macroallocational problems.

The role of personal responsibility in maintaining health.

The principles and practice of rationing in contemporary health care systems. (Soft and hard rationing.)

Medical ethics and medical economics. Ethical questions of cost-benefit and cost effectiveness analysis. The QALY.

The problem of right to health care. (The libertarian, the liberal and the socialist views about the right to health care.)

The role of the market and that of the state in the health care system.

Ethical problems of financing health care. (Fee-for-service, capitation, fixed salary, DRG-system, etc.)

Setting health care priorities in Oregon.

Attempts to define a just health care system.

8. week

Ethical questions of reproductive medicine.

Abortion.

Artificial insemination from donor.

In vitro fertilization, surrogate motherhood.

Ethical questions of genetic counseling.

Ethical questions of embryo experimentation.

9. week

Justice in Health Care II. Ethical questions of microallocation. Moral dilemmas in the allocation of scarce medical resources.

The concept of microallocation.

Ethical analysis of various selection criteria. (Medical benefit, psychological ability, supportive environment, social value criterion, resources required criterion, age, ability to pay, random selection, personal responsibility for the illness, etc.)

10. week

Ethical questions of animal experimentation.

History of the thinking about the moral status of animals.

The philosophical significance of the Darwinian conception of nature.

The views of Peter Singer: antispeciesism.

The views of Tom Regan: animal rights.

Ethical questions of experimentation on animals on the basis of a moderate animal protectionist's view.

Critical anthropomorphism.

Alternatives to animal experimentation.

11. week

Euthanasia and the withholding of life-sustaining treatment

Definitions.

The sanctity of life versus the quality of life doctrine.

Is there any difference between active and passive euthanasia?

The practice of active euthanasia in the Netherlands. The Rummelink Report.

Refusal of life sustaining treatment by competent and incompetent patients.

Possibilities to extend the autonomy of patients: living will, durable power of attorney, substituted judgement, etc.

The concept of medically futile treatment.

Ethical problems of the treatment of handicapped newborns. (The debate about the treatment of spina bifida babies, the Baby Doe case, the legal situation, etc.)

12. week

Ethical questions of human experimentation.

Possible forms of experimentation on humans.

Contradiction between the two roles of the physician. (Healer and scientist.)

The ethics of Randomized Controlled Clinical Trials. (RCT)

Randomization and prerandomization.

13. week

Ethical questions of organ- and tissue transplantation.

Some problems of justice concerning kidney transplantation and chronic haemodialysis.

Ethical questions of transplantation from living kidney donors.

The concept of death.

Ethical questions of organ harvesting from the dead.

The debate about the market of organs.

Ethical questions of using embryo- or foetal tissue in human therapy.

Ethical problems of using anencephal newborns as organ donors.

14. week

The rights of patients.

The role of patient's rights in the transformation of the paternalistic physician-patient relationship.

Moral versus legal rights.

A list of basic rights of patients.

Mechanisms to ensure the realizations of patient's rights. (Patient's rights advocates, ombudsman, hospital ethics committees, institutional review boards, arbitration, etc.)

Course Faculty:

Prof. József Kovács, MD, PhD, (Head of the Department of Bioethics), 210-2930/56350;

e-mail: kovjozs@net.sote.hu

Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@yahoo.com

Imre Szebik, MD, PhD e-mail: szebimre@net.sote.hu

Jeno Lorincz, MD, JD e-mail: lorjen@net.sote.hu

Department:

Institute of Behavioral Sciences

Department of Bioethics

NET Building, 19th, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room-2005

List of questions

1. Deontological theories of ethics.
2. Utilitarian theories of ethics.
3. The principles of dental ethics
4. Justice and dental ethics: the allocation of scarce medical resources.
5. Paternalism in dental practice
6. Informed consent
7. Information disclosure for terminally ill patients
8. Advance Directives
9. Experimentation on human subjects
10. Objection to Transplantation of Organs and Counterarguments
11. Ethical problems of live organ donation
12. Organ donation from brain-dead donors: the system of donor cards.
13. Organ donation from brain-dead donors: presumed consent
14. Active and Passive Euthanasia
15. Withdrawing and withholding life sustaining treatment.
16. Models of the dentist-patient relationship
17. Ethical issues related to treating patients with partially compromised capacity
18. Professional norms and bad outcomes
19. Ethical questions raised by HIV and AIDS in dental practice
20. Confidentiality issues in dental practice
21. Moral issues related to the HIV positive dentist
22. Possible criteria for distributing the society's resources
23. Social justice – the free market view of justice
24. Ethical issues in advertising dental services
25. Professional obligations in dentistry

Textbook:

Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

Important:

To participate on at least 75% of the total number of lessons is a prerequisite of getting the signature. Doctor's certificate is required to justify absence from the lessons and the exam.

Exam type: semi-final

Sign up for the exam: through the Neptun system.

GNATHOLOGY – lectures and practices

Department of Prosthodontics

Lecturer: ***Prof. Dr. Péter Hermann***

First Semester

Lecture (1 hour/week)

Practice (2 hours/week)

Topic of the lectures (weekly, numbered):

1. Introduction To The Physiology Of The Stomatognathic System
2. Morphology Of The Stomatognathic System
3. Jaw Positions
4. Intercuspal Position, Retruded Contact Position, Occlusal Alterations
5. Mandibular Movements
6. Occlusal Concepts
7. Articulators
8. Face-bow Transfer. Mounting Of Articulators
9. Periodontal Considerations Of Occlusion. Occlusal Trauma
10. Gothic Arch Tracing. Ultrasonic Registration And Examination Of The TMJ
11. Examinations And Differential Diagnosis Of Occlusal Problems
12. Role Of Occlusion In The Clinical Practice. Parafunctions
13. Temporomandibular Disorders
14. Test

IMPLANTOLOGY I. – lecture

Department of Oro-Maxillofacial Surgery and Stomatology

Lecture: 1 hour/week

Course Syllabus:

Introduction. History of oral implantology. The classification of oral implants, according to the anatomic site. Endosteal implants.

The indications, contraindications of implant treatment.

Diagnostics and treatment planning.

General considerations of implant surgery.

Special considerations of implant surgery. The time of implant placement.

The fundamental biomechanics of oral implants.

The role of surface chemistry and topography in the osseointegration

The essential conditions of success of the implant therapy: Biocompatibility. Osseointegration. Gingival seal. Progressive osseointegration.

The factors influencing the masticatory load transmission through implants.

The fundamentals of implant prosthodontics: Implant abutments, impression techniques. Prosthetic options on implants.

Implant failures. Biological, mechanical complications and their management.

Practice: 1 hour/week

Practice of Implantology complements and deepens the knowledge obtained during the theoretical course

- Diagnostics – X-ray diagnostics, CBCT analysis, introduction of X-ray and surgical template
- Introduction of the implant surgery through the system of the Straumann – emphasize on the unique properties of the system (surface, comparison of 1-stage / 2-stage surgical method
- Introduction of the implant prosthodontics through the SIC system – emphasize on the unique properties of the system, prosthetics of the SIC system. Practicing the steps of the prosthetics on a model, cad-cam based prosthetic abutment, safe on four concept, platform switching, Balance healing screws and abutments
- Guided bone regeneration through the products of Geistlich company – introduction of the methods of bone augmentation techniques, sinus-liftig, lateral bone augmentation practicing on models
- Introduction of the guided implant surgery Nobel Biocare Guide System overview – emphasize on the unique properties of the system
- Introduction of the failures of implantology and their solutions through the Osstem system – emphasize on the unique properties of the system, practicing on models

Semi-final examination

EMERGENCY DENTISTRY

Department of Community Dentistry

Head of department and lecturer: ***Dr. Orsolya Németh***

1st semester: only practice

2nd semester: lecture and practice

lecture: 1 hour/week

practice: 1,5 hour/week

The purpose of the subject is that the dental student would be able to recognize and cope with the possible daily emergency cases at the dental practice.

In the 21st century dental emergency does not mean extractions. It also includes Conservative Dentistry, Prosthetics, Pedodontics, Orthodontics as well as Periodontics aspects.

The curriculum of the Community Dentistry is an integral part of the other subjects.

It is necessary to teach this special field of dentistry separately. Introduction of individual cases in community dentistry helps with understanding other fields of dentistry as well.

This subject is especially important for graduates as they do not possess enough theoretical and practical knowledge yet. It would make them capable to solve any emergency case with ease.

Department of Community Dentistry is responsible for all Budapest and Pest region dental care, therefore is able to provide sufficient number of patients for practical education.

COMPULSORY SUMMER PRACTICE

4-weeks (120 hours) at a Dental Office

(Conservative Dentistry or Periodontology)

The student has to practice whole-scale comprehensive dental treatment including: Oral Prophylaxis, Restorations, Root Canal Therapy and Minor Prosthodontics as well as Er. Management.

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

Physical Education VII-VIII.

Lessons (in hours): 14 **lectures:** 0 **practicals:** 14 **seminars:** 0

Lecturer of the course: Várszegi, Kornélia

Contact: Testnevelési és Sportközpont

Phone: +36-1/ 264-1408

Detailed course/lecture description*: *(to facilitate credit recognition in other institutions)*

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1x90 mins./week sessions:

women's football, ice hockey, beginner tennis, beginner tennis 2,

4x3 hrs. and 1x2 hrs. session packages:

Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only):

cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

mat the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!

* Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors

CLINICAL MODULE

New curriculum to be introduced

Please, follow the updated version on the home page



Faculty of Dentistry
5th year

STUDY PROGRAMME

CLINICAL MODULE				
9th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semi-final	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Implantology I. Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semi-final	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semi-final	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semi-final	Pharmacology and Toxicology II.
	Total Credit	32		

*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry
#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
C = Credit point
L = Lecture (hours/week)
P = Practice (hours/week)

CLINICAL MODULE

10th semester				
subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.*	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elctive	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
compulsory	Gerostomatology	C2L1P1	semi-final	Gnathology, Proshtodontics IV.,Oral medicine II.
obligatory elctive	Obstetrics and Family Planning	C1L1P0	semi-final	Internal Medicine III. , First Aid
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I.
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	Total Credit	32		
	Diploma work	C20		

Important note: Signing up for Physical Education (PE) IX. in the 1st semester and for PE X. in the 2nd semester is compulsory.

Explanation

15 credits should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

LIST OF TEXTBOOKS (The list may change!)

- 1 Becker W.-Naumann H.- Pfaltz R.: Ear, Nose and Throat Diseases. Thieme. Stuttgart, 1994. ISBN 3-13671202-1.
- 2 Répássy,G.: Otolaryngology. Eger, Radó Ny. 2000.
- 3 Current Pediatric Diagnosis and Treatment. 13th ed. W.E.Hathaway, W.W.Hay. Appleton and Lange Medical Book. ISBN 0838514006, ISSN 0093-8556
- 4 Lecture Notes of Forensic Medicine (Bp.) 1994.
- 5 Gerhard K. Lang: Ophthalmology / a Pocket Textbook Atlas. Thieme / 2000. ISBN 3-13-126161-7 (GTV) ISBN 0-86577-936-8 (TNY) 1 2 3 4 5
- 6 Dénes J.-Gábris K.-Hidasi Gy.-Tarján I.: Pedodontics. Bp. SOTE 1995.
- 7 Andlaw, R.J.-Rock,W.P.: A Manual of Pediatric Dentistry. 1998. ISBN 0443053723
- 8 T.G.Wilson-K.S.Kornman: Fundamentals of Periodontics Quintessence. 1996. ISBN 0-86715-303-2
- 9 R.A.Cawson-E.W.Odell: Essentials of Oral Pathology and Oral Medicine. Churchill Livingstone, 1998. ISBN 0-443-06121-1
- 10 Szabó Gy.: Oral and Maxillofacial Surgery. Bp. Semmelweis Publ. 2001.
- 11 Bricker,S.L.-Langlais,R.P.-Miller,C: Oral Diagnosis, Oral Medicine and Treatment planning. 2nd ed. 2002. B.C.Decker Inc. Hamilton London 2002.
- 12 McCracken's Removable Partial Prosthodontics (10/e) Glen P. McGivney-Alan B. Carr. Hardback, Mosby, 1999. ISBN 0323006787
- 13 Schillinburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 4th ed. 2012. ISBN 93 13
- 14 R.M. Basker-J.C. Davenport: Prosthetic Treatment of the Edentulous Patient. 5th ed. McMillan Press Ltd. ISBN 978-1405192613, 2011.
- 15 C.M.Sturdevant: Operative Dentistry. Mosby. ISBN 0-80166366-0
- 16 Walton: Principles and Practice of Endodontics.
- 17 Niklaus P. Lang, Jan Lindhe (ed.): Clinical Periodontology and Implant Dentistry (Wiley Blackwell, 2015)
- 18 Proffit, WR, Fields, DW, Larson, B, Sarver, DM.: Contemporary Orthodontics 6 th ed., Mosby, 2018.
19. Mitchell, L.: An introduction to orthodontics, Oxford Publishing, 2011.

Recommended textbooks:

- 1 J Hunter, J Savin, M Dahl: Clinical Dermatology, 4th ed. Blackwell Publishing, 2007, Paperback, ISBN 9781405146630
- 2 J Bologna, J Jorizzo, R Rapini: Dermatology, 2nd ed. Elsevier, 2007. Hardback, ISBN 9781416029991
- 3 DJ Gawkrödger: Dermatology. An illustrated colour text, 4th ed. Churchill Livingstone Elsevier, 2007, Paperback, ISBN 9780443104213
- 4 JE Fitzpatrick et al: Dermatology Secrets in Color with Student Consult Access. 3rd ed. Hanley & Belfus, 2006. ISBN 1560536160
- 5 R. Graham-Brown, J Bourke: Mosby's Color Atlas and Text of Dermatology. 2nd ed. Elsevier Mosby, 2006. ISBN 072343364X
- 6 M Lebwohl et al: Treatment of Skin Disease, 2nd ed. Elsevier Mosby, 2005, ISBN 0-32-3036031
- 7 M Lebwohl, W Heymann, J Berth-Jones, I Coulson: Treatment of Skin Disease. Comprehensive Therapeutic Strategies, Expert Consult – Online and Print Hardbound, 2009, ISBN: 0702031216
- 8 Online: www.lib.sote.hu – Adatbázisok, adattárak – OVID – Books@OVID – Dermatology – Fitzpatrick's Dermatology in General Medicine
- 9 Burkit's Oral Medicine: Lynch,A.M.& Malcom,A. Lippincott. 1996. ISBN 0-397-51242-2
- 10 European federation of Preiodontology – efp.org
International Team for Implantology –iti.org
ITI Treatment Guide – iti.org/ITI-Treatment-Guide
- 11 McDonald, F.-Ireland, A.J.: Diagnosis of the Orthodontic Patient. Oxford Univ. Press. 1998. ISBN 0-19-262889-5
- 12 Graber,T.M.-Vanarsdall,R.L.: Orthodontics. Current Principles and Technics. Mosby Year Book, Inc. 1994. 2nd ed. ISBN 0-8016-6590-6
- 13 D.Hull-D.I.Johnston: Essential Paediatrics. 3rd ed. Churchill Livingstone. 1994. ISBN 0-443-04782-0.
- 14 Hollwich, F: Pocket Atlas of Ophthalmology. Thieme Verl. Ed. Stuttgart, 1986. ISBN 0-86577 244 4
- 15 Knight's Forensic Pathology. 3rd ed. 2004. Arnold.
- 16 Manual of Emergency Medicine. 5th ed. By Jon L.Jenkins, G.R.Braen. 2004 Lippincott Williams and Wilkins. Product nr. 479531-1019
- 17 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8, 1986.
- 18 Neil-Nairne: Complete Denture Prosthetics. Wright. ISBN 72 36 20 636
- 19 Nikiforuk: Understanding Dental Caries.(1-2) Karger.
- 20 Hermann Péter, Szentpétery András: Gnatológia (Semmelweis Kiadó, 2018)

GEROSTOMATOLOGY

Department of Community Dentistry
Head of department: **Dr. Orsolya Németh**
Lecturer: **Dr. Péter Kivovics**

lecture: 1 hour/week
practice: 1 hour/week

Introduction of the concepts of Gerontology and Gerostomatology. Detailed description of dental and epidemiological characteristics of the elderly. Emphasis on physiological and psychological features.
In developed industrialized countries, the number of older people is increasing year by year. This is largely due to disease control, adequate nutrition, widespread basic health care and relatively long periods without war.
The majority of patients appearing in the dental office are considered elderly. Our course aims to provide an opportunity to gain a deeper understanding of the theoretical and practical knowledge of dental and oral surgery for elderly patients.

CLINICAL DENTISTRY I.-II.

There is no lecture on the subject of Clinical Dentistry, at the beginning of the practices the previously acquired theoretical curriculum from conservative dentistry and prosthodontics will be repeated in the form of a mandatory consultation, in weekly shifts.

OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY

Lecturer: **Prof. Dr. László Tamás**
Tutor: **Dr. Beáta Bencsik**

First Semester

Lectur es (1 hour per week)	Practices (0,5 hour week)
The role of otorhinolaryngology in dentistry and medicine. Clinical anatomy of the ear. Diseases of the external ear.	Routine clinical examinations in practice.
Acute and chronic otitis media. Etiology, diagnosis, complications and therapy.	Evaluation of different types of perforations of the tympanic membrane. Cadaver bona practice. Paracentesis on moulage.
Types of hearing losses. Fundamental audiological diagnostic methods. Surgical management of hearing losses. Otosclerosis and cochlear implant.	Routine audiology. Operating theater. Video demonstration.
Clinical anatomy and physiology of the nose and paranasal sinuses. Nasal obstruction. Epistaxis.	Anterior and posterior rhinoscopy. X-ray photos of the paranasal sinuses. Clinical management of epistaxis.
Infections and tumors of the nose and paranasal sinuses. Therapeutical possibilities. Borderlines and related aspects between the oral surgery and ENT. Fundamental aspects of maxillofacial traumatology.	Operating theatre. Luc. Caldwell operation. Functional endonasal surgery. Endoscopic examination of the paranasal sinuses.
Clinical aspects of diseases of the mouth and pharynx. Diseases of the labial, oral and laryngeal mucosa.	Peritonsillar abscess. Indications and dangers of the tonsillectomy. Adenotomy. Basis of conservative of the mouth and pharynx treatment of disease.
Anatomy and physiology of the larynx. Disorders of the voice. Infections and tumors of the larynx and their management.	Direct and indirect laryngoscopy. Videostroboscopy and fiberoscopy.
Diseases of the salivary glands. Emergency management of suffocation. Conicotomy and tracheotomy. Foreign bodies in the trachea and oesophagus	

PEDIATRICS

2nd Department of Pediatrics

Tutor: *Dr. Judit Müller*

First Semester

Lectures (1 hour per week) **Practices** (0,5 hour week)

Development and Growth

Childhood Nutrition and its Disorders

Fluid and Electrolyte Disorders

Newborn Infant: Diseases and Disorders

Genetic Disorders

Congenital Heart Diseases

Respiratory Diseases

Neurologic and Muscular Disorders

Endocrine Disorders

Infectious Diseases, Immunization

Gastrointestinal Tract Disorders

Hematologic Disorders

Malignant Diseases in Childhood

Kidney and Urinary Tract Diseases

Allergic Diseases

PROSTHODONTICS IV-V.

First Semester

Clinical practices, Integrated practices

Treatment of partial edentulousness, fixed and removable dentures.

No lectures.

Second Semester

Clinical practices integrated with the conservative dentistry. Complex treatment of different cases.

No lectures.

CONSERVATIVE DENTISTRY AND ENDODONTICS IV.

First semester

The subject is taught with four practical hours per week, there is no lecture.

During the exercises the students deal with root canal treatments and revisions within the framework of clinical care under the supervision of practice leader.

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed and one documented clinical case must be presented to validate the semester by earning the signature. Practical grade: consists of midterm, „small tests“, and evaluation of work and knowledge presented at clinical practice.

CONSERVATIVE DENTISTRY AND ENDODONTICS V.

Second semester

Detailed course/lecture description[i]: *(to facilitate credit recognition in other institutions)*

Detailed weekly curriculum:

The subject is taught with three practical hours per week, there is no lecture.

During the exercises the students more independently and widely deal with the activities of the field of conservative dental care in the framework of clinical care under the supervision of the practice leader.

[i] Detailed and numbered for each week of theoretical and practical lessons one by one, indicating the names of lecturers and instructors

List of textbooks, lecture notes and recommended textbooks:

1. Ritter AV, Boushell LW, Walter R: Sturdevant's Art and Science of Operative Dentistry. 7th ed. St. Louis, Mosby, 2018.
2. Torabinejad M, Walton RE, Fouad AF: Endodontics. Principles and Practice. 5th ed. St.Louis, Missouri, Saunders/Elsevier 2014
3. Hargreaves KM, Berman LH: Cohen's Pathways of the Pulp. 11th ed. St. Louis, Missouri, Mosby/Elsevier 2015

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester a midterm exam must be passed and one documented clinical case must be presented to validate the semester by earning the signature. Practical grade: consists of midterm, „small tests“, and evaluation of work and knowledge presented at clinical practice. **Final oral exam:** students (A) must present the best three well-documented clinical cases validated by the practice teacher done at conservative or clinical practice during the entire time of their gradual course, (B) choose one-one question from three topic groups (dental materials, conservative dentistry, endodontics) and (C) receive an intraoral X-ray from which they must recognize the teeth, set up diagnosis and suggest a therapy.

ORAL AND MAXILLOFACIAL SURGERY IV.

Tutor: *Dr. Kinga Körmöczy*

First Semester

Lectures (1 hour / week)

Precanceroses.
Benign tumors of the soft tissues in the head and neck region.
Benign tumors of the bone tissues in the head and neck region.
Malignant tumors of the head and neck region. I.
(Diagnostics, pathology, epidemiology)
Malignant tumors of the head and neck region. II.
(Surgical therapy)
Malignant tumors of the head and neck region. III.
(Complex therapy)
Secondary treatment of cleft lip and palate. Orthognatic Surgery
Biomaterials.
Esthetical consideration in maxillofacial surgery
Risk patient treatment in oral surgely I.
(internal diseases, fainting, antifebrile and painkiller
treatment)
Arnbulantory narcosis in head and neck surgery,
coagulopathies, anticoagulant treatment.
Sinus lifting.
Dentoalveolar deformities.
Guest speaker
Consultation

Practices (5 hours / week)

Practicing minor oral surgery
Practicing minor oral surgery
Practicing minor oral surgery
Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery
Practicing minor oral surgery
Practicing minor oral surgery
Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery
Midterm Demonstration
Practicing minor oral surgery
Practicing minor oral surgery

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester three midterm examinations should be passed.
Practical course grade

ORAL AND MAXILLOFACIAL SURGERY V.

Second Semester

Lectures (1 hour / week) **Practices** (3 hours / week)

Diseases of the temporomandibular joint Part I. (Pathology, diagnostics)

Diseases of the temporomandibular joint Part II. (Therapy)

Peripheral nerve disorders in the head and neck region. Rehabilitation after the paresis of the Facial nerve

Antibiotic treatment in dental surgery

Maxillofacial reconstructive surgery Part I. (Reconstruction of soft tissues and bone by local flaps)

(Reconstruction by microvascular grafts)

Modern diagnostic methods in oral and maxillofacial surgery

Systematic diseases in the head and neck region

The promotion of the osteogenesis by distraction methods

Biomaterials in the maxillofacial surgery

Guest speaker

Consultation

Practice

Two weeks' clinical practice at the in-patient ward of the clinic

(1st week in the morning, 2nd week in the afternoon hours, every day)

Practical course grade and **final** examination

Note:

The maximum number of absences in a semester is 3.

More than 3 absences invalidate the semester.

During the semester three midterm examinations should be passed.

PEDODONTICS I.

Department of Orthodontics and Pediatric Dentistry

Head of Department: *Dr. Noémi Katinka Rózsa* D.M.D., Ph.D.

Phone: (1)-4591500/ 59268

E-mail: noemirozsa65@gmail.com

Tutor: *Dr. László Miklós Kaán* D.M.D., PhD.

Phone: (1)-4591500 / 59270

E-mail: kaanm@dent.semmelweis-univ.hu

First Semester

Lectures (1 hour/week)

1. The subject, signification and interactions of paediatric dentistry
2. Tooth development, anatomy and dentition of primary teeth
3. Developmental disturbances of permanent and primary teeth
4. Caries of primary teeth. Treatment possibilities
5. Consecutive illnesses of caries in primary dentition
6. Mechanism of second dentition. Physiological and pathological significance
7. Caries and treatment of permanent teeth
8. Consecutive illnesses of caries in permanent dentition
9. Psychological aspects of dental treatment during childhood
10. Filling materials in Paediatric Dentistry
11. Dental radiology in Paediatric dentistry
12. Dental anomalies in syndromes
13. Root-canal treatment of immature teeth, apexogenesis, apexification
14. Special aspects of prevention in paediatric dentistry and orthodontics

Practice (4 hours/week)

Treatment of patients.

Type of evaluation: Practical grade (1-5 grading system)

PEDODONTICS II.

Second Semester

Week *Lectures* (1 hour/week)

1. Pain control and anaesthesia during childhood
2. Traumatic injuries of primary teeth
3. Traumatic injuries of permanent teeth, complex therapy solutions
4. Non- and minimally invasive dentistry
5. Prosthetics in Paediatric dentistry
6. Periodontology and oral diseases during childhood
7. Dental attendance of children suffering from general diseases
8. The management of children with special needs
9. Aetiology and treatment methods of hard tissue discoloration
10. Administration of medicine in pedodontics
11. Oral surgery during childhood
12. Non- and minimal invasive interventions in paediatric dentistry
13. Molar-Incisor-Hypomineralisation Syndrom (MIH)
14. Consultation Courses (obligatory and elective) which in part or entirely overlap

Practice (5 hours/week)

Treatment of patients.

Types of evaluation:

Practical grade (1-5 grading system)

Final examination. Evaluation of the whole subject matter.
(1-5 grading system).

ORTHODONTICS I.

Department of Orthodontics and Pediatric Dentistry

Head of Department: *Dr. Noémi Katinka Rózsa* D.M.D., Ph.D.

tel: (1)-4591500/ 59268

E-mail: noemirozsa65@gmail.com

Tutor: *Dr. László Miklós Kaán* D.M.D., PhD.

Phone: (1)-4591500 / 59270

E-mail: kaanm@dent.semmelweis-univ.hu

First Semester

Lectures (1 hour/week)

1. The subject, significance of orthodontics, its relation to caries and periodontal diseases
2. Historical survey of orthodontics. Classification and terminology of malocclusion
3. Diagnosis of malocclusions I.
4. Diagnosis of malocclusions II. X-ray diagnosis
5. Aetiology; hereditary and acquired anomalies. Functional anomalies.
6. The timing of the orthodontic treatment
7. Biomechanical principles of orthodontics. Possibilities of tooth movement.
8. Removable appliances I. Simple orthodontic appliances.
9. Removable appliances II. Functional appliances
10. Space gaining in orthodontics. Arch expansion and molar distalization
11. Elements of multiband/multibond appliances. Multibond technics I.
12. Multibond techniques II. Orthodontic wires and the phases of orthodontic treatment
13. Modern techniques in orthodontics: splint appliances 1
14. Aesthetics in orthodontics

Practice (4 hours/week)

Treatment of patients.

Type of evaluation: Practical grade (1-5 grading system)

ORTHODONTICS II.

Second Semester

Week *Lectures* (1 hour/week)

1. Possibilities of orthodontic prevention. Early treatment in orthodontics.
2. Normooclusion. Local and general anomalies.
3. Treatment of distoocclusion.
4. Treatment of mesioocclusion
5. Extraction in orthodontics.
6. Complex treatment of orthodontic anomalies combined with missing teeth
7. Surgical-orthodontic treatments
8. Complex therapy of cleft lip and palate
9. Retention and relapse.
10. Side effects and complications of orthodontic treatment.
11. Adult orthodontic treatment.
12. Interdisciplinary aspects of orthodontic treatment.
13. Digital techniques and workflow in orthodontics
14. Consultation

Practice (5 hours/week)

Treatment of patients.

Types of evaluation:

Practical grade (1-5 grading system)

Final examination. Evaluation of the whole subject matter (1-5 grading system).

PERIODONTOLOGY III.

Department of Periodontology

First Semester

Lectures (1 hour/week)

- 1. Correlation between periodontology and orthodontics
- 2. Periodontal aspects of prosthetic rehabilitation
- 3. Morphology of periodontal defects. Indications of periodontal surgery
- 4. Periodontal surgery I. General introduction
- 5. Periodontal surgery II. Surgical correction of gingival enlargement
- 6. Periodontal surgery III. Periodontal resective/reparative surgery
- 7. Biology of periodontal tissue. Basics of regenerative techniques
- 8. Clinical application of periodontal regenerative techniques I.
- 9. Clinical application of periodontal regenerative techniques II.
- 10. Treatments of furcation defects
- 11. Biological mediators in periodontal surgery
- 12. Mucogingival surgery I.
- 13. Mucogingival surgery II. / Written exam
- Alveolar ridge preservation techniques

Practices (2 hours/week)

- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Midterm Demonstration**
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Midterm Demonstration**
- Clinical practice 14.
- Clinical practice

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester two midterm demonstrations should be passed.
Practical course grade

PERIODONTOLOGY IV.

Second Semester

Lectures (1,5 hours / week)

Week Lectures (Part One)

- 1. Biology of periodontal and periimplant tissues
- 2. Periodontal aspects of implantology, augmentations I.
- 3. Periodontal aspects of implantology, augmentations II.
- 4. Is periodontitis a risk factor in implant dentistry?
- 5. Periimplantitis. Background and management
- 6. Comprehensive case presentations I. (perio-prot direct/indirect, surg)
- 7. Comprehensive case presentations II. (perio/plastic surg - impl)
- 8. Comprehensive case presentations III. (perio-non-surg/surg - impl)
- 9. Comprehensive case presentations IV. (perio- (reg)/ortho/prostho)
- 10. Supportive therapy in periodontology and implant dentistry
- 11. Periodontal diagnostic consultation
- 12. Written exam

Seminar (2 hours/week)

- Ambulatory patient care
- Ambulatory patient care
- Ambulatory patient care
- Ambulatory patient care
- Surgical assistance
- Surgical assistance
- Surgical assistance
- Surgical assistance
- Literature review
- Clinical case conference
- Differential diagnosis
- Consultation

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester two midterm demonstrations should be passed.
Practical course grade and **final** exam

ORAL MEDICINE

Department of Oral Diagnostics

Address: Bp. VIII., Szentkirályi u. 47. 1088

Phone: 459-1500/59161, 317-1044

Tutor: ***Prof. Dr. Csaba Dobó Nagy***

E-mail: oral@fok.usn.hu

Lecturer: ***Dr. Csaba Dombi***

First Semester

Lectures (1 hour/week)

Week Lectures

1. Vesiculo-bullous oral diseases
2. Oral signs and symptoms of benign tumors
3. Precancerous conditions in the oral cavity
4. Leukoplakia
5. Malignant tumors of the oral mucous membrane
6. Oral signs and symptoms of hematological diseases
7. Clinical differential diagnosis of gingival enlargements
8. Lichen oris
9. The diseases of the lip
10. The diseases of the tongue
11. The diseases of the salivary glands
12. The oral considerations of HIV infection and viral hepatitis
13. The role of the vitamins in the etiology of oral mucosal disorders
14. Written final exam

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester two midterm demonstrations should be passed.
Practical course grade and **semi-final** exam

IMPLANTOLOGY II.

Department of Oro-Maxillofacial Surgery and Stomatology

Lecturer: *Dr. Árpád Joób-Fancsaly*

Lectures (1 hour/week)

Course Syllabus:

Bone replacement:

- Osteoconduction. Osteoinduction. Bone grafting materials.
- Guided Bone Regeneration /GBR/. Bone grafting procedures in the outpatient surgery.
- Osteogenesis, bone transplantation. Distraction osteogenesis.
- The sinus-lift procedure. Indications, contraindications, surgical techniques.
- The periodontal aspects of implant therapy.
- Nobel-Biocare implant system.
- ITI- Straumann implant system.

Implant prosthodontics:

Crowns on implants. Fixed dental prosthesis on implants. Meso-structures, combined /fixed-removable/ prosthesis on implants. Esthetic considerations in implant surgery. Surgical management of soft tissues. Comprehensive lecture. Implant therapy in the practice. Planning and completing in different anatomical situations.

Guided surgery in oral implantology.

Implant failures. Biological, mechanical complications and their management.

Practice: No practice only lecture according to the new curriculum

Final exam

Practice of Implantology complements and deepens the knowledge obtained during the theoretical course

- Diagnostics – X-ray diagnostics, CBCT analysis, introduction of X-ray and surgical template
- Introduction of the Straumann system – emphasize on the unique properties of the system (surface, comparison of 1-stage / 2-stage surgical method, Implant Surgery overview through the system
- Introduction of the SIC system – emphasize on the unique properties of the system, Prothetics of the SIC system. Practicing the steps of the prosthetics on a model, cad-cam based prosthetic abutment, safe on four concept, platform switching, Balance healing screws and abutments
- Guided bone regeneration through the products of Geistlich company – introduction of the methods of bone augmentation techniques, sinus-liftig, lateral bone augmentation practicing on models
- Smart Guide System overview – emphasize on the unique properties of the system, introduction of the guided implant surgery
- Osstem system overview – emphasize on the unique properties of the system, introduction of the failures of implantology and their solutions, practicing on models

ORAL DIAGNOSTICS II.

Department of Oral Diagnostics

Address: Bp. VIII., Szentkirályi u. 47. 1088

Phone: 459-1500/59161, 317-1044

Tutor: **Prof. Dr. Csaba Dobó Nagy**

E-mail: oral@fok.usn.hu

Fifth year 1st semester

Lecture -0 Practice (1 hour/week)

Rules of practices

Activity of the students:

1. Clinical evaluation and registration of medical and dental conditions, extraoral and intraoral examination of the patients, stomato-oncological cheque-up. Registration of medical and dental history.
2. Documentation of the above, taking oral photos, and preparing diagnostic casts.
3. Making decisions about additional diagnostic methods, X-ray examinations, referrals and consultations.
4. Making diagnosis and complete preliminary treatment planning.
5. Preparing written case-demonstrations including history, clinical finding, diagnosis, preliminary treatment plan and conclusions.
6. Written case demonstrations should be made at home, with the use of the students notes in the practice. Students are responsible for and should take great care about the patients personal rights. No personal data, medical certificate, x-ray pictures or other relevant findings can be brought home, for preparation of the case demonstrations! (only the notes made by the student during the practice, containing no personal data, no official documentation.)
7. Written theoretical evaluation will be organized in one of the practices in this semester.

Exam: Practical hours should be visited during 2 days. The time of practices is between 8.00 a.m – 1.00 p.m.

Semifinal exam will be organized at the end of fifth year, first semester.

Minimal expectations : reaching the minimum level of the written theoretical evaluation (mark 2) presentation of three written case-demonstrations reaching the minimum quality level (mark 2) Non-performance of the minimal expectations invalidate the semester!

Textbook:

- 1 Bricker, Langlais, Miller: Oral Diagnosis, Oral Medicine and Treatment Planning (second edition) 2 BC Decker Inc Hamilton London 2002

Recommended books :

- 1 Bengel, Veltman, Loevy,Taschini: Differential Diagnosis of Diseases of the Oral Mucosa QuintessencePublishing Co. Inc. Chicago, Illinois 1989
- 2 Manfred Strassburg/Gerdt Knolle : Diseases of the Oral Mucosa A Color Atlas (Second Edition) Quintessence Publishing Co. Inc. Carol Stream Illinois 1994 3 “hand-outs” will be prepared and presented for the students by the lecturers

PREHOSPITAL EMERGENCY MEDICINE

National Ambulance Service

Program Director: **Dr. Gábor Göbl**

Tutor: **Dr. László Gorove**

First Semester

Topics

The principles of emergency medicine.
 The field assessment.
 Patient assessment.
 Transportation trauma
 BLS – AED, ACLS
 Prehospital care of the injured patient
 Analgesia, anesthesia in the emergency care
 Unconsciousness, confused states
 Acute chest syndromes. ACS
 Acute cardiac failure. Arrhythmias in the emergency care
 The shock process. Evaluation and in field management of shock conditions.
 Stroke syndromes. Hypertensive emergencies.
 Acute dyspnea. Artificial ventilation on the spot
 Acute abdominal syndromes
 Toxicology in the emergency care
 Pediatric oxyology
 Obstetrical first aid
 CPR revision

Note: participation at 75% of lessons is necessary. Compensation is possible using the notes of the lectures and the recommended book.
 Mode of certifying absences: Oral in case of absence from lectures, written in case of absence from semi-final examination within 3 working days.
 Requirement of the semester signature in the lecture book: Participation at the lectures in 75% of cases. Type of the examination: semi-final
 It will be tested, whether the student is able to recognize and manage emergencies.

DERMATOLOGY

Lecturer: **Dr. Bernadett Hídvégi**

Tutor: **Dr. Bernadett Hídvégi**

Department of Dermatology, Venerology and Dermatoooncology

Second Semester

Lectures (1 hour per week)**Practices** (0,5 hour week)

Lecture

Introduction to Dermatology.

Diagnostic procedures, anatomy, functions of skin comparing to oral mucosa.

Elementary lesions. Autoimmune bullous diseases.

Sexually transmitted diseases (syphilis, gonorrhoea, NGU, HPV).

AIDS, herpes virus infections.

Skin tumors. Malignant melanoma, basal cell carcinoma, squamous cell carcinoma.

Benign tumors, paraneoplastic syndromes.

Allergic skin diseases, drug allergy.

Dermatitis, eczema, implication for dentists.

Atopic dermatitis, urticaria, psoriasis.

Bacterial skin diseases.

Cutaneous and mucosal diseases caused by fungi.

Treatment modalities.

Dermatological treatment.

Seborrheic dermatitis, acne.

Cutaneous and oral manifestations of internal diseases.

Final examination

OBSTETRICS AND FAMILY PLANNING

Dept. of Obstetrics and Gynecology

Head of Department: *Prof. Dr. Nándor Ács*

Second Semester

Lectures (1 hour/week)

Anatomy and physiology of the genital organs. The menstrual cycle.

Conception.

Prenatal care, diagnosis of pregnancy.

Normal pregnancy and development of the fetus.

Changes in maternal anatomy and physiology during pregnancy.

Spontaneous abortion. Ectopic pregnancy.

EPHgestosis. Hyperemesis.

Medical complications during pregnancy. Gestational diabetes.

Infections in obstetrics and gynecology.

Normal labour and delivery.

Abnormalities of labour and delivery.

Normal and abnormal puerperium.

Neonatology.

Gyn. endocrinology. Family planning.

Sterility, infertility.

Genetic counseling, fetal anomalies.

Semi-final examination

OPHTHALMOLOGY

Dept. of Ophthalmology

Program director: **Dr. Zsuzsa Récsán**

Tutor: **Dr. Zsófia Hargitai**

First Semester

Lectures (1 hour/week)

Introduction. History of ophthalmology.

Conjunctivitis ("red eye").

Keratitis ("red eye").

Uveitis ("red eye"). Differential diagnostic approach of the "red eye".

Basics of optics.

Diseases of the crystalline lens. Cataract surgery. Diseases of the retina. Intraocular tumours.

Glaucoma (pathomechanismus).

Glaucoma (conservative and surgical treatment).

Diseases of the eyelids. Ocular injuries. Sudden visual loss. First aid in ophthalmology.

Practical guide (0,5 hour/week)

Anatomy of the eye. Patient's history.

Objective and subjective symptoms of eye-diseases.

Eyelids and lacrimal system.

Examination of the anterior segment of the eye (focal light, slit lamp).

Refractive errors. Checking of visual acuity.

Basics of orthoptics.

Examination of the refractive media and retina. (Ophthalmoscope)

Diagnosis of glaucoma (perimetry, checking of intraocular pressure, gonioscopy).

Treatment of glaucoma.

First aid in cases of ocular injuries.

First aid in sudden visual loss.

Differential diagnostic approach of the "red eye".

Differential diagnostic approach of the "painful" eye.

Consultation.

Semi-final examination

FORENSIC DENTISTRY

Department of Forensic Medicine

Tutor: **Dr. Zoltán Szőlősi**

First Semester

Lectures (1 hour/week)

- The discipline of forensic medicine, relation to law, the legal aspects of dentistry
- Injuries
- Asphyxia
- Identification
- Toxicology I.
- Toxicology II.
- Alcohol and narcotics
- The legal aspects of clinical medicine I.
- The legal aspects of clinical medicine II.
- Facial and cranial injuries
- Sudden death, SIDS
- Risk and malpractice in dentistry
- Forensic psychiatry
- Autopsy demonstration
- Autopsy demonstration

Semi-final examination

Physical Education IX-X.

Lessons (in hours): 14 lectures: 0 practicals: 14 seminars: 0

Lecturer of the course: Várszegi, Kornélia

Contact: Testnevelési és Sportközpont

Phone: +36-1/ 264-1408

Detailed course/lecture description: *(to facilitate credit recognition in other institutions)*

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations. During the academic year, students can also choose the „Other” course category, where they record their weekly physical activity independently.

Students who cannot choose anything from the sports offer or who are forced to fulfill the conditions of participation on their own due to a lack of space can register for the “independent sports activity” course as part of the Physical Education course in the Neptune system.

In cases, a questionnaire is sent to the students through the Neptune system:

- The questionnaire can be filled in from Monday to Sunday in a semester (no entries can be made in advance or afterwards).
- Students must assure themselves that they have completed the questionnaire truthfully.
- It is a minimum requirement for the signature that a training of 1x60 minutes per week is completed and this is recorded in the questionnaire.

Free of charge:

2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men's football, handball, basketball, volleyball

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptune system. The list of these locations may vary per school year.

ELECTIVE SUBJECTS FOR Dentistry 3rd, 4th and 5th year

PREVENTION AND CLINICAL SCREENING OF ORAL MALIGNANCIES

Department of Oral Diagnostics

(Orális Diagnosztikai Osztály, Bp. VIII., Szentkirályi u. 40. 1088

Phone: 317-6600; 317-0951; fax: 317-9199)

Tutor: **Prof. Dr. Gábor Nagy D.M.D., Ph.D**

I. Theoretical background

Incidence of intraoral tumours is very high, and Hungary has a leading position in Europe. Among men this is the third in ranking the causes of death, and regarding the whole population it has the seventh place.

The two main risk factors are smoking and alcohol consumption, the combination of these multiple the risk rate. Nowadays it is noteworthy that the frequency of oral cancers is increasing in younger age groups and among women lacking the before mentioned risk factors.

II. Methods of oral cancer screening

1. *Population based methods* – large number of people invited to take part in a cancer screening, which could be combined with a general dental health assessment.
2. *Opportunistic screening*

This means the comprehensive dental examination of a particular patient attending a dental service. This screening is not only concentrating on detection of oral premalignancies or oral malignancies, but also other developmental and inflammatory lesions.

Basic investigative methods of head and neck region
detailed case history (with special aspects on tumors, life style, persistent, non-healing lesions)
Precise extra- and intraoral physical examination
Novel visual examination procedures (e.g. Veloscope)

Conclusion

Screening for oral malignancies is a very important part of dental examination. Lesions, persisting two weeks after eliminating any irritating factor, a special clinical examination including histology is needed. In this way the survival possibilities of oral cancer patients could be enhanced largely.

This shows the extreme importance of this subject in dental and medical education as well.

THEMATICS

Contemporary diagnostics of oral premalignancies and cancers

1. Importance of oral malignancies
Epidemiology, morbidities and mortality data
2. Etiological factor and pathomechanismus of oral tumors
3. Rate and efficacy of different screening methods (screen or not to screen)
4. Basic clinical signs and symptoms of oral malignancies and premalignancies I.
5. Basic clinical signs and symptoms of oral malignancies and premalignancies II.
6. Consultation
7. Possibilities of early detection and prevention
8. Diagnostic process of oral malignancies I. Traditional physical examination
9. Diagnostic process of oral malignancies II. Traditional physical examination
10. Diagnostic process of oral malignancies novel Procedures (e.g. lightningdevices)
11. Contemporary diagnostical possibilities and a multidisciplinary cooperation
12. Social and dental rehabilitation after the treatment of oral cancer
13. Consultation /Examination

PEDODONTIC AND ORTHDONTIC PREVENTION – for the 4th year, 7th semester

ORTHODONTIC DIAGNOSIS I-II. – both for the 4th year, 7th and 8th semester

Department of Pedodontics and Orthodontics

1 lecture / week

1 credit point

DIGITAL ORTHODONTICS – for the 5th year, 9th semester

Department of Pedodontics and Orthodontics

1 lecture / week

1 credit point

PEDODONTIC AND ORTHDONTIC PREVENTION

ORTHODONTIC DIAGNOSIS I-II. – both for the 5th year

Department of Pedodontics and Orthodontics

1 lecture / week

1 credit point

DIRECT AESTHETIC DENTISTRY 4th year

Department of Conservative Dentistry

Head of the Department: **Dr. Zsuzsanna Tóth**

Tutor: **Dr. Kamil Al-Katib, Dr. Zsolt Döbrentey**

Durations: 1 lecture and 3 practice

Every class : 3h (4x45 min)

Credit value: 1 credit point

Maximum group size: 50

Direct Aesthetic Dentistry I. (basic course) – 1st semester (autumn)

This elective course is for dental students having finished successfully Conservative Dentistry III.

1st week: theory

Advanced caries diagnostic and adequate treatment alternatives. The development of adhesive technology, and its potential in the light of direct restorations . Material science of composites. Stratification techniques, polymerization stress reduction. Minimally invasive and advanced preparation methods (tunnel-, sandwich- technique). Isolation techniques. Using photopolymerization devices . Practical possibilities in recontouring of tooth shapes. Theory and practice of anatomical layering technique Tooth anatomy and basic skills of Gnathology. Tooth color: hue, value, chroma, translucency, fluorescence, metamerism, opalescence, intensives. Dental photography.

2nd week: practice

Anterior wax-up. Proper design of cervico - oro – vestibular - incisal dimensions. Perikymata, grooves, character lines, and its effect on the visual dimension of the tooth.

3rd week: practice

Restorations in the front region. Preparation of a standardized full composite first incisor using the anatomical stratification technique.

4th week: practice

Medium size restoration in the molar region. Creation of appropriate cusps-fissure relation.

Direct Aesthetic Dentistry II. (advanced course) – 2nd semester (spring)

This elective course is for dental students having finished successfully Direct Aesthetic Dentistry I.

1st week: theory

Diagnostic criteria of aesthetic dentistry. The division between direct and indirect techniques. Color theory in the light of different composite materials. Physical , chemical properties and biocompatibility of materials used. Anatomical layering technique on complex and difficult cases: fluorotic spots, transparency, halo effect, discolored cracks, fissure staining . Advanced tooth anatomy: macro and micro-morphology . Smile design. Connection between aesthetics, function and durability. The adhesive technology frontier areas . Based on the use of composite Biomimetic principles. Special instruments. Documentation, dental photography and basics of presentation.

2nd time: practice

Direct veneer for randomized middle-aged „patients

3rd time: practice

Rebuilding the veneer for elderly patient.

4th time: practice

Large restoration in the molar region. Creation of appropriate cusp- fissure relation, using stain technique for making the restoration more life-like.

POSTGRADUATE COURSES

Head of Secretariat: **Dr. János Gerle**

Address: Budapest, district 8., Szentkirályi u. 47.

(7th floor., room no. 751.)

E-mail: szkepz@dent.semmelweis-univ.hu

E-mail: gerle.janos@dent.semmelweis-univ.hu

Phone: 266-7006

Fax: 266-4715

Administrators:

Ms. Erika Sviderszky Blahó

Office hours: Monday, Tuesday 13.30-15.30, Wednesday, Thursday 9.00-12.00

Phone: 266-7006, fax: 266-4715, e-mail: szkepz@dent.semmelweis-univ.hu

Ms. Veronika Gecse

Office hours: Monday, Tuesday 13.30-15.30, Wednesday, Thursday 9.00-12.00

Phone: 266-7006, fax: 266-4715, e-mail: szkepz@dent.semmelweis-univ.hu

Postgraduate courses are available at the Faculty of Dentistry at Semmelweis University, ending with a specialty exam in the following fields:

1. Pedodontics
2. Orthodontics
3. Periodontology
4. Dentoalveolar Surgery
5. Prosthetic Dentistry
6. Endodontics

The language of the postgraduate courses and the specialty exams is Hungarian. The courses convey theoretical knowledge and practical skills.

If you wish to take a specialty exam you must meet the following requirements:

you can take a specialty exam after 36 months of professional practice fulfilled as an employee, according to Hungarian law. To complete this practice, therefore, you must obtain a work permission.

professional practice includes theory and treating patients. You will need a good command of the Hungarian language to understand theory, and be able to communicate with patients

Non-European citizens must have their degree nostrified

FACULTY OF PHARMACEUTICAL SCIENCES



*Faculty of Pharmaceutical
Sciences*

The curriculum of the credit-based system for student enrolled for the 5th year in the 2021-2022 academic year

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
1. SEMESTER 2017/2018/1					
General and Inorganic Chemistry I. (Practice) GYASKASKG1A	–	5	5	–	practical mark
General and Inorganic Chemistry I. (Theory) GYASKASKE1A	4+1	–	5	–	semi-final
Introduction to Health Informatics I. (Pract.) GYINFBEIG1A	–	1	–	–	signature
Introduction to Health Informatics I. (Theory) GYINFBEIE1A	1	–	2	–	semi-final
Biophysics I. (Practice) GYFIZBIFG1A	–	3	2	–	practical mark
Biophysics I. (Theory) GYFIZBIFE1A	2	–	3	–	semi-final
Biology I. (Practice) GYGENBILG1A	–	2	2	–	practical mark
Biology I. (Theory) GYGENBILE1A	2	–	2	–	semi-final
Medical Terminology** GYLEKOTRG1A	–	2	2	–	practical mark
Mathematics I. (Practice) GYEGYMATG1A	–	2	2	–	practical mark
Mathematics I. (Theory) GYEGYMATE1A	2	–	2	–	semi-final
Physical Education I. GYTSITSNG1A	–	1	0	–	signature
History of Sciences, Propedeutics GYEGYTTPE1A	2	–	2	–	semi-final
Hungarian Medical Terminology I. * GYLEKMSZG1A	–	4	4	–	practical mark
Total:	14	20	27+6		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
2. SEMESTER 2017/2018/2					
General and Inorganic Chemistry II. GYASKASKE2A	3	–	3	General and Inorganic Chemistry I.	final #
Analytical Chemistry I. (qualitative) GYASKANKG1A	2	5	5	General and Inorganic Chemistry I.	practical mark
Anatomy GYANTANAE1A	2	–	4	Biology I.	semi-final
Anatomy Practice GYANTANAG1A	–	2	–	Biology I.	signature
Introduction to Health Informatics II. Practice GYINFBEIG2A	–	1	–	Introduction to Health Informatics I.	signature
Introduction to Health Informatics II. GYINFBEIE2A	1	–	2	Introduction to Health Informatics I.	semi-final
Biophysics II. Practice GYFIZBIFG2A	–	2	2	Biophysics I.	practical mark
Biophysics II. GYFIZBIFE2A	2	–	3	Biophysics I.	final #
Biology II. Practice GYGENBILG2A	–	2	1	Biology I.	practical mark
Biology II. GYGENBILE2A	2	–	2	Biology I.	final #
Pharmaceutical Botany I. GYNOVGYNG1A	1	2	3	Biology I.	practical mark
Mathematics II. Practice GYEGYMATG2A	–	1	1	Mathematics I. Introduction to Health Informatics I.	practical mark
Mathematics II. GYEGYMATE2A	2	–	2	Mathematics I. Introduction to Health Informatics I.	semi-final
Physical Education II. GYTSITSNG2A	–	1	0		signature
First Aid GYTRAELSE1A	1	–	0		signature
Hungarian Medical Terminology II.* GYLEKMSZG2A	–	4	2	Hungarian Medical Terminology I.	practical mark
Total:	16	20	28+2**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
3. SEMESTER 2018/2019/1					
Analytical Chemistry (quantitative) I. GYASKAKVG1A	2	5	7	Analytical Chemistry (qualitative) Mathematics II. General and Inorganic Chemistry II.	practical mark
Physical Chemistry I. GYFKTFIKE1A	4	–	4	General and Inorganic Chemistry II. Mathematics II. Biophysics II.	semi-final
Pharmaceutical Botany II. Practice GYNOVGYNG2A	–	3	2	Biology II. Pharmaceutical Botany I.	practical mark
Pharmaceutical Botany II. GYNOVGYNE2A	1	–	2	Biology II. Pharmaceutical Botany I.	final #
Organic Chemistry I. Practice GYSZKSZKG1A	–	5.5	5	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	practical mark
Organic Chemistry I. GYSZKSZKE1A	4	–	5	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	semi-final
Physical Education III. GYTSITSNG3A	–	1	0		signature
Hungarian Medical Terminology III. * GYLEKMSZG3A	–	4	2	Hungarian Medical Terminology II.	practical mark
Total:	11	18.5	25+2**		
4. SEMESTER 2018/2019/2					
Analytical Chemistry (quantitative) II. Practice GYASKAKKG2A	–	5	3	Organic Chemistry I. Analytical Chemistry (quantitative) I.	practical mark
Analytical Chemistry (quantitative) II. GYASKAKKE2A	2	–	6	Organic Chemistry I. Analytical Chemistry (quantitative) I.	final #
Biochemistry I. GYOBIBIKE1A	3	–	3	Biology II. Organic Chemistry I. Biophysics II.	semi-final
Physical Chemistry II. GYFKTFIKG2A	1	4	5	Physical Chemistry I	practical mark
Colloid Chemistry I. GYKOLKOLE1A	2	–	2	Physical Chemistry I.	semi-final
Organic Chemistry II. Practice GYSZKSZKG2A	–	5.5	4	Organic Chemistry I.	practical mark
Organic Chemistry II. GYSZKSZKE2A	4	–	5	Organic Chemistry I.	final #
Hungarian Medical Terminology IV.* GYLEKMSZG4A	–	4	2	Hungarian Medical Terminology III.	practical mark
Physical Education IV. GYTSITSNG4A	–	1	0		signature
Summer Practice I.** GYSZGNSZG1A	–	35	4	Analytical Chemistry II. Organic Chemistry II.	practical mark
Total:	12	19.5 Pract: 40 x 4	28+4+4**		

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
5. SEMESTER 2019/2020/1					
Biochemistry II. Practice GYOBIBKIG2A	–	1,5	0	Organic Chemistry II. Biochemistry I.	signature
Biochemistry II. GYOBIBKIE2A	2,5	–	3	Biochemistry I. Medical Terminology	final #
Physiology I. Practice GYKIKELTG1A	–	1	2	Biochemistry I. Medical Terminology	practical course grade
Physiology I. GYKIKELTE1A	5	–	4	Biochemistry I. Medical Terminology	semi-final
Pharmaceutical Chemistry I. GYGYKGYKG1A	4	5	8	Analytical Chemistry (quantitative) II. Organic Chemistry II. Physical Chemistry II. Medical Terminology	practical course grade
Pharmaceutical Technology I. GYGYIGYTG1A	2	3	5	Organic Chemistry II. Colloid Chemistry I. Analytical Chemistry (quantitative) II. Medical Terminology	practical course grade
Basic Immunology GYGENIMUE1A	2	–	2	Biology II. Medical Terminology Anatomy	semi-final
Colloid Chemistry II. GYKOLKOLG2A	–	2	2	Colloid Chemistry I. Analytical Chemistry (quantitative) II. Organic Chemistry II.	practical course grade
Hungarian Medical Terminology V. GYLEKMSZG5A	–	4	2	Hungarian Medical Terminology IV.	final
Total:	15.5	16.5	28		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
6. SEMESTER2019/2020/2					
Physiology II. Practice GYKIKELTG2A	–	1	2	Biochemistry II. Physiology I.	practical course grade
Physiology II. GYKIKELTE2A	5	–	4		final #
Pharmacognosy I. Practice GYFMGGNDG1A	–	4	3	Pharmaceutical Botany II. Biochemistry II. Pharmaceutical Chemistry I.	practical course grade
Pharmacognosy I. GYFMGGNDE1A	2	–	3		semi-final
Pharmaceutical Chemistry II. Practice GYGYKGYKG2A	–	5	4	Colloid Chemistry I. Biochemistry II. Pharmaceutical Chemistry I.	practical course grade
Pharmaceutical Chemistry II. GYGYKGYKE2A	4	–	4		semi-final
Pharmaceutical Microbiology GYMIKGMIE1A	3	–	5	Biochemistry II. Physiology I. Basic Immunology	final #
Pharmaceutical Microbiology Practice GYMIKGMIG1A	–	2	–		signature
Pharmaceutical Technology II. Practice GYGYIGYTG2A	–	5	4	Pharmaceutical Chemistry I. Colloid Chemistry I. Pharmaceutical Technology I.	practical course grade
Pharmaceutical Technology II. GYGYIGYTE2A	2	–	3		semi-final
Summer Practice II.** GYSZGNSZG2A	–	35	4	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	signature
Total:	16	17 Pract: 40 x 4	32 + 4		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
7. SEMESTER 2020/2021/1					
Pharmacognosy (practice) II. GYFMGGNDG2A	–	4	3	Pharmacognosy I. Pharm. Chemistry II.	practical mark
Pharmacognosy (theory) II. GYFMGGNDE2A	2	–	3		final*
Pharmaceutical Chemistry (practice) III. GYGYKGYKG3A	–	4	3	Pharm. Chemistry II. Physiology II.	practical mark
Pharmaceutical Chemistry (theory) III. GYGYKGYKE3A	2	–	3		final*
Pharmacology and Toxicology (practice) I. GYGYHHATG1A	–	2	2	Physiology II. Pharm. Chemistry II. Pharmac. Microbiol. Basic Immunology	practical mark
Pharmacology and Toxicology (theory) I. GYGYHHATE1A	4	–	4		semi-final
Pharmaceutical Technology (practice) III. GYGYIGYTG3A	–	9	5	Pharm. Chemistry II. Pharm. Techn. II.	practical mark
Pharmaceutical Technology (theory) III. GYGYIGYTE3A	3	–	4		semi-final
Industrial Pharmaceutical Technology (theory) I. GYGYIIGTE1A	3	–	2	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	semi-final
Basics of Clinical Chemistry and Laboratory Diagnostics GYLMIKLDE1A	1	–	1**	Biochemistry I.	semi-final
Basic Medical Pathophysiology (theory) I. GYGYHKKAE1A	2	–	2	Physiology II. Pharmac. Microbiol.	semi-final
Principles of Professional Ethics I. GYKGTO071E1A	–	–	–		signature
Total:	17	19	31 + 1**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
8. SEMESTER 2020/2021/2					
Pharmacology and Toxicology (practice) II. GYGYHHATG2A	–	3	2	Pharm. and Tox. I. Pharm. Techn. III.	practical mark
Pharmacology and Toxicology (theory) II. GYGYHHATE2A	4	–	4	Pharm. Chemistry III. Basic Med. Pathop. I.	final*
Pharmaceutical Technology (practice) IV. GYKGYI126G4A	–	9	6	Pharm. Techn. III. Pharm. Chemistry III.	practical mark
Pharmaceutical Technology (theory) IV. GYKGYI126E4A	3	–	4	Pharmacognosy II.	final*
Pharmacy Administration (theory+practice) I. GYEGYGIMG1A	2	2	3	Intro. to Health Inf. II. Hist. of Scienc.and Prop. Pharm. Techn. III.	practical mark
Introduction to Pharmacoeconomics (pract.) GYETEBFOG1A	–	1	1**	Pharm. and Tox. I. Mathematics II.	practical mark
Basics of Phytotherapy (theory) GYFMGFTAE1A	1	–	1**	Pharmacognosy II.	semi-final
Basics of Pharmaceutical Management (pra.) GYEGYGGMG1A	–	1	1	Pharm. and Tox. I. Mathematics II.	practical mark
Industrial Pharmaceutical Technology (theory) II. GYUGYI185E2A	2	–	2	Industrial Pharmaceutical Technology I. Pharmaceutical Technology III.	semi-final
Basic Medical Pathophysiology (theory) II. GYGYHKKAE2A	2	–	2	Basic Med. Pathop. I. Pharm. and Tox. I.	final*
Public Health (practice) GYNEINETG1A	–	2	2	Basic Medical Pathophysiology I.	practical mark
Public Health (theory) GYNEINEGE1A	2	–	2		semi-final
Diploma Work I. GYSZDSZDG1A	–	4	–	Passing all semi-finals and finals of the 7th semester	signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	16	22	28 + 2**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
9. SEMESTER 2021/2022/1					
Compulsory Practice I. GYSZGSZVG1A	–	40	8**	Passing all finals of the 8th semester	practical mark
Drug Therapy (theory+practice) GYGYHGTPE1A	2	2	4	Pharm. and Tox. II. Pharm. Techn. IV. Basic Medical Pathophysiology II.	semi-final
Pharmaceutical Care (theory+practice) GYEGYGGDE1A	2	3	4	Pharm. and Tox. II. Pharm. Techn. IV. Basic Medical Pathophysiology II.	semi-final
Clinical Pharmacokinetics and Biopharmacy (theory+practice) GYGYIKFBE1A	2	3	4	B. Med. Pathoph. II., Pharmac. and Tox.II., Pharm. Techn. IV., Public Health	semi-final
Pharmaceutical Communication and Integrated Consulting (theory+practice) GYMAGGKTG1A	1	2	1	Pharm. and Tox. II. Pharmacy Administration I.	practical mark
Pharmacy Administration (theory) II. GYEGYIGSE2A	2	–	2	Pharm. Administr. I. Pharm. Techn. IV. Public Health	final*
Pharmaceutical Informatics (theory+practice) GYDEIGIFG1A	1	1	1	Pharmacy Administration I.	practical mark
Clinical Pharmaceutics (theory+practice) GYEGYKLGE1A	1	1	1	Pharm. and Tox. II. Pharm. Techn. IV.	semi-final
Pharmaceutical Ethics and Sociology (theory+practice) GYMAGGESE1A	1	1	1	Pharm. and Tox. II. Hist. of Scienc. and Prop.	semi-final
Diploma Work II. GYSZDSDKG2A	–	5	–	Diploma Work I.	signature
Pharmaceutical industrial and regulatory affairs knowledge (teaching block)	28	28			
Drug Licensing (theory+practice) GYGYIGGNG1A	12	12	-	Pharmacy Administr. I. Pharmac. Techn. IV.	signature
Pharmacovigilance and pharmacoepidemiology (theory+practice) GYGYIGFPG1A	4	4	-	Pharmac. and Tox. II.	
Quality Assurance (theory+practice) GYGYIGMBG1A	4	4	-	Pharmac. Techn. IV. Pharmacy Administr. I.	
Drug innovation and clinical studies (theory+practice) GYGYIGGVG1A	8	8/	-	Pharmac. Techn. IV. Pharmacology and Toxicology II.	
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	12/week 28/sem.	19/week 28/sem. 40/week	18 +8**		

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
10. SEMESTER 2021/2022/2					
Compulsory Practice II. GYSZGSZVG2A	–	40	16**	Compulsory Practice I. GYSZGSZVG1A	practical mark
Diploma work/Thesis defense GYSZDDIVE1A	1/sem.	–	10**	Diploma Work II. GYSZDSDKG2A	final*
Principles of Professional Ethics II. GYKANG071E2A	–	–	–		signature
Total:	1/sem.	40	26		

* Counts to the qualification of the diploma
** Obligatory electives built-in in the curriculum

Obligatory elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Hungarian Medical Terminology (practice) II.			2		
Hungarian Medical Terminology (practice) III.			2		
Hungarian Medical Terminology (practice) IV.			4		
Compulsory Practice I. (9. semester)	–	40	8	Passing all finals of the 8th semester	practical mark
Compulsory Practice II. (10. semester)	–	40	16	Compulsory Practice. I.	practical mark
Diploma work/Thesis defense	1/félév	–	10	Diploma Work II.	practical mark
Basics of Clinical Chemistry and Laboratory Diagnostics	1	-	1	Biochemistry I.	semi-final
Introduction to Pharmacoeconomics (pract)	-	1	1	Pharm. and Tox. I. Mathematics II.	practical mark
Basics of Phytotherapy (theory)	1	-	1	Pharmacognosy II.	semi-final
Total:			45		

Elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Hungarian Medical Terminology (practice) I. GYLEKMSZG1A	–	4	6	Hungarian Medical Terminology (practice) I.	practical mark
Summer Practice I.	–	40	4	Organic Chemistry II. Analytical Chemistry II.	practical mark
Summer Practice II.	–	40	4	Pharmaceutical Chemistry II. Pharm. Techn. II.	practical mark
Total:			14		

The curriculum of the credit-based system for students enrolled for the 4th year in the 2021/2022 academic year

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
1. SEMESTER 2018/2019/1					
General and Inorganic Chemistry I. (Practice) GYASKASKG1A	–	5	5	–	practical mark
General and Inorganic Chemistry I. (Theory) GYASKASKE1A	4+1	–	5	–	semi-final
Introduction to Health Informatics I. (Pract.) GYINFBEIG1A	–	1	–	–	signature
Introduction to Health Informatics I. (Theory) GYINFBEIE1A	1	–	2	–	semi-final
Biophysics I. (Practice) GYFIZBIFG1A	–	3	2	–	practical mark
Biophysics I. (Theory) GYFIZBIFE1A	2	–	3	–	semi-final
Biology I. (Practice) GYGENBILG1A	–	2	2	–	practical mark
Biology I. (Theory) GYGENBILE1A	2	–	2	–	semi-final
Medical Terminology** GYLEKOTRG1A	–	2	2	–	practical mark
Mathematics I. (Practice) GYEGYMATG1A	–	2	2	–	practical mark
Mathematics I. (Theory) GYEGYMATE1A	2	–	2	–	semi-final
Physical Education I. GYTSITSNG1A	–	1	0	–	signature
History of Sciences, Propedeutics GYEGYTTPE1A	2	–	2	–	semi-final
Hungarian Medical Terminology I. * GYLEKMSZG1A	–	4	4	–	practical mark
Total:	14	20	29+4		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
2. SEMESTER 2018/2019/2					
General and Inorganic Chemistry II. GYASKASKE2A	3	–	3	General and Inorganic Chemistry I.	final #
Analytical Chemistry I. (qualitative) GYASKANKG1A	2	5	5	General and Inorganic Chemistry I.	practical mark
Anatomy GYANTANAE1A	2	–	4	Biology I.	semi-final
Anatomy Practice GYANTANAG1A	–	2	–	Biology I.	signature
Introduction to Health Informatics II. Practice GYINFBEIG2A	–	1	–	Introduction to Health Informatics I.	signature
Introduction to Health Informatics II. GYINFBEIE2A	1	–	2	Introduction to Health Informatics I.	semi-final
Biophysics II. Practice GYFIZBIFG2A	–	2	2	Biophysics I.	practical mark
Biophysics II. GYFIZBIFE2A	2	–	3	Biophysics I.	final #
Biology II. Practice GYGENBILG2A	–	2	1	Biology I.	practical mark
Biology II. GYGENBILE2A	2	–	2	Biology I.	final #
Pharmaceutical Botany I. GYNOVGYNG1A	1	2	3	Biology I.	practical mark
Mathematics II. Practice GYEGYMATG2A	–	1	1	Mathematics I. Introduction to Health Informatics I.	practical mark
Mathematics II. GYEGYMATE2A	2	–	2	Mathematics I. Introduction to Health Informatics I.	semi-final
Physical Education II. GYTSITSNG2A	–	1	0		signature
First Aid GYTRAELSE1A	1	–	0		signature
Hungarian Medical Terminology II.* GYLEKMSZG2A	–	4	2	Hungarian Medical Terminology I.	practical mark
Total:	16	20	28+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
3. SEMESTER 2019/2020/1					
Analytical Chemistry (quantitative) I. GYASKAKVG1A	2	5	7	Analytical Chemistry (qualitative) Mathematics II. General and Inorganic Chemistry II.	practical mark
Physical Chemistry I. GYFKTFIKE1A	4	–	4	General and Inorganic Chemistry II. Mathematics II. Biophysics II.	semi-final
Pharmaceutical Botany II. Practice GYNOVGYN2A	–	3	2	Biology II. Pharmaceutical Botany I.	practical mark
Pharmaceutical Botany II. GYNOVGYN2A	1	–	2	Biology II. Pharmaceutical Botany I.	final #
Organic Chemistry I. Practice GYSZKSZKG1A	–	5.5	5	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	practical mark
Organic Chemistry I. GYSZKSZKE1A	4	–	5	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	semi-final
Physical Education III. GYTSITSNG3A	–	1	0		signature
Hungarian Medical Terminology III. * GYLEKMSZG3A	–	4	2	Hungarian Medical Terminology II.	practical mark
Total:	11	18.5	25+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
4. SEMESTER 2019/2020/2					
Analytical Chemistry (quantitative) II. Practice GYASKAKKG2A	–	5	3	Organic Chemistry I. Analytical Chemistry (quantitative) I.	practical mark
Analytical Chemistry (quantitative) II. GYASKAKKE2A	2	–	6	Organic Chemistry I. Analytical Chemistry (quantitative) I.	final #
Biochemistry I. GYOBIBIKE1A	3	–	3	Biology II. Organic Chemistry I. Biophysics II.	semi-final
Physical Chemistry II. GYFKTFIKG2A	1	4	5	Physical Chemistry I	practical mark
Colloid Chemistry I. GYKOLKOLE1A	2	–	2	Physical Chemistry I.	semi-final
Organic Chemistry II. Practice GYSZKSZKG2A	–	5,5	4	Organic Chemistry I.	practical mark
Organic Chemistry II. GYSZKSZKE2A	4	–	5	Organic Chemistry I.	final #
Hungarian Medical Terminology IV.* GYLEKMSZG4A	–	4	2	Hungarian Medical Terminology III.	practical mark
Physical Education IV. GYTSITSNG4A	–	1	0		signature
Summer Practice I.** GYSZGNSZG1A	–	35	4	Analytical Chemistry II. Organic Chemistry II.	practical mark
Total:	12	19.5 Pract: 40 × 4	28+4+4**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
5. SEMESTER 2020/2021/1					
Biochemistry (practice) II. GYOBIBKIG2A	–	1.5	–	Organic Chemistry II. Biochemistry I.	signature
Biochemistry (theory) II. GYOBIBKIE2A	2.5	–	3		final*
Physiology (practice) I. GYTLMELNG1A	–	1	1	Biochemistry I. Medical Terminology	practical mark
Physiology (theory) I. GYTLMELNE1A	5	–	4		semi-final
Pharmaceutical Chemistry (theory+practice) I. GYGYKCKMG1A	4	4	8	Analyt. Chem. (quant.) II. Organic Chemistry II. Physical Chemistry II. Medical Terminology	practical mark
Basic of Dietetics (theory) GYGYITPAE1A	1	–	1	Biochemistry I.	semi-final
Pharmaceutical Technology (theory+practice) I. GYGYIGYTG1A	2	3	5	Organic Chemistry II. Colloid Chemistry I. Physical Chemistry II. Medical Terminology	practical mark
Basics of Clinical Chemistry and Laboratory Diagnostics (theory) GYLMIKLDE1A	1	–	1**	Biochemistry I.	semi-final
Basic Immunology (theory) GYGENIMUE1A	2	–	2	Biology II. Medical Terminology Anatomy	semi-final
Colloid Chemistry (practice) II. GYGYIKLDG2A	–	1	1	Colloid Chemistry I. Physical Chemistry II. Organic Chemistry II.	practical mark
Principles of Professional Ethics I. GYKGTO071E1A	–	–	–		signature
Hungarian Medical Terminology (practice) V. GYLEKMSZG5A	-	4	2**	Hungarian Medical Terminology (pract.) IV.	practical mark
Physical Education V. GYTSITSNG5A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	16.5	15.5	25 + 3**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
6. SEMESTER 2020/2021/2					
Physiology (practice) II. GYTLMELNG2A	–	1	1	Biochemistry II. Physiology I.	practical mark
Physiology (theory) II. GYTLMELNE2A	5	–	6		final*
Pharmacognosy (theory+practice) I. GYFMGGDIG1A	2	4	5	Pharmac. Botany II.	practical mark
Pharmaceutical Chemistry (practice) II. GYGYKGKMG2A	–	4	4	Pharmaceutical Chemistry I.	practical mark
Pharmaceutical Chemistry (theory) II. GYGYKGKYE2A	4	–	4		semi-final
Pharmaceutical Microbiology (practice) GYMIKGMIG1A	–	2	–	Physiology I. Basic Immunology	signature
Pharmaceutical Microbiology (theory) GYMIKGMBE1A	3	–	4		semi-final
Pharmaceutical Technology (practice) II. GYGYIGYTG2A	–	5	4	Pharm. Techn. I. Pharm. Chemistry I. Colloid Chemistry II.	practical mark
Pharmaceutical Technology (theory) II. GYGYIGYTE2A	2	–	3		semi-final
Physical Education VI. GYTSITSNG6A	–	1	–		signature
Summer Practice II. GYSSZG239G4A	–	40	4	Pharm. Chemistry II. Pharm. Techn. II.	practical mark
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	16	17 Pract.: 4 x 40	31 + 4		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
7. SEMESTER 2021/2022/1					
Pharmacognosy (practice) II. GYFMGGNDG2A	–	4	3	Pharmacognosy I. Pharm. Chemistry II.	practical mark
Pharmacognosy (theory) II. GYFMGGNDE2A	2	–	3		final*
Pharmaceutical Chemistry (practice) III. GYGYKGYKG3A	–	4	3	Pharm. Chemistry II. Physiology II.	practical mark
Pharmaceutical Chemistry (theory) III. GYGYKGYKE3A	2	–	3		final*
Pharmacology and Toxicology (practice) I. GYGYHHATG1A	–	2	2	Physiology II. Pharm. Chemistry II. Pharmac. Microbiol. Basic Immunology	practical mark
Pharmacology and Toxicology (theory) I. GYGYHHATE1A	4	–	4		semi-final
Basics of Pharmacoeconomics (theory) GYETEFOAG1A	0	1	1**	Mathematics II. Passing in the same term with Pharmacology and Toxicology I.	practical mark
Pharmaceutical Technology (practice) III. GYGYIGYTG3A	–	9	5	Pharm. Chemistry II. Pharm. Techn. II.	practical mark
Pharmaceutical Technology (theory) III. GYGYIGYTE3A	3	–	4		semi-final
Basic Medical Pathophysiology (theory) I. GYGYHKKAE1A	2	–	2	Physiology II. Pharmac. Microbiol.	semi-final
Industrial Pharmaceutical Technology I. GYGYIIGTE1A	3	0	2**	Pharm. Technology II. Pharm.Chem.and Anal.I.	semi-final
Physical Education VII. GYTSITSNG7A	-	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	16	21	29 +3**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
8. SEMESTER 2021/2022/2					
Pharmacology and Toxicology (practice) II. GYGYHHATG2A	–	3	2	Pharm. and Tox. I. Pharm. Techn. III. Basic Med. Pathop. I.	practical mark
Pharmacology and Toxicology (theory) II. GYGYHHATE2A	4	–	4		final*
Pharmaceutical Technology (practice) IV. GYGYIGYTG4A	–	9	6	Pharmaceutical Technology III.	practical mark
Pharmaceutical Technology (theory) IV. GYGYIGYTE4A	3	–	4		final*
Pharmacy Administration I. (theory+practice) GYEGYGMG1A	2	2	3	Basics of Pharmacoec. Hist. of Scienc.and Prop. Pharm. Techn. III.	practical mark
Basic Medical Pathophysiology (theory) II. GYGYHKAE2A	2	–	2	Basic Med. Pathop. I. Pharm. and Tox. I.	final*
Basics of Phytotherapy (theory) GYFMGFTAE1A	1	–	1**	Pharmacognosy II.	semi-final
Basics of Pharmaceutical Management (practice) GYEGYGGMG1A	–	1	1	Basics of Pharmacoeconomics	practical mark
Products of Veterinary Medicine (theory) GYGYIAGKE1A	1	0	1	Ph. Technology III. Ph. Microbiology	semi-final
Public Health (practice) GYNEINETG1A	–	2	2	Basic Medical Pathophysiology I.	practical mark
Public Health (theory) GYNEINEGE1A	2	–	2		semi-final
Physical Education VIII. GYKTSI116G8A	–	1	–		signature
Diploma Work I. GYSZDSZDG1A	–	4	–	Passing all semi-finals and finals of the 7th semester	signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	14	22	27 +1**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
9. SEMESTER 2022/2023/1					
Compulsory Practice I.	–	40	8**	Passing all finals of the 8th semester	practical mark
Drug Therapy (theory+practice)	2	2	4	Pharm. and Tox. II. Pharm. Techn. IV. Basics of Phytother.	semi-final
Pharmaceutical Care (theory+practice)	2	3	4	Pharm. and Tox. II. Pharm. Techn. IV.	semi-final
Clinical Pharmacokinetics and Biopharmacy (theory+practice)	2	3	4	Pharm. and Tox. II. Pharm. Techn. IV.	semi-final
Pharmaceutical Communication and Integrated Consulting (theory+practice)	1	2	1	Pharm. and Tox. II. Pharmacy Administration I.	practical mark
Pharmacy Administration (theory) II.	2	–	2	Pharm. Administr. I. Pharm. Techn. IV. Public Health	final*
Pharmaceutical Informatics (theory+practice)	1	1	1	Pharmacy Administration I.	practical mark
Clinical Pharmaceutics (theory+practice)	1	1	1	Pharm. and Tox. II. Pharm. Techn. IV.	semi-final
Pharmaceutical Ethics and Sociology (theory+practice)	1	1	1	Pharm. and Tox. II. Hist. of Scienc. and Prop.	semi-final
Diploma Work II.	–	5	–	Diploma Work I.	signature
Physical Education IX.	–	1	–		signature
Pharmaceutical industrial and regulatory affairs knowledge (teaching block)	28	28	–		
Drug Licensing (theory+practice)	12	12	–	Pharmacy Administr. I. Pharmac. Techn. IV.	signature
Pharmacovigilance and pharmacoepidemiology (theory+practice)	4	4	–	Pharmac. and Tox. II.	
Quality Assurance (theory+practice)	4	4	–	Pharmac. Techn. IV. Pharmacy Administr. I.	
Drug innovation and clinical studies (theory+practice)	8	8/	–	Pharmac. and Tox. II. Pharmac. Techn. IV.	
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	12/week 28/sem.	40/week 18/week 28/sem.	18 +8**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
10. SEMESTER 2022/2023/2					
Compulsory Practice II. GYSZGSZVG2A	–	40	16**	Compuls. Practice I. GYSZGSZVG1A	practical mark
Diploma work/Thesis defense GYSZDDIVE1A	1/sem.	–	10**	Diploma Work II.	final*
Principles of Professional Ethics II.	–	–	–		signature
Total:			26		

* Counts to the qualification of the diploma
** Obligatory electives built-in in the curriculum

Obligatory elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Compulsory Practice I. (9. semester)	–	40	8	Passing all finals of the 8th semester	practical mark
Compulsory Practice II. (10. semester)	–	40	16	Compulsory Practice. I.	practical mark
Diploma work/Thesis defense	1/félév	–	10	Diploma Work II.	practical mark
Hungarian Medical Terminology (practice) IV.	–	4	4	Hungarian Medical Terminology (practice) IV.	practical mark
Hungarian Medical Terminology (practice) V.	–	4	2	Hungarian Medical Terminology (practice) IV.	practical mark
Basics of Clinical Chemistry and Laboratory Diagnostics (theory)	1	–	1	Biochemistry I.	semi-final
Basics of Pharmacoeconomics	0	1	1	Pharm. and Tox. I. Mathematics II.	practical mark
Basics of Phytotherapy (theory)	1	–	1	Pharmacognosy II.	semi-final
Industrial Pharmaceutical Technology I.	3	0	2**	Pharm. Technology II. Pharm.Chem.and Anal.I.	semi-final
Total:			45		

Elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Hungarian Medical Terminology (practice) I.	–	6	4	Hungarian Medical Terminology (practice) I.	practical mark
Summer Practice I.	–	40	4	Organic Chemistry II. Analytical Chemistry II.	practical mark
Summer Practice II.	–	40	4	Pharmaceutical Chemistry and Analysis Pharm. Techn. II.	practical mark
Total:			14		

The curriculum of the credit-based system for students enrolled for 3rd year in the 2021/2022 academic year

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
1. SEMESTER 2019/2020/1					
General and Inorganic Chemistry I. (Practice) GYASKASKG1A	–	5	5	–	practical mark
General and Inorganic Chemistry I. (Theory) GYASKASKE1A	4+1	–	5	–	semi-final
Introduction to Health Informatics I. (Pract.) GYINFBEIG1A	–	1	–	–	signature
Introduction to Health Informatics I. (Theory) GYINFBEIE1A	1	–	2	–	semi-final
Biophysics I. (Practice) GYFIZBIFG1A	–	3	2	–	practical mark
Biophysics I. (Theory) GYFIZBIFE1A	2	–	3	–	semi-final
Biology I. (Practice) GYGENBILG1A	–	2	2	–	practical mark
Biology I. (Theory) GYGENBILE1A	2	–	2	–	semi-final
Medical Terminology** GYLEKOTRG1A	–	2	2	–	practical mark
Mathematics I. (Practice) GYEGYMATG1A	–	2	2	–	practical mark
Mathematics I. (Theory) GYEGYMATE1A	2	–	2	–	semi-final
Physical Education I. GYTSITSNG1A	–	1	0	–	signature
History of Sciences, Propedeutics GYEGYTTPE1A	2	–	2	–	semi-final
Hungarian Medical Terminology I. * GYLEKMSZG1A	–	4	4	–	practical mark
Total:	14	20	29+4**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
2. SEMESTER 2019/2020/2					
General and Inorganic Chemistry II. GYASKASKE2A	3	–	3	General and Inorganic Chemistry I.	final #
Analytical Chemistry I. (qualitative) GYASKANKG1A	2	5	5	General and Inorganic Chemistry I.	practical mark
Anatomy GYANTANAE1A	2	–	4	Biology I.	semi-final
Anatomy Practice GYANTANAG1A	–	2	–	Biology I.	signature
Introduction to Health Informatics II. Practice GYINFBEIG2A	–	1	–	Introduction to Health Informatics I.	signature
Introduction to Health Informatics II. GYINFBEIE2A	1	–	2	Introduction to Health Informatics I.	semi-final
Biophysics II. Practice GYFIZBIFG2A	–	2	2	Biophysics I.	practical mark
Biophysics II. GYFIZBIFE2A	2	–	3	Biophysics I.	final #
Biology II. Practice GYGENBILG2A	–	2	1	Biology I.	practical mark
Biology II. GYGENBILE2A	2	–	2	Biology I.	final #
Pharmaceutical Botany I. GYNOVGYNG1A	1	2	3	Biology I.	practical mark
Mathematics II. Practice GYEGYMATG2A	–	1	1	Mathematics I. Introduction to Health Informatics I.	practical mark
Mathematics II. GYEGYMATE2A	2	–	2	Mathematics I. Introduction to Health Informatics I.	semi-final
Physical Education II. GYTSITSNG2A	–	1	0		signature
First Aid GYTRAELSE1A	1	–	0		signature
Hungarian Medical Terminology II.* GYLEKMSZG2A	–	4	2	Hungarian Medical Terminology I.	practical mark
Total:	16	20	28+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
3. SEMESTER 2020/2021/1					
Analytical Chemistry (quantitative) (practice) GYKASK066G1A	–	4	4	General and Inorganic Chemistry II. Analytical Chemistry (qualitative)	practical mark
Analytical Chemistry (quantitative) (theory) GYKASK066E1A	4	–	4		final*
Physical Chemistry for Pharmacists (theory+practice) GYKGYI122G1A	2	2	4	Gen. and Inorg. Chem. II. Mathematics II. Biophysics II.	practical mark
Organic Chemistry (practice) I. GYKSZK123G1A	–	4	4	Gen. and Inorg. Chem. II. Analyt. Chem. (qual.) Intro. to Health Inform. II.	practical mark
Organic Chemistry (theory) I. GYKSZK123E1A	4	–	4		semi-final
Physiology (practice) I. GYKTLM068G1A	–	1	1	Anatomy Biology II.	practical mark
Physiology (theory) I. GYKTLM068E1A	5	–	4		semi-final
Biochemistry (theory+practice) I. GYKBMT069G1A	1.5	1.5	2	Gen. and Inorg. Chem. II. Biology II.	practical mark
Basic Immunology (theory) GYKGEN070E1A	2	–	2	Biology II.	semi-final
Principles of Professional Ethics I. GYKANG071E1A	–	–	–		signature
Hungarian Medical Terminology (practice) III. GYLEKMSZG3A	–	4	2	Hungarian Medical Terminology (practice) II.	practical mark
Physical Education III. GYKTSI116G3A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	18.5	17.5	29+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
4. SEMESTER 2020/2021/2					
Biochemistry (theory) II. GYKBM069E2A	3	–	3	Biochemistry I Organic Chemistry I.	final*
Colloid Chemistry (theory+practice) GYKGYI072G1A	2	2	4	Phys. Chem. for Pharm. Biophysics II.	practical mark
Organic Chemistry (practice) II. GYKSZK123G2A	–	4	4	Organic Chemistry I.	practical mark
Organic Chemistry (theory) II. GYKSZK123E2A	4	–	4		final*
Physiology (practice) II. GYKTLM068G2A	–	1	1	Physiology I. Biochemistry I.	practical mark
Physiology (theory) II. GYKTLM068E2A	5	–	6		final*
Physiological Pharmaceutics and Pharmaceutical dosage forms (theory+practice) GYKGYI073G1A	2	2	3	Physiology I. Phys. Chem. for Pharm. Hist. of Scienc. and Prop.	practical mark
Biotechnology (theory) GYKGYI074E1A	1	-	1	Biochemistry I.	semi-final
Physical Education IV. GYKTSI116G4A	–	1	–		signature
Hungarian Medical Terminology (practice) IV. GYLEKMSZG4A	–	4	2**	Hungarian Medical Terminol. (practice) III.	practical mark
Pharmacy Practice I. GYKANG238G1A	–	20/semester	–	Analytical Chem. (quant.) Medical Terminology	signature
Summer Practice I. GYSSZG234G4A	–	40	4	Organic Chemistry II. Analytical Chem. (quant.)	practical mark
Total:	17	14 20/sem. 4x40/sem	26+2**+4		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
5. SEMESTER 2021/2022/1					
Pharmaceutical Chemistry (practice) I. GYKGYK076G1A	–	4	3	Analytical Chem. (quant.) Organic Chemistry II.	practical mark
Pharmaceutical Chemistry (theory) I. GYKGYK076E1A	4	–	4		semi-final
Pharmaceutical Technology (theory+practice) I. GYKGYI126G1A	2	3	4	Physiological Pharm. and Pharmaceutical dosage forms, Colloid Chem., Medical Terminology	practical mark
Nanotechnology (theory+practice) GYKGYI078G1A	2	2	4	Colloid Chemistry	practical mark
Pharmaceutical Botany (practice) II. GYKFMG079G2A	–	1	–	Biology II. Biotechnology Pharmaceutical Botany I.	signature
Pharmaceutical Botany (theory) II. GYKFMG079E2A	1	-	1		semi-final
Dietetics (theory) GYKGYI168E1A	1	–	1	Physiology II. Biochemistry II.	semi-final
Pharmaceutical Microbiology (practice) GYKMIK081G1A	–	2	–	Basic Immunology	signature
Pharmaceutical Microbiology (theory) GYKMIK081E1A	3	–	4		semi-final
Clinical Chemistry and Laboratory Diagnostics (theory) GYKLMI082E1A	2	–	2	Physiology II. Biochemistry II.	semi-final
Basic Medical Pathophysiology I. (theory+practice) GYKGYH083G1A	2	1	2	Physiology II. Biochemistry II.	practical mark
Hungarian Medical Terminology (practice) V. GYLEKMSZG5A	–	4	2	Hungarian Medical Terminology (practice) IV.	practical mark
Physical Education V. GYKTSI116G5A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	17	18	27		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
6. SEMESTER 2021/2022/2					
Pharmacognosy (theory+practice) I.	2	4	5	Pharmaceutical Botany II.	practical mark
Pharmaceutical Chemistry (practice) II.	–	4	4	Pharmaceutical Chemistry I.	practical mark
Pharmaceutical Chemistry (theory) II.	4	–	4		final*
Pharmaceutical Technology (practice) II.	–	6	3	Pharm. Techn. I.	practical mark
Pharmaceutical Technology (theory) II.	2	–	3	Pharm. Chem. I.	semi-final
Basic Medical Pathophysiology II. (theory)	2	–	2	Basic Med. Patho.I. Dietetics Pharm. Microbiology	final*
Veterinary Pharmaceuticals (theory)	1	–	1	Pharm. Techn. I. Pharm. Microbiology	semi-final
Pharmacology and Toxicology (practice) I.	–	2	2	Basic Med. Patho.I.	practical mark
Pharmacology and Toxicology (theory) I.	2	–	2	Physiological Pharm. and Pharmaceutical dosage forms	semi-final
Physical Education VI.	–	1	–		signature
Pharmacy Practice II. GYKANG238G2A	–	20/semester	–	Pharm. Techn. I. Pharm. Chem. I.	signature
Summer Practice II.	–	40	4	Pharm. Chem. and Anal.; Pharm. Techn. II.	practical mark
Total:	13	17 20/semester 4x40/semester	26+4		

7. SEMESTER 2022/2023/1					
Pharmacognosy (practice) II.	–	4	2	Pharmacognosy I.	practical mark
Pharmacognosy (theory) II.	2	–	3		final*
Instrumental Pharmaceutical Analysis (practice)	–	5	4	Pharm. Chem. II.	practical mark
Instrumental Pharmaceutical Analysis (theory)	2	–	2	Pharm. Techn. II.	semi-final
Pharmacology and Toxicology (practice) II.	–	2	2	Basic Med. Patho. II.	practical mark
Pharmacology and Toxicology (theory) II.	3	–	3	Pharmac. and Tox. I.	semi-final
Pharmaceutical Technology (practice) III.	–	8	5	Pharm. Techn. II.	practical mark
Pharmaceutical Technology (theory) III.	2	–	2		semi-final
Biological Drugs (theory)	2	–	2	Pharm. Chem. II. Pharmac. and Tox. I. Biotechnology	semi-final
Indtroduction to Pharmacoeconomics (practice)	–	1	1	Mathematics II. Pharmac. and Tox. I.	practical mark
Industrial Pharmaceutical Technology I.	3	0	2	Pharm. Techn. II.; Pharm.Chem.and Anal.I.	semi-final
Physical Education VII.	–	1	–		signature
Total:	14	21	26+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
8. SEMESTER 2022/2023/2					
Pharmacology and Toxicology (practice) III.	–	2	2	Pharmacology and Toxicology II.	practical mark
Pharmacology and Toxicology (theory) III.	3	–	4		final*
Pharmaceutical Technology (practice) IV.	–	8	4	Pharmaceutical Technology III.	practical mark
Pharmaceutical Technology (theory) IV.	2	–	5		final*
Pharmacy Administration (theory+practice)	2	2	4	Pharmac. and Tox. II. Intr. to Pharmacoeco.	practical mark
Public Health (practice)		2	2	Basic Medical Pathophysiology II.	practical mark
Public Health (theory)	2	-	2		semi-final
Phytotherapy (theory)	2	–	2	Pharmacognosy II.	semi-final
Pharmaceutical management (practice)	–	1	1	Introduction to Pharmacoeconomics	practical mark
Pharmaceutical management (theory)	1	–	1		semi-final
Diploma Work I.	–	4	–	Passing all semi-finals and finals of the 7th semester	signature
Industrial Pharmaceutical Technology II.	3	0	2	Pharm. Technology III. Industrial Pharm.Tech. I.	semi-final
Physical Education VII.	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	15	20	27+2		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
9. SEMESTER 2023/2024/1					
Compulsory Practice Before the Board Exam I.	–	40	8**	Passing all finals of the 8th semester	practical mark
Drug Therapy (theory+practice)	2	3	5	Pharmac. and Tox.III. Pharm. Techn. IV. Phytotherapy	Semi-final
Pharmaceutical Care (theory+practice)	2	3	4	Pharmac. and Tox.III. Pharm. Techn. IV..	Semi-final
Clinical Pharmacokinetics and Biopharmacy (theory+practice)	2	3	4	Pharmac. and Tox.III. Pharm. Techn. IV.	Semi-final
Pharmaceutical Communication and Integrated Consulting (theory+practice)	1	2	2	Pharmac. and Tox.III. Pharmacy Administ.	practical mark
Pharmacy Administration (theory) II.	2	-	2	Pharmacy Admin. I. Pharm. Techn. IV. Public Health	final*
Pharmaceutical informatics (theory+practice)	1	1	1	Pharmacy Admin. I. Pharm. Techn. IV.	practical mark
Clinical Pharmaceutics (theory+practice)	1	1	1	Pharmac. and Tox.III. Pharm. Techn. IV..	Semi-final
Pharmaceutical Ethics and Sociology (theory+practice)	1	1	1	Pharmac. and Tox.III. Hist. of Scienc.and Prop.	Semi-final
Diploma Work II.	–	5	–	Diploma Work I.	signature
Physical Education IX.	–	1	–		signature
Pharmaceutical industrial and regulatory affairs knowledge (teaching block)	28	28	4		practical mark
Drug Licensing (theory+practice)	12	12	1	Pharmacy Administr. I. Pharmac. Techn. IV.	practical mark
Pharmacovigilance and pharmacoepidemiology (theory+practice)	4	4	1	Pharmac. and Tox. III.	practical mark
Quality Assurance (theory+practice)	4	4	1	Pharmac. Techn. IV. Pharmacy Administr. I.	practical mark
Drug innovation and clinical studies (theory+practice)	8	8	1	Pharmac. and Tox. III. Pharmac. Techn. IV.	practical mark
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	12/week 28/sem.	40/week 20/week 28/sem	24+8**		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
10. SEMESTER 2023/2024/2					
Compulsory Practice II.	–	40	16**	Compulsory Practice Before the Board Exam I.	practical mark
Diploma work/Thesis defense	1/sem.	–	10**	Diploma Work II.	final*
Principles of Professional Ethics II.	–	–	–		signature
Total:			26		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

Obligatory elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Compulsory Practice Before the Board Exam I.	–	40	8	Passing all finals of the 8th semester	practical mark
Compulsory Practice Before the Board Exam II.	–	40	16	Compulsory Practice Before the Board Exam I.	practical mark
Diploma work/Thesis defense	1/sem.	–	10	Diploma Work II.	practical mark
Hungarian Medical Terminology (practice) I.	–	4	4		practical mark
Hungarian Medical Terminology (practice) IV.	–	4	2	Hungarian Medical Terminology (practice) III.	practical mark
Industrial Pharmaceutical Technology I.	3	0	2	Pharm. Techn. II.; Pharm. Chem. and Anal. I.	semi-final
Industrial Pharmaceutical Technology II.	3	0	2	Pharm. Technology III. Industrial Pharm.Tech. I.	semi-final
Total:			44		

Elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Hungarian Medical Terminology (practice) II.	-	4	2	Hungarian Medical Terminology (practice) I.	practical mark
Hungarian Medical Terminology (practice) III.	-	4	2	Hungarian Medical Terminology (practice) II.	practical mark
Summer Practice I.	--	40	4	Organic Chemistry II. Analytical Chemistry II.	practical mark
Summer Practice II.	--	40	4	Pharmaceutical Chemistry and Analysis Pharm. Techn. II.	practical mark
Total:			12		

The curriculum of the credit-based system for students enrolled from 2020

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
1. SEMESTER					
General and Inorganic Chemistry (practice) I. GYKASK106G1A	–	4	4		practical mark
General and Inorganic Chemistry (theory) I. GYKASK106E1A	3	–	3		semi-final
Informatics (practice) GYKDEI107G1A	–	2	2		practical mark
Biophysics (practice) I. GYKFIZ108G1A	–	2.5	2		practical mark
Biophysics (theory) I. GYKFIZ108E1A	1.5	–	2		semi-final
Biology (practice) I. GYKGEN109G1A	–	2	2		practical mark
Biology (theory) I. GYKGEN109E1A	2	–	2		semi-final
First Aid (practice) GYKTRA110G1A	–	1	1		practical mark
Pharmaceutical Terminology (practice) GYKLEK154G1A	–	2	2		practical mark
Mathematics for Pharmacists (practice) GYKEGY112G1A	–	2	2		practical mark
Mathematics for Pharmacists (theory) GYKEGY112E1A	2	–	2		semi-final
Introduction to Pharmaceutical Studies (methodology, law) (theory) GYKEGY113E1A	1	–	1		semi-final
History of Pharmaceutics and Propedeutics (theory) GYKFMG153E1A	2	–	2		semi-final
Principles of Professional Ethics I. GYKGTO071E1A	–	–	–		signature
Physical Education I. GYKTSI116G1A	–	1	–		signature
Hungarian Pharmaceutical Terminology (practice) I. GYKLEK155G1A	–	2	0		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	11.5	18.5	27		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
2. SEMESTER					
General and Inorganic Chemistry (theory) II. GYKASK106E2A	3	–	3	Gen. and Inorg. Chemistry I.	final*
Analytical Chemistry (theory+practice) I. GYKASK117G1A	2	4	6	Gen. and Inorg. Chemistry I., Introd. to Pharm. Studies, Mathematics for Pharm.	practical mark
Anatomy (practice) GYKANT118G1A	–	2	–	Biology I., Pharm. Terminology, First Aid	signature
Anatomy (theory) GYKANT118E1A	2	–	2		semi–final
Biophysics (practice) II. GYKFIZ108G2A	–	2.5	2	Biophysics I.	practical mark
Biophysics (theory) II. GYKFIZ108E2A	1.5	–	2		final*
Biology (practice) II. GYKGEN109G2A	–	2	2	Biology I.	practical mark
Biology (theory) II. GYKGEN109E2A	2	–	2		final*
Communication and Information Networks (theory+practice) GYKMAG120G1A	1	1	2	Introd. to Pharm. Studies	practical mark
Basics of Economics (theory) GYKEMK121E1A	1	–	1	Mathematics for Pharm., Introd. to Pharm. Studies	semi–final
Physical Chemistry for Pharmacists (theory+practice) GYKGYI122G1A	2	2	4	Gen. and Inorg. Chemistry I., Biophysics I., Mathematics for Pharm.	practical mark
Hungarian Pharmaceutical Terminology (practice) II. GYKLEK155G2A	–	2	0	Hungarian Pharmaceutical Terminology (practice) I.	signature
Physical Education II. GYKTSI116G2A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi–final or practical mark
Total:	14.5	16.5	26		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
3. SEMESTER					
Analytical Chemistry (practice) II. GYKASK117G2A	–	4	4	Gen. and Inorg. Chem. II., Analytical Chemistry I.	practical mark
Analytical Chemistry (theory) II. GYKASK117E2A	4	–	4		final*
Colloid Chemistry (theory and practice) GYKGYI072G1A	2	2	4	Physic. Chem. for Pharm., Biophysics II.	practical mark
Organic Chemistry (practice) I. GYKSZK123G1A	–	4	4	Gen. and Inorg. Chem. II.	practical mark
Organic Chemistry (theory) I. GYKSZK123E1A	4	–	4		semi-final
Physiology (practice) I. GYKTLM124G1A	–	2	1	Anatomy, Biology II.	practical mark
Physiology (theory) I. GYKTLM124E1A	4	–	4		semi-final
Biochemistry (theory+practice) I. GYKBMT069G1A	1.5	1.5	2	Gen. and Inorg. Chem. II., Biology II.	practical mark
Basic Immunology (theory) GYKGEN070E1A	2	–	2	Biology II.	semi-final
Hungarian Pharmaceutical Terminology (practice) III. GYKLEK155G3A	–	2	1	Hungarian Pharmaceutical Terminology (practice) II.	practical mark
Physical Education III. GYKTSI116G3A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	17.5	16.5	30		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
4. SEMESTER					
Biochemistry (theory) II. GYKBM069E2A	3	–	3	Biochemistry I., Organic Chemistry I.	final*
Organic Chemistry (practice) II. GYKSZK123G2A	–	4	4	Organic Chemistry I.	practical mark
Organic Chemistry (theory) II. GYKSZK123E2A	4	–	4		final*
Physiological Pharmaceutics and Pharmaceutical dosage forms(theory+practice) GYKGYI073G1A	2	2	3	Physiology I., Physic. Chem. for Pharm., History of Pharm. and Prop.	practical mark
Physiology (practice) II. GYKTLM124G2A	–	2	1	Physiology I., Biochemistry I.	practical mark
Physiology (theory) II. GYKTLM124E2A	6	–	6		final*
Biotechnology (theory) GYKGYI074E1A	1	–	1	Biochemistry I.	semi-final
Nanotechnology (theory+practice) GYKGYI078G1A	2	2	4	Colloid Chemistry	practical mark
Pharmacy Practice I. GYKANG238G1A	–	20/semester	–	Analytical Chemistry II., Pharmaceutical Terminology	signature
Hungarian Pharmaceutical Terminology (practice) IV. GYKLEK155G4A	–	2	3	Hungarian Pharmaceutical Terminology (practice) III.	final
Physical Education IV. GYKTSI116G4A	–	1	–		signature
Summer Practice I. GYSSZG234G1A (1 week) GYSSZG234G2A (2 weeks) GYSSZG234G3A (3 weeks) GYSSZG234G4A (4 weeks)	–	40/week	1/2/3/4 depending on the number of the weeks	Organic Chemistry II., Analytical Chemistry II.	practical mark elective subject
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	18	13 +20/semester +40/week	26 +3 +1/2/3/4		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
5. SEMESTER					
Pharmaceutical Botany (practice) GYKFMG125G1A	–	2	1	Biology II., Biotechnology	practical mark
Pharmaceutical Botany (theory) GYKFMG125E1A	2	–	2		semi–final
Dietetics (theory) GYKGYI168E1A	1	–	1	Physiology II., Biochemistry II.	semi–final
Pharmaceutical Technology I. (theory+practice) GYKGYI126G1A	2	3	4	Physiological Pharmaceutics and Pharm. dosage forms, Pharmaceutical Terminology, Nanotechnology	practical mark
Pharmaceutical Chemistry and Analysis (practice) I. GYKGYK127G1A	–	4	3	Analytical Chemistry II., Organic Chemistry II.	practical mark
Pharmaceutical Chemistry and Analysis (theory) I. GYKGYK127E1A	4	–	4		semi–final
Pharmaceutical Microbiology (practice) GYKMIK081G1A	–	2	–	Basic Immunology	signature
Pharmaceutical Microbiology (theory) GYKMIK081E1A	3	–	4		semi–final
Basic Medical Pathophysiology I. (theory+practice) GYKGYH128G1A	2	1	2	Physiology II., Biochemistry II.	practical mark
Clinical Chemistry and Laboratory Diagnostics (theory) GYKLMI082E1A	2	–	2	Physiology II., Biochemistry II.	semi–final
Statistics for Pharmacists (theory+practice) GYKEGY129G1A	2	2	4	Mathematics for Pharm., Physiological Pharmaceutics and Pharm. dosage forms, Informatics	practical mark
Physical Education V. GYKTSI116G5A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi–final or practical mark
Total:	18	15	27		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
6. SEMESTER					
Basic Medical Pathophysiology II. (theory+practice) GYKGYH128E2A	2	1	3	Basic Med. Pathoph. I., Pharmac. Microbiology, Dietetics	final*
Pharmacognosy (theory+practice) I. GYKFMG130G1A	2	4	5	Pharmaceutical Botany	practical mark
Pharmaceutical Chemistry and Analysis (practice) II. GYKGYK127G2A	–	4	4	Pharmaceutical Chemistry and Analysis I.	practical mark
Pharmaceutical Chemistry and Analysis (theory) II. GYKGYK127E2A	4	–	4		final*
Pharmaceutical Technology (practice) II. GYKGYI126G2A	–	6	3	Pharm. Techn. I., Pharm. Chem. and Anal. I., Statistics for Pharmacists	practical mark
Pharmaceutical Technology (theory) II. GYKGYI126E2A	2	–	3		semi-final
Veterinary Pharmaceuticals (theory) GYKGYI085E1A	1	–	1	Pharmaceutical Techn. I., Pharmac. Microbiology	semi-final
Pharmacology and Toxicology (practice) I. GYKGYH086G1A	–	2	2	Basic Med. Pathoph. I., Physiological Pharmaceutics and Pharmaceutical dosage forms	practical mark
Pharmacology and Toxicology (theory) I. GYKGYH086E1A	2	–	2		semi-final
Pharmacy Practice II. GYKANG238G2A	–	20/semester	–	Pharm. Techn. I., Pharm. Chem. and Anal. I.	signature
Physical Education VI. GYKTSI116G6A	–	1	–		signature
Summer Practice II. GYSSZG239G1A (1 week) GYSSZG239G2A (2 weeks) GYSSZG239G3A (3 weeks) GYSSZG239G4A (4 weeks)	–	40	1/2/3/4 depending on the number of the weeks	Ph. Chem. and Analysis I., Pharm. Techn. II.	practical mark elective subject
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	13	18 +20/semester +40/week	27+1/2/3/4		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
7. SEMESTER					
Pharmacognosy (practice) II. GYKFMG130G2A	–	4	2	Pharmacognosy I.	practical mark
Pharmacognosy (theory) II. GYKFMG130E2A	2	–	3		final*
Instrumental Pharmaceutical Analysis (practice) GYKGYK087G1A	–	5	4	Ph. Chem. and Analysis II., Pharm. Technology II.	practical mark
Instrumental Pharmaceutical Analysis (theory) GYKGYK087E1A	2	–	2		semi-final
Pharmacology and Toxicology (practice) II. GYKGYH086G2A	–	2	2	Pharmacol. and Tox. I. Basic Med. Pathoph. II.	practical mark
Pharmacology and Toxicology (theory) II. GYKGYH086E2A	3	–	3		semi-final
Pharmaceutical Technology (practice) III. GYKGYI126G3A	–	8	5	Pharm. Technology II.	practical mark
Pharmaceutical Technology (theory) III. GYKGYI126E3A	2	–	2		semi-final
Industrial Pharmaceutical Technology I. GYGYIIGTE1A	3	0	2	Pharm. Technology II., Ph. Chem. and Analysis I.	semi-final
Biological Drugs (theory) GYKGYI088E1A	2	–	2	Ph. Chem. and Analysis II., Pharmac. and Tox. I., Biotechnology	semi-final
Pharmacoeconomics (practice) GYKETE131G1A	–	1	1	Pharmac. and Tox. I., Basics of Economics, Statistics for Pharmacists	practical mark
Physical Education VII. GYKTSI116G7A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	14	21	26+2		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
8. SEMESTER					
Pharmacology and Toxicology (practice) III. GYKGYH086G2A	–	2	2	Pharmacology and Toxicology II.	practical mark
Pharmacology and Toxicology (theory) III. GYKGYH086E3A	3	–	4		final*
Pharmaceutical Technology (practice) IV. GYKGYI126G4A	–	8	4	Pharmaceutical Technology III.	practical mark
Pharmaceutical Technology (theory) IV. GYKGYI126E4A	2	–	5		final*
Pharmacy Administration (theory+practice) I. GYKEGY090G1A	2	2	4	Pharmac. and Tox. II., Pharmacoeconomics	practical mark
Public Health (practice) GYKNEI091G1A	–	2	2	Basic Med. Pathoph. II., Dietetics	practical mark
Public Health (theory) GYKNEI091E1A	2	–	2		semi–final
Phytotherapy (theory) GYKFMG092E1A	2	–	2	Pharmacognosy II.	semi–final
Pharmaceutical management (practice) GYKEGY093G1A	–	1	1	Pharmacoeconomics	practical mark
Pharmaceutical management (theory) GYKEGY093E1A	1	–	1		semi–final
Industrial Pharmaceutical Technology II. GYGYIIGTE2A	3	0	2	Pharm. Technology III., Industrial Pharm. Techn. I.	semi–final
Diploma Work I. GYKSZD132G1A	–	2	–	Passing all final and semi–final of the 7th semester	signature
Physical Education VIII. GYKTSI116G8A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi–final or practical mark
Total:	15	18	27+2		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
9. SEMESTER					
Compulsory Practice Before the Board Exam I. GYKANG133G1A	–	40	8	Passing all finals of the 8th semester	practical mark
Drug Therapy (theory+practice) GYKGYH095E1A	2	3	5	Pharmac. and Tox. III., Pharmac. Techn. IV., Phytotherapy	semi-final
Pharmaceutical Care (theory+practice) GYKEGY096E1A	2	3	4	Pharmac. and Tox. III., Pharmac. Techn. IV.	semi-final
Clinical Pharmacokinetics and Biopharmacy (theory+practice) GYKGYI097E1A	2	3	4	Pharmac. and Tox. III., Pharmac. Techn. IV.	semi-final
Pharmaceutical Communication and Integrated Consulting (theory+practice) GYKMAG098G1A	1	2	2	Pharmac. and Tox. III., Pharmacy Administration I.	practical mark
Pharmacy Administration (theory) II. GYKEGY090E2A	2	–	2	Pharmacy Administration I., Public Health, Pharmac. Techn. IV.	final*
Pharmaceutical Informatics (theory+practice) GYKDEI099G1A	1	1	1	Pharmac. Techn. IV., Pharmacy Administration I.	practical mark
Clinical Pharmaceutics (theory+practice) GYKEGY100E1A	1	1	1	Pharmac. and Tox. III., Pharmac. Techn. IV.	semi-final
Pharmaceutical Ethics and Sociology (theory+practice) GYKMAG101E1A	1	1	1	Pharmac. and Tox. III., History of Pharm. and Prop.	semi-final
Diploma Work II. GYKSZD132G2A	–	5	–	Diploma Work I.	signature
Physical Education IX. GYKTSI116G9A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Pharmaceutical industrial and regulatory affairs knowledge (teaching block)	28	28	4		practical mark
Drug Licensing (theory+practice) GYKGYI102G1A	12	12	1	Pharmacy Administration I., Pharmac. Techn. IV.	practical mark
Pharmacovigilance and pharmacoepidemiology (theory+practice) GYKGYI103G1A	4	4	1	Pharmac. and Tox. III.	practical mark
Quality Assurance (theory+practice) GYKGYI104G1A	4	4	1	Pharmac. Techn. IV., Pharmacy Administration I.	practical mark
Druginnovation and clinicalstudies (theory+practice) GYKGYI105G1A	8	8	1	Pharmac. and Tox. III., Pharmac. Techn. IV.	practical mark
Total:	12 /week 28/sem.	20/week 40/ week 28/sem.	24+8		

*Counts to the qualification of the diploma

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
10. SEMESTER					
Compulsory Practice Before the Board Exam II. GYKANG133G2A	–	40	16	Compulsory Practice, Before the Board Exam I.	practical mark
Diploma work/Thesis defense	1/sem.	–	10	Diploma Work II.	final*
Principles of Professional Ethics II. GYKANG071E2A	–	–	–		signature
Total:	1/sem.	40/week	26		

*Counts to the qualification of the diploma

Obligatory elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Hungarian Pharmaceutical Terminology (practice) IV. GYKLEK155G4A	–	2	3	Hungarian Pharmaceutical Terminology (practice) III.	final*
Industrial Pharmaceutical Technology I. GYGYIIGTE1A	3	0	2	Pharm. Technology II., Pharm. Chem. and Analysis I.	semi-final
Industrial Pharmaceutical Technology II. GYGYIIGTE2A	3	0	2	Industrial Pharm. Tech. I., Pharm. Technology II.	semi-final
Compulsory Practice Before the Board Exam I. GYKANG133G1A	–	40	8	Passing all finals of the 8th semester	practical mark
Compulsory Practice Before the Board Exam II. GYKANG133G2A	–	40	16	Compulsory Practice Before the Board Exam I.	practical mark
Diploma work/Thesis defense	1/sem.	–	10	Diploma Work II.	practical mark
Total:			41		

Elective subjects in the recommended curriculum

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Summer Practice I. GYSSZG234G1A (1 week) GYSSZG234G2A (2 weeks) GYSSZG234G3A (3 weeks) GYSSZG234G4A (4 weeks)	--	40	1/2/3/4	Organic Chemistry II., Analytical Chemistry II.	practical mark
Summer Practice II. GYSSZG239G1A (1 week) GYSSZG239G2A (2 weeks) GYSSZG239G3A (3 weeks) GYSSZG239G4A (4 weeks)	--	40	1/2/3/4	Ph. Chem. and Analysis I., Pharm. Technology II.	practical mark
Total:			2-8		

FACULTY OF PHARMACEUTICAL SCIENCES

**Curriculum of the credit-based training for first year students
in the 2021/2022 academic year**



Pharmaceutical Sciences
1st year

1. SEMESTER

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
General and Inorganic Chemistry (practice) I. GYKASK106G1A	–	4	4		practical mark
General and Inorganic Chemistry (theory) I. GYKASK106E1A	3	–	3		semi-final
Informatics (practice) GYKDEI107G1A	–	2	2		practical mark
Biophysics (practice) I. GYKFIZ108G1A	–	2.5	2		practical mark
Biophysics (theory) I. GYKFIZ108E1A	1.5	–	2		semi-final
Biology (practice) I. GYKGEN109G1A	–	2	2		practical mark
Biology (theory) I. GYKGEN109E1A	2	–	2		semi-final
First Aid (practice) GYKTRA110G1A	–	1	1		practical mark
Pharmaceutical Terminology (practice) GYKLEK154G1A	–	2	2		practical mark
Mathematics for Pharmacists (practice) GYKEGY112G1A	–	2	2		practical mark
Mathematics for Pharmacists (theory) GYKEGY112E1A	2	–	2		semi-final
Introduction to Pharmaceutical Studies (methodology, law) (theory) GYKEGY113E1A	1	–	1		semi-final
History of Pharmaceutics and Propedeutics (theory) GYKFMG153E1A	2	–	2		semi-final
Principles of Professional Ethics I. GYKGTO071E1A	–	–	–		signature
Physical Education I. GYKTSI116G1A	–	1	–		signature
Hungarian Pharmaceutical Terminology (practice) I. GYKLEK155G1A	–	2	0		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	11.5	18.5	27		

General and Inorganic Chemistry (theory) I., General and Inorganic Chemistry (practice) I.

Complete name of the course: Általános és szervetlen kémia (elmélet) I., Általános és szervetlen kémia (gyakorlat) I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Ált. és szerv. kémia (elm.) I., Ált. és szerv. kémia (gyak.) I.

English name of the course: General and Inorganic Chemistry (theory) I., General and Inorganic Chemistry (practice) I.

Neptun-Code:	GYKASK106E1A, GYKASK106G1A
Type of registration:	obligatory
Institute:	Institute of Chemistry, Department of Analytical Chemistry, ELTE
Name of the tutor/lecturer:	<p>Szabolcs Béni associate professor Phone: +36208250489 E-Mail: beni.szabolcs@pharma.semmelweis-univ.hu</p> <p>István Szalai full professor Phone: 3722500 / 1902 E-Mail: szalai.istvan@chem.elte.hu</p> <p>Norbert Szoboszlai associate professor Phone: 3722500 / 6430 E-Mail: szobosz@chem.elte.hu</p>
Further tutors:	<p>Norbert Szoboszlai (head of laboratory) assistant professor Gitta Vácziné Schlosser assistant professor Anikó Zsigrainé Vasanits assistant professor Edina Kiss assistant professor István Molnár research assistant Tamás Pál teaching assistant PhD students</p>
Number of classes /week:	3+4
Credit points:	3+4

Course principles:

To provide a basic knowledge in chemistry from the pharmaceutical industry/pharmacy point of view and to establish a solid background for advanced (bio)chemistry courses.

Brief course summary:

Elementary particles: electron, proton, neutron. The Bohr model of the atom. Properties of the electron. Heisenberg's uncertainty principle. Schrödinger's equation and the quantum numbers. Pauli's exclusion principle and Hund's rule. Periodic table and periodic properties. Ionic bond and the types of ions. Covalent bond and its representation in Lewis structures. Hybridization of orbitals. The valence bond theory. Molecular geometry, the VSEPR theory. The formation of molecular orbitals. Bond polarity and the polarity of the molecules. Single and multiple bonds. Electronegativity and its determination. The ionic character of covalent bonds. Covalent radius, bonding energy, network covalent bonds. Metallic bonding. Weak bonding forces. Dispersion, dipole forces and hydrogen bonding. Multicenter bonds. Chemical equilibria, the law of mass action. K_p and K_c . The Le Chatelier principle. The temperature and pressure dependence of the equilibrium constant. Acid/base equilibria. Conjugated acid–base pairs and their strengths. The acid/base equilibria of water. The pH and its calculation. Strength of acids and bases. Hydrolysis. Buffer systems. Complex formation equilibria. Types of ligands. Mass balance equations, calculation of complex equilibria. Heterogeneous equilibria, the solubility product constant, solubility. Chemical kinetics. Reaction order and molecularity. First order reactions. Age determinations based upon radioactive decompositions. Second order, pseudo–first order and zero order reactions. Reaction mechanisms. The temperature dependence of the reaction rate, collision theory. Catalysis. Autocatalytic reactions. Enzyme catalyzed, induced and oscillatory reactions. Thermochemistry. Hess's law. Internal energy and enthalpy changes of reactions. Entropy. Spontaneity of chemical reactions, the free energy. Coupled reactions and their spontaneity. Photochemistry and radiation chemistry. States of matter. Properties and kinetic theory of gases. Properties of liquids. The surface tension. Freezing, boiling. The phase diagram of water. Crystal structures, unit cell. The rate of crystallization. Sublimation. The mechanism of dissolution. Types of concentrations. Rules of dilute solutions. Determination of MM by colligative properties.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	3	4	–	–	42+56	autumn	–

Semester program

I. Lecture topics/week

1. week: States of matter, phase changes and the most common purification methods. Purification of water.
2. week: Chemical equilibria and the factors affecting the chemical equilibrium. Law of mass action. Acid–base theories.
3. week: Acid–base equilibria and the pH. pH calculations.
4. week: Elementary particles. Basic interaction. Standard model. Electron, proton neutron. Structure of atoms. Bohr model. Schrödinger equation. Quantum numbers. Structure of atoms.
5. week: Redox reactions. Spontaneous redox processes.
6. week: Galvanic cell and electrolysis.
7. week: Colligative properties. Complex formation, characterization of complexes.
8. week: Heterogeneous equilibria.
9. week: Periodic table and the periodic properties of the elements. Ionic and covalent bonds. Lewis structure. Octet rule. Valence shell electron pair repulsion theory. Geometry of molecules. The dipole moment.
10. week: Weak bonding forces. Dispersion, dipole forces and hydrogen bonding
11. week: Valence bond theory.
12. week: Molecular orbital theory
13. week: Thermochemistry and thermodynamics.
14. week: Reaction kinetics

II. Practice topics/week

- | | | |
|----------|----------|--|
| 1st week | 9 Sept. | Grading requirements. General instructions, safety in laboratory.
Opening inventory. Nomenclature of inorganic compounds.
Observation of osmosis (p. 159). |
| 2nd week | 16 Sept. | Short test I.
Problem solving: concentrations, mixing and diluting of solutions.
Recrystallization of alum (p. 63). Sublimation of iodine (p. 71). |
| 3rd week | 23 Sept. | Short test II.
Problem solving: basics of stoichiometry, acid–base reactions.
Purification of hydrochloric acid by distillation (p. 69). |
| 4th week | 30 Sept. | Short test III
Problem solving: stoichiometry, gas laws.
Water purification using ion–exchange resins (p.72). |
| 5th week | 7 Oct. | Short Test IV.
Hydrolysis, Observation of hydrolysis of some salts (p. 96).
Preparation of copper(II) sulfate (p. 93). |
| 6th week | 14 Oct. | Short test V. Balancing redox equations, standard potential.
Experimental observation of redox reactions, direction of spontaneous change.
Observation of some oxidation–reduction reactions (p. 119). |

7th week	21. Oct.	Short test VI. Determination of mass of a magnesium sample (p. 144).
8th week	28 Oct.	Test Paper I. Preparation of metallic substances: copper and manganese (p.123–124).
9th week	4 Nov	Short test VII. Problem solving: pH calculations, Part I. Preparation of copper(I) oxide (p. 128). "Chemical volcano": thermal decomposition of ammonium dichromate.
10th week	11 Nov.	Short test VIII. Problem solving: pH calculations, Part II. Buffer solutions and buffer action (p. 145).
11th week	18 Nov.	Short test IX. Thermal decomposition, Observation of thermal decomposition of inorganic substances (p. 102) Theory: Preparation of precipitated sulfur.
12th week	25 Nov.	Short test X. Preparation of a double salt, Mohr's salt (p. 128)
13th week	2 Dec.	Preparation of a coordination compound, [tetraammin copper(II)] sulfate (p. 139).
Final test	3 Dec	
14th week	9 Dec	Theory: Reaction kinetics: Landolt reaction. Observation of reaction rates
Final test retake.		Short test retake and make-up labs. Closing inventory.

Course requirements

Order of consultations: upon request prior major tests

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

Students should pass the major test with an average of 2.0.

Knowledge testing during the semester:

Two major test (see schedule for the dates) with retake possibilities.

Requirements of the signature at the end of the semester: Successful completion of the laboratory requirements

Individual activity of the student during the semester (protocol, etc.) lab reports must be presented

Performance control in the examination period (final, semi-final): final exam

Performance control in the examination period (written, oral, written and oral): oral exam

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):course materials provided in the Moodle system

Lásztity–Noszál: Practical Inorganic and General Chemistry. Bp.

Lásztity–Gyimesi: Qualitative Inorganic Analysis. Bp.

Kőrös: General Chemistry. Bp.

Kőrös: Inorganic Chemistry.

Masterton–Hurley: Chemistry. Principles and Reactions. Saunders College Publishing, 1998.

List of course materials: available in the moodle

Scientific, course related researches, publications/essays: –

Informatics (practice)

Complete name of the course: Informatika (gyakorlat)
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Informatics
English name of the course: Informatics (practice)

Neptun-Code: GYKDEI107G1A
Type of registration: obligatory
Institute: Semmelweis University, Faculty of Public Services, Institute of Digital Health Sciences

Name of the tutor/lecturer: **Dr. Szócska Miklós** PhD, associate professor
E-Mail: titkarsag.dei@semmelweis-univ.hu

Further tutors: **Sándor Zoltán** assistant lecturer
Tamus Ádám PhD, associate professor
Tóth Tamás assistant lecturer

Number of classes /week: Practice: 2
Credit points: 2

Course principles:
The goal of the course is to introduce the students to the applications of health information technology, especially the sources, organiza- tion, analysis and presentation of health information and knowledge. To improve the basic computer skills of students, including the use of office software tools, digital data storage and analysis methods. Acquisition and practical application of IT tools and methods required for later studies (e.g. preparation of a dissertation)

Brief course summary:
– Knowledge of basic MS Office tools
– Sources of health information and knowledge, online scientific databases and the basics of evidence–based medicine

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	–	2	–	–	28	autumn	–

Semester program

Practice topics/week:

1. MS Excel – basics of data storage
2. MS Excel – processing of data
3. MS Excel – data representation, diagrams
4. MS Excel – advanced level exercises
5. Collection and processing of medical data
6. Practice, preparation for the test
7. **1. test** (Excel exercises, computer test)
8. Theoretical basics of databases
9. Creation of a simple database with Ms Access
10. Data extraction from databases, performing queries
11. Online health information sources
12. Data protection, data security
13. The future of health informatics
14. **2. test** (Access exercises and information searching, computer-based test)

Order of consultations: by agreement

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

Attendance of at least 75% of the practices, at least 50% result of both tests

Knowledge testing during the semester:

- Mid-term test on week 7 (topic: Excel)
- Mid-term test on week 14 (topics: Access, online information sources)
- Replacement test: 2 times in the first week of the exam period

Requirements of the signature at the end of the semester:

Attendance of at least 75% of the practices, at least 50% result of both tests

Individual activity of the student during the semester (protocol, etc.): none

Performance control in the examination period (final, semi-final): Practical grade

Performance control in the examination period (written, oral, written and oral): written (computer test)

Prescribed external practice: none

Recommended literature:

Meskó Bertalan: The Guide to the Future of Medicine, Webicina 2014 ISBN 9789631200072

Microsoft Office Help and Training Center: <https://support.office.com/>

List of course materials:

The educational materials are available at <http://dei-cloud.semmelweis.hu>. Username and password are announced at the first practice.

Scientific, course related researches, publications/essays: –

Biophysics (theory) I., Biophysics (practice) I.

Complete name of the course: Biofizika I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Biophysics I.

English name of the course: Biophysics (theory) I., Biophysics (practice) I.

Neptun-Code: GYKFIZ108E1A, GYKFIZ108G1A
 Type of registration: obligatory
 Institute: Department of Biophysics and Radiation Biology

Name of the tutor/lecturer: **Dr. Levente Herényi**
 Phone: +36 1 4591-500/60222
 E-Mail: herenyi.levente@med.semmelweis-univ.hu

Further tutors: **Dr. Gergely Agócs** senior lecturer, PhD
Dr. Gabriella Csík associate professor, PhD
Dr. Rita Galántai teacher, PhD
Dr. Nikoletta Kósa assistant lecturer
Dr. Ádám Orosz assistant lecturer PhD
Dr. Gusztáv Schay senior lecturer, PhD
Dr. László Smeller professor DSc
Dr. István Voszka associate professor, PhD
Dr. Ádám Zolcsák PhD student

Number of classes /week: 1.5 hours lecture
 2.5 hours practice
 Credit points: 2 + 2

Course principles:

Biophysics plays a basic role in the education of pharmaceutical students. There are dual role of the subject: on one side it gives general knowledge of natural sciences, on the other side it gives theoretical and practical basis of application of physical principles and methods in pharmaceutical sciences.

Brief course summary:

In connection to the previous it helps the development of structured way of thinking. Through this one can find connection to the basic subjects and to the applied pharmaceutical subjects.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	1.5	–	–	–	21	autumn	in the exam period
1	–	2.5	–	–	35	autumn	in the exam period

Semester program

I. Lecture topics/week

1. week: Introduction.
2. week: Geometrical optics.
3. week: Fermat principle; Applications of geometrical optics.
4. week: Wave optics; Applications of wave optics;
5. week: Particle properties of electromagnetic radiations.
Photon concept.
6. week: Radiations; Law of attenuation of intensity of radiation.
7. week: Structure of matter; atom, electron.
8. week: Atomic and molecular interactions.
9. week: Many atom systems; Boltzmann distribution; Gases; Solids.
10. week: Light emission, scattering, absorption; Thermal radiation.
11. week: Luminescence; Light sources; Lasers.
12. week: Liquid crystals; biological and artificial membranes.
13. week: Structural organization of living systems: water, nucleic acids, proteins.
14. week: Radioactive isotopes and radiation.

II. Practice topics/week

1. week: Introduction. Laboratory safety rules. Graphical representation of data.
2. week: Optical lenses, light microscope;
3. week: Concentration determination with refractometer.
4. week: Optics of the eye: image formation in the eye.
5. week: Special light microscopes.
6. week: Hooke's law, resonance, AFM principle.
7. week: Light emission. Medical and laboratory applications.
8. week: Identification of matter and concentration measurement with polarimeter.
9. week: Light absorption. Medical and laboratory applications.
10. week: Fundamentals of nuclear measuring technique.
11. week: Measurement of skin impedance. Applications of it.
12. week: Fields of application of ultrasound.
13. week: Absorption of gamma radiation. Gamma radiation protection.
14. week: Repetition.

Order of consultations: Weekly in the exam period.

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.)

Participation on at least 75 % of the practices. Lab. report must be done about the measurements. The missed measurements can be made up within the 4 weeks cycle.

Knowledge testing during the semester: Midterm tests on the 6th and 11th weeks. Retake is possible on the 13th week.

Requirements of the signature at the end of the semester:

1. At least 50 points in the test in Physical bases of biophysics.
2. Participation on at least 75 % of the practices, (in case of more than 3 absences the signature for the semester is denied.)
3. Acceptance of lab. reports.
4. The practice grade should be at least 2.

Individual activity of the student during the semester (protocol, etc.): Lab. report should be made about all the measurements.

Performance control in the examination period (final, semi-final): Semifinal exam

Performance control in the examination period (written, oral, written and oral): Written and oral

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):

Damjanovich–Fidy–Szöllősi (eds): Medical Biophysics (2009)

Medical biophysics practices (Semmelweis Publisher, 2015)

Biology (theory) I., Biology (practice) I.

Complete name of the course: Biológia I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Biol I.

English name of the course: Biology (theory) I., Biology (practice) I.

Neptun-Code: GYKGEN109E1A and GYKGEN109G1A

Institute: Department of Genetics, Cell- and Immunobiology Semmelweis University, Faculty of Medicine

Name of the tutor/lecturer: **Prof. Dr. Edit Buzás** DSc

coordinator: **Dr. Orsolya Láng** PhD
Phone: 2102940/56251
E-Mail: lang.orsolya@med.semmelweis-univ.hu

Further tutors: **Dr. Sára Tóth** Associate Professor
Dr. Valéria László Associate Professor
Dr. András Kristóf Fülöp Associate Professor
Dr. Hargita Hegyesi Associate Professor
Dr. László Kóhidai Associate Professor
Dr. Viola Tamási Associate Professor
Dr. Eszter Lajkó Research Fellow
Dr. Marianna Csilla Holub Associate Professor
Dr. Zoltán Wiener Associate Professor
Dr. Tamás Visnovitz Assistant Professor

Number of lectures /week: 2 (lecture) + 2 (practice)

Credit points: 2+2

Course principles:

Basics of classical and molecular cell biology and techniques applied in the field of modern cell biology are discussed. The subject provides theoretical background for Physiology, Biochemistry and Anatomy.

Brief course summary:

The subject Biology I. discusses the close relation of the function and structure of the eukaryotic cells. It discusses the most significant phenomena of cell compartmentalization, function, aging and cell death. In practices the following topics are studied: light- and electron-microscopy and histotechniques, relevant techniques of cell biology applied to detect basic cell physiological activities.

First Aid (practice)

Complete name of the course: Elsősegélynyújtás

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: First Aid (practice)

English name of the course: First Aid

Neptun-Code: GYKTRA110G1A

Type of registration: obligatory

Institute: Department of Traumatology

Name of the tutor/lecturer: **Prof. Dr. Hangody László** Professor

Head of Department

Phone: +36 1 467 3851

E-Mail: trauma_office@med.semmelweis-univ.hu

Number of classes /week: 1 practice/week

Credit points: 1

Course principles:

The aim of the course is to acquire the theoretical knowledge of first aid and the practical aspects of resuscitation.

Brief course summary:

First aid is the initial care for an illness or injury. It generally consists of a series of simple and, in some cases, potentially life-saving techniques that an individual can be trained to perform with minimal equipment. All students who graduate from Semmelweis University, including pharmacists should have a knowledge of how to provide basic first aid to an injured or ill person.

This curriculum is delivered to the students through e-learning material and practical training in resuscitation.

Course data

Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	–	1	–	–	14	autumn	–

Semester program

I. Lecture topics/week:

E-learning material: (Semmelweis University's E-learning portal – moodle)

1. Program and goal of first aid
2. Cardio–pulmonary resuscitation (CPR)
3. Bleeding and its control, bandaging methods
4. Mechanical injuries – open and closed
5. Thermal injuries
6. Sport injuries
7. Internal bleeding
8. Respiratory diseases
9. First aid in internal medicine
10. Shock
11. Unconscious patient
12. Multiple casualty accident: organization and transport

II. Practice topics/week

Each student must complete one CPR exercise per semester. Only after completing the 12 topics and completing the test series, the students will have the opportunity to apply for one of the CPR exercises, and they can register for each exercise in the Moodle system. Order of consultations:

One practice at Uzsoki Hospital to learn how to perform CPR on CPR manikins. Students have the opportunity for consultation of the e-learning materials during the practices.

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.) :

Completion of CPR practice is obligatory, without that (only by listening to the electronic curriculum and completing the short tests afterwards) the student will not receive a signature.

In case the student fails to attend CPR practice due to illness, a medical certificate has to be presented and the student has to attend another CPR practice on a date announced by the department.

Knowledge testing during the semester:

The students are required to listen to the e-learning material and complete the tests after each lecture. In case of failing to do so, the student cannot take part in the CPR practice.

Requirements of the signature at the end of the semester:

Studying the entire e-learning material at Semmelweis University's e-learning portal (moodle), and completing the short tests related to each lecture afterwards. At least 90% outcome of each test is required. In addition, during the semester, one CPR practice is obligatory for all students on one of the CPR practices organized by the Department of Traumatology.

Individual activity of the student during the semester (protocol, etc.):

Studying the entire e-learning material at Semmelweis University's e-learning portal (moodle), and completing the short tests related to each lecture afterwards.

Performance control in the examination period (final, semi-final): –

Performance control in the examination period (written, oral, written and oral): –

Prescribed external practice: –

List of course materials:

E-learning material and practical training in resuscitation

Semmelweis University's E-learning portal (moodle)

Scientific, course related researches, publications/essays: –

Pharmaceutical Terminology (practice)

Complete name of the course: Gyógyszerészi terminológia (gyakorlat)

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Pharmaceutical Terminology

English name of the course: Pharmaceutical Terminology (practice)

Neptun-Code: GYKLEK154G1A

Type of registration: obligatory

Institute: Division of Foreign Languages and Communication, Faculty of Health Sciences

Name of the tutor/lecturer: **Alexandra Bakó** language teacher

Phone: (1) 48–64962

E-Mail: bako.alexandra@se-etk.hu

Further tutors: **Lili Szöllősi** language teacher

Number of classes /week: 2

Credit points: 2

Course principles:

The course is to prepare students for understanding Latin and Greek medical and pharmaceutical terminology, including the language of anatomy, diagnostics, pathophysiology, and prescriptions.

Brief course summary:

Students get familiarised with the basics of Latin grammar, such as forming plural forms of Latin nouns, adjective agreement, the use of numbers, and prepositional phrases (accusative and ablative cases). Furthermore, they develop an extensive Latin and Greek vocabulary that enables them to understand and formulate medical terms in the fields of medicine and pharmaceuticals.

Mathematics for Pharmacists

Complete name of the course: Matematika gyógyszerészeknek

Name of the Program: Pharmacy Basic Education

Abbreviated name of the course: Math

English name of the course: Mathematics for Pharmacists

Neptun-Code: GYKEGY112E1A, GYKEGY112G1A
Type of registration: obligatory
Institute: University Pharmacy Department Of Pharmacy Administration

Name of the tutor/lecturer: **László Tóthfalusi** Ph.D.
Phone: (+36–1) 476–3600
E-Mail: totlasz@net.sote.hu

Further tutors: **Dr. Andrea Meskó** Ph.D.
Phone: +36–1–476–3600/ 53053
E-Mail: mesko.attilane@pharma.semmelweis-univ.hu
Lajos Gergő Ph.D.
Gillemotné Dr. Orbán Katalin Ph.D.

Number of classes /week: 2 (Lecture), 2 (Practice)
Credit points: 2+2

Course principles:

Acquisition of basic pharmacological numeracy skills, review of mathematical apparatus used in other subjects, introduction of computer bases of modeling techniques useful in scientific research

Brief course summary:

The course aims to provide a comprehensive overview of the mathematical tools used in the pharmaceutical sciences. From a mathematical point of view, it covers the following subjects: Elementary and linear algebra, mathematical analysis and numerical methods. The aim of the exercises is to develop the numerical skills used in basic pharmaceutical practice, to get acquainted with the computer possibilities used for mathematical calculations.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	2	–	–	–	28	Autumn	–
1	–	2	–	–	28	Autumn	–

Semester program

I. Lecture topics/week

Topics of theoretical lessons (broken down by week):

Week 1:	Mathematics in pharmacy: calculation, measurement, modeling
Week 2:	Functions
Week 3:	Series, Lines
Week 4:	Continuity, Limit
Week 5:	Differentiation
Week 6:	Applications of differentiation
Week 7:	Integration
8. week:	Differential equations
Week 9:	Using a computer to solve numerical problems 1
Week 10:	Matrices, linear systems of equations
Week 11:	Bivariate functions, concept of partial derivation
Week 12:	Determinant, eigenvalue, linear mappings
Week 13:	Differential systems of equations
Week 14:	Using a computer to solve numerical problems 2

II. Practice topics/week

Topics of practical classes (broken down by week):

Week 1:	Pharmacological calculations 1. Algebraic problems
Week 2:	Pharmacist Calculations 2. Log and Exp Functions, Summary of Measurement Data
Week 3:	Pharmacological calculations 3. Representation and transformation of functions
Week 4:	Application of sequences
Week 5:	Differentiation examples
Week 6:	Quiz 1
Week 7:	Integration examples 1
Week 8:	Integration examples 2
Week 9:	Differential equations 1
Week 10:	Differential equations 2
Week 11:	Solving linear equations
Week 12:	Quiz 2
Week 13:	Solving linear equations 2
Week 14:	Quiz (retake)

Course requirements

Order of consultations: Consultation is possible during the seminars

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

Participation in at least 75% of the practice sessions is mandatory. The retake quiz on the last week of the semester is needed if one of the quiz opportunities are missed or if the quiz result is below the acceptable minimum.

Knowledge testing during the semester: Two quizzes

Requirements of the signature at the end of the semester: Two accepted quiz results

Individual activity of the student during the semester (protocol, etc.): Solving practice exercises

Performance control in the examination period (final, semi-final): Semi-final

Performance control in the examination period (written, oral, written and oral): Written

Prescribed external practice: None

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):

Mateking: <https://www.mathxplain.com/>

<https://www.khanacademy.org/math/ap-calculus-abath-for-science>

<http://www.cse.salford.ac.uk/physics/gsmcdonald/pp/PPLATOResources/maths%20for%20science/mathsforscience.pdf>

Calculus volume 1 from <https://openstax.org/subjects/math>

List of course materials:

Handouts on the course website (Moodle)

Scientific, course related researches, publications/essays: –

Introduction to Pharmaceutical Studies

Complete name of the course: Bevezetés a gyógyszerészeti tanulmányokba

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course:

English name of the course: Introduction to pharmaceutical studies

Neptun-Code: GYKEGY113E1A
Type of registration: obligatory
Institute: University Pharmacy Department of Pharmacy Administration
Name of the tutor/lecturer: **Dr. Romána Zelné** professor, Ph.D., D.Sc.
Phone: 2170–927
E-mail: zelko.romana@pharma.semmelweis-univ.hu

Further tutors: **Dr. Palcsó Barnabás** PharmD

Number of classes /week: 1

Credit points: 1

Course principles:

Introducing the purpose, content elements, structure and system of requirements of pharmacist training, which provides orientation for further university studies.

Brief course summary:

The aim of the course is to get acquainted with the content and structural elements of the university training program, the starting point of which is the knowledge of the training and output requirements of a pharmacist, based on the relevant Hungarian EU–compliant regulations. This will be followed by a presentation of the organizational structure and training structure of Semmelweis University and the Faculty of Pharmacy. Particular emphasis is placed on the use of the Unified Higher Education Study System (Neptune) and the concepts of university education, the practical significance and application of university regulations that primarily affect students, the rights and obligations of university citizens, and the system of student requirements.

The course describes the way of using student services, the possibilities of catching up, the operation of the talent management and mentoring program, the possibility of participating in research, scientific student work and demonstration work. The different forms of education, the tools that help students prepare, and the ways to use them are also presented.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	1	–	–	–	14	autumn	–

Semester program

I. Lecture topics/week

1. The aim and characteristics of pharmacist training, disciplines, structure of pharmacist training
2. Training and output requirements – Purpose of pharmacist training, general and professional competencies (Knowledge, Ability, Attitude, Autonomy and Responsibility), EU-compliant degree in pharmacy
3. Characteristics of the master's program – Structure of the training – Undergraduate training (Basic subjects, Professional subjects, Internships – before summer and final exam), Postgraduate training (Residency training (3 disciplines), Doctoral training (Ph.D.), Compulsory further training –
4. "Pharmacy as a profession, lifelong learning "
5. Training places, structure of Semmelweis University, organizational units, Faculty of Pharmacy and its organizational units, standing committees of the Faculty, university citizens, teaching and research positions at the university
6. Unified Higher Education Study System (Neptun) and its management: entry into the system, enrolment (registration) process, subject enrolment process (subject application, course application), exam application process, viewing of results, messaging. Study administration
7. Important training-related concepts: active semester, passive semester, pre-study policy, waiver, recognition of previous studies, credit, credit transfer, subject requirements, examination period, study average, credit index, adjusted credit index, scholarship calculation, public scholarship
8. Rights and obligations of university citizens-SZMSz-Student Requirements System
9. Writing student applications, professional CV (structured and textual), digital communication at the university, student application opportunities (announced by university, professional organizations)
10. Student organizations (IPSF, HUPSA); Student mobility (scholarships – Erasmus, HUPSA SEP, Campus Mundi, institutional coordination
11. Learning and accountability forms, catch-up programs, talent management-mentoring program
12. The order and criteria of the students' opinions of the teaching work
13. Involvement in the research work of the institute – Scientific students, student conference, demonstration work, rector's application
14. E-learning (Moodle-Zoom), use of library services and databases, physical education and sports facilities, dormitory care, vocational dormitory system

II. Practice topics/week: –

Course requirements

Order of consultations: –

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):
successful course attendance

Knowledge testing during the semester:

a written structural professional CV

Requirements of the signature at the end of the semester:

Individual activity of the student during the semester (protocol, etc.)

Performance control in the examination period (final, semi-final): semifinal

Performance control in the examination period (written, oral, written and oral): written

Prescribed external practice: –

List of teaching materials (List of textbooks, hand-outs, scripts, etc.): lecture notes

List of course materials: lecture notes

Scientific, course related researches, publications/essays: –

History of Pharmaceutics and Propedeutics (theory)

Complete name of the course: Gyógyszerészettörténet és propedeutika

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: History and Propedeutics

English name of the course: History of Pharmaceutics and Propedeutics (theory)

Neptun-Code: GYKFMG153E1A

Type of registration: obligatory

Institute: Department of Pharmacognosy

Name of the tutor/lecturer: **Dr. Eszter Riethmüller** research fellow, Ph.D.

Phone: +361-459-1500/55404

E-Mail: riethmuller.eszter@pharma.semmelweis-univ.hu

Number of classes /week: 2

Credit points: 2

Course principles:

Understanding how the history of pharmaceutics is bond up with the development of many different sciences. Genaral knowledge of drugs, international organizations, pharmacy practice and education.

Brief course summary:

The course aims to show how the history of pharmaceutics is bond up with the development of many different sciences. It gives and un-derstanding of the way in which the notion of pharmaceutical science changes as its methods evolve and scientific knowledge progresses. Therefore, the subject can give students a new relation to the scientific knowledge they possess and that they will gain in the following years of their studies.

The purpose of Propedeutics is to impart general knowledge of drugs including classification, naming, doses, utilization, pharmacopoeias, preparation of drugs, organization of drug supply. It also puts special emphasis on current global health issues and the role of the pharma-cist and the international organizations in overcoming them.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	2	–	–	–	28	autumn	as demanded

Semester program

I. Lecture topics/week

1. week: Introduction. The place of the subject in the curriculum. The multidisciplinary nature of pharmacy.
2. week: The role and importance of history of science in understanding the notion and development of science. The structure of scientific revolutions. Distinction between science and pseudoscience.
3. week: The endless evolution of medical science and medical technology: from prehistoric times to present day and beyond I.
4. week: The endless evolution of medical science and medical technology: from prehistoric times to present day and beyond II.
5. week: The impact of the development of natural sciences on drug therapy: what has changed over time and what has not.
6. week: Drugs on the market today: classification based on the origin, pharmaceutical action, way of application, and formulation.
7. week: Drugs and doses. Introduction to pharmacokinetics.
8. week: How new medicines are born: evolution of drug discovery, drug discovery today.
9. week: Introduction to pharmaceutical quality assurance. The impact of technological development on the quality and safety of medicines.
10. week: Pharmacies in Hungary: premises, personnel, ordering of drug preparations, pharmaceutical literature.
11. week: Pharmacy practice around the world.
12. week: Global health issues I.:
The role of international organizations of healthcare: historical and current issues, future challenges.
13. week: Global health issues II.:
Prevention of drug abuse. Narcotic controls.
14. week: The changing role of the pharmacist in healthcare and its effect on pharmaceutical education

II. Practice topics/week –

Course requirements

Order of consultations: as demanded

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.): –

Knowledge testing during the semester: –

Requirements of the signature at the end of the semester: –

Individual activity of the student during the semester (protocol, etc.):

Not obligatory assay and/or presentation.

Performance control in the examination period (final, semi-final): Semi-final examination

Performance control in the examination period (written, oral, written and oral): Written and oral examination

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):

Hand-outs of lectures

David L. Cowen, William H. Helfand: Pharmacy, an illustrated history. Harry N. Abrams., Publishers, New York. (1998)

List of course materials: Lecture hall projection

Scientific, course related researches, publications/essays: –

Principles of Professional Ethics I.

Complete name of the course: Hivatásetikai alapok I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Principles of Prof. Ethics

English name of the course: Principles of Professional Ethics I.

Neptun-Code: GYKGTO071E1A

Type of registration: obligatory

Number of classes /week: –

Credit points: –

Newly enrolled students have to take an oath at the Opening Ceremony.

Physical Education I.

Complete name of the course: Physical Education I.
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: P. E. I.
English name of the course: Physical Education I.

Neptun Code: GYKTSI116G1A
Type of registration: obligatory
Institute: Semmelweis University's Centre for Physical Education and Sports

Name of the tutor/lecturer: **Várszegi, Kornélia** director
Phone: +36-1/264-1408
E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu

Further tutors: **Doharné Buczkó, Anikó** P.E. teacher
Kalmus, Dániel P.E. teacher
Lehel, Zsolt P.E. teacher
Sótonyiné Hrehuss, Nóra P.E. teacher
Várszegi, Kornélia P.E. teacher
Weisz, Miklós P.E. teacher

Number of classes /week: 1 class (practice)/week
Credit points: 0 credit

Course principles:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Brief course summary:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice – so that they can represent those in their later practice, through their own health-promoting behavior.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	–	1	–	–	14	autumn	–

Semester program

I. Lecture topics/week: –

II. Practice topics/week:

- 1st Week: General information
Health and Safety, Fire and Environmental protection. The mid-year adoption requirements, the construction of the classes and the presentation of the university recreational and sports opportunities for extra-curricular activities. Heart rate measurements, Ruffier test and evaluation of the results.
- 2nd Week: Athletic
Exercises to improve stamina. Preferably outdoors, on grass ground running, with the aim of developing good running and breathing techniques.
- 3rd Week: Flying disc
Introduction the basic of frisbee rules and practicing the basic technical elements in pairs and game situation.
- 4th Week: Tennis
Introducing the basis technical elements of tennis (forehand and backhand shot), improving hand–eye coordination.
- 5th Week: Agility ladder
Introducing different running, skipping techniques using agility ladder.
- 6th Week: Football
Introducing the basic technical elements of football. Single exercises and exercises in pairs to improve the ball skill development.
- 7th Week: Badminton
Introducing the basic technical and tactical elements of badminton. Introducing the basic rules and game.
- 8th Week: Circuit training
Bodyweight exercises and exercises with basic equipment to learn the correct functional movement pattern.
- 9th Week: Ruffier test and ball skill developing exercises
Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention.
- 10th Week: Meta
Introducing the game and the basic rules. Aim to improve the ball skill development, improve reaction time, speed and explosiveness.
- 11th Week: Obstacle course
To complete a built up obstacle course using differend creeping-climbing, hovering, pulling, skipping, throwing techniques for general skill development.
- 12th Week: Core traning
Postural correction exercises using the own bodyweight especially to strenghten the core muscles to prevent the health of the vertebrae.
- 13th Week: Skipping rope
Endurance and coordination developing exercises at different levels using skipping rope.
- 14th Week: Dumbbell exercises
Strengthening exercises with dumbbells.

Course requirements

Order of consultations: –

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

The number of active participations for physical education classes is 9, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Knowledge testing during the semester:

There is no mandatory control during the term.

Requirements of the signature at the end of the semester:

Active participation in practice classes 9 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

Individual activity of the student during the semester (protocol, etc.): –

Performance control in the examination period (final, semi-final): –

Performance control in the examination period (written, oral, written and oral): –

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.): –

List of course materials: –

Scientific, course related researches, publications/essays: –

Hungarian Pharmaceutical Terminology I.

Complete name of the course: Magyar gyógyszerészeti szaknyelv (gyakorlat) I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Hungarian Pharmaceutical Terminology I.

English name of the course: Hungarian Pharmaceutical Terminology (practice) I.

Neptun-Code: GYKLEK155G1A

Type of registration: obligatory

Institute: Division of Foreign Languages and Communication, Faculty of Health Sciences

Name of the tutor/lecturer: **Alexandra Bakó** language teacher

Phone: (1) 48-64962

E-Mail: bako.alexandra@se-etk.hu

Further tutors:

Borda Szandra language teacher

Nagyné Górász Judit language teacher

Kovács Ildikó language teacher

Nagy Borbála language teacher

Tick Vera language teacher

Tóth Zsuzsanna language teacher

Number of classes /week: 2

Credit points: 0

Course principles:

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language/' and in their academic studies.

Brief course summary:

The first semester is dedicated to learning basic general vocabulary and grammar. Students acquire basic structures and the vocabulary for everyday topics / e.g. shopping, food, housing etc./. The course places special emphasis on phrases essential for everyday communication, e.g. introductions, greetings, getting/giving information etc. and on phrases needed in basic communication at a pharmacy.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
1	0	0	2	0	28	autumn	0

Semester program

I. Lecture topics/week: –

II. Practice topics/week:

Week 1	The Hungarian alphabet
Week 2	Greetings
Week 3	Basic pharmacy vocabulary
Week 4	Number
Week 5	Descriptions (nouns and adjectives)
Week 6	Ordering foods and drinks (accusative case)
Week 7	Asking for medications (accusative case)
Week 8–9	Locatives
Week 10–11	Activities – verbs
Week 12	Explaining what can be found in a pharmacy
Week 13	Explaining what people do in a pharmacy
Week 14	Final test (written and oral)

Course requirements

Order of consultations: Individual consultations by email or in person on meeting formerly agreed upon with the teacher via email.

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

An attendance of 75% minimum is required to get the signature.

The student must have a minimum average of 2.00 based on the tests in class to pass the subject.

Knowledge testing during the semester:

Beside the final test the teacher may evaluate the students' performance with the help of short tests.

Requirements of the signature at the end of the semester:

An attendance of 75% minimum and taking the final test.

Individual activity of the student during the semester (protocol, etc.):

Homework in the forms of language practice tasks.

Performance control in the examination period (final, semi-final): –

Performance control in the examination period (written, oral, written and oral): –

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):

Gyöngyösi Livia – Hetesy Bálint. Hungarian language: Jó reggelt! Semmelweis Egyetem Egészségtudományi Kar, 2010.

List of course materials: –

Scientific, course related researches, publications/essays: –

2. SEMESTER

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
General and Inorganic Chemistry (theory) II. GYKASK106E2A	3	–	3	Gen. and Inorg. Chemistry I.	final*
Analytical Chemistry (theory+practice) I. GYKASK117G1A	2	4	6	Gen. and Inorg. Chemistry I., Introd. to Pharm. Studies, Mathematics for Pharm.	practical mark
Anatomy (practice) GYKANT118G1A	–	2	–	Biology I., Pharm. Terminology, First Aid	signature
Anatomy (theory) GYKANT118E1A	2	–	2		semi-final
Biophysics (practice) II. GYKFIZ108G2A	–	2.5	2	Biophysics I.	practical mark
Biophysics (theory) II. GYKFIZ108E2A	1.5	–	2		final*
Biology (practice) II. GYKGEN109G2A	–	2	2	Biology I.	practical mark
Biology (theory) II. GYKGEN109E2A	2	–	2		final*
Communication and Information Networks (theory+practice) GYKMAG120G1A	1	1	2	Introd. to Pharm. Studies	practical mark
Basics of Economics (theory) GYKEMK121E1A	1	–	1	Mathematics for Pharm., Introd. to Pharm. Studies	semi-final
Physical Chemistry for Pharmacists (theory+practice) GYKGYI122G1A	2	2	4	Gen. and Inorg. Chemistry I., Biophysics I., Mathematics for Pharm.	practical mark
Hungarian Pharmaceutical Terminology (practice) II. GYKLEK155G2A	–	2	0	Hungarian Pharmaceutical Terminology (practice) I.	signature
Physical Education II. GYKTSI116G2A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	14.5	16.5	26		

* Counts to the qualification of the diploma

General and Inorganic Chemistry (theory) II.

Complete name of the course: Általános és szervetlen kémia (elmélet) II.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Ált. és szerv. kémia (elm.) II.

English name of the course: General and Inorganic Chemistry (theory) II.

Neptun-Code: GYKASK106E2A

Type of registration: obligatory

Institute: Institute of Chemistry, Department of Analytical Chemistry, ELTE

Name of the tutor/lecturer: **Szabolcs Béni** associate professor

Phone: +36208250489

E-Mail: beni.szabolcs@pharma.semmelweis-univ.hu

Academic degree:

Number of classes /week: 3

Credit points: 3

Course principles:

This course aims to provide a solid background in inorganic chemistry in order to support organic, analytical and pharmaceutical chemistry studies and to lay down the basic chemical transformations to understand bio(inorganic) chemistry. The course will also provide fundamental knowledge in material science necessary for the understanding of modern pharmaceutical technology.

Brief course summary:

This course provides an introduction to inorganic chemistry through a descriptive chemistry point of view. The lectures provide the facts about the (biologically, pharmaceutically or environmentally) most important elements and their compounds. Through these facts: physical/chemical properties, composition, structure and reactivity etc.) we intend to build a solid chemical background to support both qualitative and quantitative analytical chemistry as well as bio- and pharmaceutical chemistry. Systematizing and rationalizing known chemical facts of various elements (stabilization, bonding, oxidation states, most important reactions with the most common inorganic elements such as hydrogen, oxygen, halogens, nitrogen, sulfur and carbon as well as metals and small inorganic molecules-acids/bases will broaden the students' understanding in natural sciences. The occurrence, preparation, use, and pharmaceutical and/or biological role of these substances are highlighting the role of natural sciences (especially inorganic chemistry) from pharma industry to food sciences from medical research through environmental chemistry.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	3	–	–	–	42	spring	–

Semester program

I. Lecture topics/week

1. Introduction into descriptive chemistry. The elemental composition of the Universe. Origins of the elements. The composition of the lithosphere, hydrosphere and atmosphere. The evolution of the atmosphere. The classification of the elements: metals, nonmetals and metalloids. Trends in metallic and nonmetallic character, chemical periodicity, general trends in the periodic table.
2. Chemistry of hydrogen, oxygen, nitrogen and carbon. Hydrogen: occurrence, preparation, chemical properties, uses. Binary hydrogen compounds (covalent, ionic, interstitial and complex hydrides).
3. Nitrogen: occurrence, chemical properties. Hydrogen compounds of nitrogen. Oxides and oxyacids of nitrogen. Carbon: elemental forms of carbon. Inorganic compounds of carbon. The carbon-oxygen cycle in nature.
4. Chemistry of other nonmetallic elements The noble gases. (He, Ne, Ar, Kr, Xe, Rn) and their compounds. The halogens (F, Cl, Br, I, At): occurrences, preparation, properties and uses. Oxyacids and oxyanions. The biological role of halogens.
5. The group 6A elements (S, Se, Te). General characteristics, occurrences, preparation, properties. Oxides, oxyacids and oxyanions of sulfur and selenium. Sulfur and selenium in biology.
6. The group 5A elements (P, As, Sb, Bi). General characteristics, occurrences, preparation, properties. The oxycompounds of phosphorus. – The biological significance of the P–O bond. Silicon, the major element of the geosphere. Silicates. Clay minerals. Glass. – A comparison of the properties of carbon and silicon. Boron and its compounds. Metals.
7. Occurrence and distribution of metals. Metallurgy. The physical and chemical properties of metals and alloys. The alkali metals (Li, Na, K, Rb, Cs). General characteristics. Some important compounds of sodium and potassium.
8. The alkaline earth metals (Be, Mg, Ca, Sr, Ba). General characteristics. Some important compounds of magnesium and calcium. The zinc–group metals (Zn, Cd, Hg). Occurrences, chemical properties.
9. The transition metals. Physical properties, electron configurations and oxidation states. The chemistry of selected transition metals: chromium, manganese, iron, copper, molybdenum, platinum. Chemistry of coordination compounds
10. The structure of complexes. Types of ligands. Chelates. Isomerisms. Bonding in complexes. The magnetic and optical properties of complexes.
11. The dynamics of coordination compounds: Complex equilibria, ligand exchange rates. The coordination chemistry of alkali metal ions. (Host-guest complexation.) Metals in biology.
12. Life essential metals and ligands in biosystems. Metals in enzymatic and trigger processes. Metals in oxygen and nitrogen biochemistry.
13. Metals in biomineralization. Metal–induced toxicity. The biomedical use of metal complexes and metal complexation. The chemistry of the environment
14. A brief overview of the chemistry of the lithosphere, hydrosphere and atmosphere.

II. Practice topics/week–

Course requirements

Order of consultations: upon request

Prerequisites: General and Inorganic Chemistry I.

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.): –

Knowledge testing during the semester: –

Requirements of the signature at the end of the semester: course attendance

Individual activity of the student during the semester (protocol, etc.): –

Performance control in the examination period (final, semi-final): final exam

Performance control in the examination period (written, oral, written and oral): oral exam

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand–outs, scripts, etc.):

Chemistry of the Elements, second edition by N. N. GREENWOOD and A. EARNSHAW

School of Chemistry University of Leeds, U.K. ELSEVIER, BUTTERWORTH, HEINEMANN

All the complete lecture slides are provided beforehand as PDF files. Some book chapters are also provided as further reading.

List of course materials: –

Scientific, course related researches, publications/essays: –

Analytical Chemistry (theory+practice) I.

Complete name of the course: Analitikai kémia (elmélet + gyakorlat) I.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Anal. Chem. I.

English name of the course: Analytical Chemistry (theory+practice) I.

Neptun-Code: GYKASK117G1A

Institute: Eötvös University, Institute of Chemistry, Department of Analytical Chemistry

Name of the tutor/lecturer: **Dr. Krisztina Kurin–Csörgei** head of department, associate professor, PhD, Dr. Habil

Phone: (+36)1-372-2500/1241

E-Mail: kurin@chem.elte.hu

Dr. Béni Szabolcs head of institute, associate professor, PhD, Dr. Habil

Phone: 476-3600 / 55304

E-mail: beni.szabolcs@pharma.semmelweis-univ.hu

Further tutors:

Norbert Szoboszlai (lecture and practice) assistant professor

Katalin Perényi–Zih (practice) assistant professor

Anikó Vasanits–Zsigrai assistant professor

István Molnár assistant professor

Edina Kiss assistant professor PhD students

Number of lectures /week: 2 hrs lecture + 4 hrs practice

Credit points: 6 (2+4)

Course principles: –

Brief course summary:

The aim of analytical chemistry is to obtain qualitative and quantitative information about the chemical composition and structure of materials. Quantitative Analytical Chemistry is based on the determination of quantity of the components using different chemical and instrumental methods.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	2	4	–	–	28 + 56 = 84	Spring semester	2–4/semester

Semester program

I. Lecture topics/week

1. week: Introduction. Analytical Chemistry: definition, aim, methods and brief history.
2. week: Theoretical basis of qualitative analytical ionic reactions. Qualitative analytical chemistry: definition, classification of the reactions (analytical parameters, group reagents, group reactions, Fresenius-system)
3. week: Group reagents for qualitative analysis of cations. Identification reactions for cations.
4. week: Group reagents for qualitative analysis of anions. Identification reactions for anions.
5. week: Qualitative analysis of complex solution and solid sample. Instrumental analytical methods in inorganic qualitative analysis.
6. week: Types of interactions in analytical chemistry. Quantitative analysis and its important methods. Steps of chemical analysis.
7. week: Preparation of sample for analysis (sampling, storage and dissolving of the sample, fusion).
8. week: Acid–base equilibria in aqueous solution. Calculation of pH (strong and weak acids/bases, salts, buffer solutions).
9. week: Neutralization analysis: aim, standard solutions and standardization.
10. week: Possibilities for end point detection (chemical and instrumental). Acid–base indicators.
11. week: Change of pH during the acid-base titration (calculation of titration curves for the reaction of strong acid/base with strong base/acid, weak acid/base with strong base/acid, polyprotic acid with strong base). Indicator error.
12. week: The main possibilities of determination in acidimetry and alkalimetry. (measurement of strong/weak acids, strong/weak bases, salts, „specific“ determinations, with examples).
13. week: Reactions in nonaqueous solutions. Classification of solvents. Advantages and disadvantages of using non-aqueous solvents.
14. week: Nonaqueous titrations: standard solutions, end point detection, applications.

II. Practice topics/week

1. week: Laboratory inventory (bench and equipments); Safety and order in the laboratory; The schedule of the semester; Practical and theoretical requirements in the semester. Reactions of Group I of cations. Reactions of As(III). Analysis of simple unknown.
2. week: Reactions of Group III of cations. Analysis of complex unknown (I. – III.).
3. week: Reactions of Group IV and V of cations. Analysis of simple unknown (I. – V.)
4. week: Reactions of the most important anions. Analysis of complex unknown.
5. week: Analysis of a solid sample (salt mixture).
6. week: Test I. Practicing of use the laboratory tools; Neutralization analysis: Determination of sulfuric acid.
7. week: Neutralization analysis: Determination of sulfuric acid.
8. week: Neutralization analysis: Standardization of $\approx 0.1\text{N}$ hydrochloric acid.
9. week: Neutralization analysis: Continuation of previous week's measurements; Determination of lactic acid.
10. week: Acidity–Alkalimetry: Determination of sodium tetraborate and boric acid in the presence of each other.
11. week: Neutralization analysis: Determination of NaOH and Na_2CO_3 in the presence of each other.
12. week: Acidity–Alkalimetry: Indirect determination of sodium thiosulfate; Determination of "Lidocaine" in nonaqueous solution.
13. week: Test II. Nonaqueous titration of a pharmaceutical.
14. week: Retake II. Supplements; Closing

Course requirements

Order of consultations: at the request of students (in the period prior to the tests; etc.)

Prerequisites: General and Inorganic Chemistry I., Introduction to Pharm. Studies, Mathematics for Pharmacists

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

The student should be present – at least – in 75% of the total number of laboratory practices scheduled during the semester.

All exercises or measurements must be performed according to the time table. In case of absences the measurements must be completed in an "extra lab"; or-in justified cases – at the end of the semester.

Knowledge testing during the semester:

The students should write 2 major test–papers in two different parts of the subject during the semester in a time announced in advance and scheduled during the time of the laboratory practices. The major test cover all measurements performed in the laboratory practices and/or discussed during the lecture, the theoretical background and numerical problem solving. After each test we provide the opportunity for correction in the form of “retake test” and the marks of the supplementary tests are taken into account when determining the final grade. Shorter oral or written questionings related to the laboratory training can occur during the entire semester. All written tests and oral answers will be evaluated according to a five–scale grading system. Minimum 50% of performance is required for passing the tests. A written report should be prepared about the completion of all laboratory exercises. The results of the analysis or measurements should be presented for evaluation to the supervising teacher within a week after completion of the exercises. In default of doing so the measurements are marked as “unsatisfactory”. At least 80% of the exercises must successfully be performed (it means – in most cases – to reach an accuracy of $\pm 4\%$ in the quantitative determinations). The unsuccessful identifications or measurements can be repeated once during the time available for measurements to be completed due to absences.

Requirements of the signature at the end of the semester:

The final grade of the laboratory training on analytical chemistry will be established from considering the accomplishments of both theoretical and practical requirements.

The theoretical requirement for passing the semester is that the average of two marks obtained to the tests which cover the two parts of the subject should reach a minimum value of 2.0 and the very last mark is not “unsatisfactory” (i.e. higher than 1.).

The practical requirements are fulfilled if the average of all marks obtained for the individual identifications and measurements is higher than 2.51.

Individual activity of the student during the semester (protocol, etc.): –

Performance control in the examination period (final, semi-final): –

Performance control in the examination period (written, oral, written and oral): –

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand–outs, scripts, etc.):

Buvári–Barcza: Quantitative Analytical Chemistry. Bp. (SE)

Lásztity–Gyimesi: Qualitative Inorganic Analysis. Bp. (SE)

Skoog, West, Holler: Fundamentals of Analytical Chemistry. Saunders College Publishing

Materials of the lectures and practices can be downloaded from Moodle E-learning system and <http://www.webkvanti.chem.elte.hu> (web page).

List of course materials: –

Scientific, course related researches, publications/essays: –

Anatomy (theory), Anatomy (practice)

Complete name of the course: Anatómia
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Anatomy (theory), Anatomy (practice)
English name of the course: Anatomy (theory), Anatomy (practice)

Neptun-Code: GYKANT118E1A, GYKANT118G1A
Type of registration: obligatory
Institute: Department of Anatomy, Histology and Embryology

Name of the tutor/lecturer: **Dr. Csáki Ágnes** associated professor, Ph.D.
E-Mail: csaki.agnes@med.semmelweis-univ.hu

Further tutors: **Dr. Halász Vanda** assistant lecturer
Dr. Herberth–Minkó Krisztina assistant professor, Ph.D.
Szászné Dr. Kocsis Katalin assistant professor, Ph.D.
Dr. Kozsurek Márk assistant professor, Ph.D.
Pecsenye–Fejszák Nóra assistant lecturer
Dr. Puskár Zita senior research fellow, Ph.D.
Dr. Tóth Zsuzsanna Emese senior research fellow, Ph.D.

Number of classes /week: 2 lecture / week + 2 practice / week
Credit points: 2 (GYKANT118E1A) + 0 (GYKANT118G1A)
Course principles:

- to teach the terminology of the human anatomy to the future pharmacists
- to discuss those special anatomical and physiological conditions, which may influence the therapeutical considerations;
- to discuss those anatomical conditions, which are necessary for the understanding of the further medical subjects of the pharmacists' studies;
- to teach the terminology (Latin and English) of human body parts (at a gross and microscopical anatomical level) necessary for the understanding of the medical language during the communication between the pharmacists and the doctors.

Special attention is required concerning the anatomy of the central nervous system and the digestive tract, the absorption of medicines and their mechanism of action.

Brief course summary:

The lectures include all topics of anatomy, histology and embryology. Locomotor system, internal organs, nervous system, general and detailed histology, general embryology and development of organs are the topics of the lectures.
During the dissection room practices the tutors discuss and demonstrate some chapters of anatomy of the locomotor system, internal organs and nervous system. During the histology lab practices, after a short introduction, the students can examine the most important sections with an electronic histology system.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	2/week	0	–	–	28/semester	spring	–
2	0	2/week	–	–	28/semester	spring	–

Semester program

I. Lecture topics/week

1. week: 1. Introduction, Locomotor System
2. Skull, vertebral column, head, neck muscles
2. week: 3. Basic tissues I
4. Basic tissues II, Skin
3. week: 5. The Immune System, the Lymphoid Organs
6. Blood, hematopoiesis
4. week: 7. Heart, the Vascular System
8. The Respiratory System, the Mechanics of Breathing
5. week: 9. The Digestive System I, abdominal cavity
10. The Digestive System II
6. week: 11. The Liver, the Pancreas
12. The Kidneys and the Urinary tract
7. week: 13. The Female Reproductive Organs, cycle
14. The Male Reproductive Organs, Pelvis
8. week: 15.–16. Midterm
9. week: 17. Nervous System introduction (synapses, neurotransmitters) Spinal cord, spinal nerves
18. Central Nervous System, meninges, blood supply, CSF, Encephalon, Spinal cord, Spinal nerves
10. week: 19. Motor system, Sensory system, Limbic system
20. Cranial nerves, The Autonomic Nervous System
11. week: 21. The Eyeball and Visual system
22. The Organ of Hearing and Equilibrium.
12. week: 23. Hypothalamus, the Endocrine Organs I
24. The Endocrine Organs II

13. week: 25. Germ cells, Fertilization, Development of the fetus, Placenta,
26. Teratology
14. week: 27. Development of the Digestive System and Reproductive organs
28. Malformations

II. Practice topics/week

1. week: Introduction, upper and lower limbs
2. week: basic tissues, skin
3. week: skull, vertebral column, head, neck muscles
4. week: histology of the blood, vessels and the lymphoid organs
5. week: respiratory tract, thoracic cavity
6. week: respiratory tract histology, gastrointestinal tract histology I.
7. week: heart, large vessels
8. week: gastrointestinal tract histology II.; kidney and urinary tract histology
9. week: gastrointestinal tract, abdominal cavity
10. week: genital organs histology, spermatogenesis, oogenesis
11. week: urogenital system, pelvis
12. week: nervous system and sensory organs histology
13. week: nervous system: brain, spinal cord, cranial nerves, spinal nerves, main vessels and nerves on limbs, sensory organs
14. week: endocrine organs, placenta

Course requirements

Order of consultations: –

Prerequisites: Biology I., Medical Terminology, First Aid

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

Attendance of a minimum of 75% of practices is necessary for the end–term signatures.

Knowledge testing during the semester: written (electronic) midterm test

Requirements of the signature at the end of the semester:

Attendance of a minimum of 75% practices is necessary for the end–term signatures.

Individual activity of the student during the semester (protocol, etc.): –

Performance control in the examination period (final, semi-final): semifinal exam

Performance control in the examination period (written, oral, written and oral): written (electronic) semifinal exam

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand–outs, scripts, etc.):

Faller, A, Schuenke, M.: The Human Body: An Introduction to Structure and Function (Flexibook) 2004., Thieme, Stuttgart

List of course materials:

Lecture hall for the lectures. For the practices dissection practical room and histology practical laboratory, with the appropriate devices.

Scientific, course related researches, publications/essays: –

Biophysics (theory) II., Biophysics (practice) II.

Complete name of the course: Biofizika II.
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Biophysics II.
English name of the course: Biophysics II.

Neptun-Code: GYKFIZ108E2A, GYKFIZ108G2A
Type of registration: compulsory
Institute: Department of Biophysics and Radiation Biology

Name of the tutor/lecturer: **Dr. Levente Herényi** associate professor, PhD
Phone: +36 1 4591-500/60222
E-Mail: herenyi.levente@med.semmelweis-univ.hu

Further tutors: **Dr. Gergely Agócs** senior lecturer, PhD
Dr. Gabriella Csík associate professor, PhD
Dr. Rita Galántai teacher, PhD
Dr. Nikoletta Kósa assistant lecturer
Dr. Ádám Orosz assistant lecturer PhD
Dr. Gusztáv Schay senior lecturer, PhD
Dr. László Smeller professor DSc
Dr. István Voszka associate professor, PhD
Dr. Ádám Zolcsák PhD student

Number of classes /week: 1.5 hours lecture, 2.5 hours practice
Credit points: 2 + 2

Course principles:
Biophysics plays a basic role in the education of pharmaceutical students. There are dual role of the subject: on one side it gives general knowledge of natural sciences, on the other side it gives theoretical and practical basis of application of physical principles and methods in pharmaceutical sciences.

Brief course summary:
In connection to the previous it helps the development of structured way of thinking. Through this one can find connection to the basic subjects and to the applied pharmaceutical subjects.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	1.5	–	–	–	21	spring	in the exam period
2	–	2.5	–	–	35	spring	in the exam period

Semester program

I. Lecture topics/week

1. week X–radiation and its interaction with matter.
2. week Basic electronic units and circuits. Amplifier.
3. week Signal transduction, signal selection.
4. week Sound, Ultrasound.
5. week Bases of radioisotope diagnostic methods.
6. week Transport phenomena, flow of fluids and gases.
7. week Diffusion, osmosis.
8. week Thermodynamic aspects of transport processes.
9. week Membrane potential, Action potential.
10. week Sensory phenomena, Laws of sensation.
11. week Optical spectroscopic techniques.
12. week Mass spectroscopy methods.
13. week Radio spectroscopy methods.
14. week Sedimentation and electrophoretic methods.

II. Practice topics/week

1. week Dosimetry, dose measuring devices.
2. week Coulter–counter. Electric counting of blood cells.
3. week Production and absorption of x–radiation. Fundamentals of x–ray imaging.
4. week Amplifier, signal processing.
5. week Gamma energy determination. Dual isotope labeling.
6. week Physical basis of electrocardiography.
7. week Audiometry. Determination of auditory threshold.
8. week Pulse generator (pacemaker).
9. week Imaging with gamma radiation.
10. week Diffusion and its significance in human body.
11. week Flow of fluids. Biophysical bases of blood circulation.
12. week Sensory function.
13. week Principle of CAT–scan. Model measurement.
14. week Repetition.

Course requirements

Order of consultations: Weekly in the exam period.

Prerequisites: Biophysics I.

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.):

Participation on at least 75 % of the practices. Lab. report must be done about the measurements. The missed measurements can be made up within the 4 weeks cycle.

Knowledge testing during the semester:

Midterm tests on the 6th and 11th weeks. Retake is possible on the 13th week.

Requirements of the signature at the end of the semester:

1. At least 50 points in the test in Physical bases of biophysics.
2. Participation on at least 75 % of the practices, (in case of more than 3 absences the signature for the semester is denied.)
3. Acceptance of lab. reports.
4. The practice grade should be at least 2.

Individual activity of the student during the semester (protocol, etc.): Lab. report should be made about all the measurements.

Performance control in the examination period (final, semi-final): Final exam

Performance control in the examination period (written, oral, written and oral): Written and oral

Prescribed external practice: –

List of teaching materials: (List of textbooks, hand–outs, scripts, etc.):

Damjanovich–Fidy–Szöllősi (eds): Medical Biophysics (2009)

Medical biophysics practices (Semmelweis Publisher, 2015)

List of course materials: –

Scientific, course related researches, publications/essays: –

Biology (theory) II., Biology (practice) II.

Complete name of the course: **Biológia II.**
Name of the Programme: **Pharmacy Basic Education**
Abbreviated name of the course: **Biol II.**
English name of the course: **Biology (theory) II., Biology (practice) II.**

Neptun-Code: GYKGEN109E2A, GYKGEN109G2A
Institute: Department of Genetics, Cell- and Immunobiology Semmelweis University, Faculty of Medicine

Name of the tutor/lecturer: **Prof. Dr. Edit Buzás** DSc

coordinator: **Dr. Orsolya Láng** Phone: 2102940/56251
E-Mail: lang.orsolya@med.semmelweis-univ.hu
PhD

Further tutors: **Dr. Sára Tóth** Associate Professor
Dr. Valéria László Associate Professor
Dr. András Kristóf Fülöp Associate Professor
Dr. Hargita Hegyesi Associate Professor
Dr. László Kóhidai Associate Professor
Dr. Viola Tamási Associate Professor
Dr. Eszter Lajkó Research Fellow
Dr. Marianna Csilla Holub Associate Professor
Dr. Zoltán Wiener Associate Professor
Dr. Tamás Visnovitz Assistant professor

Number of lectures /week: 2 (lecture) + 2 (practice) Credit points: 2 + 2

Course principles:
Beside the basics of Mendelian genetics and cytogenetics, pharmacogenetics and genomics are discussed as well as the main molecular genetic techniques are presented. The subject provides theoretical background for Microbiology and Immunology.

Brief course summary:
The subject Biology II. discusses Mendelian genetics, molecular genetics and genomics. The most significant characteristic of inheritance in human and the techniques applied in medical field are studied.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	2	–	–	–	28	Spring	6 (during exam period)
2	–	2	–	–	28	Spring	6 (during exam period)

Semester program

I. Lecture topics/week

1. week Transmission of the genetic information. Meiosis
2. week Introduction to human genetics. The human genome.
3. week Genetic variation I.
4. week Genetic variation II.
5. week Epigenetics
6. week Cytogenetics
7. week Autosomal inheritance I.
8. week Autosomal inheritance II.
9. week Role of sex in inheritance; Genetics of sex
10. week Genetics of biological processes (Genetics of stem cell and tumor biology)
11. week Introduction to genomics; Methods in genomics
12. week Genetics and genomics of complex trait and disorder
13. week Pharmacogenetics and nutrigenomics
14. week Gene and genome manipulation
(The order of lectures may vary.)

II. Practice topics/week

1. week Mitosis
2. week Meiosis and gametogenesis
3. week Cytogenetics I.
4. week Cytogenetics II.
5. week Study of monogenic inheritance; Pedigree analysis
6. week Factors effecting the expression of genotype
7. week Midterm I.
8. week Molecular genetics I.
9. week Molecular genetics II.
10. week Molecular genetics III.
11. week Medical applications of genetic methods I.
12. week Medical applications of genetic methods II.
13. week Midterm II.
14. week Complex inheritance
(The order of lectures may vary.)

Course requirements

Order of consultations: during exam period 1/week

Prerequisites: Biology I.

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

Student must visit 75% of the lessons. More than three absences from the practice or more than four absences from the lecture invalidate the semester, no signature is given. There are no extra practices. There are two midterms during the semester. To get practice grade and signature the average of the midterms has to be 2.0. Missed or failed midterms might be repeated two times. No improvement of midterm grade.

Knowledge testing during the semester:

The two midterm tests are written and contain questions from theoretical and practical part.

Requirements of the signature at the end of the semester:

Practice grade and not more than four absences from the lectures.

Individual activity of the student during the semester (protocol, etc.) –

Performance control in the examination period (final, semi-final): final

Performance control in the examination period (written, oral, written and oral): written

Prescribed external practice: –

List of teaching materials (List of textbooks, hand-outs, scripts, etc.):

PowerPoint presentations on our web site (<http://gsi.semmelweis.hu>)

List of course materials:

Genetics and genomics (e-book) – <http://gsi.semmelweis.hu/> (The user name and password is on course datasheet of the Neptun)

Alberts et al.: Essential Cell Biology. Garland Publ. Inc. (4th or 5th edition, ISBN: 9780815344544)

Scientific, course related researches, publications/essays:

The activity of the Department of Genetics, Cell- and Immunobiology (DGCI) includes teaching, research and diagnostics. Our scientific work focuses on a broad scale in the fields of immunology, cell biology and genomics. The main research groups of the Department: National Heart Program, Extracellular Vesicle; Medical Genomics; Chemotaxis; Experimental Translational Immunomics and Molecular Cancer Biology. The applied methodologies include: cell- and molecular biological, immunological, genomic and bioinformatic techniques and procedures.

Communication and Information Networks

Complete name of the course: Kommunikáció és információs hálózatok
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Communication and Information Networks
English name of the course: Communication and Information Networks

Neptun-Code: GYKMAG120G1A
Type of registration: compulsory
Institute: Institute of Behavioural Sciences

Name of the tutor/lecturer: **Dr. Pilling János** PhD, Associate professor
Phone: +36 (1) 2102930/56457
E-Mail: pilling.janos@med.semmelweis-univ.hu
Dr. Hankó Balázs

Further tutors: **Dr. Tóth Mónika Ditta** PhD, assistant professor

Number of classes /week: 1 lecture, 1 seminar
Credit points: 2

Course principles:
Proper communication has an essential role in pharmaceutical practice. The main objectives of the course are the following:

- to teach basic skills to improve pharmacists’ communicational techniques of information gathering, active listening and patient education
- introduction of pharmaceutical communication with the useage of digital and social media

Brief course summary:
The education will be interactive and practical. In the first part of the semester students will get familiar with the basic concepts of pharmaceutical communication with a special focus on information delivery, patient education, active listening, and empathy. Shared decision making will be also covered, such as improving compliance and promoting lifestyle changes. In the second block of the course students will get familiar with online information sources, and the use of social media and infocommunication in pharmacy practice. In the third part of the semester students will participate on field practice to be able to observe patient–pharmacist interactions.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	1	1	–	–	28	spring	–

Semester program

I. Lecture topics/week

1. week Role of communication in pharmaceutical practice. Behavioural etiquette during pharmacist-patient interaction.
2. week Role of non-verbal communication and empathy in pharmacists' work.
3. week Barriers of information delivery in patient education. Improving health literacy.
4. week Shared decision-making. Different ways of persuasion.
5. week Model of behavioural change. Promoting lifestyle changes in the pharmacy.
6. week Information search on the Internet: professional and layman information sources.
7. week Basic rules of social media usage.
8. week Pharmaceutical options of social media usage.
9. week Possibilities of modern infocommunication in the pharmacy.
10. week Social media, new ways and perspectives of infocommunication
11. week Field Practice
12. week Presentation about field practice
13. week Presentation about field practice
14. week Preparation for the written exam

II. Practice topics/week

1. week Role of communication in pharmaceutical practice. Behavioural etiquette during pharmacist-patient interaction.
2. week Role of non-verbal communication and empathy in pharmacists' work.
3. week Barriers of information delivery in patient education. Improving health literacy.
4. week Shared decision-making. Different ways of persuasion.
5. week Model of behavioural change. Promoting lifestyle changes in the pharmacy.
6. week Information search on the Internet: professional and layman information sources.
7. week Basic rules of social media usage
8. week Pharmaceutical options of social media usage.
9. week Possibilities of modern infocommunication in the pharmacy.
10. week Social media, new ways and perspectives of infocommunication
11. week Field Practice
12. week Presentation about field practice
13. week Presentation about field practice
14. week Written exam

Course requirements

Order of consultations: Seminars will ensure the possibility of ongoing consultation with the seminar leader.

Prerequisites: Introduction to Pharmaceutical Studies

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

The participation at minimum 75% of the practice seminars is the prerequisite of the signature. Participation on field practice and short presentation about the experiences.

Knowledge testing during the semester: Written examination at the end of the semester, on the last practice.

Requirements of the signature at the end of the semester:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature. Presentation about the field practice experiences.

Individual activity of the student during the semester (protocol, etc.):

Presentation about the experiences during field practice.

Performance control in the examination period (final, semi-final): semi-final

Performance control in the examination period (written, oral, written and oral): written examination

Below 50%: 1

50%–65%: 2

66%–75%: 3

76%–85%: 4

85%–100%: 5

Prescribed external practice: Students take part on field practice in a pharmacy. They will observe communicational aspects of pharmacist–patient interaction.

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.)

Pilling János: Medical Communication in practice. Medicina, Budapest, 2020.

Beardsley, RS. – Skrabal, MZ. – Kimberlin, CL: Communication Skills in Pharmacy Practice. Wolters Kluwer. Seventh edition. 2020.

List of course materials: –

Scientific, course related researches, publications/essays: –

Basics of Economics (theory)

Complete name of the course: Közgazdaságtani alapismeretek (elmélet)
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Közg. Alapism.
English name of the course: Basics of Economics (theory)

Neptun-Code: GYKEMK121E1A
Type of registration: obligatory
Institute: EKK Egészségügyi Menedzserképző Központ

Number of classes /week: 1
Credit points: 1

Course principles:
The general objective of the course is to present and describe the importance of the economic thoughts and principles in the everyday life. The focal point is to give support to the students to make good decisions and to be efficient at work.

Short description of the course:
Despite the lay opinion on the role of Economics, it is not mainly about money. Economics is about to assist decision making in situations, where resources are scarce compared to the needs. The aim of studying economics is to understand the decision–making process behind allocating the currently available resources, the unlimited needs confronts the limited resources. In simple words, seeking for the best decisions always comes with an unavoidable inevitable choice between alternative uses of the resources available. Using examples from the field of pharmacy brings students closer to the understanding of using economic principles during their future career. The consequences of economic actions can be evaluated from different perspectives. Students must learn how to use them when they are about to make decisions or just about to evaluate the possible alternatives.

The course includes for major parts as follows:
Part 1: Intends to present the goals and the content of the economic thoughts, including definitions of economic terms.
Part 2: Focuses on the use of Economics at macro level, the level of the national economy. The three major problems people face when organizing the economy are what, how and for whom to produce. Answering the three questions raises several concerns like economic growth, economic equilibrium, employment, inflation, state finance etc.
Part 3: This part is about microeconomics, which includes terms like demand, supply, corporate profit, calculating break–even point etc.
Part 4: Gives an introduction to applied economics at both macro and micro level. Using the fundamental principles of economics students get an insight into the basics of business decisions. Some methods will be presented as break even analysis and cash flow analysis. The relevance and the principle of using cost–benefit analysis in health care will also be discussed.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2nd	1	–	–	–	14	spring	–

Semester program

Lecture topics/week:

1. week: What is economics about? What do economists do? The dilemma of choice.
2. week: The justification of economics: Scarcity. Forms of scarcity and the ways of addressing them.
3. week: The consequence of scarcity: Decision-making situation. What inputs are needed for decision-making.
4. week: Evaluation of decisions. Did we make a good decision? What are the criterias for good decisions? Defining and evaluating benefits and costs.
5. week: Summary of economic principles. Video presentation. Comprehensive approach to costs and benefits in economics and beyond economics. Case study on the average speed of driving a car.
6. week: Economics at macro level: insight into macroeconomics. Economic growth, equilibrium, unemployment, inflation and money-markets.
7. week: The role of market in economic organization. Will the invisible hand give a solution?
8. week: The role of the government in regulating the economy. What is the role of the government in the drug market?
9. week: The role of the government in health care. Public tasks, public providers, public financing.
10. week: Economics of operating private and public companies. Insight into the world of microeconomics. Determinants of the operational results.
11. week: Viewing and understanding management performance. The economic nature of revenues and costs. Types of costs.
12. week: Calculating financial balance of economic operators: break-even analysis, cash-flow analysis, trade-off analysis.
13. week: Continuing the previous lecture, presentation and discussion of cases week
14. week: Summary, takeaways

II. Practice topics/week

Course requirements

Order of consultations: two occasions upon request prior to final tests

Prerequisites: –

Semester acceptance conditions: (successful course attendance, mid-term tests, absence, etc.): result of mid-term tests, number of absences

Knowledge testing during the semester: mid-term tests

Requirements of the signature at the end of the semester: based on semester acceptance conditions

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.):

Economics / Paul A. Samuelson, William D. Nordhaus. — 19th ed. p. cm.—(The McGraw-Hill series economics)

Hand-outs including the PPT slides of the lectures

Physical Chemistry for Pharmacists (theory+practice)

Complete name of the course: Fizikai kémia gyógyszerészeknek

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: Physical Chemistry

English name of the course: Physical Chemistry for Pharmacists (theory+practice)

Neptun-Code: GYKGY1122G1A

Type of registration: obligatory

Institute: Department of Pharmaceutics

Complete name of the course: Physical Chemistry

Name of the tutor/lecturer: **Dr. István Antal** Professor, PhD, Dr. Habil
Phone: 36 1-2170914
E-mail: antal.istvan@pharma.semmelweis-univ.hu

Deputy: **Dr. Krisztina Ludányi**
ludanyi.krisztina@pharma.semmelweis-univ.hu
associate professor

Further tutors: **Dr. Miklós Zrínyi** professor emeritus
Dr. Krisztina Ludányi associate professor
Dr. Angéla Jedlovsky-Hajdú associate professor
Dr. Nikolett Kállai-Szabó senior lecturer
Dr. Lívía Budai senior lecturer

Number of lectures /week: 2

Number of practices /week: 2

Credit points: 4

Course principles:

The aim of the course is to acquire the physicochemical basics necessary for pharmaceutical knowledge.

Knowledge of physical chemistry provides a solid foundation for understanding drug manufacturing processes and drug control methods as well as the behavior of drugs in the body.

Brief course summary:

Physical chemistry deals with the internal structure of matter, the interactions dependent on the structure of matter, and the most common laws of influencing changes in the material system.

Students will become familiar with basic physicochemical knowledge in the areas of thermodynamics, reaction kinetics, electrochemistry, rheology, interfacial phenomena, transport processes, and measurement data processing. The material of the lectures and exercises provides a basis for understanding the physical and physicochemical methods in the pharmacopoeia.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	2	2	–	–	56	Spring	When necessary

Semester program

I. Lecture topics/week

1. Fundamentals of chemical thermodynamics I. (Typical thermodynamic quantities, internal energy, entropy I, II main theorem)
2. Fundamentals of chemical thermodynamics II. (Theorem III, statistical interpretation of entropy, environmental effects, enthalpy, free energy, free enthalpy, direction of processes)
3. Physical properties and state changes of gases, liquids, solids (phase rule, gas laws, amorphous and crystalline materials, morphology, polymorphism)
4. Solutions and mixtures (free enthalpy, chemical potential, activity, ideal and non-ideal mixtures, solubility, solvation, hydration, solubilization, colligative properties)
5. Synthetic and biopolymers (prim., sec., tert., and quaternary structures, elasticity, solubility, fractionation, gelation)
6. Physical equilibria (phase equilibria, distribution, dissociation, partition coefficient)
7. Kinetics of homogeneous reactions (order, molecularity, rate equation, catalysis, inhibition, autocatalysis, kinetics of enzyme reactions)
8. Chemical equilibrium (equilibrium constant, simple and complex equilibria, ligand equilibria, cooperative equilibria)
9. Properties of electrolyte solutions (dissociation, acidity, alkalinity, colligative properties)
10. Kinetics of heterogeneous chemical reactions, basics of electrochemistry
11. Interfacial phenomena (adhesion, surface tension, wetting, adsorption, isotherms)
12. Transport phenomena I. (diffusion, transfer transport, membrane diffusion, osmosis, permeability)
13. Transport phenomena II (rheology, viscosity, Newtonian and non-Newtonian fluids, flow profiles)
14. Heterogeneous processes (specific surface area, adsorption, desorption, dissolution kinetics, electrodes, kinetics of electrode reactions)

Course requirements

Order of consultations: Upon individually agreed appointments with the trainers at practical courses and the lecturers.
Prerequisites: Gen. and Inorg. Chem. I., Biophysics I., Mathematics for Pharm.

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

Absences can be accepted according to the Examination and Studies Regulation.

Knowledge testing during the semester:

Completion of 2 written reports from the material of the lectures and practices with at least sufficient results. Replacement option is according to the Examination and Studies Regulation.

II. Practice topics/week

1. Introduction, methods. Aspects of evaluation of measurements, laboratory order.
2. Thermoanalytical and calorimetric tests. Melting point (eutectics), heat of fusion determination, DSC analysis.
3. Examination of crystalline and amorphous materials by powder X-ray, DSC, melting point measurement, morphological characterization.
4. Determination of the freezing point decrease of solutions. Investigation of eutectic formation during freeze-drying.
5. Determination of partition coefficient
6. Reaction kinetics I. First-order and pseudo-first-order reaction (ester hydrolysis, antacid "pH-stat" acid neutralization).
7. Reaction kinetics II. Effect of temperature on reaction rate (Arrhenius relation).
8. Reaction kinetics III. Secondary reaction (saponification at equal molar concentrations)
9. Reaction kinetics IV. Kinetics of enzyme reactions (hydrolysis of fats in the presence of lipase). Zero order reaction (hydrolysis in acetylsalicylic acid suspension or dissolution of the drug from a tablet)
10. Determination of weak acid dissociation constant (pH measurement, spectrophotometry)
11. Effect of surface tension on droplet formation (droplet number determination, Donnan-pipette)
12. Determination of specific surface area (activated carbon). Wetting angle measurement by image analysis.
13. Rheology, viscosity measurement (Ostwald, rotational), flow and viscosity curves, thixotropy, viscoelasticity.
14. Investigation of dissolution rate and diffusion rate (eg. benzoic acid, calcium acetylsalicylate), effect of surface/particle size Consultation, subsidiary practice

Requirements of the signature at the end of the semester:

The condition of acceptance is a valid practical course grade and completion of reports.

List of teaching materials:

A.T.Florence and D.Attwood:Physicochemical Principles of Pharmacy, Pharmaceutical Press, (2006)
D.T.Haynie:Biological Thermodynamics, Cambridge University Press, (2001)
H.Moynihan and A.Craen:Physicochemical Basis of Pharmaceuticals, Oxford University Press, (2009)
T.N.Tozer, M.Rowland: Introduction to Pharmacokinetics and Pharmacodynamics, The quantitative Basis of Drug therapy, Lippincott Williams and Wilkins (2006)
T.P.Kenakin:A Pharmacology Primer Theory, Applications, and Methods, Academic Press (2006)

Hungarian Pharmaceutical Terminology (practice) II.

Complete name of the course: Magyar gyógyszerészeti szaknyelv (gyakorlat) II.
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Hungarian Pharmaceutical Terminology II.
English name of the course: Hungarian Pharmaceutical Terminology (practice) II.

Neptun-Code: GYKLEK155G2A
Type of registration: obligatory
Institute: Division of Foreign Languages and Communication, Faculty of Health Sciences
Name of the tutor/lecturer: *Alexandra Bakó* language teacher
Phone: (1) 48-64962
E-Mail: bako.alexandra@se-etk.hu

Further tutors: *Borda Szandra* language teacher
Nagyné Górász Judit language teacher
Kovács Ildikó language teacher
Nagy Borbála language teacher
Tick Vera language teacher
Tóth Zsuzsanna language teacher

Number of classes /week: 2
Credit points: 0

Course principles:
The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies.

Brief course summary:
The second semester is dedicated to learning basic general vocabulary and grammar. Students acquire basic structures and the vocabulary for everyday topics / e.g. shopping, food, housing etc./. The course places special emphasis on phrases essential for everyday communication, e.g. introductions, greetings, getting/giving information etc. and on phrases needed in basic communication at a pharmacy.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	0	0	2	0	28	spring	0

Semester program

Practice topics/week:

Week 1	Giving directions
Week 2	Locatives
Week 3	Asking about time
Week 4	When to take the medicine
Week 5	Body parts
Week 6	Basic verbs – talking about diseases
Week 7	Basic verbs – asking about symptoms
Week 8–9	How to take the medicine
Week 10	Warning about side effects
Week 11	Plural forms of nouns
Week 12–13	Serving clients at the pharmacy
Week 14	Final test (written and oral)

Course requirements

Order of consultations: Individual consultations by email or in person on meeting formerly agreed upon with the teacher via email.

Prerequisites: Hungarian Pharmaceutical Terminology I.

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

An attendance of 75% minimum is required to get the signature.

The student must have a minimum average of 2.00 based on the tests in class to pass the subject.

Knowledge testing during the semester:

Beside the final test the teacher may evaluate the students' performance with the help of short tests.

Requirements of the signature at the end of the semester: An attendance of 75% minimum and taking the final test.

Individual activity of the student during the semester (protocol, etc.): homework in the forms of language practice tasks.

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.)

Gyöngyösi Livia – Hetes Bálint. Hungarian language: Jó reggelt! Semmelweis Egyetem Egészségtudományi Kar, 2010.

Physical Education II.

Complete name of the course: Testnevelés II.

Name of the Programme: Pharmacy Basic Education

Abbreviated name of the course: P. E. II.

English name of the course: Physical Education II.

Neptun-Code: GYKTSI116G2A

Type of registration: compulsory

Institute: Semmelweis University's Centre for Physical Education and Sports

Name of the tutor/lecturer: **Várszegi, Kornélia** director

Phone: 06-1/264-14-08

E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu

Further tutors:

Doharné Buczkó, Anikó P.E. teacher

Kalmus, Dániel P.E. teacher

Lehel, Zsolt P.E. teacher

Sótonyiné Hrehuss, Nóra P.E. teacher

Várszegi, Kornélia P.E. teacher

Weisz, Miklós P.E. teacher

Number of classes /week: 1 class (practice)/week

Credit points: 0 credit

Course principles:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Brief course summary:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behavior.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
2	–	1	–	–	14	spring	–

Semester program

Practice topics/week

- 1st week: General information: Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra-curricular activities.
- 2nd week: Basketball: Dribbling, passing and shooting drills in order to improve fine motor skills.
- 3rd week: Bench exercises: Using the dimensions of the sport bench by running, skipping, jumping, lifting etc. exercises.
- 4th week: Rubber band exercises: Strength and coordination training by taking advantage of the elastic features of the object.
- 5th week: Floorball: Introducing the sport to the Students by exposing the major rules, proper technique of stick handling. Passing and shooting drills.
- 6th week: "Double-trouble": Strength and stretch training in pairs by applying different starting positions. Functional movements executed in pairs.
- 7th week: Volleyball: Introducing the fundamental elements of the game (serves, hits, digs etc.) Exposing the major rules and techniques.
- 8th week: Frisbee: Taking the next step into the game by applying tactical elements in match situations. Passing and catching drills in different moving forms.
- 9th week: Ruffier test and ball skill developing exercises
Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention. Sport games on the side (Dodge-ball, King of the court etc.)
- 10th week: Circuit training: General strengthening drills at each stations. Applying different intensity level, regarding the various conditions of the Students.
- 11th week: Tennis: Involving the new strokes into the learning process: form of serves, the volleys, the smash etc.
- 12th week: Badminton: Introducing the new technical and tactical elements of the game (drop shots, lobs, smash etc.) Exposing the rules of doubles.
- 13th week: Core exercises: Relative (own body) weight exercises applying different equipment (hand weights, rubber band etc.) with the aim of postural correction, by strengthening the core muscles in order to avoid spinal deformations.
- 14th week: Box exercises: Applying the sport box by jumping, lifting, slaloming, carrying (etc) it. By this enhance the level of strength and stamina.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball)

Course requirements

Order of consultations: –

Prerequisites: –

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

The number of active participations for physical education classes is 9 (for trainings 15 times!), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Knowledge testing during the semester:

There is no mandatory control during the term.

Requirements of the signature at the end of the semester:

Active participation in practice classes 9 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

FACULTY OF PHARMACEUTICAL SCIENCES

**Curriculum of the credit-based training
for second year students
in the 2021/2022 academic year**



*Pharmaceutical Sciences
2nd year*

3. SEMESTER

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Analytical Chemistry (practice) II. GYKASK117G2A	–	4	4	Gen. and Inorg. Chem. II., Analytical Chemistry I.	practical mark
Analytical Chemistry (theory) II. GYKASK117E2A	4	–	4		final*
Colloid Chemistry (theory and practice) GYKGYI072G1A	2	2	4	Physic. Chem. for Pharm., Biophysics II.	practical mark
Organic Chemistry (practice) I. GYKSZK123G1A	–	4	4	Gen. and Inorg. Chem. II.	practical mark
Organic Chemistry (theory) I. GYKSZK123E1A	4	–	4		semi-final
Physiology (practice) I. GYKTLM124G1A	–	2	1	Anatomy, Biology II.	practical mark
Physiology (theory) I. GYKTLM124E1A	4	–	4		semi-final
Biochemistry (theory+practice) I. GYKBMT069G1A	1.5	1.5	2	Gen. and Inorg. Chem. II., Biology II.	practical mark
Basic Immunology (theory) GYKGEN070E1A	2	–	2	Biology II.	semi-final
Hungarian Pharmaceutical Terminology (practice) III. GYKLEK155G3A	–	2	1	Hungarian Pharmaceutical Terminology (practice) II.	practical mark
Physical Education III. GYKTSI116G3A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	17.5	16.5	30		

* Counts to the qualification of the diploma

Analytical Chemistry (theory) II. Analytical chemistry (practice) II.

Full name of the subject: Analitikai kémia (elmélet) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Analytical Chemistry (theory) II., Analytical chemistry (practice) II.
German name of the subject: Analytische Chemie (Vorlesung) II, Analytische Chemie (Praktikum) II
Neptun code of the subject: GYKASK117E2A, GYKASK117G2A
Type of registration: obligatory
Responsible department: Department of Analytical Chemistry, Eötvös Loránd University
Responsible tutor: **Dr. Krisztina Kurin-Csörgei**
head of department, associate professor, PhD, Dr. Habil
Phone: (+36)1-372-2500/1241
E-Mail: kurin@chem.elte.hu
Dr. Béni Szabolcs head of institute, associate professor, PhD, Dr. Habil
Phone: 476-3600 / 55304
E-mail: beni.szabolcs@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Katalin Perényi-Zih (practice) assistant professor
István Molnár (practice) associate professor
Edina Kiss (practice) associate professor
PhD students (practice)

Classes per week: 4 lectures, 4 practices
Credit point: 4+4

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Analytical Chemistry is a scientific discipline and the teaching material, that develops and applies methods, instruments and strategies to obtain information on the composition and the nature (structure) of matter in space and time. Analytical Chemistry is concerned with two main aspects: (1) determination of the composition of a sample of matter or of a system – this means the identification of the components (qualitative analysis) and (2) the determination of the quantity of the components (quantitative analysis).

Short description of the subject:

The aim of analytical chemistry is to obtain qualitative and quantitative information about the chemical composition and structure of materials. Quantitative Analytical Chemistry is based on the determination of quantity of the components using different chemical and instrumental methods.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
3	56	56	–	–	112 (56+56)	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Introduction. Analytical Chemistry (Quantitative): definition, aim. Steps of chemical analysis.
2. week: Complex formation equilibria. Stepwise complex formation, stability constants. Effect of pH and auxiliary foreign ligands on the apparent (conditional) stability constant. Complex formation with monodentate and polydentate ligands. The chelate and entropy effect. Complexometric titrations with monodentate ligands. Chelatometric titration curves. Calculation of $p[Mn^{+}]$ at different points and regions of the curve.
3. week: Chelatometric titrations: standard solutions and standardization. Methods for end point detection at direct and back titrations. Metal ion indicators. Types and applicability of EDTA titrations.: direct, back, displacement and indirect titrations.
4. week: Precipitation equilibria. The solubility product and the common ion effect. Effect of pH and complex formation on the solubility of precipitates (examples). Calculation of argentometric titration curves. Standard solutions and standardization. Possibilities of end point detection. The main methods of argentometric titrations (Mohr's Volhard's, Fayans', Schulek's method).
5. week: Gravimetry. Steps of gravimetry: precipitation, filtration, washing, treatment of precipitate, weighing, calculation. Applications of gravimetry: determination of different cations and anions (examples). Electrogravimetry. Redox equilibria. Oxidizing and reducing agents (examples). The redox potential and its calculation. Classification of redox titrations. Requirements for redox reaction to be used. The effect of pH, complex- and precipitate formation and electrolyte concentration on redox potentials (examples).
6. week: Redox titration curves. Calculation of the redox potential at different points and regions of the curve. Permanganometry: standard solution, mechanism of $KMnO_4$ reduction. Titration in acidic, neutral and basic solutions. Chromatometry and cerimetry: standard solutions, end point detection, applications. Reductometric titration methods. Bromatometry: methods, standard solutions, end point detection, determinations (examples for direct, back titrations).
7. week: Iodometric titrations: standard solutions, end point detection, pH-dependence of the titrations. Determination of reductants. Iodometry: direct and indirect determination of oxidants.
8. week: Possibilities of instrumental end point detections (summary). Conductometry (principle and applications for the titration of strong and weak acids with different titrants).
9. week: Potentiometry: potentiometric titrations and direct potentiometry (with examples). Coulometry. Dead stop titrations.
10. week: Emission and absorption of electromagnetic radiation by atoms and molecules. Physical backgrounds of spectroscopy. Molecular absorption spectroscopy: theory and applications of UV-VIS spectrophotometry.
11. week: Molecular emission spectroscopy: theory and applications of fluorescence analysis. Atomic emission and absorption spectroscopy. "Modern" spectroscopic methods.
12. week: Separation techniques (summary). Separations by chromatography. Types of sorption. Chromatogram. Classical column chromatography. Gas chromatography (GC). Paper and thin layer chromatography.
13. week: High-performance liquid chromatography (HPLC). Parts of the instrument. Separation of components using computer aided program of HPLC. Ion chromatography (IC). Parts of the instrument. Separation of cations and anions (examples). "Modern" chromatographic methods.
14. week: Evaluation of the measurement results. Random error and its calculation. Reliability limits. Regular error. Literature of analytical chemistry. Summary.

Topics of practical classes (pro week):

- | | |
|---|---|
| <p>1. week: Taking over laboratory bench and equipments; Safety and order in the laboratory; The schedule of the semester; Practical and theoretical requirements in the semester; Chelatometry (introduction); Determination of bismuth ions.</p> <p>2. week: Chelatometric determination of calcium and magnesium ions in the presence of each other (in mineral water).</p> <p>3. week: Chelatometry: Determination of aluminum ions in "Aluminium aceticum tartaricum solutum"; Determination of copper and zinc ions in the presence of each other.</p> <p>4. week: Argentometry: Determination of bromide ions by Volhard's and Fayans' methods.</p> <p>5. week: Redox titrations; Permanganometry: Standardization of $\approx 0.1N$ potassium permanganate solution; Determination of hydrogen peroxide content in tablet "Hyperol"; Determination of the total iron content by Zimmermann-Reinhardt method (1/2 group); Determination of bromide ions (Winkler' method).</p> <p>6. week: Chromatometry: Determination of Mohr salt; Cerimetry: Determination of amidazophene.</p> <p>7. week: Test I. Bromatometry: Determination of ascorbic acid (Vitamin C) in tablets (e.g. VitC, Rutascorbin, Béres C); Determination of azophene.</p> | <p>8. week: Bromatometry/Iodometry: Determination of phenol in water / acetyl salicylic acid content in tablets (e.g. Aspirin, Kalmopyrin, Istopyrin) by Koppeschaar's method. Iodometric determination of copper (II)-ions. Retake I.</p> <p>9. week: Iodometry/Iodometry: Determination of iodide by Winkler's method; Determination of mannitol by Malaprade's reaction with periodate.</p> <p>10. week: Potentiometric titration of acetic acid; Potentiometric titration of bromide content of "Elixirium thymi composita"; Direct potentiometric determination of fluoride content. in tooth paste.</p> <p>11. week: Computer aided learning of modern instrumental analytical methods (HPLC); HPLC measurement (separation of medicine sample); Ion chromatographic measurement (theory and determination of anions in "Evian" water).</p> <p>12. week: Spectrofluorencency: Determination of quinine in "Tonic"; Spectrophotometric determination of phosphate content in egg shell.</p> <p>13. week: Test II. Conductometric determination of Betaine hydrochloride; Conductometric determination of acid contents in red wine; Water determination by Karl Fischer' titration. (Extra lab: Supplements).</p> <p>14. week: Retake II. Supplements; Closing</p> |
|---|---|

Schedule of consultations: at the request of students (in the period prior to the tests; etc.)

Course requirements

Prerequisites: Analytical chemistry I., General and Inorganic Chemistry II.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The student should be present at least in 75% of the total number of laboratory practices scheduled during the semester.

All exercises or measurements must be performed according to the time table. In case of absences the measurements must be completed in an "extra lab"; or-in justified cases – at the end of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

The students should write 2 major test-papers from two different parts of the subject during the semester in a time announced in advance and scheduled during the laboratory practices. The major tests cover all measurements performed in the laboratory practices and/or discussed during the lecture, the theoretical background and numerical problem solving. After each test we provide the opportunity for correction of the mark in the form of "retake test" and the marks of the supplementary tests are taken into account when determining the final grade. Shorter oral or written questionings related to the laboratory training can occur during the entire semester. All written tests and oral answers will be evaluated according to a five scale grading system. Minimum 50% of performance is required for passing the tests. The students are allowed to use their own non-programmable calculator. The use of mobile phone, smart watch, tablet, etc. is forbidden. If the students use any kind of illegal helps when he/she takes oral or written tests, his/her practical mark is automatically "unsatisfactory".

Requirements of signature: (practice)

The final grade of the laboratory training on analytical chemistry will be established from considering the accomplishments of both theoretical and practical requirements. The theoretical requirement for passing the semester is that the average of two marks obtained by the two major tests (or retake tests) should reach a minimum value of 2.0 and the very last mark is not "unsatisfactory" (i.e. higher than 1.).

The practical requirements are fulfilled if the final mark for the measurements is minimum 2.

The final practical grade is determined by considering the grades obtained for the tests and the final mark of the measurements.

Requirement for allowing to take final oral exam is to have a valid (min. 2) mark on the subject of laboratory practice.

Number and type of projects students have to perform independently during the semester and their deadlines:

A written report should be prepared about the completion of each laboratory exercise. The results of the measurements should be presented to the supervising teacher for evaluation within a week after completion of the exercises. In default of doing so the measurements are marked as “unsatisfactory” and it should be repeated during the time of “extra lab”.

Type of the semester-end examination: signature, practical grade, final

Form of the semester-end examination: final oral exam

List of teaching materials (List of textbooks, hand-outs, scripts, etc.):

Buvári-Barcza: Quantitative Analytical Chemistry. Bp. (SE)

Skoog, West, Holler: Fundamentals of Analytical Chemistry. Saunders College Publishing

Materials of the lectures and practices can be downloaded from Moodle E-learning system and <http://www.webkvanti.chem.elte.hu> (web page).

Organic Chemistry (theory) I., Organic Chemistry (practice) I.

Full name of the subject: Szerves kémia (elmélet) I., Szerves kémia (gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Org Chem
English name of the subject: Organic Chemistry (theory) I., Organic Chemistry (practice) I.
German name of the subject: Organische Chemie (Vorlesung+Praktikum) I

Neptun code of the subject: GYKSZK123E1A; GYKSZK123G1A
Type of registration: obligatory
Responsible Department: Semmelweis University, Department of Organic Chemistry

Responsible tutor: **Dr. Petra Dunkel** assistant professor, PhD
 Phone: +36-1-476-3600/53006
 E-mail: dunkel.petra@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Andrea Czompa assistant professor, PhD
Dr. Balázs Balogh assistant professor, PhD
Dr. Levente Kárpáti assistant professor, PhD
Dr. Ruth Deme assistant lecturer, PhD
Dr. Dóra Bogdán assistant lecturer, PhD
Dr. Róbert Ludmerczki assistant lecturer, PhD
Kata Antal assistant lecturer, PhD
Dr. Márton Ivánczi PhD student
Nikolett Varró PhD student

Classes per week: 4 lectures, 4 practices
Credit point(s): 4+4

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The course includes and discusses the state-of the art knowledge of synthetic and structural organic chemistry subjects to develop problem-solving skills for organic chemistry and biomolecular sciences.

Short description of the subject:

To satisfy the requirements of the Faculty of Pharmacy, the course in Organic Chemistry has two main purposes:

- The presentation of modern concepts and subject-matter concerning the structures, syntheses, physical and chemical properties, structure-property relationships, and practical applications of organic compounds, with special emphasis on bioactive molecules. The presentation and practical applications of the most important methods and tools of organic chemistry.
- To provide a solid molecular, organic chemical basis for subsequent subjects in the curriculum of students at the Faculty of Pharmacy.

Course data

Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
3	4	42 (6 hours biweekly)	17,5 (2,5hours biweekly)	–	56+42 +17,5	Autumn semester	upon demand

Program of semester

Topics of theoretical classes (pro week):

1. week: Introduction to Organic Chemistry. MO theory 1. Atomic orbitals, LCAO-MO method, σ and π orbitals, molecular orbitals, delocalisation. MO theory 2. Hybridisation, Lewis-Langmuir theory of bonds, valence bond method, resonance. Conjugation: allyl, pentadienyl system, butadiene and hexatriene electron systems. Classification of organic compounds. Isomers: constitutional and conformational isomers, stereoisomers. Enantiomers and diastereomers.
2. week: Chirality, absolute configuration according to Cahn-Ingold-Prelog. Stereochemistry of organic compounds containing more than one center of chirality. Axial chirality, determination of absolute configuration. Prochiral compounds: alkenes, imines or carbonyl compounds. Tautomerism. Newman and Fischer-projection. Classification of reactions: ionic or radical reactions. Electron-negativity, reactivity of reagents: inductive, mesomeric and steric effects. Kinetic and thermodynamic control.
3. week: Nomenclature of organic compounds I. Alkanes and cycloalkanes: physical properties, preparations, reactions. Mono- and disubstituted cyclohexanes.
4. week: Alkenes: structure, preparations, reactions. Cis-trans isomerization. Addition reactions. Markovnikov and anti-Markovnikov addition. Radical reactions and their mechanism. Addition vs substitution. Polymerisation. Diolefines: structure, cycloaddition reactions, Woodward-Hoffmann rules I.
5. week: Alkynes: structure, preparations, reactions. Nucleophilic addition reactions. Benzene and aromaticity. Extension of the aromatic system. Antiaromatic and non-aromatic structures. SEAr reactions of aromatic compounds. Activating and deactivating groups, direction rules.
6. week: S_NAr reactions of aromatic compounds. Linear free energy relationships. Structure of halogenated hydrocarbons, physical, biological properties, preparations. Nucleophilic substitution reactions: S_N1, S_N2, S_Ni, elimination reactions: E1, E2, E1cB-factors influencing rate of S_N vs. E reactions: substrate, solvent, temperature effects, role of the base, of the leaving group, stereochemical consequences.
7. week: Alcohols, phenols, ethers: structure, preparations. Protecting groups. Acid-base theories. Acidity and basicity of organic compounds. Acid-base reactions.
8. week: Organic sulfur compounds and amines: structure, preparation, physical and chemical properties, more important derivatives.
9. week: Aromatic diazonium and nitro compounds, organophosphorus compounds: structure, preparation, physical and chemical properties

10. week: Nomenclature of organic compounds II. Oxo compounds I: aldehydes and ketones-structure, preparation, physical and chemical properties. Addition to the carbonyl group. (Enolate chemistry I.)
11. week: Carboxylic acids and their derivatives: preparation, reactivity, nucleophilic reactions at the acyl carbon atom, physical, chemical and biological properties. (Enolate chemistry II.)
12. week: Substituted carboxylic acids, dicarboxylic acids and their derivatives. Synthetic applications of ethyl acetoacetate and diethyl malonate.
13. week: Amino acids: preparation, physical and chemical properties. Peptides: preparation and the determination of the amino acid sequence. Proteins. Carbohydrates I.
14. week: Carbohydrates II. Carbonic acid and derivatives.

Topics of practical classes (pro week):

1. week: –
2. week: Tautomerism and mesomerism, type of isomers, mesomer resonance structures, hybridisation states. Conformational isomerism of n-butane, stereochemistry. Chirality, nomenclature of chiral compounds, Fischer projection of amino acids. Prochirality, constitutopic, homotopic, enantiotopic and diastereotopic atoms, groups and surfaces. Classification of reagents: electrophilic, nucleophilic and radical. Type of organic reactions.
3. week: Introduction into cheminformatics.
4. week: Substituted cyclohexane derivatives, chair conformers and relationship among them. Radical halogenation of alkanes, preparation of substituted olefins, addition reactions and their stereochemistry. Molecularity and kinetic order, kinetic and thermodynamic control. Aromatic, antiaromatic and non-aromatic systems. Synthesis of aromatic hydrocarbons, reactions of aromatic compounds.
5. week: Recrystallization of 4-bromoacetanilide. Melting point determination (presentation).
6. week: Stereochemistry of S_N2 and S_E2 reactions and interpretation of the transition state. Aliphatic and aromatic hydroxyl and halogen compounds: basic properties of substitution and elimination reactions and their mechanism.
7. week: Preparation and recrystallization of 4-bromoacetanilide.
8. week: Preparations, applications and reactions of quinones and ethers. Organic sulfur compounds, preparations of sulfonamides, reactions. Chemical properties of amines, basicity, preparations, reactions, diazotation.
9. week: Benzocaine

10. week: Aldehydes and ketones. Addition to the carbonyl group. Reactions of α -hydrogen of aldehydes and ketones.
11. week: (E,E)-1,5-diphenylpenta-1,4-diene-3-one
12. week: Reactivity of carboxylic acids and their derivatives (acylation), reactions involving α -hydrogen.
13. week: Chromatography (thin-layer chromatography, column chromatography)
14. week: Supplement. Inventory Amino acids, peptides, proteins. Carbohydrates, carbonic acid derivatives
- Schedule of consultations: as many times as students ask for consultation, at least 1 week before the date of consultation

Course requirements

Prerequisites: GYASKASKE2A General and inorganic chemistry II.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

At the mid-term tests (two/semester) students have to answer in a written form questions on the subject-matter of the main lectures, the practicals and the seminars, the dates of which are fixed at the beginning of the semesters. The value of the midterm test can be either ranging 2-5 or failed. If the test is failed or the student did not attend it, the student must attend the following makeup test. If the makeup test is failed, a second makeup test should be written. If any of the makeup tests reach the passmark, then the midterm test is accepted. If also the second makeup test is failed, the student does not get signature for the semester, they are not allowed to sit in the semi-final examination. Grades for the main and makeup mid-term tests of the same topic are not averaged.

If necessary, students may make up for missed or unsuccessful experiments at a proper time after preliminary agreement with the leading instructor at the end of the semester. Without permission, the repetition of unsuccessful experiments is not allowed. Course material for the seminars (problem sets) are provided in advance to the students. Students are expected to consult these materials before the respective seminars. Attendance is mandatory at the seminars. Missed seminars could be attended at the same week (with another group) upon prior permission from the leading instructor. If anyone has 2 or more absences from the seminars, they must pass a report from the topics of missing seminars, and this report must be accepted. Attendance on at least 75% of the practical course necessary for the signature by the end of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Lecture: two written mid-terms tests at the 8th and 12th week of the semester, each followed by two makeup opportunities

Practice: At the beginning of each laboratory practical, students must write a short test on the theoretical and practical subject-matter of the experiment. These tests are immediately corrected by the leading instructor, and the practical work can be started only if the short test is accepted. If the test is not successful, the preparation in question can be performed only at the end of the semester. Two written mid-terms tests at the 8th and 12th week of the semester, each followed by two makeup opportunities.

Requirements of signature: at least grade 2 at each of the mid-term tests, passmark for the practical course

At the mid-term tests (two/semester) students have to answer in a written form questions on the subject-matter of the main lectures, the practicals and the seminars, the dates of which are fixed at the beginning of the semesters. The value of the midterm test can be either ranging 2-5 or failed. If the test is failed or the student did not attend it, the student must attend the following makeup test. If the makeup test is failed, a second makeup test should be written. If any of the makeup tests reach the passmark, then the midterm test is accepted. If also the second makeup test is failed, the student does not get signature for the semester, they are not allowed to sit in the semi-final examination. Grades for the main and makeup mid-term tests of the same topic are not averaged. On the basis of the attendance and the results described in the protocol, the performance of the practical tasks is validated by the signature of the leading instructor. At least 75% of the compounds or experiments must be graded as acceptable. Evaluation of the compounds is based on their yield and purity, and the average of the marks for each preparation gives the preparation mark. The appropriate parts of the laboratory note-book should be prepared in advance and after the completion of each practical, the note-book should be submitted to the leading instructor, together with the product of the experiment.

Number and type of projects students have to perform independently during the semester and their deadlines: mid-term tests, completing practicals

Type of the semester-end examination: Lecture: semi-final, Practice: practical grade

Form of the semester-end examination: written examination

Scientific, course related researches, publications, assays:

1. F.A. Carey, R.M. Giuliano: Organic Chemistry, 10th Ed. McGraw Hill: New York, 2016 ISBN 0073511218
2. T.W.Gr. Solomons, C.B. Fryhle, S.A. Snyder: Organic Chemistry, 12th Ed. John Wiley & Sons, Inc., 2016 ISBN 1118875761 M. Jones, Jr., S.A. Fleming: Organic chemistry, 5th Ed. Norton Science Co., 2014 978-0-393-91303-3
3. Experimental Organic Chemistry for students at the 2nd year of the Faculty of Pharmacy Compiled by teaching staff of Department of Organic Chemistry under the supervision of Péter Mátyus Department of Organic Chemistry, 2012
4. Gábor Krajsovsky: Heterocyclic compounds Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry Budapest, 2018 <http://mek.oszk.hu/19100/19197>
5. László Szabó, Gábor Krajsovsky: Isomerism in Organic Compounds Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry Budapest, 2017 <http://mek.oszk.hu/17200/17283/>
6. Gábor Krajsovsky: Collection of Organic chemical problems Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry Budapest, 2017 <http://mek.oszk.hu/17200/17281/?from=rss>
7. World of Molecules II Compiled by Péter Mátyus, contribution by Gábor Krajsovsky, formatted by Balázs Balogh, Department of Organic Chemistry, Semmelweis University, matyus.peter@pharma.semmelweis-univ.hu (2011) Pázmány Péter Katolikus Egyetem, Semmelweis Egyetem és a Dialóg Campus Kiadó-Nordex Kft. által alkotott konzorcium http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_A_molekulak_vilaga_II/adatok.html
8. Organic and Biochemistry, Part: Organic Chemistry Compiled by Péter Mátyus, contribution by Gábor Krajsovsky, formatted by Balázs Balogh, Department of Organic Chemistry, Semmelweis University, matyus.peter@pharma.semmelweis-univ.hu (2011) Pázmány Péter Katolikus Egyetem, Semmelweis Egyetem és a Dialóg Campus Kiadó-Nordex Kft. által alkotott konzorcium http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_Szerves_es_biokemia/adatok.html
9. J. Clayden, N. Greeves, S. Warren: Organic chemistry (paperback) Oxford University Press, 2012 ISBN 978-0-19-927029-3
10. J. Clayden, S. Warren: Solutions manual to accompany organic chemistry (paperback) Oxford University Press, 2013 ISBN 9780199663347
11. A. Corbella, E. Marcantoni, G. Renzi: Seminars in Organic Synthesis. Royal Society of Chemistry, 2011 ISBN 978-88-86208-64-2
12. J.W. Zubrich: The Organic Chem Lab Survival Manual. A Student's Guide to Techniques. John Wiley & Sons, Inc., 2012 ISBN 978-1-118-08339-0
13. K.L. Williamson, K.M. Masters: Techniques Labs for Macroscale and Microscale Organic Experiments. Brooks Cole 2016, 7th Ed ISBN 1305577191
14. E. Pretsch, P. Bühlmann, M. Badertscher: Structure Determination of Organic Compounds. Springer-Verlag, Berlin • Heidelberg, 2009 ISBN 3540938095

Necessary equipment: laboratory glassware (students' laboratory), reagents and further technical equipment for synthetic work

Physiology (theory) I., Physiology (practice) I.

Full name of the subject: Élettan (elmélet) I., Élettan (gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Physiology (theory) I., Physiology (practice) I.
German name of the subject: Physiologie (Vorlesung) I., Physiologie (Praktikum) I.

Neptun code of the subject: GYKTLM124E1A, GYKTLM124G1A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Translational Medicine

Responsible tutor: *Dr. Zoltán Benyó* Director, professor, PhD, DSc
E-Mail: benyo.zoltan@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Zoltán Benyó Professor, PhD, DSc
Dr. Tamás Ivanics Associate professor, PhD
Dr. Zsuzsanna Miklós Associate professor, PhD
Dr. Margittai Éva Assistant professor, PhD
Dr. Éva Ruisanchez Assistant professor, PhD
Dr. Monori-Kiss Anna Assistant professor, PhD
Dr. Éva Pál Assistant lecturer, PhD
Dr. László Hricisák Assistant lecturer, PhD
Dr. Ákos Zsembery Associate professor, PhD

Classes per week: 4 lectures, 2 practices
Credit point(s): 4 (theory) + 1 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The goal is to teach physiological processes from subcellular, cellular and tissue-level processes all the way to complex regulation on the organism level, including studies in humans. Special emphasis is laid on the presentation of complex adaptation processes playing an important role in health preservation, and on studying how physiological regulatory processes respond to changes in the external or internal environment.

Short description of the subject:

Theoretical lectures and practices are held every week. Seminars/Practices are for discussion of ongoing new lecture material and performing relevant physiological measurements in small groups. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars. Students are required to take 6 written exams in each semester, and a lab exam at the end of the semester. Based on the results of the tests and the lab exam students get a lab work grade at the end of the semester. Students take a written theoretical examination in the exam period.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
3	56	28			84	Autumn semester	

Program of semester

I. Lecture topics/week

1. week: Historic overview, concepts of physiological control, homeostasis. Cell membrane. Basics in cell physiology. Signal transduction. Secondary messenger mechanisms.
2. week: Ionic equilibria and resting membrane potentials, ion channels and gates. Action potentials. Synaptic transmission.
3. week: Muscle. Contractile mechanism. Skeletal, cardiac, and smooth muscles. Biomechanics, electrical properties, metabolism. Structure and general functional characteristics of the autonomic nervous system. Vegetative transmitters.
4. week: Functional organization of the cardiovascular system. Dynamics of blood flow. Physiological functions of the blood vessels, their significance in the healthy functioning of the organism.
5. week: Principles of hemodynamics. Rheology of blood. Pressure and flow in large vessels. Circulatory resistance. Measurement of pressure, flow and cardiac output. Physiology of the venous system. Microcirculation. Control of lymphatic flow and interstitial fluid volume.
6. week: Biomechanical basis of cardiac functions. Cardiac pump. Signal transduction in the cardiomyocyte. Cardiac cycle. Electrical activity of the heart.
7. week: Conduction in cardiac fibers, cardiac excitability, cardiac rhythmicity, electrocardiography.
8. week: Cardiovascular control mechanisms. Local control mechanisms. Systemic control mechanisms.
9. week: Control of cardiac output. Circulation through organs and special regions. Coronary circulation. Circulation of blood and cerebrospinal fluid in the brain.
10. week: Splanchnic circulation. Circulation through skeletal muscles. Circulation of the skin. Physiology of respiration. Structure and function of the respiratory system, pulmonary mechanics.
11. week: Gas transport between the lungs and the tissues. Types of hypoxia. Regulation of respiration. Neural and chemical control of respiration. Adaptation of cardiorespiratory system and skeletal muscle to physical exercise.
12. week: Formation and excretion of urine. Structures of the kidneys and the nephron. Renal circulation. Glomerular filtration. Tubular functions. Mechanisms adjusting the composition of urine.
13. week: Fluid compartments. Regulation of extracellular fluid composition and volume.
14. week: Role of the kidneys in the control of blood pressure. Micturition. Physiological aspects of different forms of circulatory shock.

Topics of practical classes (pro week):

II. Practice topics/week

Seminars are held every even week (1x45 min) and are for discussion of ongoing new lecture material. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars.

Practices are held every uneven week (3x45 min), and students are required to carry out relevant physiological measurements in small (2-3 persons) groups.

1. week: Introduction. Study of the electrical properties of the neurons in a simulatory setting (Sim Neuron)
2. week: Written test and consultation of the previous week's theoretical material
3. week: Electroneurography, measurement of the impulse conduction velocity of a motor nerve.
4. week: Written test and consultation of the previous weeks' theoretical material
5. week: Electromyography, study of the electrical properties of the skeletal muscle
6. week: Written test and consultation of the previous weeks' theoretical material
7. week: Blood pressure measurement
8. week: Written test and consultation of the previous weeks' theoretical material
9. week: ECG
10. week: Written test and consultation of the previous weeks' theoretical material
11. week: Spirometry
12. week: Written test and consultation of the previous weeks' theoretical material
13. week: Retake lab, exam consultation
14. week: Practical exam.

Schedule of consultations: Consultations take place on every even week

Course requirements

Prerequisites: Anatomy GYKANT118E1M, Biology II. GYKGEN109E2M

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Seminars are held every even week (1x45 min) and are for discussion of ongoing new lecture material. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars. Students are required to take 6 written exams in each semester. Passing level is 50% of the maximum points. Absence from a seminar yields grade 1 (fail) for that week. The worst grade of the 6 seminar tests is omitted from the calculation of the Lab Work Grade. Students are required to write at least 4 seminar tests, and achieve at least 2,0 average on these tests to become eligible for the semifinal or final exam.

Practices are held every uneven week (3x45 min), and students are required to carry out relevant physiological measurements in small (2-3 persons) groups. Practices are obligatory. Missing 25% of the practice time (7 hours practice time) results in denial of admission to the semifinal or final exam. A retake opportunity is provided for the students to make up for missed practices at the end of the semester. Students are required to take a lab exam at the end of the semester. Only those students can be admitted to the lab exam who completed at least 5 lab practices.

Based on the results of the seminar tests and the lab exam students get a Lab Work Grade at the end of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

The theoretical knowledge of the students is tested systematically in a written form on the seminars. The form of the test can be quiz or multiple-choice type questions. Students are required to take 6 written exams in each semester. Passing level is 50% of the maximum points. Absence from a seminar yields grade 1 (fail) for that week. The worst grade of the 6 seminar tests is omitted from the calculation of the Consultation Grade.

Requirements of signature:

The worst grade of the 6 seminar tests is omitted from the calculation of the Consultation Grade. The results of the remaining 5 tests are averaged to yield the Consultation Grade, which must be at least 2,0 to get the signature for the semester and become eligible for the semifinal or final exam.

Students are required to take a lab exam at the end of the semester. Only those students can be admitted to the lab exam who completed at least 5 lab practices.

Based on the Consultation Grade and the result of the lab exam students get a Lab Work Grade at the end of the semester. The Lab Work Grade is calculated by averaging the Consultation Grade and the result of the lab exam (50-50%).

Further requirements of the signature at the end of the semester is to participate on at least 75% of the practices.

Type of the semester-end examination: practical grade, semi-final

Form of the semester-end examination: written exam

Scientific, course related researches, publications, essays:

Dee Unglaub Silverthorn: Human Physiology – An Integrated Approach, 8th edition (Pearson Education, 2019)

Guyton and Hall: Textbook of Medical Physiology 13th Edition (Elsevier, 2016)

Ganong's Review of Medical Physiology 26th Edition (McGraw-Hill & Lange, 2019)

A. Fonyó: Principles of Medical Physiology (Medicina Publishing House, 2002)

Biochemistry (theory+practice) I.

Full name of the subject: **Biokémia I.**
Program: **undivided program (pharmaceutical)**
Schedule: **full-time**
Short name of the subject: **English name of the subject: Biochemistry (theory+practice) I.**
German name of the subject: **Biochemie (Vorlesung+Praktikum)**

Neptun code of the subject: GYKBT069G1A
Type of registration: obligatory
Responsible department: Department of Biochemistry of Semmelweis University

Responsible tutor: **Dr. Attila Ambrus** Ph.D.
Phone: 459-1500/60050
E-mail: ambrus.attila@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
András Szöllősi Ph. D.
Zsófia Komáry Ph. D.
Olivér Ozohanics Ph. D.
Bálint Nagy Pharm. D.
Erzsébet Maróthy Tóth Pharm. D.

Classes per week: 1,5 lectures, 1,5 practices
Credit point(s): 2

Professional content, intent of acquirement and its function in order to implement the goals of the program:
The main goal of this course is to introduce students to the mechanisms of human biochemical processes at the molecular level. The program is designed to also provide a broader insight into physiological processes that enables students to connect all their previous studies to metabolic processes, and also provides them with the basic knowledge to understand mechanisms of drug action discussed later in Pharmacology. The skills and knowledge acquired in this program is inevitable for modern rational drug design.

Short description of the subject:
Protein structure, protein analysis. Characteristics, structure, kinetics, regulation of enzymes. Glycolysis and gluconeogenesis. PDH, citric acid cycle, oxidative phosphorylation.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
3	21	21	–	–	42	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

Week 1: Protein composition and structure
 Week 2: Protein purification, analysis
 Week 3: Myoglobin and hemoglobin
 Week 4: Basic concepts and kinetics of enzymes
 Week 5: Enzyme kinetics
 Week 6: Enzyme catalytic strategies
 Week 7: Enzyme regulatory strategies,
 Week 8: High group transfer potential compounds
 Week 9: Glycolysis, gluconeogenesis: reactions, isoenzymes, enzyme deficiencies
 Week 10: Glycolysis, gluconeogenesis regulation, Pasteur-effect, catabolic and anabolic significance
 Week 11: PDHC, citric acid cycle: reactions, enzyme defects
 Week 12: Citric acid cycle: regulation, catabolic and anabolic significance, anaplerotic reaction
 Week 13: Respiratory chain: components, operation; ATP synthase
 Week 14: Oxidative phosphorylation, shuttles, transporters

Topics of practical classes (pro week):

Week 1: ASAT and ALAT activity
 Week 3: Purification of trypsin by affinity chromatography
 Week 5: Lactate dehydrogenase polyacrylamide gel electrophoresis
 Week 7: Determination of blood sugar level
 Week 9: Hemostasis: prothrombin time, partial thromboplastin time, fibrin stability
 Week 11: Determination of serum TAG and cholesterol
 Week 13: Succinate dehydrogenase activity

Schedule of consultations: upon mutual agreement

Course requirements

Prerequisites: General and inorganic chemistry II. GYKASK106E2A, Biology II. GYKGEN109E2A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: Less than two absences from the practice. Justification of absence is not required.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

two obligatory written midterm examinations with retakes

Requirements of signature: both midterms to be successful

Type of the semester-end examination: signature/practical grade/semi-final/final

Scientific, course related researches, publications, assays:

Berg-Tymoczko-Stryer: Biochemistry 9th edition

lecture slides with personal lecture notes

Hungarian Pharmaceutical Terminology (practice) III.

Full name of the subject: Magyar gyógyszerészeti szaknyelv (gyakorlat) III.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Hung. Pharm. Term. III.
English name of the subject: Hungarian Pharmaceutical Terminology (practice) III.
German name of the subject: Pharmazeutische Fachsprache Ungarisch (Praktikum) III.

Neptun code of the subject: GYKLEK155G3A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Languages for Specific Purposes

Responsible tutor: Alexandra Bakó language teacher
E-mail: bako.alexandra@se-etk.hu

Name of the persons responsible for the teaching of the subject:
Borda Szandra language teacher
Nagyné Górász Judit language teacher
Kovács Ildikó language teacher
Nagy Borbála language teacher
Tóth Vera language teacher
Tóth Zsuzsanna language teacher

Classes per week: 2 practices
Credit point: 1

Professional content, intent of acquirement and its function in order to implement the goals of the program:
The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies.

Short description of the subject:
The third semester is dedicated to learning how to communicate with clients and colleagues at the pharmacy. Students acquire basic structures and the vocabulary for describing the characteristics of medicines. The course places special emphasis on functional language needed for obtaining and providing information, giving recommendations and instructions and on phrases needed in basic communication at a pharmacy. The semester also focuses on preparing students for the final exam (both written and oral) at the end of the 4th semester.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
3	0	28	–	–	28	Autumn semester	–

Program of semester

Topics of practical classes (pro week):

Week 1	Types of medicines
Week 2	Effect of medicines
Week 3	General instructions
Week 4	Instructions about specific forms of medicines
Week 5	Possible side effects
Week 6	Symptoms and treatment of common UTIs
Week 7-8	Symptoms and treatment of common children's diseases
Week 9-10	Symptoms and treatment of respiratory conditions
Week 11-12	Symptoms and treatment of cardiovascular conditions
Week 13	Revision
Week 14	Final test (written and oral)

Schedule of consultations: Individual consultations by email or in person on meeting formerly agreed upon with the teacher via email.

Course requirements

Prerequisites: GYKLEK155G2A Hungarian Pharmaceutical Terminology II.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: An attendance of 75% minimum is required to get the signature.

The student must have a minimum average of 2.00 based on the tests in class to pass the subject.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Beside the final test the teacher may evaluate the students' performance with the help of short tests.

Requirements of signature: An attendance of 75% minimum and taking the final test.

Number and type of projects students have to perform independently during the semester and their deadlines:

homework in the forms of language practice tasks

Type of the semester-end examination: signature

Form of the semester-end examination: written and oral

List of teaching materials (List of textbooks, hand-outs, scripts, etc.):

Marthy A. & Végh Á. Egészségére! Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.

Physical Education III.

Full name of the subject: Testnevelés III.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: P. E. III.
English name of the subject: Physical Education III.
German name of the subject: Sport III

Neptun code of the subject: GYKTSI116G3A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: **Várszegi, Kornélia** director
Phone: +36-1/264-1408
E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Doharné Buczkó, Anikó P.E. teacher
Farkas, Dominika P.E. teacher
Kalmus, Dániel P.E. teacher
Lehel, Zsolt P.E. teacher
Sótonyiné Hrehuss, Nóra P.E. teacher
Várszegi, Kornélia P.E. teacher
Weisz, Miklós P.E. teacher

Classes per week: 1 practice
Credit point: 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:
One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Short description of the subject:
The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behavior.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
3. semester	0	14	–	–	14	Autumn semester	–

Program of semester

Topics of practical classes (pro week):

- 1st week: General information
Health and Safety, Fire and Environmental protection. The mid-year adoption requirements, the construction of the classes and the presentation of the university recreational and sports opportunities for extra-curricular activities. Heart rate measurement exercises. Ruffier test and evaluation of the results.
- 2nd week: Athletic
Differend athletic exercises like throwing, shot put. Preferably outdoors with the aim of learn how to exetute the exercise with a proper form and breathing technique.
- 3rd week: Tennis
Introducing and learning advanced technical elements (serve, volley) and game.
- 4th week: Agility ladder
To perform different exercises to improve speed, balance and concentration. Preferably outdoors, on grass ground.
- 5th week: Relay race and competitive games
To improve explosiveness, skills and experience good team spirit.
- 6th week: Football
Practicing the technical elements of football in pairs and game situation.
- 7th week: Circuit training
Functional exercises with bodyweight and exercises with basic equipments to improve general coordination skills.
- 8th week: Badminton
Introducing the technical and tactical elements of doubles game. Game applying all the previously known rules.
- 9th week: Ruffier test
Comparing the results with the previously recorded one to bring the importance of the health of the cardiovascular system to the attention.
- 10th week: Meta
Reminders of the basic need to know about META. Learn tactical elemnts of the game and using them. Aim to improve ball skill development, reaction time, explosiveness and collective gaming experience.
- 11th week: Obstacle course
To complete a built up obstacle course using differend creepping- climbing,hovering, pulling,skipping, throwing techniques for general skill developement.
- 12th week: Mobilisation
Dinamic stretching exercises with and without equipment to prevent the health of the joints by maintaining and developing the mobility of it.
- 13th week: Skipping rope
Skill developing exercises with skipping rope individually and in pairs, in place and in motion at different levels.
- 14th week: Kettlebell
Different kind of strenghtening exercises with kettlebell.
Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball)

Course requirements

Prerequisites: –

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The number of active participations for physical education classes is 10 (for trainings 15 times!), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence

registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage. Requirements of signature: Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

4. SEMESTER

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Biochemistry (theory) II. GYKBM069E2A	3	–	3	Biochemistry I., Organic Chemistry I.	final*
Organic Chemistry (practice) II. GYKSZK123G2A	–	4	4	Organic Chemistry I.	practical mark
Organic Chemistry (theory) II. GYKSZK123E2A	4	–	4		final*
Physiological Pharmaceutics and Pharmaceutical dosage forms(theory+practice) GYKGYI073G1A	2	2	3	Physiology I., Physic. Chem. for Pharm., History of Pharm. and Prop.	practical mark
Physiology (practice) II. GYKTLM124G2A	–	2	1	Physiology I., Biochemistry I.	practical mark
Physiology (theory) II. GYKTLM124E2A	6	–	6		final*
Biotechnology (theory) GYKGYI074E1A	1	–	1	Biochemistry I.	semi-final
Nanotechnology (theory+practice) GYKGYI078G1A	2	2	4	Colloid Chemistry	practical mark
Pharmacy Practice I. GYKANG238G1A	–	20/semester	–	Analytical Chemistry II., Pharmaceutical Terminology	signature
Hungarian Pharmaceutical Terminology (practice) IV. GYKLEK155G4A	–	2	3	Hungarian Pharmaceutical Terminology (practice) III.	final
Physical Education IV. GYKTSI116G4A	–	1	–		signature
Summer Practice I. GYSSZG234G1A (1 week) GYSSZG234G2A (2 weeks) GYSSZG234G3A (3 weeks) GYSSZG234G4A (4 weeks)	–	40/week (1/2/3/4 weeks)	1/2/3/4 depending on the number of the weeks	Organic Chemistry II., Analytical Chemistry II.	practical mark elective subject
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	18	13 +20/semester +40/week	29 +1/2/3/4		

* Counts to the qualification of the diploma

Biochemistry (theory) II.

Full name of the subject: **Biokémia II.**
Program: **undivided program (pharmaceutical)**
Schedule: **full-time**
Short name of the subject: **Biochemistry II.**
English name of the subject: **Biochemistry (theory) II.**
German name of the subject: **Biochemie (Vorlesung) II**

Neptun code of the subject: GYKBMT069E2A
Type of registration: obligatory
Responsible department: Department of Biochemistry of Semmelweis University

Responsible tutor: **Dr. Attila Ambrus** Ph.D.
E-mail: ambrus.attila@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Jordan Jordanov Ph. D.
Dr. István Léránt Ph. D.
Dr. László Tretter Ph. D., D. Sc.
Dr. Krasimir Kolev
Dr. Erzsébet Maróthy Tóth Ph. D., D. Sc. Pharm. D.

Classes per week: 3 lectures
Credit point: 3

Professional content, intent of acquirement and its function in order to implement the goals of the program:
The main goal of this course is to introduce students to the mechanisms of human biochemical processes at the molecular level. The program is designed to also provide a broader insight into physiological processes that enables students to connect all their previous studies to metabolic processes, and also provides them with the basic knowledge to understand mechanisms of drug action discussed later in Pharmacology. The skills and knowledge acquired in this program is inevitable for modern rational drug design.

Short description of the subject:
Metabolism of carbohydrates, lipids, amino acids and nucleotides. Regulation of the biochemical pathways. Enzyme defects. Pharmacological targets. Integration of metabolism between the organs. Synthesis and degradation of neurotransmitters. Hemostasis, blood coagulation and fibrinolysis.

Course data							
Recommen- ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
4	42	0			42	Spring semester	

Program of semester

Topics of theoretical classes (pro week):

- Week 1: Digestion and absorption of carbohydrates. Metabolism of fructose and galactose, enzyme defects; Pentose phosphate pathway: reactions, regulation, significance
- Week 2: Uronic acid pathway: significance; Metabolism of glycogen, reactions, regulation
- Week 3: Degradation of saturated, unsaturated, even- and odd-chained fatty acids; Metabolism of ketone bodies; Synthesis of fatty acids, regulation
- Week 4: Elongation and desaturation of fatty acids; Synthesis of eicosanoids; Digestion of lipids; Degradation of triglycerides and phospholipids; Fatty acid transporters; The role of lipids in signal transduction
- Week 5: Synthesis of triglycerides and phospholipids; Metabolism of lipoproteins, hyperlipoproteinaemias
- Week 6: Synthesis of cholesterol, its regulation; Transport of cholesterol; Pharmacological targets; Synthesis of bile acids, enterohepatic circulation
- Week 7: Synthesis of steroid hormones; Digestion of proteins, amino acid transporters
- Week 8: Urea cycle: reactions, regulation, enzyme defects; Degradation of amino acids; Glucoplastic and ketoplastic amino acids; Synthesis of amino acids; Molecules derived from amino acids
- Week 9: Synthesis, degradation and salvage reactions of nucleotides; Pharmacological targets
- Week 10: Metabolic integration: red blood cell, adipocyte, heart, skeletal muscle
- Week 11: Metabolic integration: brain, kidney, liver in well-fed and fasting states
- Week 12: Synthesis and degradation of neurotransmitters, receptor types
- Week 13: Hemostasis: blood coagulation, role of thrombocytes, pharmacological targets
- Week 14: Hemostasis: fibrinolysis; role of endothelium and liver. Pharmacological targets

Schedule of consultations: on demand

Course requirements

Prerequisites: Biochemistry I. GYKBMT069G1A, Organic chemistry I. GYKSZK123G1A, GYKSZK123E1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: two obligatory midterm tests

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Two midterm exams will be held in the Moodle system. The first midterm exam will take place on week 7, the material is Carbohydrates and Lipids discussed in the lectures before week 7. The second midterm will take place on week 13, the material is the remaining lipid metabolism, amino acid and nucleotide metabolism, metabolic integration. Retake may be written after each midterm exam for the students who missed the midterm.

Requirements of signature: writing of two midterm exams

Number and type of projects students have to perform independently during the semester and their deadlines: –

Type of the semester-end examination: final

Form of the semester-end examination: written test in the Moodle system (together with oral part in case of distance exam)

Scientific, course related researches, publications, assays:

Berg-Tymoczko-Stryer: Biochemistry 9th edition

lecture slides with personal lecture notes

Organic Chemistry (theory) II., Organic Chemistry (practice) II.

Full name of the subject: Szerves kémia (elmélet) II., Szerves kémia (gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Org Chem II.
English name of the subject: Organic Chemistry (theory) II., Organic Chemistry (practice) II.
German name of the subject: Organische Chemie (Vorlesung+Praktikum) II

Neptun code of the subject: GYKSZK123E2A; GYKSZK123G2A
Type of registration: obligatory
Responsible Department: Semmelweis University, Department of Organic Chemistry

Responsible tutor: **Dr. Petra Dunkel** assistant professor, PhD
 Phone: +36-1-476-3600/53006
 E-mail: dunkel.petra@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Andrea Czompa assistant professor, PhD
Dr. Balázs Balogh assistant professor, PhD
Dr. Levente Kárpáti assistant professor, PhD
Dr. Ruth Deme assistant lecturer, PhD
Dr. Dóra Bogdán assistant lecturer, PhD
Dr. Róbert Ludmerczki assistant lecturer, PhD
Kata Antal assistant lecturer, PhD
Dr. Márton Ivánczi PhD student
Nikolett Varró PhD student

Classes per week: 4 lectures, 4 practices
Credit point(s): 4+4

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The course includes and discusses the state-of the art knowledge of synthetic and structural organic chemistry subjects to develop problem-solving skills for organic chemistry and biomolecular sciences.

Short description of the subject:

To satisfy the requirements of the Faculty of Pharmacy, the course in Organic Chemistry has two main purposes:

- The presentation of modern concepts and subject-matter concerning the structures, syntheses, physical and chemical properties, structure-property relationships, and practical applications of organic compounds, with special emphasis on bioactive molecules. The presentation and practical applications of the most important methods and tools of organic chemistry.
- To provide a solid molecular, organic chemical basis for subsequent subjects in the curriculum of students at the Faculty of Pharmacy.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
4	56	42 (6 hours biweekly)	17,5 (2.5 hours biweekly)	–	56+56	Spring semester	upon demand

Program of semester

Topics of theoretical classes (pro week):

1. week: Carbon-carbon bond forming reaction with palladium catalysis, organometallic compounds of zinc and magnesium. Inter- and intramolecular reactions.
2. week: Heterocyclic nomenclature. Heterocyclic and heteroaromatic compounds.
3. week: π -Excessive aromatic heterocyclic compounds I.
4. week: π -Excessive aromatic heterocyclic compounds II.
5. week: π -Excessive aromatic heterocyclic compounds III.
6. week: π -Excessive aromatic heterocyclic compounds IV.
7. week: π -Excessive aromatic heterocyclic compounds V. π -Deficient aromatic heterocyclic compounds I.
8. week: π -Deficient aromatic heterocyclic compounds II.
9. week: π -Deficient aromatic heterocyclic compounds III. Heterocyclic polyenes.
10. week: Nucleosides, nucleotides and nucleic acids. Natural compounds: alkaloids I.
11. week: Natural compounds: alkaloids II. Terpenes, steroids, representatives of the classes, further natural products.
12. week: Natural compounds. Stereochemistry.
13. week: Stereochemistry of the citric acid cycle. Vitamins.
14. week: Sulfonamides. Woodward-Hoffmann rules II. Diels-Alder reaction.

Topics of practical classes (pro week):

1. week: –
2. week: Nomenclature examples from semester I-II, nomenclature of heterocyclic compounds.
3. week: Chemical bibliography and databases.
4. week: Heterocyclic compounds – advanced synthetic routes and reaction pathways. 3-, 4- and 5-membered heterocycles.
5. week: Diethyl-(3,5-dimethylpyrrole-2,4-dicarboxylate).
6. week: Heterocyclic compounds – advanced synthetic routes and reaction pathways. 6-, 7- and 8-membered heterocycles.
7. week: Cyclohexanone oxime and phthalimide.
8. week: Natural compounds: alkaloids.
9. week: 4-Nitrobenzoic acid.
10. week: Isoprenoids and steroids-structure and preparations.
11. week: Acetylsalicylic acid.
12. week: Solving of advanced organic chemistry problems, vitamins, citrate cycle.
13. week: Purification of ethyl acetate.
14. week: Supplement. Inventory. Sulfonamides, stereochemistry, Woodward-Hoffmann rules, solving of organic chemistry problems from semester I-II.

Schedule of consultations: as many times as students ask for consultation, at least 1 week before the date of consultation

Course requirements

Prerequisites: GYKSZK123E1A Organic chemistry (theory) I.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

At the mid-term tests (two/semester) students have to answer in a written form questions on the subject-matter of the main lectures, the practicals and the seminars, the dates of which are fixed at the beginning of the semesters. The value of the midterm test can be either ranging 2-5 or failed. If the test is failed or the student did not attend it, the student must attend the following makeup test. If the makeup test is failed, a second makeup test should be written. If any of the makeup tests reach the passmark, then the midterm test is accepted. If also the second makeup test is failed, the student does not get signature for the semester, they are not allowed to sit in the semi-final examination. Grades for the main and makeup mid-term tests of the same topic are not averaged.

If necessary, students may make up for missed or unsuccessful experiments at a proper time after preliminary agreement with the leading instructor at the end of the semester. Without permission, the repetition of unsuccessful experiments is not allowed. Course material for the seminars (problem sets) are provided in advance to the students. Students are expected to consult these materials before the respective seminars. Attendance is mandatory at the seminars. Missed seminars could be attended at the same week (with another group) upon prior permission from the leading instructor. If anyone has 2 or more absences from the seminars, they must pass a report from the topics of missing seminars, and this report must be accepted. Attendance on at least 75% of the practical course necessary for the signature by the end of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

two written mid-term tests at the 8th and 12th week of the semester, each followed by two makeup opportunities

Practice: At the beginning of each laboratory practical, students must write a short test on the theoretical and practical subject-matter of the experiment. These tests are immediately corrected by the leading instructor, and the practical work can be started only if the short test is accepted. If the test is not successful, the preparation in question can be performed only at the end of the semester. Two written mid-terms tests at the 8th and 12th week of the semester, each followed by two makeup opportunities

Requirements of signature: at least grade 2 at each of the mid-term tests, passmark for the practical course

At the mid-term tests (two/semester) students have to answer in a written form questions on the subject-matter of the main lectures, the practicals and the seminars, the dates of which are fixed at the beginning of the semesters. The value of the midterm test can be either ranging 2-5 or failed. If the test is failed or the student did not attend it, the student must attend the following makeup test. If the makeup test is failed, a second makeup test should be written. If any of the makeup tests reach the passmark, then the midterm test is accepted. If also the second makeup test is failed, the student does not get signature for the semester, they are not allowed to sit in the semi-final examination. Grades for the main and makeup mid-term tests of the same topic are not averaged. On the basis of the attendance and the results described in the protocol, the performance of the practical tasks is validated by the signature of the leading instructor. At least 75% of the compounds or experiments must be graded as acceptable. Evaluation of the compounds is based on their yield and purity, and the average of the marks for each preparation gives the preparation mark. The appropriate parts of the laboratory note-book should be prepared in advance and after the completion of each practical, the note-book should be submitted to the leading instructor, together with the product of the experiment.

Number and type of projects students have to perform independently during the semester and their deadlines: mid-term tests, completing practicals

Type of the semester-end examination:

Lecture: final

Practice: practical grade

Form of the semester-end examination: written examination

Scientific, course related researches, publications, essays:

1. F.A. Carey, R.M. Giuliano: Organic Chemistry, 10th Ed.
McGraw Hill: New York, 2016
ISBN 0073511218
2. T.W.Gr. Solomons, C.B. Fryhle, S.A. Snyder: Organic Chemistry, 12th Ed.
John Wiley & Sons, Inc., 2016
ISBN 1118875761
3. M. Jones, Jr., S.A. Fleming: Organic chemistry, 5th Ed.
Norton Science Co., 2014
978-0-393-91303-3
4. Experimental Organic Chemistry for students at the 2nd year of the Faculty of Pharmacy Compiled by teaching staff of Department of Organic Chemistry under the supervision of Péter Mátyus
Department of Organic Chemistry, 2012
5. Gábor Krajsovsky: Heterocyclic compounds
Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry
Budapest, 2018
<http://mek.oszk.hu/19100/19197>
6. László Szabó, Gábor Krajsovsky: Isomerism in Organic Compounds
Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry
Budapest, 2017
<http://mek.oszk.hu/17200/17283/>
7. Gábor Krajsovsky: Collection of Organic chemical problems
Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry
Budapest, 2017
<http://mek.oszk.hu/17200/17281/?from=rss>
8. World of Molecules II
Compiled by Péter Mátyus, contribution by Gábor Krajsovsky, formatted by Balázs Balogh, Department of Organic Chemistry, Semmelweis University, matyus.peter@pharma.semmelweis-univ.hu (2011)
9. Pázmány Péter Katolikus Egyetem, Semmelweis Egyetem és a Dialóg Campus Kiadó-Nordex Kft. által alkotott konzorcium
http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_A_molekulak_vilaga_II/adatok.html
10. Organic and Biochemistry, Part: Organic Chemistry
Compiled by Péter Mátyus, contribution by Gábor Krajsovsky, formatted by Balázs Balogh, Department of Organic Chemistry, Semmelweis University, matyus.peter@pharma.semmelweis-univ.hu (2011)

11. Pázmány Péter Katolikus Egyetem, Semmelweis Egyetem és a Dialóg Campus Kiadó-Nordex Kft. által alkotott konzorcium
http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_Szerves_es_biokemia/adatok.html
12. J. Clayden, N. Greeves, S. Warren: Organic chemistry (paperback)
Oxford University Press, 2012
ISBN 978-0-19-927029-3
13. J. Clayden, S. Warren: Solutions manual to accompany organic chemistry (paperback)
Oxford University Press, 2013
ISBN 9780199663347
14. A. Corbella, E. Marcantoni, G. Renzi: Seminars in Organic Synthesis.
Royal Society of Chemistry, 2011
ISBN 978-88-86208-64-2
15. J.W. Zubrich: The Organic Chem Lab Survival Manual. A Student's Guide to Techniques. John Wiley & Sons, Inc., 2012
ISBN 978-1-118-08339-0
16. K.L. Williamson, K.M. Masters: Techniques Labs for Macroscale and Microscale Organic Experiments.
Brooks Cole 2016, 7th Ed
ISBN 1305577191
17. E. Pretsch, P. Bühlmann, M. Badertscher: Structure Determination of Organic Compounds.
Springer-Verlag, Berlin • Heidelberg, 2009
ISBN 3540938095
18. Necessary equipment: laboratory glassware (students' laboratory), reagents and further technical equipment for synthetic work

Physiology (theory) II., Physiology (practice) II.

Full name of the subject: Élettan (elmélet) II., Élettan (gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Physiology (theory) II., Physiology (practice) II.
German name of the subject: Physiologie (Vorlesung) II., Physiologie (Praktikum) II.

Neptun code of the subject: GYKTLM124E2A, GYKTLM124G2A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Translational Medicine

Responsible tutor: **Dr. Zoltán Benyó** Director, professor, PhD, DSc
E-Mail: benyo.zoltan@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Zoltán Benyó Professor, PhD, DSc
Dr. Tamás Ivanics Associate professor, PhD
Dr. Zsuzsanna Miklós Associate professor, PhD
Dr. Margittai Éva Assistant professor, PhD
Dr. Éva Ruisanchez Assistant professor, PhD
Dr. Monori-Kiss Anna Assistant professor, PhD
Dr. Éva Pál Assistant lecturer, PhD
Dr. László Hricisák Assistant lecturer, PhD
Dr. Ákos Zsembery Associate professor, PhD

Classes per week: 6 lectures, 2 practices
Credit point(s): 6 (theory), 1 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The goal is to teach physiological processes from subcellular, cellular and tissue-level processes all the way to complex regulation on the organism level, including studies in humans. Special emphasis is laid on the presentation of complex adaptation processes playing an important role in health preservation, and on studying how physiological regulatory processes respond to changes in the external or internal environment.

Short description of the subject:

Theoretical lectures and practices are held every week. Seminars/Practices are for discussion of ongoing new lecture material and performing relevant physiological measurements in small groups. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars. Students are required to take 6 written exams in each semester, and a lab exam at the end of the semester. Based on the results of the tests and the lab exam students get a lab work grade at the end of the semester. Students take a written theoretical examination in the exam period.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
4	84	28	–	–	112	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

I. Lecture topics/week

1. week: Buffer systems of the blood. Other buffer systems of the body. Principles of acid-base balance. Regulation of acid-base balance in the body.
2. week: Production of blood cells. Blood groups. Blood coagulation. Anemias and pathophysiological conditions.
3. week: Gastrointestinal motility and secretions. Innervation of the GI tract. GI hormones. Regulation of GI motility. Regulation of GI secretion: Salivary secretion; Gastric secretion; Exocrine pancreas. Liver and biliary system.
4. week: Digestion and Absorption. Carbohydrates, lipids and proteins. Absorption of water and electrolytes. Absorption of vitamins and minerals.
5. week: General principles of endocrine physiology. The pituitary gland. Anterior lobe hormones. Growth hormone and physiology of growth. Posterior lobe hormones.
6. week: The adrenal cortex. Structure, blood supply and its control. Innervation. Structure and biosynthesis of adrenocortical hormones. Effects of glucocorticoids and control of their secretion. Effects of mineralocorticoids and control of their secretion. Effects of adrenal androgens and estrogens. Endocrine regulation of calcium metabolism and the physiology of bone.
7. week: The thyroid gland. Formation and secretion of thyroid hormones. Control of synthesis and secretion. Transport and metabolism of thyroid hormones. Effects of thyroid hormones. Clinical correlates. Endocrine functions of the pancreas and the regulation of carbohydrate metabolism.
8. week: Hormonal control of intermediary metabolism. Whole body metabolism. Regulation of feeding and body mass. Starvation and obesity. The reproductive glands. Development and function of the reproductive system. The female reproductive system. Pregnancy. Lactation. The male reproductive system. Endocrine function of the testes.
9. week: The autonomic nervous system and its central control. Adrenal medulla. Sympathetic and parasympathetic tone. Principles of sensory systems. Sensory receptors. Electrical and ionic events in receptors. "Coding" of sensory information.
10. week: Somatosensory functions. Cutaneous, deep and visceral sensation; sensory pathways. Inflammation and pain sensation.
11. week: Arousal mechanisms, sleep and the electrical activity of the brain. The reticular formation and the reticular activating system. The thalamus and the cerebral cortex. Evoked cortical potentials and the EEG. Physiologic basis of consciousness and sleep. Regulation of circadian rhythm.

12. week: Spinal organization of motor function. Monosynaptic reflexes. Polysynaptic reflexes. Spinal reflexes. Spinal and supraspinal control of muscular tone. Spinal shock. Control of posture and movement. The vestibular system. Basal ganglia. Cerebellum. Role of the function in motor coordination. Spinal integration, medullary, midbrain and cortical components.
13. week: The visual system. The image-forming mechanism. The photoreceptor mechanism. Responses in the visual pathways and cortex. Color vision. Eye movements. The auditory system. Chemical senses. Physiology of olfaction. Physiology of taste.
14. week: Neural basis of instinctual behavior. Physiology of the hypothalamus. Regulation of body temperature. Fever. Limbic functions. Motivation. Emotion. Higher cerebrocortical functions. Conditioned reflexes, learning and memory. Integrative functions of the neocortex.

Topics of practical classes (pro week):

II. Practice topics/week

Seminars are held every even week (1x45 min) and are for discussion of ongoing new lecture material. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars.

Practices are held every uneven week (3x45 min), and students are required to carry out relevant physiological measurements in small (2-3 persons) groups.

1. week: Studying the circulatory and respiratory adaptation responses during physical exercise
2. week: Written test and consultation of the previous week's theoretical material
3. week: Acid-base disorders in the clinical practice
4. week: Written test and consultation of the previous weeks' theoretical material
5. week: Measurement of pulse wave velocity
6. week: Written test and consultation of the previous weeks' theoretical material
7. week: Clinical case studies
8. week: Written test and consultation of the previous weeks' theoretical material
9. week: Blood glucose measurement and oral glucose tolerance test
10. week: Written test and consultation of the previous weeks' theoretical material
11. week: Examination of motor reflexes and vestibular function, EOG.
12. week: Written test and consultation of the previous weeks' theoretical material
13. week: Retake lab, exam consultation
14. week: Practical exam.

Schedule of consultations: Consultations take place on every even week

Course requirements

Prerequisites:

Physiology I. GYKTLM124E1A

Biochemistry I. GYKBM069G1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Seminars are held every even week (1x45 min) and are for discussion of ongoing new lecture material. Also, the theoretical knowledge of the students is tested systematically in a written form on the seminars. Students are required to take 6 written exams in each semester. Passing level is 50% of the maximum points. Absence from a seminar yields grade 1 (fail) for that week. The worst grade of the 6 seminar tests is omitted from the calculation of the Lab Work Grade. Students are required to write at least 4 seminar tests, and achieve at least 2,0 average on these tests to become eligible for the semifinal or final exam.

Practices are held every uneven week (3x45 min), and students are required to carry out relevant physiological measurements in small (2-3 persons) groups. Practices are obligatory. Missing 25% of the practice time (7 hours practice time) results in denial of admission to the semifinal or final exam. A retake opportunity is provided for the students to make up for missed practices at the end of the semester. Students are required to take a lab exam at the end of the semester. Only those students can be admitted to the lab exam who completed at least 5 lab practices.

Based on the results of the seminar tests and the lab exam students get a Lab Work Grade at the end of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

The theoretical knowledge of the students is tested systematically in a written form on the seminars. The form of the test can be quiz or multiple-choice type questions. Students are required to take 6 written exams in each semester. Passing level is 50% of the maximum points. Absence from a seminar yields grade 1 (fail) for that week. The worst grade of the 6 seminar tests is omitted from the calculation of the Consultation Grade.

Requirements of signature:

The worst grade of the 6 seminar tests is omitted from the calculation of the Consultation Grade. The results of the remaining 5 tests are averaged to yield the Consultation Grade, which must be at least 2,0 to get the signature for the semester and become eligible for the semifinal or final exam.

Students are required to take a lab exam at the end of the semester. Only those students can be admitted to the lab exam who completed at least 5 lab practices.

Based on the Consultation Grade and the result of the lab exam students get a Lab Work Grade at the end of the semester. The Lab Work Grade is calculated by averaging the Consultation Grade and the result of the lab exam (50-50%).

Further requirements of the signature at the end of the semester is to participate on at least 75% of the practices.

Type of the semester-end examination: practical grade, final

Form of the semester-end examination: written exam

Scientific, course related researches, publications, assays:

Dee Unglaub Silverthorn: Human Physiology – An Integrated Approach, 8th edition (Pearson Education, 2019)

Guyton and Hall: Textbook of Medical Physiology 13th Edition (Elsevier, 2016)

Ganong's Review of Medical Physiology 26th Edition (McGraw-Hill & Lange, 2019)

A. Fonyó: Principles of Medical Physiology (Medicina Publishing House, 2002)

Hungarian Pharmaceutical Terminology (practice) IV.

Full name of the subject:	Magyar gyógyszerészeti szaknyelv (gyakorlat) IV.
Program:	undivided program (pharmaceutical)
Schedule:	full-time
Short name of the subject:	Hung. Pharm. Term. IV.
English name of the subject:	Hungarian Pharmaceutical Terminology (practice) IV.
German name of the subject:	Pharmazeutische Fachsprache Ungarisch (Praktikum) IV
Neptun code of the subject:	GYKLEK155G4A
Type of registration:	obligatory elective
Responsible department:	Semmelweis University, Department of Languages for Specific Purposes
Responsible tutor:	Alexandra Bakó language teacher bako.alexandra@se-etk.hu
Name of the persons responsible for the teaching of the subject:	Borda Szandra language teacher Nagyné Górácz Judit language teacher Kovács Ildikó language teacher Nagy Borbála language teacher Tick Vera language teacher Tóth Zsuzsanna language teacher
Classes per week:	2 practices
Credit point:	3

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies.

Short description of the subject:

The fourth semester is dedicated to learning how to communicate with clients and colleagues at the pharmacy. Students acquire basic structures and the vocabulary for describing the characteristics of medicines. The course places special emphasis on functional language needed for obtaining and providing information, giving recommendations and instructions and on phrases needed in basic communication at a pharmacy. The semester also focuses on preparing students for the final exam (both written and oral) at the end of the semester.

Physical Education IV.

Full name of the subject: Testnevelés IV.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: PE IV.
English name of the subject: Physical Education IV.
German name of the subject: Sport IV

Neptun code of the subject: GYKTSI116G4A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: *Várszegi, Kornélia* director

Name of the persons responsible for the teaching of the subject:
Doharné Buczkó, Anikó P.E. teacher
Farkas, Dominika P.E. teacher
Kalmus, Dániel P.E. teacher
Lehel, Zsolt P.E. teacher
Sótonyiné Hrehuss, Nóra P.E. teacher
Várszegi, Kornélia P.E. teacher
Weisz, Miklós P.E. teacher

Classes per week: 1 practice(s)
Credit point(s): 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Short description of the subject:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behavior.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
4. semester	0	14			14	Spring semester	

Program of semester

Topics of practical classes (pro week):

1st. week:	General information Accident, fire and environmental knowledge. Requirement for acceptance of the semester system, the structure of the classes and the presentation of the university recreational sports opportunities for extra-curricular activities.	9th. week:	Ruffier test Comparing the results with the previously recorded one to bring the importance of the health of the cardiovascular system to the attention.
2nd. week:	Basketball Dribbling and shooting skill improving drills. Games: 1 on 1; 2 on 2; shooting contests, king of the court. Scrimmage.	10th. week:	Circuit training Specialized chain of drills for strengthen the shoulder, back, chest, arm and leg muscles, considering the fitness level of the Students.
3rd. week:	Wall-bar exercises Enhance strength and balance by climbing, declining, hanging, skipping, pulling, pushing etc. exercises.	11th. week:	Tennis Introducing variations of ground strokes and grip types (slice, topspin, lobs etc.) Exposing the rules of doubles. Games (all around the world, etc.)
4th. week:	Circuit training A chain of compete drills in a certain time period with and without equipment. The aim is to improve the general level of strength and stamina.	12th. week:	Badminton Exposing the rules and the basic tactical elements of the doubles game. Scrimmage.
5th. week:	Floorball Passing and receiving skill improving drills. Exposing shots on goal (wrist- slap- and snapshots). Scrimmage.	13th. week:	Core exercises Body-weight exercises targeting to strengthen the muscles of the trunk thus develop a strong fascia to protect it from the harmful effects of overdose sitting (studying)
6th. week:	Drills in pairs Strength, agility, coordination and battling skill improving exercises with a partner incorporated.	14th. week:	Medicine-ball exercises Strength and coordination (complex) skill developing exercises by throwing, rolling, passing, lob, shot-put, etc. with a partner incorporated. Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./ week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball)
7th. week:	Volleyball Introducing the defensive elements of the game (receiving serves, blocks). Exposing unknown rules. Games.		
8th. week:	Game-day Introducing and practicing different kind of cohesion enhancing games (Tick-Tac-Toe, etc.)		

Course requirements

Prerequisites: –

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The number of active participations for physical education classes is 10 (for trainings 15 times!), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Requirements of signature: Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

FACULTY OF PHARMACEUTICAL SCIENCES

**Curriculum of the credit-based training for third year students
in the 2021/2022 academic year**



Pharmaceutical Sciences
3rd year

5. SEMESTER

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Pharmaceutical Chemistry (practice) I. GYKGYK076G1A	–	4	3	Analytical Chem. (quant.) Organic Chemistry II.	practical mark
Pharmaceutical Chemistry (theory) I. GYKGYK076E1A	4	–	4		semi-final
Pharmaceutical Technology (theory+practice) I. GYKGYI126G1A	2	3	4	Physiological Pharm. and Pharmaceutical dosage forms, Colloid Chem., Medical Terminology	practical mark
Nanotechnology (theory+practice) GYKGYI078G1A	2	2	4	Colloid Chemistry	practical mark
Pharmaceutical Botany (practice) II. GYKFMG079G2A	–	1	–	Biology II. Biotechnology Pharmaceutical Botany I.	signature
Pharmaceutical Botany (theory) II. GYKFMG079E2A	1	–	1		semi-final
Dietetics (theory) GYKGYI168E1A	1	–	1	Physiology II. Biochemistry II.	semi-final
Pharmaceutical Microbiology (practice) GYKMIK081G1A	–	2	–	Basic Immunology	signature
Pharmaceutical Microbiology (theory) GYKMIK081E1A	3	–	4		semi-final
Clinical Chemistry and Laboratory Diagnostics (theory) GYKLMI082E1A	2	–	2	Physiology II. Biochemistry II.	semi-final
Basic Medical Pathophysiology I. (theory+practice) GYKGYH083G1A	2	1	2	Physiology II. Biochemistry II.	practical mark
Hungarian Medical Terminology (practice) V. GYLEKMSZG5A	–	4	2	Hungarian Medical Terminology (practice) IV.	practical mark
Physical Education V. GYKTSII16G5A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	17	18	27		

Pharmaceutical Chemistry (theory) I., Pharmaceutical Chemistry (practice) I.

Full name of the subject: Gyógyszerészi kémia (elmélet) I., Gyógyszerészi kémia (gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Pharm. Chem. I.
English name of the subject: Pharmaceutical Chemistry (theory) I., Pharmaceutical Chemistry (practice) I.
German name of the subject: Pharmazeutische Chemie (Vorlesung) I., Pharmazeutische Chemie (Praktikum) I.

Neptun code of the subject: GYKGYK076E1A, GYKGYK076G1A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmaceutical Chemistry

Responsible tutor: **Dr. Péter Horváth** Head of the Department, Associate professor, Ph.D.
 Phone: 06-1-217-0891
 E-Mail: horvath.peter@pharma.semmelweis-univ.hu
 Address: Semmelweis University, Department of Pharmaceutical Chemistry, H-1092 Budapest, Högyes Endre u. 9.

Name of the persons responsible for the teaching of the subject:
Dr. Péter Horváth associate professor, head of the department, Ph.D.
Dr. Krisztina Takács-Novák full professor, D.Sc.
Dr. László Órfi full professor, Ph.D.
Dr. Gergely Völgyi associate professor, Ph.D.
Dr. Károly Mazák associate professor, Ph.D.
Dr. Márta Mazák-Kraszni associate professor, Ph.D.
Dr. Gergő Tóth assistant professor, Ph.D.
Dr. Arash Mirzahosseini assistant lecturer, Ph.D.
Dr. Tamás Pál assistant lecturer, Ph.D.
Dr. István Kóteles assistant lecturer
Dr. Dóra Csicsák assistant lecturer

Classes per week: 4 lectures, 4 practices
Credit point: 4 (theory), 3 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Integration of the curriculum of various chemical and biological courses and extension with specific chemical knowledge regarding properties, mechanism of action and analytics of drug substances.

Short description of the subject:

theory: Teaching of synthesis, analytics, physico-chemical and chemical properties, structure-activity relationships, receptor-bindings and biochemical background of biological effects of drug substances.

Practice: Teaching of analytics, physico-chemical and chemical properties of drug substances.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5	56	56			112	Autumn semester	

Program of semester

Topics of theoretical classes (pro week):

1. week: Introduction. (Pharmaceutical Chemistry, Pharmacopoeias)
Preliminary testing of inorganic and organic compounds, classification
Identification of organic functional groups
2. week: General purity tests in Pharmacopoeia
Structural and physical chemistry of drug action I.
3. week: Structural and physical chemistry of drug action II.
Protonspeciation of drugs
Determination of protonation constants, optimization of pH-dependent processes
4. week: Characterization of lipophilicity, determination of partition coefficient
Application of UV-VIS spectrophotometry in the analysis of drugs
5. week: Separation techniques I. Thin-layer chromatography
Separation techniques II. HPLC
6. week: Determination of organic acids and bases
Major analgetics I.
7. week: Major analgetics II.
Minor analgetics
8. week: Nonsteroidal antiinflammatory drugs
Local anaesthetics
9. week: Narcotics
Sedato-hypnotics and anxiolytics
10. week: Psychopharmacons I.
Psychopharmacons II.

11. week: Cholinergic and adrenergic agents I.
Cholinergic and adrenergic agents II.
12. week: Cholinergic and adrenergic agents III.
Identification of drug mixtures
13. week: Quantitative determination of drug mixtures
Antiepileptics
14. week: Drugs acting on the digestive system
Consultation

Topics of practical classes (pro week):

1. week: Equipping, revision of basic analytical tasks
2. week: Preliminary testing and classification of inorganic and organic compounds
3. week: General purity tests for inorganic ions
4. week: Determination of protonation macroconstants by potentiometry
5. week: Determination of protonation macro- and microconstants by UV/pH titration
6. week: Determination of logP
7. week: Major analgetics
8. week: Minor analgetics
9. week: Nonsteroidal anti-inflammatory agents
10. week: Local anaesthetics
11. week: Sedato-hypnotics and anxiolytics
12. week: Psychopharmacons
13. week: Cholinergic and adrenergic agents
14. week: Identification and quantitative determination of drug mixtures

Course requirements

Prerequisites:

Analytical Chemistry (quant.) GYKASK066E1A

Organic Chemistry II. GYKSZK123E2A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: Based on the Study and Exam Regulations

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Practice: Project reports on weeks 6, 10 and 13.

Requirements of signature:

Attendance on the lectures. (Extent of the absence is based on the Study and Exam Regulation)

Attendance on the practices. (Extent of the absence is based on the Study and Exam Regulation)

The average of the scheduled project reports is at least 2.

The required minimum amount of points during practices is accumulated.

Type of the semester-end examination:

theory: signature/practical grade/semi-final/final

practice: signature/practical grade/semi-final/final

Form of the semester-end examination: written and oral

Necessary equipment: practice: drug substances, reagents, laboratory equipments, instruments

Pharmaceutical Botany (theory + practice) II.

Full name of the subject: Gyógyszerészi növénytan (elmélet + gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Botany
English name of the subject: Pharmaceutical Botany (theory + practice) II.
German name of the subject: Pharmazeutische Botanik (Vorlesung + Praktikum) II

Neptun code of the subject: GYKFMG079E2A; GYKFMG079G2A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmacognosy

Responsible tutor: Szabolcs Béni head of department, associate professor, Ph.D.
E-mail: beni.szabolcs@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Imre Boldizsár assistant professor, Ph.D.
Attila Ványolós assistant professor, Ph.D.
Anna Bucsy-Sólyomváry professor's assistant, Ph.D.
Andrea Böszörményi assistant professor, Ph.D.

Classes per week: 1 lecture, 1 practice
Credit point: 1

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The main aims of the subject are as follows:
1) To get familiar with the botanical features of plants at the cytological, histological and organizational levels in order to gain basic knowledge essential for pharmacopoeial drug analyzes.
2) Understanding the general and specific metabolic processes and physiological phenomena of plants to understand the production and accumulation of biologically active substances (and their mode of storage).
3) To study the chemotaxonomy of plants in order to be able to recognize medicinal herbs (and poisonous plants) and to understand their kinship and chemism.

Short description of the subject:

The subject summarizes current knowledge on the structure and function of plant cells and their participation in biochemical processes. It presents the anatomical (histological) and macroscopic morphological characteristics of the plant organs, that also represent drugs, and their physiological processes, highlighting their role in the production and accumulation of biologically active substances. It describes the systematization of the flora most important from the pharmaceutical point of view: chemotaxonomy with special emphasis on chemism. In this context, it presents important medicinal herbs (and poisonous plants) and their morphological characteristics necessary for their recognition.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5	14	14			28	Autumn semester	

Program of semester

Topics of theoretical classes (pro week):

1. week: Introduction. The division of wildlife. The concepts of plant, herb and drug. The structure of the flower among gymnosperms and angiosperms: the diversity of the appearance of the flower parts as an opportunity to identify plant species and their kinship.
2. week: Presentation of inflorescences: characteristics of the cyme and clustering types in major plant families.
3. week: The pollination and fertilization process in gymnosperms and angiosperms, floral biological phenomena. The process of seed and fruit formation in the context of fertilization. Morphological examination of seeds and fruits.
4. week: Structure of plant cells. Plastids: structure and function; processes of photosynthesis and their significance. Degradation processes in the context of secondary metabolism. Nitrogen metabolism and its relationship to nitrogen-containing secondary metabolites.
5. week: Formation and structure of the cell wall. Vacuoles and their contents. The role of the cell walls and crystal forms in the microscopic examination of drugs.
6. week: The concepts of tissue-tissue system-organ. The meristems. Characteristics of the dermal tissue system (primary, secondary and tertiary dermal tissues) and the exogenous excretory systems: their appearance and role in drug identification. Demonstrating the diversity of ground tissues by highlighting the endogenous secretory systems Occurrence of endogenous systems in herbs.
7. week: Characteristics of the conductive tissue system: organ- and system-specific manifestations.
8. week: Histological structure of root systems and various roots (demonstrated by examples of root drugs). Morphology and histology of the shoot axis (stem): young and old (thickened) forms and parts as drug forms.
9. week: Appearance and histological structure of leaves in the macroscopic and microscopic identification of plants. Water management and mineral nutrition of plants: water uptake, transport, and release in relation to the morphological and functional characteristics of the root, stem and leaf (also a summary of the microscopic morphological characteristics of the three organs).
10. week: Principles of plant systematics. Comparison of different systems (artificial, natural, developmental, and chemotaxonomic) highlighting the pharmaceutical significance of chemotaxonomy. Basic mycological knowledge: medically essential and edible / toxic representatives of the fungal world. Pteridophytes: their two-stage ontogeny, external and internal structure. Detailed presentation of medicinal and toxic species highlighting similarities and differences.

11. week: Presentation and classification of gymnosperms with introduction to the species with medicinal importance. Chemotaxonomy of angiosperms I. Magnoliidae subclass of dicotyledons and the class of monocotyledons. Comparison of monocotyledons and dicotyledons and their evolutionary relationship.
12. week: Chemotaxonomy of angiosperms II. Description of the subclasses Caryophyllidae and Hamamelididae. Chemotaxonomy of angiosperms III. Rosidae subclass as the five-membered, free-petal among the dicotyledons.
13. week: Chemotaxonomy of angiosperms IV. Introduction of the Dilleniidae subclass by studying the heterogeneous groups belonging to it.
14. week: Chemotaxonomy of angiosperms V. Characterization of subclasses Cornidae and Lamiidae. Chemotaxonomy of angiosperms VI. Asteridae subclass as the top of progression

Topics of practical classes (pro week):

1. week: Morphological knowledge: in ELTE Botanical Garden on plant examples or Characteristics of typical plants of Brassicaceae, Fabaceae families. Structure of flowers I.
2. week: Characteristics of typical plants of the families Apiaceae, Malvaceae, Lamiaceae. Structure of flowers II. Inflorescences I.
3. week: Study of typical plants of families Solanaceae, Asteraceae (Cichoriaceae). Inflorescences II. Structure of leaves (macroscopic characteristics).
4. week: Macroscopic characteristics of seeds and fruits.
5. week: Structure of a young root.
6. week: Old root structure, types of root thickening.
7. week: Structure of young stems and rhizomes.
8. week: Structure of old stems, types of stem thickening.
9. week: 1st Midterm (herbal knowledge 1.) Examination of the xylem and the rhytidome I.
10. week: Examination of the xylem and the rhytidome II.
11. week: Foliage tissue structure.
12. week: Structure of flower parts.
13. week: Histological structure of seeds and crops.
14. week: 2nd Midterm (plant recognition from herbarium specimens and the material of the practices). Retake of missed practices.

Schedule of consultations: as demanded

Course requirements

Prerequisites:

GYGENBILE2A	Biology II.
GYNOVGNG1A	Pharmaceutical botany I.
GYKGYI074E1A	Biotechnology

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: Absence from 25% of the practices is allowed.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Practice: written test on the 9th and 14th weeks, possibility of grade improvement at the practice following the test, and on the last week

Requirements of signature:

Practice: successful completion of the midterm tests (each separately with at least sufficient result)

Number and type of projects students have to perform independently during the semester and their deadlines:

Practice: preparation (and presentation) of a plant collection of at least 20 species composed of herbs included in the material of the semester, evaluated by one grade equivalent to the grade of one midterm (however, it does not replace any of the midterms)

Type of the semester-end examination: Lecture: semi-final, Practice: signature

Form of the semester-end examination: oral examination

Necessary equipment: Lecture hall, projection, wi-fi

Practice: A light microscope for each student; a stereomicroscope for each two students. A collection of microscopic preparations for each two students. Slides, coverslips. Manual microtome (e.g. MT.5503 Euromex). Projector, demonstration light microscope equipped with a digital camera that can be connected to a projector. A3 size laminator for "perpetuation" of herbarium sheets

Pharmaceutical Microbiology (theory+practice)

Full name of the subject: Gyógyszerészi mikrobiológia (elmélet+gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Pharmaceutical Microbiology (theory+practice)
German name of the subject: Mikrobiologie für Pharmazeuten (Vorlesung+Praktikum)

Neptun code of the subject: GYKMIK081E1A; GYKMIK081G1A
Type of registration: obligatory
Responsible department: Institute of Medical Microbiology of Semmelweis University

Responsible tutor: Dr. Orsolya Dobay associate professor, PhD
Phone: 210-2959; 56287 ext.
E-Mail: dobay.orsolya@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Szabó Dóra full professor, DSc
Dr. Dobay Orsolya associate professor, PhD
Dr. Ghidán Ágoston assistant professor (lecturer), PhD
Dr. Andrea Horváth professor's assistant

Classes per week: 3 lectures, 2 practices
Credit point(s): 4

Professional content, intent of acquirement and its function in order to implement the goals of the program:
The importance of microbiology in the medical curriculum, including the education of students of Faculty of Pharmacy is permanently growing. The knowledge about new types of microbial agents - beside the well-known old ones -, new diseases caused by microbes, the more and more frequent nosocomial infections and the epidemics believed overcome, but recently emerging is necessary for the pharmacist, too. They have to be familiar with the continuously growing possibilities of methods used in diagnostic work, prevention and therapy of infectious diseases caused by microbes.
The goal of the training course is that the students of Faculty of Pharmacy learn about the nature of the most important human pathogenic agents, their appearance, the ways of their transmission, the possibilities of killing them inside as well as outside the human body. In addition to the basic knowledge of microbiology an increasing emphasis is placed on the topics connected with the utilization of microbes in pharmacy, in pharmacological research and industry.

Short description of the subject:
The students learn about the physiological and pathological effects of microbes in the organism, i.e. in the human body. Beside the general characterization of the most important pathogens (bacteria, viruses, fungi, and parasites), the students learn about the possibilities of sterilization and disinfections, mode of actions of antimicrobial agents, control of infectious diseases as well as the basic methods of laboratory diagnosis of infectious diseases. Because microorganisms have special importance in pharmaceutical industry, the most important new results, methods (i.e. recombinant technologies) are also summarized.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5	42	28			70	Autumn semester	

Program of semester

Topics of theoretical classes (pro week):

- Week 1. Brief history, subject and aim of Microbiology. Occurrence and importance of microbes in nature. General microbiology. Morphology, reproduction and physiology of bacteria. Microbial genetics.
- Week 2. Disinfection. Principles and practice of sterilization. Introduction to antimicrobial chemotherapy.
- Week 3. Mode of action of the antibiotics. Resistance to antibiotics.
- Week 4. Principles of microbial pathogenicity. Immunity to microbes. Active and passive immunization.
- Week 5. Cocci causing purulent diseases (Staphylococcus, Streptococcus, Neisseria)
- Week 6. Normal flora of the intestinal tract and the importance of it. Bacteria causing enteral diseases.
- Week 7. Causative agents of respiratory tract infections.
- Week 8. Endospore forming bacteria. Parasitology (protozoa and helminths).
- Week 9. Causative agents of human mycosis and their therapy.
- Week 10. General virology. Antiviral chemotherapy. DNA viruses.
- Week 11. Enteral viruses and diseases caused by them. Hepatitis viruses.
- Week 12. Respiratory pathogenic viruses. Arbo- and reoviruses, Rhabdoviruses.
- Week 13. Retroviruses. AIDS. Tumor viruses. The role of viruses in carcinogenesis.
- Week 14. Production of therapeutic substances by recombinant DNA technology. Microorganisms in pharmaceutical sciences. Nosocomial infections

Topics of practical classes (pro week):

- Week 1. Introduction to basic microbiology, laboratory rules. Microscopic examination of microbes.
- Week 2. Cultivation of bacteria.
- Week 3. Methods for sterilization and disinfection.
- Week 4. Determination of antibiotic susceptibility of bacteria.
- Week 5. In vitro antigen-antibody reactions (serological methods).
- Week 6. Gram-positive and Gram-negative cocci (Cultures, smears, biochemical reactions, serological tests, antibiotic susceptibility, vaccines).
- Week 7. Enteral Gram-negative rods (Enterobacteriales). Cultures, smears, biochemical reactions, serological tests, antibiotic susceptibility, vaccines); Vibrio, Helicobacter, Campylobacter.
- Week 8. Pseudomonas. Gram-negative coccobacilli (Cultures, smears, antibiotic susceptibility, vaccines).
- Week 9. Non-spore forming Gram-positive bacteria. Mycobacteria (Cultures, smears, enzyme reactions, serological tests, antibiotic susceptibility, vaccines).
- Week 10. Endospore-forming Gram-positive aerobic and anaerobic bacteria (Cultures, smears, enzyme reactions, serological tests, antibiotic susceptibility, vaccines).
- Week 11. Spirochetes. Rickettsiae, Chlamydiae, Mycoplasmas (Cultures, smears, enzyme reactions, serological tests, antibiotic susceptibility, vaccines).
- Week 12. Medically important fungi (Cultures, smears).
- Week 13. Medical parasitology (macroscopic and microscopic preparations).
- Week 14. General virology (cultivation and morphology of viruses, cell-virus interactions, serological tests).

Schedule of consultations: in the exam period, personal appointments with the tutor

Course requirements

Prerequisites: GYGENIMME1A Basic immunology

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Lectures: presence on at least 75 % of the total number of lectures.

Laboratory practice: maximum 3 absences. acceptable practice in microbiological laboratory methods

Requirements of signature: Active presence and no more than 3 absences on the practical classes.

Number and type of projects students have to perform independently during the semester and their deadlines:

Practice: two times in the semester, 10 questions (essay). The accepted result: at least 6 points/midterm.

Type of the semester-end examination: semi-final

Form of the semester-end examination: oral exam, with preceding written minimum questions

Scientific, course related researches, publications, essays:

Studies on the antibiotic resistance of bacteria (cause of resistance, mechanisms of the development of resistance) Asymptomatic carriage of pneumococci, staphylococci, etc. Microbiom analysis. Studies on adenoviruses, herpes viruses, papillomaviruses, HIV (structure, pathomechanism, etc.).

Necessary equipment:

All materials required for the laboratory work is provided by the Institute.

Clinical Chemistry and Laboratory Diagnostics (theory)

Full name of the subject: Klinikai kémia és laboratóriumi diagnosztika
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: –
English name of the subject: Clinical Chemistry and Laboratory Diagnostics (theory)
German name of the subject: Klinische Chemie und Labordiagnostik (Vorlesung)

Neptun code of the subject: GYKLMIO82E1A
Type of registration: obligatory
Responsible department: Department of Laboratory Medicine of Semmelweis University

Responsible tutor: **Prof. Dr. Barna Vásárhelyi** M.D., Ph.D., D. Sc.
 Phone: 06-1-361-459/62098
 E-mail: vasarhelyi.barna@med.semmelweis-univ.hu
 Title, academic degree:

Name of the persons responsible for the teaching of the subject:
Dr. Adrienne Fehér M.D., Clinical laboratory specialist,
 hematology specialist, transfusion medicine specialist
Dr. Gellért Karvaly Pharm. D., Ph.D.
Dr. Ibolya Kocsis Pharm. D., Ph.D., clinical laboratory specialist
Dr. Györgyi Molnár-Világos Pharm. D., clinical laboratory specialist
Dr. Zsófia Szabó Pharm. D., clinical laboratory specialist
Dr. Zoltán Vajda M.D., hematology specialist

Classes per week: 2 lectures
Credit point(s): 2

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The aim of the course is to provide valuable knowledge on the principles and practice of laboratory diagnostics, as well as on the specialties of clinical chemistry, hematology and immunology in the field of interest of pharmacy students. by giving a systematic overview on the basics of these disciplines. In addition, the measures of the quality assurance of clinical laboratory assays are presented.

Short description of the subject:

Pharmacists are approached by patients with questions related to laboratory diagnostics on a daily basis. In pharmacies expertise in performing simple fingerprick tests (eg. blood glucose and lipid measurement), as well as assistance with the interpretation of laboratory reports is often required. Concerning the latter, it is especially important that this assistance is adequate yet restrained. In the clinical setting, the proper interpretation of laboratory tests which shed light on the efficacy and the biochemical adverse effects of medications is highly valuable. Pharmaceutical expertise has an important added value in this respect. Therapeutic drug monitoring is emerging as a special field of laboratory medicine where pharmacists play a unique role. The clinical laboratory relies heavily on the knowledge of pharmacists, gained during the training of laboratory specialists. During the course, the main aspects of ordering clinical laboratory tests, the major analytical procedures, and the art of interpreting laboratory reports are presented.

There is a special emphasis on:

- laboratory tests performed by the bedside and in pharmacies,
- tests for diagnosing the lesions of the various organ systems,
- the evaluation of the pharmacodynamic effects of drugs using biochemical tests,
- therapeutic drug monitoring, and
- quality assurance in the clinical laboratory.

During the lectures theory is combined with case reports. 2 sessions are dedicated to visiting some of the clinical laboratories of Semmelweis University to provide a real-life experience.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5	28	0	–	–	28	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1. Preanalytical factors influencing the results of laboratory assays. (Dr. Barna Vásárhelyi)
2. Major analytical procedures employed in clinical laboratories. Quality assurance. (Dr. Györgyi Molnár-Világos)
3. Interpretation of assay results. (Dr. Barna Vásárhelyi)
4. Bedside laboratory tests (with demonstration). Urine testing. (Dr. Ibolya Kocsis)
5. Laboratory diagnostics of inflammation. Acute phase reactions. Testing for infections. (Dr. Zsófia Szabó)
6. Immunology tests I. Hypersensitivity reactions, allergy tests. (Dr. Zsófia Szabó)
7. Immunology tests II. Autoimmunity, immune system deficiencies. (Dr. Zsófia Szabó)
8. Diagnostics of tissue lesions (Dr. Barna Vásárhelyi)
9. Diagnostics of metabolic disorders (diabetes, hyperlipidemia). (Dr. Barna Vásárhelyi)
10. Therapeutic drug monitoring. (Dr. Gellért Karvaly)
11. Tests for hemostasis. Monitoring of anticoagulants. (Dr. Adrienne Fehér)
12. Basics of blood count interpretation. Blood group tests. (Dr. Adrienne Fehér)
13. Laboratory visit I.
14. Laboratory visit II.

Schedule of consultations: Online, by individual arrangement

Course requirements

Prerequisites: Biochemistry II. GYKBMT069E2A, Physiology II. GYKTLM068E2A GYKTLM068G2A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

As required by the effective regulations of the Faculty of Pharmacy.

Requirements of signature: Attendance of lectures as required by the Faculty of Pharmacy

Type of the semester-end examination: semi-final

Form of the semester-end examination: Written test

Necessary equipment:

1. McPherson RA, Pincus MR: Henry's Clinical Diagnosis and Management by Laboratory Methods 22nd Edition
2. Learning guide on the website (<https://semmelweis.hu/laboratorium/english/>), and in the Moodle-system under Laboratory Medicine course (itc.semmelweis.hu)

Hungarian Medical Terminology (practice) V.

Full name of the subject: Magyar orvosi szaknyelv (gyakorlat) V.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Hung. Med. Term. V.
English name of the subject: Hungarian Medical Terminology (practice) V.
German name of the subject: Ungarische medizinische Fachsprache (Praktikum) V

Neptun code of the subject: GYLEKMSZG5A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Languages for Specific Purposes

Responsible tutor: Alexandra Bakó language teacher
E-mail: bako.alexandra@se-etk.hu

Name of the persons responsible for the teaching of the subject:
Borda Szandra language teacher
Nagyné Górász Judit language teacher
Kovács Ildikó language teacher
Nagy Borbála language teacher
Tóth Vera language teacher
Tóth Zsuzsanna language teacher

Classes per week: 4 practices
Credit point: 2

Professional content, intent of acquirement and its function in order to implement the goals of the program:
The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective professional communication in the language they use during their field practice. With the help of this course they become able to communicate with the patients in the Hungarian hospitals and pharmacies.

Short description of the subject:
Students acquire basic structures and the vocabulary for everyday topics. The course places special emphasis on phrases essential for everyday communications.

Topics: Communication practice (family and social history); Communication practice (internal medicine -medical history); Communication practice (treatments, medication); Common illnesses - symptoms; The respiratory system; The cardiovascular system; The urinary system; The digestive system; The Endocrine system

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5	0	56			56	Autumn semester	

Program of semester

Topics of practical classes (pro week):

Lesson 1-4:	Communication practice (family and social history)
Lesson 5-6:	Communication practice (internal medicine – medical history)
Lesson 7-8:	Communication practice (treatments, medication)
Lesson 9-10:	Common illnesses – symptoms
Lesson 11-16:	The respiratory system
Lesson 17-22:	The cardiovascular system
Lesson 23-24:	Consolidation
Lesson 25-26:	Test 1 + situation
Lesson 27-32:	The urinary system
Lesson 33-38:	The digestive system
Lesson 39-44:	The Endocrine system
Lesson 45-50:	Consolidation
Lesson 51-52:	Test – situation, communication practice
Lesson 53-56:	Mock final exam (oral part), assessment

Schedule of consultations:

Individual consultations by email or in person on meeting formerly agreed upon with the teacher via email.

Course requirements

Prerequisites: GYLEKMSZG4A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

An attendance of 75% minimum is required to get the signature.

The student must have a minimum average of 2.00 based on the final exam to pass the subject.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Beside the final test the teacher may evaluate the students' performance with the help of short tests.

Requirements of signature:

An attendance of 75% minimum and taking the final test.

Number and type of projects students have to perform independently during the semester and their deadlines:

homework in the forms of language practice tasks

Type of the semester-end examination: final

Form of the semester-end examination: written and oral

List of teaching materials (List of textbooks, hand-outs, scripts, etc.):

Marthy A. & Végh Á. Egészségére! Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.
sample tests provided by the teacher

Physical Education V.

Full name of the subject: Testnevelés V.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: –
English name of the subject: Physical Education V.
German name of the subject: Sport V

Neptun code of the subject: GYKTSI116G5A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: **Várszegi, Kornélia** director
Phone: +36-1/264-1408
E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Fodor, Ákos tennis trainer
Kalmár, Jessica aerobics trainer
Kalmus, Dániel circuit training trainer
Katona, László hiking, badminton, boulder trainer
Lehel, Zsolt tennis, golf, icehockey trainer
Nagy-Kismarci, Bence cheerleading trainer
Rimay, István football trainer
Weisz, Miklós basketball trainer

Classes per week: 1 practice
Credit point(s): 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Upon completion of the course the student will be able to carry out regular physical activity.
After completing the „beginner swimming” course, one will acquire water-confident swimming skills.

Short description of the subject:

The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behavior

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
5. semester	0	14			14	Autumn semester	

Program of semester

Topics of practical classes (pro week):

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,

4x3 hrs. and 1x2 hrs. session packages: Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Course requirements

Prerequisites: –

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The number of active participations for physical education classes is 10, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams.

As teams take part in championships during the school year, we only accept applications from professional athletes!

Requirements of signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

Type of the semester-end examination: signature/practical grade/semi-final/final

6. SEMESTER 2021/2022/2

Subject	Lecture (hour/week)	Practice (hour/week)	Credit	Prerequisites	Exam type
Pharmacognosy (theory+practice) I.	2	4	5	Pharmaceutical Botany II.	practical mark
Pharmaceutical Chemistry (practice) II.	–	4	4	Pharmaceutical	practical mark
Pharmaceutical Chemistry (theory) II.	4	–	4	Chemistry I.	final*
Pharmaceutical Technology (practice) II.	–	6	3	Pharm. Techn. I.	practical mark
Pharmaceutical Technology (theory) II.	2	–	3	Pharm. Chem. I.	semi-final
Basic Medical Pathophysiology II. (theory)	2	–	2	Basic Med. Patho.I. Dietetics Pharm. Microbiology	final*
Veterinary Pharmaceuticals (theory)	1	–	1	Pharm. Techn. I. Pharm. Microbiology	semi-final
Pharmacology and Toxicology (practice) I.	–	2	2	Basic Med. Patho.I.	practical mark
Pharmacology and Toxicology (theory) I.	2	–	2	Physiological Pharm. and Pharmaceutical dosage forms	semi-final
Physical Education VI.	–	1	–		signature
Pharmacy Practice II. GYKANG238G2A	–	20/semester	–	Pharm. Techn. I. Pharm. Chem. I.	signature
Summer Practice II.	–	40	4	Pharm. Chem. and Anal.; Pharm. Techn. II.	practical mark
Total:	13	17 20/semester 4x40/semester	26+4		

Pharmacognosy (theory+practice) I.

Full name of the subject:	Gyógynövény- és drogismeret (elmélet+gyakorlat) I.
Program:	undivided program (pharmaceutical)
Schedule:	full-time
Short name of the subject:	Pharmacognosy I.
English name of the subject:	Pharmacognosy (theory+practice) I.
German name of the subject:	Pharmakognosie (Vorlesung+Praktikum) I
Neptun code of the subject:	GYKFMG130G1A
Type of registration:	obligatory
Responsible Department:	Semmelweis University, Department of Pharmacognosy
Responsible tutor:	Szabolcs Béni head of department, associate professor, Ph.D. E-mail: beni.szabolcs@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:

Szabolcs Béni associate professor, Ph.D.
Ágnes Alberti associate professor, Ph.D.
Andrea Böszörményi assistant professor, Ph.D.
Orsolya Csernák assistant professor, Ph.D.
Ida Fejős assistant professor, Ph.D.
László Kursinszki associate professor, Ph.D.
Eszter Riethmüller assistant professor, Ph.D.
Attila Ványolós assistant professor, Ph.D.
Nóra Gampe professor's assistant, Ph.D.

Classes per week: 2 lectures, 4 practices
Credit point: 5

Professional content, intent of acquirement and it's function in order to implement the goals of the program:

The aim of the course is to acquaint pharmacy students with medicinal plants, herbal drugs and the analytical methods applied in their quality assurance. By doing so, it contributes to the education of pharmacy students to become key experts in herbal medicines. It contributes to the training of students with modern knowledge of pharmacognosy at a time when the knowledge about natural substances and herbs has come to the fore and has expanded with new aspects due to European harmonization.

Short description of the subject:

The topics of the classes follow the biogenetic system of plant materials. It represents a shift in proportion and, in part, selection in the curriculum that sufficiently emphasizes the importance of knowledge of herbal drugs and their active ingredients that are important in therapeutic practice. At the same time, it provides sufficient knowledge in the context of structure-activity relationships for the sufficient processing of newly emerging herbal drugs, possibly of foreign origin, based on their chemical groups. It also introduces the requirements of the European Pharmacopoeia (Ph. Eur.) regarding herbal drugs and preparations. It thus provides knowledge of all herbal drugs and active substances that serve as raw materials for phytopharmaceuticals (including those that will soon become traditional OTC medicines) and preventive products (dietary supplements).

Knowledge of plant material: drug recognition; macroscopic and microscopic examination (cross section, powder preparation, quantitative microscopy).

Detection of active ingredients and constituents of herbal drugs (preparation, extraction and purification techniques, general and specific chemical reactions, chromatographic methods), quantitative evaluations (pharmacopoeial and standard methods) and isolation of individual components or selective determination by complex chromatographic and spectroscopic methods. Application of herbal drugs based on their positive effects in prevention, phytotherapy and improving quality of life.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
6	28	56	–	–	84	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week:	Introduction to Pharmacognosy	1. week:	Introduction, safety rules. Macroscopic and microscopic knowledge. European Pharmacopoeia.
2. week:	History of Pharmacognosy. Cultivation and processing of medicinal plants.	2. week:	General methods in Pharmacognosy.
3. week:	Biogenetic system of plant materials. Saccharides, carbohydrates.	3. week:	Vegetable drugs containing carbohydrates (starches, mucilages, etc.).
4. week:	Plant acids. Polyketides.	4. week:	Plant acids and their drugs.
5. week:	Classification of phenolic compounds. Hydroxycinnamic acid derivatives	5. week:	Plant lipids and their drugs.
6. week:	Coumarins.	6. week:	Phenolglycosides, lignans, coumarins and diarylheptanoids.
7. week:	Lignans. Styrylpyrans. Diarylheptanoids. Arylalkanes. Stilbenoids.	7. week:	Flavonoids and chief drugs I.
8. week:	Flavonoids.	8. week:	Flavonoids and chief drugs II.
9. week:	Isoflavonoids. Rotenoids. Calchones. Anthocyanins.	9. week:	Tannins and chief tannin drugs.
10. week:	Tannins.	10. week:	Anthraglycoside containing crude drugs I. Chemical tests, quantitative determinations.
11. week:	Naphthoquinones. Anthraglycosides.	11. week:	Anthraglycoside containing crude drugs II. Quantitative determination of sennosides.
12. week:	Naphthodianthrone. Terpenophenolics.	12. week:	Terpenophenolics and phloroglucine derivatives.
13. week:	Obligatory test -exam	13. week:	Individual task I.: Natural product development,
14. week:	Fungi	14. week:	Individual task II.: Identification of crude drugs based on the methods prescribed in the Ph. Eur.

Topics of practical classes (pro week):

Schedule of consultations: as demanded

Course requirements

Prerequisites: GYKFMG079E2A – Pharmaceutical botany II.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: Three absences from the practices are allowed.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

During the term-time: three written or oral examinations based on the material of the practices and the lectures. Test of the knowledge of herbal drugs: examination of unknown drug mixtures, identification of unknown drug powders, recognition of microscopic preparations. The grade of the obligatory midterm test is given double weight, the marks obtained during the further examinations are taken into account with single weight when determining the practical mark. Midterm examinations can be retaken twice. In the case of the improvement of the grade, the average of the correction mark (s) and the original grade (s) will be taken into account.

Requirements of signature:

Participation at the practices. Submission and acceptance of reports. The average of the grades of the midterm examinations is at least 2.0. Successful completion of the obligatory midterm test.

Number and type of projects students have to perform independently during the semester and their deadlines: Presentation of a chosen topic.

Type of the semester-end examination: practical grade

Necessary equipment: Lecture hall, projection, wi-fi.

Laboratory equipped with microscopes, labwares, extractors, distillation equipment, instruments (UV-VIS, IR, HPLC, GC), chemicals.

Pharmaceutical Chemistry (theory) II., Pharmaceutical Chemistry (practice) II.

Full name of the subject: Gyógyszerészi kémia (elmélet) II., Gyógyszerészi kémia (gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Pharm. Chem. II.
English name of the subject: Pharmaceutical Chemistry (theory) II., Pharmaceutical Chemistry (practice) II.
German name of the subject: Pharmazeutische Chemie (Vorlesung) II., Pharmazeutische Chemie (Praktikum) II.

Neptun code of the subject: GYKGYK076E2A, GYKGYK076G2A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmaceutical Chemistry

Responsible tutor: **Dr. Péter Horváth** Head of the Department, Associate professor, Ph.D.
 E-Mail: horvath.peter@pharma.semmelweis-univ.hu
 Phone: 06-1-217-0891
 Semmelweis University, Department of Pharmaceutical Chemistry, H-1092 Budapest, Hőgyes Endre u. 9.

Name of the persons responsible for the teaching of the subject:
Dr. Péter Horváth associate professor, head of the department, Ph.D.
Dr. Krisztina Takács-Novák full professor, D.Sc.
Dr. László Örfi full professor, Ph.D.
Dr. Gergely Völgyi associate professor, Ph.D.
Dr. Károly Mazák associate professor, Ph.D.
Dr. Márta Mazák-Kraszni associate professor, Ph.D.
Dr. Gergő Tóth assistant professor, Ph.D.
Dr. Arash Mirzahosseini assistant lecturer, Ph.D.
Dr. Tamás Palla assistant lecturer, Ph.D.
Dr. István Köteles assistant lecturer
Dr. Dóra Csicsák assistant lecturer

Classes per week: 4 lectures, 4 practices
Credit point(s): 4 (theory), 4 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Integration of the curriculum of various chemical and biological courses and extension with specific chemical knowledge regarding properties, mechanism of action and analytics of drug substances.

Short description of the subject:

theory: Teaching of synthesis, analytics, physico-chemical and chemical properties, structure-activity relationships, receptor-bindings and biochemical background of biological effects of drug substances.

practice: Teaching of analytics, physico-chemical and chemical properties of drug substances.

Course data

Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
6	56	56	–	–	112	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Cardiac glycosides. Chemistry, analytics of cardiac glycosides, sugars
Cardiovascular drugs: antiarrhythmic agents
2. week: Cardiovascular drugs: antianginal agents
Cardiovascular drugs: antihypertensive agents
3. week: Cardiovascular drugs: antihyperlipidemic agents
Cardiovascular drugs: anticoagulants
4. week: Antidiabetics
Diuretics
5. week: Antihistamines
Corticosteroids
6. week: Sexual hormones
Vitamins I.
7. week: Vitamins II.
Disinfectants
8. week: Chemotherapeutics: sulfonamides
Chemotherapeutics: antimalarial drugs, fluoroquinolones
9. week: Chemotherapeutics: antituberculotics, antifungal agents
Antibiotics: β -lactams, chloramphenicol
10. week: Antibiotics: tetracyclines, aminoglycosides
Antiviral agents
11. week: Anticancer drugs
Biological and biosimilar drugs

12. week: Drug research I.
Drug research II.
13. week: Quality assurance, GLP, validation
Drugs acting on the thyroid gland
14. week: Nootropics
Consultation

Topics of practical classes (pro week):

1. week: Equipping, identification.
2. week: Cardiovascular drugs I. (digitalis glycosides and sugars)
3. week: Cardiovascular drugs II. (antiarrhythmic and antianginal agents)
4. week: Cardiovascular drugs III. (antihypertensive agents and anticoagulants)
5. week: Diuretics
6. week: Antihistamines
7. week: Steroid hormones
8. week: Vitamins
9. week: Disinfectants and chemotherapeutics I. (China alkaloids)
10. week: Chemotherapeutics II. (sulfonamides, fluoroquinolones)
11. week: Antibiotics
12. week: Validation of methods
13. week: Personal task: Complete pharmacopoeial qualification of an organic compound (Ph. Eur.)
14. week: Substitutional practice, desequipping

Course requirements

Prerequisites: Pharmaceutical Chemistry I. GYKGK076E1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: Based on the Study and Exam Regulation

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results: Project reports on weeks 6, 10 and 13.

Requirements of signature:

Attendance on the lectures. (Extent of the absence is based on the Study and Exam Regulation)

Attendance on the practices. (Extent of the absence is based on the Study and Exam Regulation)

The average of the scheduled project reports is at least 2.

The required minimum amount of points during practices is accumulated.

Fulfilment of the compulsory personal task practice.

Type of the semester-end examination:

theory: final

practice: practical grade

Form of the semester-end examination: written and oral

Necessary equipment: practice: drug substances, reagents, laboratory equipments, instruments

Pharmacology and Toxicology (theory) I., Pharmacology and Toxicology (practice) I.

Full name of the subject: Gyógyszerhatástan és toxikológia (elmélet) I., Gyógyszerhatástan és toxikológia (gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Pharmacology and Toxicology (theory) I., Pharmacology and Toxicology (practice) I.
German name of the subject: Pharmakologie und Toxikologie (Vorlesung) I., Pharmakologie und Toxikologie (Praktikum) I.

Neptun code of the subject: GYKGYH086E1A, GYKGYH086G1A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmacodynamics

Responsible tutor: **Dr. Tamás Tábi** Associate Professor, PhD
Phone: +36 1 210-44-11
E-mail: tabi.tamas@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Éva Szökő Full Professor, DSc
Dr. György Bagdy Full Professor, DSc
Dr. László Tóthfalusi Associate Professor, DSc
Dr. Tamás Tábi Associate Professor, PhD
Dr. Rudolf Laufer Assistant lecturer

Classes per week: 2 lectures, 2 practices
Credit point(s): 2 (theory), 2 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:
Understanding the mechanism and effect of drugs

Short description of the subject:
The course aims at teaching of the mechanism of action, side effects and interactions of drugs and the basics of their therapeutic use.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
6	28	28	–	–	56	Spring semester*	–

Program of semester

Topics of theoretical classes (pro week):

1. week: General principles of drug action, receptor theory I
2. week: Pharmacokinetics
3. week: Factors influencing the drug effect. Basics of clinical pharmacology
4. week: Autonomic drugs. Striated muscle relaxants
5. week: Chemical neurotransmission in the CNS
6. week: General and local anesthetics. Opioids
7. week: Drugs used in affective disorders. Anxiolytic and hypnotic drugs
8. week: Antipsychotic drugs. Drugs of abuse
9. week: Pharmacology of neurodegenerative disorders. Antiepileptics. Drugs of migraine
10. week: Immunopharmacology
11. week: Nonsteroidal anti-inflammatory drugs. Drugs of gout
12. week: Glucocorticoids. Pharmacology of the respiratory system
13. week: Drugs of inflammatory disorders.
14. week: Drug interactions and adverse drug reactions

Topics of practical classes (pro week):

1. week: Introduction to pharmacology
2. week: Drug targets, receptor-drug interaction
3. week: Dose-response curves
4. week: Administration routes
5. week: Blood level curves
6. week: Factors influencing the drug effect
7. week: Midterm exam: general pharmacology
8. week: Autonomic drugs
9. week: Drugs of heart
10. week: Drugs of circulation
11. week: Use of cardiovascular drugs
12. week: Midterm exam: autonomic and cardiovascular pharmacology
13. week: Drugs of coagulation and lipid lowering drugs
14. week: Review and summary

Course requirements

Prerequisites:

Basic Medical Pathophysiology I. GYKGYH083G1A

Physiological Pharmaceutics and Pharmaceutical dosage forms GYKGYI073G1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: The attendance to lectures is highly recommended.

The attendance to practices is mandatory. Presence on minimum 75% of practices is required to the acceptance of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Two written midterm exams (on weeks 7 and 12)

Requirements of signature:

Attendance to lectures.

Attendance to practices. Completion of both midterm tests with at least pass (50%) results.

Type of the semester-end examination: signature/practical grade/semi-final/final

Form of the semester-end examination: written

Scientific, course related researches, publications, assays:

Ritter et al.: Rang & Dale's Pharmacology 9th ed. Elsevier 2019

Physical Education VI.

Full name of the subject: Testnevelés VI.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: P. E. VI.
English name of the subject: Physical Education VI.
German name of the subject: Sport VI

Neptun code of the subject: GYKTSI116G6A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: **Várszegi, Kornélia** director
Phone: +36-1/264-1408
E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Fodor, Ákos tennis trainer
Kalmár, Jessica aerobics trainer
Kalmus, Dániel circuit training trainer
Katona, László hiking, badminton, boulder trainer
Lehel, Zsolt tennis, golf, icehockey trainer
Nagy-Kismarci, Bence cheerleading trainer
Rimay, István football trainer
Weisz, Miklós basketball trainer

Classes per week: 1 practice
Credit point(s): 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Upon completion of the course the student will be able to carry out regular physical activity.
After completing the “beginner swimming” course, one will acquire water-confident swimming skills.

Short description of the subject:

The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behaviour

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
6. semester	0	14	–	–	14	Spring semester*	–

Course requirements

Prerequisites: –

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The number of active participations for physical education classes is 10, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Requirements of signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

Type of the semester-end examination: signature

FACULTY OF PHARMACEUTICAL SCIENCES

**Curriculum of the credit-based training for fourth year
students in the 2021/2022 academic year**



Pharmaceutical Sciences
4th year

7. SEMESTER 2021/2022/1

Subject	Lecture (hour/ week)	Practice (hour/ week)	Credit	Prerequisites	Exam type
Pharmacognosy (practice) II. GYFMGGNDG2A	–	4	3	Pharmacognosy I. Pharm. Chemistry II.	practical mark
Pharmacognosy (theory) II. GYFMGGNDE2A	2	–	3		final*
Pharmaceutical Chemistry (practice) III. GYGYKGYKG3A	–	4	3	Pharm. Chemistry II. Physiology II.	practical mark
Pharmaceutical Chemistry (theory) III. GYGYKGYKE3A	2	–	3		final*
Pharmacology and Toxicology (practice) I. GYGYHHATG1A	–	2	2	Physiology II. Pharm. Chemistry II. Pharmac. Microbiol. Basic Immunology	practical mark
Pharmacology and Toxicology (theory) I. GYGYHHATE1A	4	–	4		semi-final
Basics of Pharmacoeconomics (practice) GYETEFOAG1A	0	1	1**	Mathematics II. Passing in the same term with Pharmacology and Toxicology I.	practical mark
Pharmaceutical Technology (practice) III. GYGYIGYTG3A	–	9	5	Pharm. Chemistry II. Pharm. Techn. II.	practical mark
Pharmaceutical Technology (theory) III. GYGYIGYTE3A	3	–	4		semi-final
Basic Medical Pathophysiology (theory) I. GYGYHKKAE1A	2	–	2	Physiology II. Pharmac. Microbiol.	semi-final
Industrial Pharmaceutical Technology I. GYGYIIGTE1A	3	0	2**	Pharm. Technology II. Pharm. Chem. and Anal.I.	semi-final
Physical Education VII. GYTSITSNG7A	–	1	–		signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	16	21	29 +3**		

Pharmacognosy (theory) II., Pharmacognosy (practice) II.

Full name of the subject: Gyógynövény és drogismeret (elmélet) II., Gyógynövény és drogismeret (gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Pharmacognosy II.
English name of the subject: Pharmacognosy (theory) II., Pharmacognosy (practice) II.
German name of the subject: –

Neptun code of the subject: GYFMGGNDE2A; GYFMGGNDG2A
Type of registration: obligatory
Responsible Department: Semmelweis University, Department of Pharmacognosy

Responsible tutor: **Szabolcs Béni** head of department, associate professor, Ph.D.
E-mail: beni.szabolcs@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Szabolcs Béni associate professor, Ph.D.
Ágnes Alberti associate professor, Ph.D.
Andrea Böszörményi assistant professor, Ph.D.
Orsolya Csernák assistant professor, Ph.D.
Ida Fejős assistant professor, Ph.D.
László Kursinszki associate professor, Ph.D.
Eszter Riethmüller assistant professor, Ph.D.
Attila Ványolós assistant professor, Ph.D.
Nóra Gampe professor's assistant, Ph.D.

Classes per week: 2 lectures, 4 practices,
Credit point: 3+3

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The aim of the course is to acquaint pharmacy students with medicinal plants, herbal drugs and the analytical methods applied in their quality assurance. By doing so, it contributes to the education of pharmacy students to become key experts in herbal medicines. It contributes to the training of students with modern knowledge of pharmacognosy at a time when the knowledge about natural substances and herbs has come to the fore and has expanded with new aspects due to European harmonization.

Short description of the subject:

The topics of the classes follow the biogenetic system of plant materials. It represents a shift in proportion and, in part, selection in the curriculum that sufficiently emphasizes the importance of knowledge of herbal drugs and their active ingredients that are important in therapeutic practice. At the same time, it provides sufficient knowledge in the context of structure-activity relationships for the sufficient processing of newly emerging herbal drugs, possibly of foreign origin, based on their chemical groups. It also introduces the requirements of the European Pharmacopoeia (Ph. Eur.) regarding herbal drugs and preparations. It thus provides knowledge of all herbal drugs and active substances that serve as raw materials for phytopharmaceuticals (including those that will soon become traditional OTC medicines) and preventive products (dietary supplements).

Knowledge of plant material: drug recognition; macroscopic and microscopic examination (cross section, powder preparation, quantitative microscopy).

Detection of active ingredients and constituents of herbal drugs (preparation, extraction and purification techniques, general and specific chemical reactions, chromatographic methods), quantitative evaluations (pharmacopoeial and standard methods) and isolation of individual components or selective determination by complex chromatographic and spectroscopic methods. Application of herbal drugs based on their positive effects in prevention, phytotherapy and improving quality of life.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
7	28	56	-	-	84	Autumn semester	-

Program of semester

Topics of theoretical classes (pro week):

- 1. week: Terpenoids. Biogenetic generalities, classification. Essential oils in the plant kingdom and their therapeutic significance.
- 2. week: Acyclic, monocyclic and bicyclic monoterpenes and their drugs.
- 3. week: Essential oil-rich drugs containing phenylpropane derivatives and aromatic monoterpenes. Sesquiterpenes and their drugs. Balms, resins and their drugs.
- 4. week: Valepotriate iridoid ester-containing drugs. Iridoids and their drugs. Therapeutic significance of bitter substance-containing drugs and their preparations: secoiridoid, sesquiterpene lactone, diterpene, seco-triterpene, cinnamic acid pregnane ester, cucurbitacin type bitter substances and their drugs.
- 5. week: General description of triterpenes and sterane compounds. Structure, chemical classification and effects of saponins. Steroid saponins. Triterpene saponins and their drugs. Therapeutic significance of adaptogenic drugs and their preparations. Other steroids and triterpenes. Tetraterpenes. Polyterpenes.
- 6. week: Drugs containing sterane-based cardiac glycosides and their significance in medicine. Ecdysterols and their drugs.
- 7. week: Plant nitrogen metabolism. Amino acids, peptides, biogenic amines. Issues of lectins and their medicinal use. Plant enzymes in therapy. Alkaloids in general (Biosynthesis, chemical structure / effect). Ornithine and lysine alkaloids I: Tropane and ecgonin alkaloids.
- 8. week: Ornithine and lysine-derived alkaloids II: Pyrrolidine- and piperidine-based alkaloids, pyrrolizidine and quinolizidine-based alkaloids and their drugs. Tryptophan-derived alkaloids. Simple indole backbone, hemiterpenoid - indole backbone, monoterpenoid - indole backbone and dimeric indylindole backbone alkaloids and their drugs. Strychnane and quinoline backbone alkaloids and their drugs.

- 9. week: Phenylalanine (tyrosine, DOPA) derived alkaloids. Phenoloid-isoquinoline backbone, benzyloisoquinoline, morphinan backbone, dimeric benzyloisoquinoline backbone, phenylisoquinoline, phenanthridine backbone, monoterpenoid-isoquinoline backbone alkaloids and their drugs.
- 10. week: Phenylalanine-derived protoalkaloids: Tropolone, aminophenylpropane, and benzylamine backbone alkaloids and their drugs. Pseudoalkaloids. Purine, pyrimidine-based and imidazole-based alkaloids, pyridine carboxylic acids and their drugs.
- 11. week: Terpene-derived alkaloids and their drugs. Mustard oil glycosides. Drugs containing other sulfur compounds.
- 12. week: Pharmaceutical biotechnology.
- 13. week: Obligatory written test.
- 14. week: Plant research and phytotherapy in the XXI. century.

Topics of practical classes (pro week):

- 1. week: Bitter substances of plants. Classification, reactions, bitterness value.
- 2. week: Essential oil containing drugs I.
- 3. week: Essential oil containing drugs II.
- 4. week: Saponins and chief saponin drugs. Methods used in the identification and quality control of saponins.
- 5. week: Cardioactive glycosides and chief drugs
- 6. week: Methods used in the analyses of cardioactive glycosides.
- 7. week: Tropane alkaloid containing drugs
- 8. week: Isoquinoline alkaloids, their chief drugs-
- 9. week: Quinoline and indole alkaloids, their chief drugs
- 10. week: Pseudo- and protoalkaloids, their chief drugs I.
- 11. week: Pseudo- and protoalkaloids, their chief drugs II.
- 12. week: Plant biotechnology
- 13. week: Individual task I. : Natural product development
- 14. week: Individual task II.: Identification of crude drugs based on the methods prescribed in the Ph. Eur.

Schedule of consultations: as demanded

Prerequisites:

- GYKFMG130G1A Pharmacognosy I.
- GYGYKGYKE2A Pharmaceutical chemistry II.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:
Three absences from the practices are allowed.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

During the term-time: two written or oral examinations based on the material of the practices. Test of the knowledge of herbal drugs: examination of unknown drug mixtures, identification of unknown drug powders, recognition of microscopic preparations.

The grade of the obligatory midterm test is given double weight, the marks obtained during the further examinations are taken into account with single weight when determining the practical mark.

Midterm examinations can be retaken twice. In the case of the improvement of the grade, the average of the correction mark (s) and the original grade (s) will be taken into account.

Demonstration of that the student: a) has adequate knowledge of plant materials (recognition of herbal drugs), and b) is able to independently perform quality testing of herbal drugs based on the Ph. Eur. Academic competition.

Requirements of signature:

Participation at the practices. Submission and acceptance of reports. The average of the grades of the midterm examinations is at least 2.0.

Successful completion of the obligatory midterm test.

Number and type of projects students have to perform independently during the semester and their deadlines:

Practice: Participation at the practices. Submission and acceptance of reports. The average of the grades of the midterm examinations is at least 2.0. Successful completion of the obligatory midterm test.

Type of the semester-end examination:

Lecture: final

Practice: practical grade

Form of the semester-end examination:

Lecture : oral examination

Necessary equipment:

Lecture hall, projection, wi-fi.

Practice : Laboratory equipped with microscopes, labwares, extractors, distillation equipment, instruments (UV-VIS, IR, HPLC, GC), chemicals

Pharmaceutical Chemistry (theory) III., Pharmaceutical Chemistry (practice) III.

Full name of the subject: Gyógyszerészi kémia (elmélet) III., Gyógyszerészi kémia (gyakorlat) III.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Pharm. Chem. III.
English name of the subject: Pharmaceutical Chemistry (theory) III., Pharmaceutical Chemistry (practice) III.
German name of the subject: Pharmazeutische Chemie (Vorlesung) III., Pharmazeutische Chemie (Praktikum) III.

Neptun code of the subject: GYGKGYKE3A, GYGKGYKG3A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmaceutical Chemistry

Responsible tutor: **Dr. Péter Horváth** Head of the Department, Associate professor, Ph.D.
 Phone: 06-1-217-0891
 E-Mail: horvath.peter@pharma.semmelweis-univ.hu
 Semmelweis University, Department of Pharmaceutical Chemistry, H-1092 Budapest, Hőgyes Endre u. 9.

Name of the persons responsible for the teaching of the subject:
Dr. Péter Horváth associate professor, head of the department, Ph.D.
Dr. Krisztina Takács-Novák full professor, D.Sc.
Dr. László Örfi full professor, Ph.D.
Dr. Gergely Völgyi associate professor, Ph.D.
Dr. Károly Mazák associate professor, Ph.D.
Dr. Márta Mazák-Kraszni associate professor, Ph.D.
Dr. Gergő Tóth assistant professor, Ph.D.
Dr. Arash Mirzahosseini assistant lecturer, Ph.D.
Dr. Tamás Palla assistant lecturer, Ph.D.
Dr. István Köteles assistant lecturer
Dr. Dóra Csicsák assistant lecturer

Classes per week: 2 lectures, 4 practices
Credit point: 3 (theory), 3 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Integration of the curriculum of various chemical and biological courses and extension with specific chemical knowledge regarding properties, mechanism of action and analytics of drug substances.

Short description of the subject:

Teaching of synthesis, analytics, physico-chemical and chemical properties, structure-activity relationships, receptor-bindings and biochemical background of biological effects of drug substances.

Teaching of analytics, physico-chemical and chemical properties of drug substances.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
7	28	56	-	-	74	Autumn semester	-

Program of semester

Topics of theoretical classes (pro week):

1. week: Disinfectants
2. week: Chemotherapeutics: sulfonamides
3. week: Chemotherapeutics: antimalarial drugs, fluoroquinolones
4. week: Analysis of drug mixtures I.
5. week: Analysis of drug mixtures II.
6. week: Chemotherapeutics: antituberculotics, antifungal agents
7. week: Antibiotics: β -lactams, chloramphenicol
8. week: Antibiotics: tetracyclines, aminoglycosides
9. week: Antiviral agents
10. week: Anticancer drugs

11. week: Drug research I.
12. week: Drug research II.
13. week: Biological and biosimilar drugs
14. week: Consultation

Topics of practical classes (pro week):

1. week: Equipping, identification.
2. week: Disinfectants and chemotherapeutic drugs
3. week: Antibiotics
4. – 5. weeks: Identification of drug mixtures
6. – 13. weeks: Quantitative determination of drug mixtures
14. week: Substitutional practice, desequipping

Course requirements

Prerequisites:

Pharmaceutical Chemistry II. GYGYGYKE2A
Physiology II. GYKTLM124E2A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Based on the Study and Exam Regulation

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

practice: Project reports on weeks 4, 9 and 12.

Requirements of signature:

Attendance on the lectures. (Extent of the absence is based on the Study and Exam Regulation)

Attendance on the practices. (Extent of the absence is based on the Study and Exam Regulation)

The average of the scheduled project reports is at least 2.

The required minimum amount of points during practices is accumulated.

Type of the semester-end examination:

theory: final

practice: practical grade

Form of the semester-end examination: written and oral

Necessary equipment:

practice: drug substances, reagents, laboratory equipments, instruments

Pharmacology and Toxicology (theory) I., Pharmacology and Toxicology (practice) I.

Full name of the subject: Gyógyszerhatástan- toxikológia (elmélet) I., Gyógyszerhatástan- toxikológia (gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Pharmacology and Toxicology (theory) I., Pharmacology and Toxicology (practice) I.
German name of the subject: Pharmakologie und Toxikologie (Vorlesung) I., Pharmakologie und Toxikologie (Praktikum) I.

Neptun code of the subject: GYGYHHATE1A, GYGYHHATG1A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmacodynamics

Responsible tutor: **Dr. Tamás Tábi** Associate Professor, PhD
Phone: +36 1 210-44-11
E-mail: tabi.tamas@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Éva Szőkő Full Professor, DSc
Dr. György Bagdy Full Professor, DSc
Dr. László Tóthfalusi Associate Professor, DSc
Dr. Tamás Tábi Associate Professor, PhD
Dr. Rudolf Laufer Assistant lecturer

Classes per week: 4 lectures, 2 practices
Credit point: 4 (theory), 2 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:
Understanding the mechanism and effect of drugs

Short description of the subject:
The course aims at teaching of the mechanism of action, side effects and interactions of drugs and the basics of their therapeutic use.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
7	56	28	-	-	84	Autumn semester	-

Program of semester

Topics of theoretical classes (pro week):

1. week: General principles of drug action, receptor theory I
2. week: Dose-respons curves. Agonist and antagonist ligands
3. week: Fate of drugs in the body
4. week: Pharmacokinetics
5. week: Cholinergic drugs drugs. Striated muscle relaxants
6. week: Adrenergic drugs
7. week: Antiadrenergic drugs. Drugs of Glaucoma
8. week: Drugs affecting the heart
9. week: Drugs of circulation
10. week: Diuretics
11. week: Drugs affecting blood coagulation
12. week: Lipid lowering drugs
13. week: Basics of clinical pharmacology
14. week: Factors influencing the drug effect.

Topics of practical classes (pro week):

1. week: Introduction to pharmacology
2. week: General principles of drug action, receptor theory
3. week: Pharmacokinetics
4. week: Factors influencing the drug effect. Basics of clinical pharmacology
5. week: Cholinergic drugs. Striated muscle relaxants
6. week: Adrenergic drugs
7. week: Midterm exam: general and autonomic pharmacology
8. week: General and local anesthetics. Opioids
9. week: Psychopharmacology 1
10. week: Psychopharmacology 2
11. week: Neuropharmacology Nonsteroidal anti-inflammatory drugs. Drugs of gout
12. week: Midterm exam: pharmacology of CNS
13. week: Immunopharmacology
14. week: Anti-inflammatory drugs

Course requirements

Prerequisites:

Physiology II. GYTLMELE2A

Pharmaceutical Chemistry II. GYGYKGYKE2A

Pharmaceutical Microbiology GYMIKGMBE1A

Basic Immunology GYGENIMUE1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The attendance to lectures is highly recommended.

The attendance to practices is mandatory. Presence on minimum 75% of practices is required to the acceptance of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Two written midterm exams (on weeks 7 and 12)

Requirements of signature: Attendance to lectures.

Attendance to practices. Completion of both midterm tests with at least pass (50%) results.

Type of the semester-end examination:

theory: semi-final

practice: practical grade

Form of the semester-end examination: written

Scientific, course related researches, publications, assays:

Ritter et al.: Rang & Dale's Pharmacology 9th ed. Elsevier 2019

Basics of Pharmacoeconomics (practice)

Full name of the subject: Farmakoökonómia alapjai (gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Basics of Pharmacoeconomics (practice)
German name of the subject: Einführung in die Farmakoökonomie (Praktikum)
Neptun code of the subject: GYETEFOAG1A
Type of registration: obligatory elective
Responsible department: Semmelweis University, Center for Health Technology Assessment

Responsible tutor: **Assoc. Prof. András Inotai** PhD, DrHabil
Phone: +3670 430 4645
E-Mail: inotai.andras@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Prof. Zoltán Kaló PhD, DrHabil
Assoc. Prof. Balázs Nagy PhD, DrHabil
Zsuzsanna Petykó PhD candidate

Classes per week: 1 practice (2x45 mins bi-weekly)
Credit point: 1

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
7	0	14	–	–	14	Autumn semester*	-

Professional content, intent of acquirement and its function in order to implement the goals of the program:
Practice-oriented teaching of basic health- and pharmacoeconomic knowledge for pharmacy students to enable them interpreting and determining the cost-effectiveness of pharmaceuticals, and understanding the principles of pharmaceutical pricing and reimbursement.

Program of semester

Topics of practical classes (pro week):

Class	Topic	Lecturer
Week 1 90 min	Health care market and market failures Elements of health care system Financing health care	Zoltán Kaló
Week 3 90 min	Pharmacoeconomics, Health Technology Assessment, Classification of economic evaluations	Zoltán Kaló
Week 5 90 min	Steps of health economic evaluation I - Evidence synthesis, health outcome measurement (quality of life, utility, quality adjusted life years)	Zsuzsanna Petykó, András Inotai
Week 7 90 min	Steps of health economic evaluation II – Measuring costs, decision rule (threshold, multicriteria decision analysis)	Balázs Nagy
Week 9 90 min	Health economic modelling (classification, applicability)	Balázs Nagy
Week 11 90 min	Pricing of original and generic medicines	András Inotai
Week 13 90 min	Pharmaceutical reimbursement system, cost control techniques	András Inotai
Evaluation Week 14	Test type exam	

Schedule of consultations: 90 mins bi-weekly (contact hours)

Course requirements

Prerequisites: Mathematics II. GYEGYMATE2A, GYEGYMATG2A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

1 unjustified absence is permitted.

Requirements of signature: successful test at the end of the semester (week 14, classroom exam)

Type of the semester-end examination:

signature/practical grade/semi-final/final

Form of the semester-end examination: test type classroom exam of the entire semester curricula at week 14, opportunity for correction: week 1 of exam period

Scientific, course related researches, publications, assays:

education material include slide deck, compulsory and recommended reading materials

Necessary equipment:

NA, personal laptop is recommended for interactive health economic modeling

Physical Education VII.

Full name of the subject: Testnevelés VII.
Program: undivided program (pharmaceutical)
Schedule: full-time
English name of the subject: Physical Education VII.
German name of the subject: Sport VII
Neptun code of the subject: GYKTSI116G7A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: *Várszegi, Kornélia* director
E-Mail: varszegi.kornelia@semmelweis-univ.hu, sportkozpont@semmelweis-univ.hu
Phone: +36-1/264-1408

Name of the persons responsible for the teaching of the subject:

Fodor, Ákos tennis trainer
Kalmár, Jessica aerobics trainer
Kalmus, Dániel circuit training trainer
Katona, László hiking, badminton, boulder trainer
Lehel, Zsolt tennis, golf, icehockey trainer
Nagy-Kismarci, Bence cheerleading trainer
Rimay, István football trainer
Weisz, Miklós basketball trainer

Classes per week: 1 practice
Credit point: 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Upon completion of the course the student will be able to carry out regular physical activity.
After completing the “beginner swimming” course, one will acquire water-confident swimming skills.

Short description of the subject:

The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice - so that they can represent those in their later practice, through their own health-promoting behaviour.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
7. semester	0	14			14	Autumn semester	

Program of semester

Topics of practical classes (pro week):

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.
1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, advanced Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba
1 x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,
4 x 3 hrs. and 1x 2 hrs. session packages: Hiking 1, Hiking 2.
2x90 mins./week sport training (competitive sport, for qualified only): cheerdance, cheerleader, men's football, handball, basketball, volleyball

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Course requirements

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The number of active participations for physical education classes is 10, regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days, after registration in the Neptun system. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Requirements of signature:

Active participation in practice classes 10 times under the conditions described above.

May be exempted from attending classes the student who

1. whose diagnosis and the opinion of the sports doctor do not allow to exercise, and submits a certificate to the TSK or
2. does sports regularly and submits a certificate of association and federation to the Foreign Students Secretariat until the last study day in the 4th week of the semester. On the basis of the submitted application and its annexes, the TVB decides on the exemption of both the Hungarian and foreign students.

Type of the semester-end examination: signature

8. SEMESTER 2021/2022/2

Subject	Lecture (hour/ week)	Practice (hour/ week)	Credit	Prerequisites	Exam type
Pharmacology and Toxicology (practice) II. GYGYHHATG2A	–	3	2	Pharm. and Tox. I. Pharm. Techn. III. Basic Med. Pathop. I.	practical mark
Pharmacology and Toxicology (theory) II. GYGYHHATE2A	4	–	4		final*
Pharmaceutical Technology (practice) IV. GYGYIGYTG4A	–	9	6	Pharmaceutical Technology III.	practical mark
Pharmaceutical Technology (theory) IV. GYGYIGYTE4A	3	–	4		final*
Pharmacy Administration I. (theory+practice) GYEGYIMG1A	2	2	3	Basics of Pharmacoecon. Hist. of Scienc.and Prop. Pharm. Techn. III.	practical mark
Basic Medical Pathophysiology (theory) II. GYGYHKKAE2A	2	–	2	Basic Med. Pathop. I. Pharm. and Tox. I.	final*
Basics of Phytotherapy (theory) GYFMGFTAE1A	1	–	1**	Pharmacognosy II.	semi-final
Basics of Pharmaceutical Management (practice) GYEGYGGMG1A	-	1	1	Basics of Pharmacoeconomics	practical mark
Products of Veterinary Medicine (theory) GYGYIAGKE1A	1	0	1	Ph. Technology III. Ph. Microbiology	semi-final
Public Health (practice) GYNEINETG1A	-	2	2	Basic Medical Pathophysiology I.	practical mark
Public Health (theory) GYNEINEGE1A	2	–	2		semi-final
Physical Education VIII. GYKTSII16G8A	–	1	–		signature
Diploma Work I. GYSZDSZDG1A	–	4	–	Passing all semi-finals and finals of the 7th semester	signature
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark
Total:	14	22	27 +1**		

Pharmacology and Toxicology (theory) II., Pharmacology and Toxicology (practice) II.

Full name of the subject: Gyógyszerhatástan- toxikológia (elmélet) II., Gyógyszerhatástan- toxikológia (gyakorlat) II.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Pharmacology and Toxicology (theory) II., Pharmacology and Toxicology (practice) II.
German name of the subject: Pharmakologie und Toxikologie (Vorlesung) II., Pharmakologie und Toxikologie (Praktikum) II.

Neptun code of the subject: GYGYHHATE2A, GYGYHHATG2A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmacodynamics

Responsible tutor: **Dr. Tamás Tábi** Associate Professor, PhD
 Phone: +36 1 210-44-11
 E-mail: tabi.tamas@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Éva Szökő Full Professor, DSc
Dr. György Bagdy Full Professor, DSc
Dr. László Tóthfalusi Associate Professor, DSc
Dr. Tamás Tábi Associate Professor, PhD
Dr. Rudolf Laufer Assistant lecturer

Classes per week: 4 lectures, 3 practices
Credit point: 4 (theory), 2 (practice)

Professional content, intent of acquirement and its function in order to implement the goals of the program:
 Understanding the mechanism and effect of drugs

Short description of the subject:
 The course aims at teaching of the mechanism of action, side effects and interactions of drugs and the basics of their therapeutic use.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
8	56	42	–	–	98	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Drugs affecting circulation
2. week: Drugs affecting heart. Diuretics
3. week: Lipid lowering drugs. Drugs affecting coagulation.
4. week: Drugs affecting carbohydrate metabolism
5. week: Reproductive pharmacology
6. week: Drugs affecting calcium and bone metabolism. Drugs affecting the pituitary and thyroid
7. week: Drugs affecting GI tract function
8. week: Principles of antimicrobial chemotherapy
9. week: Antibacterial drugs
10. week: Antimycobacterial, antifungal, antiparasitic and antiviral drugs
11. week: Anticancer drugs
12. week: Drugs affecting the hemopoietic system. Vitamins and retinoids
13. week: Toxicology
14. week: Toxicology

Topics of practical classes (pro week):

1. week: Repetition
2. week: Drugs affecting the circulation
3. week: Drugs affecting the heart, diuretics. Use of cardiovascular drugs
4. week: Drugs affecting lipid levels and blood coagulation
5. week: Antidiabetics
6. week: Endocrine pharmacology
7. week: Midterm exam: cardiovascular and endocrine pharmacology
8. week: Gastrointestinal pharmacology
9. week: Antibacterial drugs
10. week: Antimycobacterial, antifungal, antiviral and antiparasitic drugs
11. week: Anticancer drugs
12. week: Midterm exam: gastrointestinal pharmacology, chemotherapy
13. week: Hemopoietic drugs. Vitamins. Understanding SmPC
14. week: Toxicology

Course requirements

Prerequisites:

Pharmacology and Toxicology I. GYGYHHATE1A

Pharmaceutical Technology III. GYGYIGYTE3A

Basic Medical Pathophysiology I. GYGYHKKAE1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

The attendance to lectures is highly recommended.

The attendance to practices is mandatory. Presence on minimum 75% of practices is required to the acceptance of the semester.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results: Two written midterm exams (on weeks 7 and 12)

Requirements of signature:

Attendance to lectures.

Attendance to practices. Completion of both midterm tests with at least pass (50%) results.

Type of the semester-end examination:

theory: semi-final

practice: practical grade

Form of the semester-end examination: written

Scientific, course related researches, publications, assays:

Ritter et al.: Rang & Dale's Pharmacology 9th ed. Elsevier 2019

Pharmacy Administration (theory+practice) I.

Full name of the subject: Gyógyszerügyi ismeretek (elmélet+gyakorlat) I.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Pharmacy Administration (theory+practice) I.
German name of the subject: Pharmazeutische Administration (Vorlesung+Praktikum) I.
Neptun code of the subject: GYEGYGIMG1A
Type of registration: obligatory
Responsible Department: Semmelweis University, University Pharmacy Department of Pharmacy Administration

Responsible tutor: **Dr. Romána Zelkó** professor, Ph.D., D.Sc.
Phone: 2170-927
E-mail: zelko.romana@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Ágnes Mészáros associate professor, Ph.D., Dr. Habil

Classes per week: 2 lectures, 2 practices
Credit point: 3

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The course seeks to introduce students with main fields of pharmacy, the responsibilities of the pharmacist: To teach about competencies and professional skills required in relation to drug dispensing, hospital-clinical pharmacy, and industrial pharmacy, as well as on economics and management, quality management.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
8	28	28	–	–	56	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

1. Introduction to Pharmacy Administration
2. Pharmaceutical research, Pharmaceutical Industry
3. Good Laboratory Practice (GLP)
4. Quality Management and GMP I
5. GMP II.
6. European Marketing Authorization I.
7. European Marketing Authorization II.
8. Marketing of pharmaceuticals
9. Risk assessment in relation to magisterial preparation
10. Pharmacovigilance in daily practice
11. Good Pharmacy Practice
12. Hospital Pharmacy Practice
13. Good Distribution Practice (GDP)
14. Drug tenders and applied health economics

Topics of practical classes (pro week):

1. Pharmacy education (Good Pharmacy Education Practice)
2. Importance of health promotion and patient education
3. Publication strategies
4. EBM and systematic literature reviews
5. The importance of Medline and UpToDate databases
6. GCP and the role of the hospital pharmacist
7. Drug Utilization Studies (Lecture)
8. Personal carrier management, CV
9. Professional life after graduation
10. ADR Website
11. Health literacy and "Healthy websites"
12. Student's Presentation on health promotion I
13. Student's Presentation on health promotion II.
14. Consultation and written practical exam (multiple choice)

Course requirements

Prerequisites:

Pharmaceutical Technology III. GYGYIGYTE3A GYGYIGYTG3A,
Basics of Pharmacoeconomics GYETEFOAG1A,
History of Sciences, Propereutics GYEGYTTPE1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:
according to the University's Study and Examination Regulations

Requirements of signature: attendance at 75% of the parctices

Number and type of projects students have to perform independently during the semester and their deadlines:
one presentation on health promotion topic

Type of the semester-end examination:
practical grade

Form of the semester-end examination:
written

Basics of Phytotherapy (theory)

Full name of the subject:	Fitoterápia alapjai (elmélet)
Program:	undivided program (pharmaceutical)
Schedule:	full-time
English name of the subject:	Basics of Phytotherapy (theory)
German name of the subject:	Grundlagen der Phytotherapie (Vorlesung)
Neptun code of the subject:	GYFMGFTAE1A
Type of registration:	obligatory elective
Responsible Department:	Semmelweis University, Department of Pharmacognosy
Responsible tutor:	Ágnes Alberti associate professor, Ph.D. alberti.agnes@pharma.semmelweis-univ.hu
Name of the persons responsible for the teaching of the subject:	Ágnes Alberti associate professor, Ph.D. Eszter Riethmüller assistant professor, Ph.D. Orsolya Csernák assistant professor, Ph.D. Ida Fejős assistant professor, Ph.D. Nóra Gampe professor's assistant, Ph.D.
Classes per week:	1 lecture(s)
Credit point(s):	1

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The aim of the course is to acquaint pharmacy students with herbal drugs and medicines, dietary supplements and other preparations that can be used in rational phytotherapy: focusing on their composition, effects, methods of administration, indications for therapy, relevant pharmacological and clinical data, major side effects and interactions. It provides a basis for the selection of herbal medicines with traditional and well-established use in stand-alone or complementary therapy. It contributes to the assessment of herbs according to their real values, to the recognition of their importance in prevention and therapy.

Short description of the subject:

In the context of the subject, lecturers describe the relevant areas of indication in rational phytotherapy and the medicinal plants and plant-based preparations that can be used in them, including their active ingredients. The subject describes industrial / galenic preparations, tea blends and recipes containing medicinal plants. It presents the mechanisms of action revealed so far, the most significant synergistic effects, the possible side effects and interactions. It deals with the data of clinical studies, recommendations for use and dosing, and presents examples for herbal medicines and phytotherapeutic preparations from Hungary and other countries.

Course data							
Recommen-ded term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semes-ter	Normal course offer	Consultations
8	14	0	–	–	14	Spring semester	–

Program of semester

Topics of theoretical classes (pro week):

- 1. week: The complexity of herbal medicines. Herbal products regulations.
- 2. week: Activity, safety and quality of herbal medicines.
- 3. week: Plants and the respiratory system.
- 4. week: Plants and the immune system
- 5. week: Plants and the digestive system.
- 6. week: Plants and the liver and biliary system.
- 7. week: Plants and the urogenital system.

- 8. week: Plants and the musculoskeletal system
- 9. week: Anti-inflammatory plants.
- 10. week: Plants and the cardiovascular system.
- 11. week: Plants and metabolic diseases.
- 12. week: Plants and the nervous system.
- 13. week: Adaptogenic plants.
- 14. week: Plants and the cutaneous system.

Schedule of consultations: as demanded

Course requirements

Prerequisites: GYFMGGNDE2A - Pharmacognosy II.

Type of the semester-end examination: semi-final

Form of the semester-end examination: oral examination

Basics of Pharmaceutical Management (practice)

Full name of the subject:	Gyógyszerészi gazdálkodás és menedzsment alapjai (gyakorlat)
Program:	undivided program (pharmaceutical)
Schedule:	full-time
Short name of the subject:	English name of the subject: Basics of Pharmaceutical Management (practice)
German name of the subject:	Grundlagen der pharmazeutischen Management (Praktikum)
Neptun code of the subject:	GYEGYGGMG1A
Type of registration:	obligatory
Responsible Department:	Semmelweis University, University Pharmacy Department Of Pharmacy Administration
Responsible tutor:	Dr. Ágnes Mészáros associate professor, Ph.D., Dr. Habil Phone: 06-20663-2460 E-Mail: meszaros.agnes@pharma.semmelweis-univ.hu
Name of the persons responsible for the teaching of the subject:	Dr. Romána Zelné associate professor, Ph.D., Dr. Habil
Classes per week:	1 practice
Credit point:	1

Professional content, intent of acquirement and its function in order to implement the goals of the program:

To provide the students with essentials about how management issues of a Pharmacy (community and hospital).

The aim of the course is to make students acquainted with the basic, theoretical and practical tasks of public/ hospital pharmacies related to their management activities.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
8	0	14	–	–	14	Spring semester	

Program of semester

Topics of practical classes (pro week):

- 1-2: Responsibilities and duties of the Pharmacist in the community pharmacy
- 3-4: The Medical Prescription
- 5-6: Handling of Drug shortages
- 7-8: Logistics and stock control; inventory models in pharmacy practice, IT possibilities: dispensing robots in the community pharmacy
- 9-10: Financing Healthcare, the DRG based payment system
- 11-12: Hospital pharmacy management: The Drug Formulary
- 13-14: Hospital Pharmacists: The Drug and therapeutic committee

Course requirements

Prerequisite: Basics of Pharmacoeconomics GYETEFOAG1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

According to the University's Study and Examination Regulations

Requirements of signature: attending 75% of the practices

Form of the semester-end examination: written

Public Health (theory + practice)

Full name of the subject: Népegészségtan (elmélet+gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Public Health (theory + practice)
German name of the subject: Gesundheitslehre (Vorlesung + Praktikum)

Neptun code of the subject: GYNEINEGE1A, GYNEINETG1A
Type of registration: obligatory
Responsible department: Department of Public Health of Semmelweis University

Responsible tutor: Zoltán Ungvári director, PhD
Contact information:
1089 Budapest, Nagyvárad tér 4. 13. em.
phone: 210-2954
e-mail: ungvari.zoltan@med.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Melinda Péntzes senior lecturer, PhD
András Terebessy senior lecturer, PhD
Péter Csépe senior research fellow, PhD
Ferenc Horváth assistant lecturer
Vince Pongor assistant lecturer

Classes per week: 2 lectures, 2 practices
Credit point: 2+2

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Acquire skills in qualitative assessment of different epidemiological studies, comprehensive and comprehensible reading of the scientific evidence-based literature. Acquire basic statistical skills. Design and conduct research, choosing the most appropriate epidemiological methods. Conducting individual health promotion based on key lifestyle factors and learning the basics of community health promotion. Apply practical knowledge of epidemiology and infection control.

Short description of the subject:

Public health deals with issues affecting human health at the population level. As an applied science, its basic aim is to preserve and improve health and prevent disease. To achieve these objectives, public health integrates several disciplines. Epidemiology introduces students to the prevention of communicable diseases, with a particular focus on infection control. Classical public health describes the role of environmental factors in the development of disease, the clinical aspects of which are nowadays dealt with in environmental medicine. The main aim of occupational medicine is to protect the health of employees by preventing occupational diseases. Our professional background is strengthened by the fact that our Institute merged with the Department of Occupational and Environmental Medicine of the University in 2010. In addition to disease prevention, the idea of health promotion was pioneered in the second half of the 20th century with the formulation of the “new public health”. Our aim is to enable future pharmacists to carry out individual health promotion and to be familiar with the concept of community health promotion. For all these activities, the acquisition and use of epidemiology as a methodology of public health is essential. Our aim is to familiarise students with the application of health promotion and prevention at the population and individual level, preparing them for practice.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
8	28	28	-	-	56	Spring semester	-

Program of semester

Topics of theoretical classes (pro week):

- Week 1: History of Hungarian medicine/public health. Definition of health, levels of prevention. Theoretical foundations of health promotion. The concept and functioning of public health
- Week 2: Health determinants. Health status of the Hungarian population. Health determinants in Hungary. Principles of health policy
- Week 3: Epidemiology and prevention of smoking and smoking-related diseases
- Week 4: Epidemiology and prevention of cardiovascular diseases. Epidemiology and prevention of cancer
- Week 5: Epidemiology and prevention of respiratory diseases. Thyroid diseases. Vulnerable groups
- Week 6: Mental health. Ageing
- Week 7: Obesitas//Diabetes. Physical activity
- Week 8: Epidemiology of communicable diseases. Vaccinations
- Week 9: Infection control. Nosocomial infections
- Week 10: Nutritional status and dietary habits of the Hungarian population. Food safety
- Week 11: Environmental health: climate change, environmental health effects of air. Environmental health: soil, water
- Week 12: Chemical safety and toxicology. Ionising radiation, types, effects, limits
- Week 13: Occupational health. Maternal, infant, child and adolescent health, health inspector network and school health
- Week 14: Structure, financing and administration of health and public health in Hungary. Health policy. Quality assurance and quality improvement in health care

Topics of practical classes (pro week):

- Week 1: Introduction. Demography
- Week 2: Epidemiology. Morbidity measurement (incidence, prevalence). Risk and causality (risk indicators). Epidemiological study types (descriptive studies, analytical studies: cross-sectional, cohort, case-control)
- Week 3: Screening tests (population) for public health purposes. Evaluation of screening tests (sensitivity, specificity, predictive values, ROC curve)
- Week 4: Interventional studies (RCTs). Meta-analyses. Critical reading
- Week 5: Design, organisation and evaluation of health promotion programmes.
- Week 6: Smoking and minimal intervention
- Week 7: Alcohol SBI (screening and brief intervention)
- Week 8: Physical activity/movement recommendations.
- Week 9: Mental health, mental hygiene. Prevention of illicit drug use
- Week 10: Preparing an individual health plan
- Week 11: Epidemiological concepts. Epidemiology system. Epidemiological investigation
- Week 12: Practical knowledge of vaccination
- Week 13: Case studies in environmental and occupational health
- Week 14: Practical exam

Schedule of consultations: if necessary, in agreement with the teacher

Course requirements

Prerequisites: GYGYHKAE1A Basic Medical Pathophysiology (theory) I.

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

In order to obtain a signature, the student must meet at least 75% of the attendance in the practical sessions and seminars. This means 11 completed practicals for 14 practicals (the 3 'allowed' absences do not need to be certified). Make-ups can be made on another practice in the same week.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Week 14, a practical exam on the practical material. Failed practical examinations can be made up until the end of the first week of the examination period, in agreement with the trainer, up to a maximum of 2 times.

Requirements of signature: The condition for obtaining a signature is that the student meets the attendance and participation requirement of at least 75% in practical sessions and seminars.

Type of the semester-end examination:

Practice: practical grade
Lecture: semi-final

Form of the semester-end examination: oral practical exam and written test exam

Scientific, course related researches, publications, assays:

Public health e-learning material (<https://itc.semmelweis.hu/moodle/>)

Physical Education VIII.

Full name of the subject: Testnevelés VIII.
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: PE VIII.
English name of the subject: Physical Education VIII.
German name of the subject: Körpererziehung VIII

Neptun code of the subject: GYTSITSNG8A
Type of registration: obligatory
Responsible department: Semmelweis University, Physical Education and Sports Center

Responsible tutor: **Várszegi, Kornélia** director
 Contact information:
 Phone: +36-1/264-1408
 E-Mail: varszegi.kornelia@semmelweis-univ.hu
 sportkozpont@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Lehel, Zsolt icehockey trainer
Nagy-Kismarci, Bence cheerleading trainer
Rímay, István football trainer
Várszegi, Kornélia P.E. teacher
Weisz, Miklós basketball trainer

Classes per week: 1 practice
 Credit point: 0

Professional content, intent of acquirement and its function in order to implement the goals of the program:

Upon completion of the course the student will be able to carry out regular physical activity.
 After completing the “beginner swimming” course, one will acquire water-confident swimming skills.

Short description of the subject:

The short-term goal of the course is to maintain and improve the students’ current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and life-style advice – so that they can represent those in their later practice, through their own health-promoting behavior.

FACULTY OF PHARMACEUTICAL SCIENCES

**Curriculum of the credit-based training for fifth year students
in the 2021/2022 academic year**



*Pharmaceutical Sciences
5th year*

9. SEMESTER 2021/2022/1

Subject	Lecture (hour/ week)	Practice (hour/ week)	Credit	Prerequisites	Exam type
Compulsory Practice I. GYSZGSZVG1A	–	40	8**	Passing all finals of the 8th semester	practical mark
Drug Therapy (theory+practice) GYGYHGTPE1A	2	2	4	Pharm. and Tox. II. Pharm. Techn. IV. Basic Medical Pathophysiology II.	semi-final
Pharmaceutical Care (theory+practice) GYEGYGGDE1A	2	3	4	Pharm. and Tox. II. Pharm. Techn. IV. Basic Medical Pathophysiology II.	semi-final
Clinical Pharmacokinetics and Biopharmacy (theory+practice) GYGYIKFBE1A	2	3	4	B. Med. Pathoph. II., Pharmac. and Tox.II., Pharm. Techn. IV., Public Health	semi-final
Pharmaceutical Communication and Integrated Consulting (theory+practice) GYMAGGKTG1A	1	2	1	Pharm. and Tox. II. Pharmacy Administration I.	practical mark
Pharmacy Administration (theory) II. GYEGYGISE2A	2	-	2	Pharm. Administr. I. Pharm. Techn. IV. Public Health	final*
Pharmaceutical Informatics (theory+practice) GYDEIGIFG1A	1	1	1	Pharmacy Administration I.	practical mark
Clinical Pharmaceutics (theory+practice) GYEGYKLGE1A	1	1	1	Pharm. and Tox. II. Pharm. Techn. IV.	semi-final
Pharmaceutical Ethics and Sociology (theory+practice) GYMAGGESE1A	1	1	1	Pharm. and Tox. II. Hist. of Scienc. and Prop.	semi-final
Diploma Work II. GYSZDSDKG2A	–	5	–	Diploma Work I.	signature

Subject	Lecture (hour/sem.)	Practice (hour/sem.)	Credit	Prerequisites	Exam type
Pharmaceutical industrial and regulatory affairs knowledge (teaching block)	28	28	–		
Drug Licensing (theory+practice) GYGYIGGNG1A	12	12	–	Pharmacy Administr. I. Pharmac. Techn. IV.	signature
Pharmacovigilance and pharmacoepidemiology (theory+practice) GYGYIGFPG1A	4	4		Pharmac. and Tox. II.	
Quality Assurance (theory+practice) GYGYIGMBG1A	4	4	–	Pharmac. Techn. IV. Pharmacy Administr. I.	
Drug innovation and clinical studies (theory+practice) GYGYIGGVG1A	8	8/	-	Pharmac. Techn. IV. Pharmacology and Toxicology II.	
Elective or obligatory elective subjects	–	–	–		semi-final or practical mark

Drug Therapy (theory+practice)

Full name of the subject: Gyógyszeres terápia (elmélet+gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Drug Therapy (theory+practice)
German name of the subject: –

Neptun code of the subject: GYGYHGTPE1A
Type of registration: obligatory
Responsible department: Semmelweis University, Department of Pharmacodynamics

Responsible tutor: *Dr. Éva Szőkő* Full Professor, DSc

Name of the persons responsible for the teaching of the subject:
Dr. Éva Szőkő Professor, DSc
Dr. Tamás Tábi Associate Professor, PhD
Dr. László Tóthfalusi Associate Professor, DSc
Gabriella Juhász Associate Professor, DSc

Invited physicians:
Andras Telekes, PhD
Bernadette Rojkovich, PhD
Iren Szalay, PhD
Miklós Sipos, PhD

Classes per week: 2 lectures, 2 practices
Credit point: 4

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The course aims at teaching the principles of evidence-based drug use and the treatment of common disorders according to the recent guidelines. Discussion of the frequent and severe adverse effects and clinically important drug interactions are important.

Short description of the subject:

Selected topics of the subject comprise drug therapy of chronic diseases, pain managements and diseases where self-medication for symptom relief are common.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
9	20	20	–	–	40	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Strategies of drug therapy. Evidence-based medicine
2. week: Drug therapy of chronic cardiac failure and hypertension
3. week: Therapy of acute and chronic joint disorders
4. week: Pharmacotherapy of neuropathic pain and some neurological diseases
5. week: Pain management in cancer
6. week: Therapy of dermatologic inflammations
7. week: Therapy of gastroenterological diseases
8. week: Therapy of eye disorders
9. week: Therapy of urological disorders
10. week: Contraception. Treatment of common gynecological disorders

Topics of practical classes (pro week):

1. week: Therapy of venous disorders
2. week: Therapy of ischemic heart disease, myocardial infarction
3. week: Therapy of diabetes mellitus
4. week: Drug therapy of Parkinson's disease and schizophrenia
5. week: Pharmacotherapy of anxiety and sleep disorders
6. week: Pharmacotherapy of asthma and COPD
7. week: Therapy of allergic rhinitis
8. week: Drug therapy of osteoporosis. Pain management Drug therapy of common respiratory and urinary tract infections
9. week: Therapy of disorders of the gastrointestinal tract
10. week: Therapy of skin disorders: acne, fungal infections

Course requirements

Prerequisites:

Basic Medical Pathophysiology (theory) II. GYGYHKAE2A
 Pharmacology and Toxicology II. GYGYHHATE2A
 Pharmaceutical Technology IV. GYKGYI126E4A, GYKGYI126G4A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

practice: maximum 2 absences are allowed.

Requirements of signature: attending at least 75% of the practice classes.

Type of the semester-end examination:

lecture: semi-final practice: signature

Pharmaceutical Communication and Integrated Consulting (theory+practice)

Complete name of the course: Gyógyszerészi kommunikáció és integrált tanácsadás
Name of the Programme: Pharmacy Basic Education
Abbreviated name of the course: Pharmaceutical Communication
English name of the course: Pharmaceutical Communication and Integrated Consulting (theory+practice)

Neptun-Code: GYMAGGKTG1A
Type of registration: obligatory
Institute: Institute of Behavioural Sciences

Name of the tutor/lecturer: **Dr. Pilling János** PhD, Associate professor
Phone: +36 (1) 2102930/56457
E-Mail: pilling.janos@med.semmelweis-univ.hu
Dr. Hankó Balázs

Further tutors: **Dr. Tóth Mónika Ditta** PhD, assistant professor

Number of classes /week: 3
Credit points: 2

Course principles:

Proper communication has an essential role in pharmaceutical practice. The main objectives of the course are the following:

- to teach basic skills to improve pharmacists' communicational techniques of information gathering, active listening and patient education
- improving skills, which can help to handle difficult communicational situations, such as coping with angry, aggressive patients, intimate questions etc.
- to teach and practice communication techniques that can improve the success of pharmaceutical work, i.e. team, marketing and assertive communication

Brief course summary:

The education will be interactive and practical. In the first part of the semester students will get familiar with the basic concepts of pharmaceutical communication with a special focus on information delivery, patient education, active listening, and empathy. Risk communication and shared decision making will be also covered, such as improving compliance and promoting lifestyle changes. The second part of the semester will cover the possible coping strategies with communicational challenges in pharmaceutical practice such as handling tense, hostile patients, communication about intimate topics (menstruation, sexuality, stigmatizing disorders etc.), communication with patients from different age-groups. Students will learn communicational techniques to handle patients with mental health disorders such as anxiety, depression, suicidal ideation, alcohol/drug addiction, and psychosis. At the end of the semester marketing communication skills and team communication techniques will be the main focus of the seminars.

Course data							
Recommended semester of completing the course	Lecture (contact hrs/ week)	Practice (contact hrs/ week)	Seminar (contact hrs/ week)	Individual lecture	Total number of contact hours/ semester	Semester	Consultation
9	1	2	–	–	30	autumn	–

Semester program

I. Lecture topics/week

1. week: Role of communication in pharmaceutical practice. Active listening and empathy.
2. week: Communication difficulties and possible solutions of patient education. Possibilities of improving health literacy.
3. week: Communication about risk of the treatment. Shared decision-making. Communicational questions of patient safety.
4. week: Improving patient's adherence and promoting lifestyle changes in the pharmacy.
5. week: The specialities of age and gender in pharmaceutical communication. Communication about intimate questions.
6. week: Team communication. Assertive communication
7. week: Communication with tense, hostile patients, strategies to prevent violence. Handling complaints and patient's claims.
8. week: Communication with patients with mental health disorders I: anxiety, depression, crisis
9. week: Communication with patients with mental health disorder II: addiction, psychosis
10. week: Marketing communication in pharmaceutical practice.

II. Practice topics/week

1. week: Role of communication in pharmaceutical practice. Active listening and empathy. Verbal and non-verbal communication.
2. week: Communication difficulties and possible solutions of patient education. Possibilities of improving health literacy
3. week: Communication about risk of the treatment. Shared decision-making. Communicational questions of patient safety.
4. week: Improving patient's adherence and promoting lifestyle changes in the pharmacy.
5. week: The specialities of age and gender in pharmaceutical communication. Communication about intimate questions.
6. week: Team communication. Assertive communication
7. week: Communication with tense, hostile patients, strategies to prevent violence. Handling complaints and patient's claims.
8. week: Communication with patients with mental health disorders I: anxiety, depression, crisis
9. week: Communication with patients with mental health disorder II: addiction, psychosis
10. hét: Written exam

Course requirements

Order of consultations: Seminars will ensure the possibility of ongoing consultation with the seminar leader.

Prerequisites:

Pharmacology and Toxicology II. GYGYHHATE2A GYGYHHATG2A
Pharmacy Administration I. GYEGYGIMG1A

Semester acceptance conditions (successful course attendance, mid-term tests, absence, etc.):

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

Knowledge testing during the semester:

Written examination at the end of the semester, on the last practice.

Requirements of the signature at the end of the semester:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

Performance control in the examination period: final

Performance control in the examination period (written, oral, written and oral)

Written examination.

Below 50%: 1
50%-65%: 2
66%-75%: 3
76%-85%: 4
85%-100%: 5

List of teaching materials (List of textbooks, hand-outs, scripts, etc.):

Pilling, János: Medical Communication in practice. Medicina, Budapest, 2020.

Beardsley, RS. – Skrabal, MZ. – Kimberlin, CL: Communication Skills in Pharmacy Practice. Wolters Kluwer. Seventh edition. 2020.

Pharmacy Administration (theory) II.

Full name of the subject:	Gyógyszerügyi szervezés (elmélet) II.
Program:	undivided program (pharmaceutical)
Schedule:	full-time
Short name of the subject:	English name of the subject: Pharmacy Administration (theory) II.
German name of the subject:	–
Neptun code of the subject:	GYEGYGSZE2A
Type of registration:	obligatory
Responsible Department:	Semmelweis University, University Pharmacy Department Of Pharmacy Administration
Responsible tutor:	Dr. Romána Zelkó professor, Ph.D., D.Sc. Contact: - telephone: 2170-927 - e-mail: zelko.romana@pharma.semmelweis-univ.hu
Name of the persons responsible for the teaching of the subject:	Dr. Mészáros Agnes associate professor, Ph.D., Dr. Habil
Classes per week:	2 lectures
Credit point:	2

Professional content, intent of acquirement and its function in order to implement the goals of the program:

The course seeks to introduce students with main fields of pharmacy, the responsibilities of the pharmacist: To teach about competencies and professional skills required in relation to drug dispensing, hospital-clinical pharmacy, and industrial pharmacy, as well as on economics and management, quality management.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
9	20	0	–	–	20	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

- | | |
|--|--|
| 1. Quality management within the lifecycle of drugs | 6. Human resource management, leadership |
| 2. Fight against counterfeit Medicine | 7. Good Documentation systems |
| 3. The European Pharmacopoea | 8. Elements of decision making, pharmacist prescribing |
| 4. Financial pressures; Managing health care | 9. Questionnaire Design |
| 5. Information need, managing quality in health care | 10. The EU institutional system |

Course requirements

Prerequisites:

Pharmacy Administration I. GYEGYIMG1A, Pharmaceutical Technology IV. GYKGYI126E4A GYKGYI126G4A, Public Health GYNEINEGE1A GYNEINETG1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup: according to the University's Study and Examination Regulations

Requirements of signature: successful exam

Type of the semester-end examination: final

Pharmaceutical informatics (theory+practice)

Full name of the subject: Gyógyszerészi informatika (elmélet+gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: Pharmaceutical Informatics
English name of the subject: Pharmaceutical informatics (theory+practice)
German name of the subject: Pharmazeutische Informatik (Vorlesung+Praktikum)

Neptun code of the subject: GYDEIGIFG1A
Type of registration: obligatory
Responsible department: Institute of Digital Health Sciences of the Faculty of Health and Public Services of Semmelweis University

Responsible tutor: **Dr. Szócska Miklós** PhD, associate professor
titkarsag.dei@semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Zajzon Gergely assistant lecturer
Dr. Tamus Zoltán Ádám PhD, associate professor
Tóth Tamás assistant lecturer
Iváncsy Tamás guest lecturer

Classes per week: 1 lecture, 1 practice
Credit point: 1

Professional content, intent of acquirement and its function in order to implement the goals of the program:
To acquaint students with the IT systems and applications used in pharmacy. The subject reviews the life cycle of medicines and related legislation, and then presents in detail the IT tools that can be used during each step, from drug development and official licensing to drug distribution.

Short description of the subject:
Successful completion of the subject will result in the acquisition of the following competencies: Knowledge of the processes of drug development, authorization and distribution. Getting to know the IT methods, tools, code systems and databases used in these.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
9	10	10	–	–	20	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Lifecycle of pharmaceutical products, Introduction to the relevant legal hierarchy
2. week: Methods of computer molecular design
3. week: Drug development process, approval of clinical trials
4. week: Introduction to Drug authorization (Regulatory Affairs): CTD (Common Technical Document), eCTD standards
5. week: Pharmacovigilance, related IT systems, databases (Eudra-Vigilance, E2B, PSUR)
6. week: Drug Reimbursement system and relevant databases
7. week: Pharmacy IT systems, Serialisation
8. week: Mobile devices, portable devices, sensors, smart devices in healthcare
9. week: IT tools for evidence-based medicine and personalized medicine
10. week: Prescription software, electronic prescription

Topics of practical classes (pro week):

1. week: Clinical trial related IT systems – EudraCT, clinicaltrials.gov, clinicaltrialsregister.eu
2. week: National and international pharmaceutical databases (OGYÉI database, basics of pharmaceutical electronic register system, EudraPharm, EudraGMP, EudraNET)
3. week: CTD, eCTD
4. week: IT background of pharmaceutical reimbursement: Pupha, OWL, fix reimbursement
5. week: Pharmaceutical code systems and standards (ATC, DDD)
6. week: Pharmaceutical code systems and standards (Active ingredients register, INN, BNO, MedDRA)
7. week: QRD, Readability, structure of product information files (SmPC, PIL)
8. week: Pharmaceutical promotion and marketing
9. week: IT systems for pharmaceutical sales information – OSAP1913 – P@NKA, IMS
10. week: ORKA prescription software

Schedule of consultations: by agreement

Course requirements

Prerequisites: Pharmacy Administration I. GYEGYIMG1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Attendance of at least 75% of the classes. Max. 3 absences are allowed

Requirements of signature:

Attendance of at least 75% of the classes

Type of the semester-end examination:

practical grade

Form of the semester-end examination:

written (computer test)

Scientific, course related researches, publications, assays:

The educational materials are available at <http://dei-cloud.semmelweis.hu>. Username and password are announced at the first class.

Clinical Pharmaceutics (theory+practice)

Full name of the subject: Klinikai gyógyszerészet (elmélet+gyakorlat)
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Clinical Pharmaceutics (theory+practice)
German name of the subject: Klinische Pharmazie (Vorlesung+Praktikum)

Neptun code of the subject: GYEGYKLGE1A
Type of registration: obligatory
Responsible Department: Semmelweis University, University Pharmacy Department Of Pharmacy Administration

Responsible tutor: **Dr. Ágnes Mészáros** associate lecturer, PhD, Dr. Habil
Phone: 206632460
E-Mail: meszaros.agnes@pharma.semmelweis-univ.hu

Name of the persons responsible for the teaching of the subject:
Dr. Romána Zelkó professor, PhD, DS.c
Dr. Dénes Kliner PharmD

Classes per week: 1 lecture, 1 practice
Credit point: 1

Professional content, intent of acquirement and it's function in order to implement the goals of the program:
Practice-oriented presentation of the tasks of a clinical pharmacist; to provide information about essential topics of clinical pharmacy.

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
9	10	10	–	–	20	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1-2. Clinical Pharmacy and Medication reconciliation
3-4: Anaesthesia and surgery
5-6: Essentials in Paediatrics
7-8: Essentials in Cardiology
9-10: Essentials in Oncology

Topics of practical classes (pro week):

1-2. Clinical Pharmacy and Medication reconciliation
3-4: Anaesthesia and surgery
5-6: Essentials of therapy in Paediatrics
7-8: Essentials of therapy in Cardiology
9-10: Essentials in Oncology, cytotoxic infusion production

Course requirements

Prerequisites:

Pharmacology and Toxicology II. GYGYHHATE2A GYGYHHATG2A,
Pharmaceutical Technology IV. GYKGYI126E4A GYKGYI126G4A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

According to the university's Study and examination regulations

Requirements of signature: attending 75% of the practices

Type of the semester-end examination: semi-final

Form of the semester-end examination: written

Pharmaceutical Ethics and Sociology (theory+practice)

Full name of the subject: Gyógyszerési etika-szociológia
Program: undivided program (pharmaceutical)
Schedule: full-time
Short name of the subject: English name of the subject: Pharmaceutical Ethics and Sociology (theory+practice)
German name of the subject: Pharmazeutische Ethik und Soziologie (Vorlesung+Praktikum)

Neptun code of the subject: GYMAGGESE1A
Type of registration: obligatory
Responsible department: Institute of Behavioural Sciences of Semmelweis University

Responsible tutor: **Dr. József Kovács**
Contact information: 210-2953
kovacs.jozsef@med.semmelweis-univ.hu
Title, academic degree: MD, PhD, (Head of the Department of Bioethics)

Name of the persons responsible for the teaching of the subject:
Dr. József Kovács MD, PhD, (Head of the Department of Bioethics)
Dr. Zsuzsa Gyórfy PhD, associate professor
Dr. Edmond Girasek PhD Assistant Professor
Bence Döbrösy MSc assistant lecturer

Classes per week: 1 lecture, 1 practice
Credit point: 1

Professional content, intent of acquirement and its function in order to implement the goals of the program:

- To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patient research subjects and fellow health care professionals
- To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health
- To gain a solid foundation for future studies in any social subject related to pharmacy
- To enhance competence in designing, undertaking and evaluating research involving human subjects
- To enhance communication skills useful in dispensaries or in hospitals

Brief course summary:

The course is designed to give a broad overview of the field of bioethics, including concepts, theory, and research. Regarding sociology, the usage of medications became an integrated practice in modern societies which has several social connotations. Pharmacists will encounter the social problems connected with discovering, producing, distributing and consuming medicines on an every-day basis. The course aims to provide understanding of all these processes based on introducing some, selected sociological concepts

Course data							
Recommended term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/ semester	Normal course offer	Consultations
9	10	10	–	–	20	Autumn semester	–

Program of semester

Topics of theoretical classes (pro week):

1. week: Principles of Medical Ethics (Jozsef Kovacs)
2. week: Competence and Capacity to Make Health Care Decisions. Informed Consent I.
3. week: Informed consent II. Confidentiality and Medical Records (Jozsef Kovacs)
4. week: End of Life Issues (Jozsef Kovacs)
5. week: Pharmacist-patient, pharmacist-pharmacist relationship. Pharmacist and society. Malpractice. Ethical Questions of Human Research. Ethical questions of organ transplantation. (Jozsef Kovacs)
6. week: Introduction to sociology. Basic Concepts The pharmaceutical Aspects of Illness Behaviour (Bence Döbrössi)
7. week: Inequalities in Health (Edmond Girasek)
8. week: The pharmaceutical Aspects of Intercultural (Bence Döbrössi)
9. week: Technology and Society (Zsuzsa Györfi)
- 10..week: Healthcare Systems (Edmond Girasek)

Topics of practical classes (pro week):

1. week: Principles of Medical Ethics (Jozsef Kovacs)
2. week: Competence and Capacity to Make Health Care Decisions. Informed Consent I.
3. week: Informed consent II. Confidentiality and Medical Records (Jozsef Kovacs)
4. week: End of Life Issues (Jozsef Kovacs)
5. week: Pharmacist-patient, pharmacist-pharmacist relationship. Pharmacist and society. Malpractice. Ethical Questions of Human Research. Ethical questions of organ transplantation. (Jozsef Kovacs)
6. week: Introduction to sociology. Basic Concepts The pharmaceutical Aspects of Illness Behaviour (Bence Döbrössi)
7. week: Inequalities in Health (Edmond Girasek)
8. week: The pharmaceutical Aspects of Intercultural (Bence Döbrössi)
9. week: Technology and Society (Zsuzsa Györfi)
10. week: Healthcare Systems (Edmond Girasek)

Course requirements

Prerequisites:

Pharmacology and Toxicology (theory) II. GYGYHHATE2A
 Pharmacology and Toxicology (practice) II. GYGYHHATG2A
 History of Sciences, Propedeutics GYEGYTTPE1A

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

Students are expected to attend regularly the course and participation list will be recorded at the end of every lecture. Participating on at least 75% of the total number of lectures is a prerequisite for getting the signature needed to absolve the course. The maximum number of absences permitted: three absences from the classes

Requirements of signature:

Participation on at least 75% of the total number of classes is a prerequisite for getting the signature needed to absolve the course

Type of the semester-end examination:

Written final of the sociology component of the course

Written test on the ethics component of the course

Form of the semester-end examination: written

Scientific, course related researches, publications, essays:

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.)

1. Conrad Fischer—Caterina Oneto (2016): Medical Ethics for the Boards. (Third edition) New York: McGraw-Hill Education. ISBN: 978-1-259-64121-3 MHID 1-25-964121-X
2. The textbook is available in the following bookshop: Medicina könyvesbolt, Budapest, IX. Üllői út 91/a (tel: 06-1-215-3786)
3. Graham Scrambler (ed) Sociology as Applied to Health and Medicine, Palgrave Macmillan 2018
 Lectures: The power point slides of the lectures can be found at:
<http://semmelweis.hu/magtud/en/education/faculty-of-pharmacy>
 The lecture slides are also available on Moodle

10. SEMESTER 2021/2022/2

Subject	Lecture	Practice (hour/sem.)	Credit	Prerequisites	Exam type
Compulsory Practice II. GYSZGSZVG2A	–	40	16**	Compulsory Practice I. GYSZGSZVG1A	practical mark
Diploma work/Thesis defense GYSZDDIVE1A	1/sem.	–	10**	Diploma Work II. GYSZDSDKG2A	final*
Principles of Professional Ethics II. GYKANG071E2A	–	–	–		signature
Total:	1/sem.	40	26		

* Counts to the qualification of the diploma

** Obligatory electives built-in in the curriculum

EVALUATION OF PROGRESS

Grading system

- a) Five-scale
excellent (5)
good (4)
average/fair (3)
satisfactory/pass (2)
unsatisfactory/fail (1)
- b) Three-scale
excellent (5)
fair (3)
fail (1)

Types of evaluation

1. Practical course grade (gyakorlati jegy) (according to either the 5-scale or the 3-scale grading system)
2. Semi-final examination (kollokvium) Evaluation of a one-semester subject matter (1–5 grading system)
3. Final examination (szigorlat) Evaluation of the whole subject matter (1–5 grading system)
4. Obligatory practice at hospital (3-scale grading system)

Average Results

When the student has taken all the compulsory examinations and fulfilled every other obligation during the examination period, the semester will be validated in the student's lecture book by the Dean's signature.

The student's average results are:

Outstanding	(kitűnő)	if the average is 5.00
Excellent	(jeles)	if the average is 4.51–4.99
Good	(jó)	if the average is 3.51–4.50
Satisfactory	(közepes)	if the average is 2.51–3.50
Pass	(elégséges)	if the average is 2.00–2.50

EXEMPTION

Exemption **from courses** and examinations may be granted on the basis of the student's previously documented studies or additional credit-by-examinations stipulated by the departments. The student must submit all relevant documents at the departments concerned. Exemption may be granted by the Educational Board of each Faculty on the basis of the department's written prior approval. "Checking" exams can be prescribed by the departments. PE exemption: Only under condition the diagnosis is checked by a licensed Hungarian health care practitioner, too.

Application deadline: Prior to registration to the first and the second semester!

No reduction of tuition fee is granted in case of exemptions.

REQUIREMENTS FOR APPLICATION AND ADMISSION

Application Criteria

Applicants must be at least 18 years of age by the end of the calendar year of application, and preferably under the age of 30. Applicants are requested to either have completed high school/senior secondary school before the time of application, or to currently attend the last year of high school/secondary school. In the latter case, the Matriculation / School Leaving Certificate has to be uploaded into SEMAPHOR by the 21st of August the year of application.

Semmelweis University seeks students who possess a strong background and interest in natural sciences (particularly in biology and chemistry), a good command of English, and a strong motivation to study and practice medicine, dentistry, pharmaceutical sciences or other health care professions.

Applications should be submitted online in SEMAPHOR (Semmelweis Application Handling and Online Review) system at <https://semaphor.semmelweis.hu> **until the 31st of May.**

The following documents are required to be uploaded (original, or as certified copies, in English or in the original language with a certified English translation).

1. **Matriculation / School Leaving Certificate** from an accredited high school / senior secondary school. Registration number of documents should be indicated. If you are in your final year and have not yet received this certificate, you can still apply and take the entrance examination. The final deadline for uploading the Matriculation Certificates is the 21st of August.
2. **Curriculum Vitae** (Resume) in English.
3. **Motivation letter**
4. **Copy of passport (or ID card for citizens of Schengen Area member countries)** with your personal data.
5. **Passport photo.**

Medical Certificate – Certification that the applicant is physically and mentally able to complete higher educational studies, and does not suffer from chronic or infectious diseases is requested from the successful applicants **for the acceptance of an offered admission.** The **certificate downloaded from the University's website (http://semmelweis.hu/english/files/2019/01/Medical_certificate_sample_20190_SEMAPHOR.pdf)** should be issued within 90 days before the date of uploading.

Applicants have to register (sign up) for the entrance examinations in SEMAPHOR after having submitted a valid application (and paid the Admission Procedure Fee). Registrations can only be withdrawn before the deadline for registration to the given examination. The absence of a registered applicant at the entrance examination is not considered as the withdrawal of registration but as an examination attended without valuable result.

COST OF THE PROGRAM FOR TWO SEMESTERS

Tuition fee for the 2021/2022 academic year

Medicine	USD 9,100 / semester
Dentistry	USD 9,100 / semester
Pharmaceutical Sciences	USD 6,000 / semester

The first year tuition fee (+ the enrollment fee – USD 220 payable in the 1st semester) should be paid in two installments (unless the Hungarian Visa regulations have different conditions):

Medicine	USD 9,320 (USD 9,100 tuition fee + USD 220 enrollment fee enrollment fee is payable once during the studies)
Dentistry	USD 9,320 (USD 9,100 tuition fee + USD 220 enrollment fee enrollment fee is payable once during the studies)
Pharmaceutical Sciences	USD 6,220 (USD 6,000 tuition fee + USD 220 enrollment fee enrollment fee is payable once during the studies)
Before February 1	Medicine USD 9,100 Dentistry USD 9,100 Pharmacy USD 6,000

Dentistry students pay additional material fee:	
years 3, 4 & 5:	USD 3,600
(first semester:	USD 1,800
second semester:	USD 1,800)

Please note: the material fee is subject to change; also 2nd year students taking clinical subject(s) from the 3rd year have to pay material fee 3rd, 4th and 5th year students may apply for exemption from paying the material fee under certain conditions. Please inquire about the rule regarding eligibility for exemption at the English Secretariat.

Students admitted to the 1st year are obliged to pay a deposit fee of USD 2000 to confirm their seat. The deposit fee is non-refundable. Students failing a year or after passive status pay the sum of the year they join after the failure/ passive status. Transfer students pay the highest tuition fee in force in the actual academic year. Application fee for transfer students: USD 350 (non-refundable) Enrollment fee for transfer students: USD 220 (payable together with the tuition fee) The student admitted delaying the commencement of his/her studies is obliged to pay the tuition fee of that academic year when he/she starts his/her studies.

Payment Details

Payments can be made by bank transfer in **USD** to the bank account of Semmelweis University:

Account name ("account with institution"): Semmelweis University

Account (IBAN) Number: HU67 1000 4012 1000 8016 0051 4534

Bank name: Magyar Államkincstár (Hungarian State Treasury)

Bank address: 4. Hold Street, H-1054 Budapest, Hungary

Swift/BIC code: **HUSTHUHB (correspondent Swift/BIC code: MANEHUHB)**

Note: The money transfer sheet should include the **name of the student** as it is written in the passport and the remark invoice ID number.

Personal checks and money orders are not accepted.

Please note that the above mentioned net amounts have to arrive to the account – the bank commission charges have to be paid by the student.

The bank account at the Hungarian National Treasury is **not a classic bank account**. There is absolutely no personal administration of payments in that institution, and they do not have a cashier, so going there to pay fees personally is pointless.

Please understand that it is only the recipient institution of Semmelweis University's tuition fees, and not a bank.

Important: *If the tuition fee is not credited to our bank account by the above deadlines, students have to pay a default charge to the university and may be suspended/dismissed.*

OTHER MEDICAL UNIVERSITIES IN HUNGARY

University of Szeged, Hungary

H-6720 Szeged, Dugonics square 13.

Phone: (+36-62) 544-000

Fax: (+36-62) 546-371

Foreign Students' Secretariat

Head: Andrea Lehocki-Balog

office.fs@med.u-szeged.hu

Tel.: + 36 62 545-458

University of Pécs, Medical School

H-7624 Pécs, Szigeti út 12., HUNGARY

General Medicine in English

Dentistry in English

Pharmacy

Lívia Csídei (Ms.)

Head of the English Student Service Center

Tel.: +36 72/ 536-018

Fax: +36 72/ 536-110

E-mail: studentservice.center@aok.pte.hu

University of Debrecen Medical and Health Science Center

International Education Center

Address: Nagyerdei krt. 98.

4032 Debrecen

Hungary

E-mail: info@edu.unideb.hu

Tel.: + 36 52 258-051, + 36 52 258-052

VISA AND RESIDENCE PERMIT INSTRUCTIONS

Application for Entry Visa & Residence Permit

Foreign nationals (**under visa obligation**) wishing to pursue studies in Hungary are required to apply for entry visa & residence permit (exceeding 90 days) in their home countries and enter the country on the entry visa issued by the Hungarian Embassy or Consulate.

The entry visa is valid for a single entry and up to 30 days of stay in Hungary. Within 3 DAYS upon arrival, you will have to register your address and within 30 DAYS you have to submit your application for the residence permit to the Immigration Office in Budapest.

The following documents are required for the application for the entry permit:

- A wholly and legibly completed **Application** for Residence Permit (+ INSET 14 – Purpose of Study or Student Mobility)
- a valid **passport** (valid for at least eighteen months at the time of submitting the application)
- two passport size color **photos** (not older than six months)
- **Letter of Acceptance** from the University
- **proof of payment of the tuition fee*** (you get it from the University after your tuition fee has arrived)
- **proof of financial means** ensuring livelihood in Hungary (bank statement about the balance of your credit card, cash, or a declaration by the parents that they will provide the funds for all your expenses in Hungary)
- an **application fee of 60 EUR**
- the Hungarian Embassy may ask for your flight reservation and air ticket
- the **address of your residence in Hungary**
- certification of **valid medical insurance** coverage in Hungary

REGISTRATION PROCEDURE FOR EU AND EEA CITIZENS

Citizens of the member states of the European Union and the European Economic Area are not required to obtain a student visa in order to enter Hungary for the purpose of studies. They will, however, be required to register their stay with the Immigration Office not later than 93 days, following their entry into Hungary.

The following documents are required for registration:

- **completed** Data Sheet for the Issuance of Registration Certificate and for the Registration of Residence
- **school certificate in Hungarian** from the secretariat of your college / university
- your **ID card or your valid travel document**
- **lease contract** (*lakásbérleti szerződés*) for the apartment (It has to specify the landlord's and your personal data – date and place of birth, mother's maiden name, permanent address, landlord's ID number, your passport number. The contract has to be signed by two witnesses.)*

If you stay with an acquaintance or a relative as a guest, a statement of admission (befogadói nyilatkozat) has to be attached by the owner of the apartment that you stay with them as a guest. If the apartment is your property, a property sheet (tulajdoni lap) has to be attached to verify it. If you rent the apartment through an agency and you signed a contract with the agency, the agency should provide the authorization received from the owner of the apartment.

- The administrative service fee charged for the issue of a registration certificate is HUF 1,000, payable by credit card at the Immigration office
- proof of funds to cover your expenses (bank statement for 3 months) – You may also be required to hand in maintenance statement signed by your parents.

* Citizens of countries in Africa, Asia, Eastern Europe (under visa obligation) and the Middle East are required to transfer the tuition fee for the first academic year in full before applying for the entry permit.

If you are the holder of the bank account (opened in your home country or in Hungary), it is sufficient to enclose a bank statement on the current balance. If the holder of the account is a parent or a relative, you should document that you have exchanged or drawn funds from ATMs in the amount of at least approx. USD 800 and enclose a photocopy of the bank card.

- copy of a valid medical insurance coverage in Hungary (EHIC card, contract with a private medical insurance company or a valid health insurance policy), but take the original too with you.

If you meet all conditions for residence in Hungary for a period longer than three months, the immigration authority will issue a Registration Certificate to you that contains the address of your first residence in Hungary. You will receive your ID card on spot and Address Card by mail. Please see below for how to reach the Immigration Office.

Application for residence permit for students from non-EU countries with a permanent residence visa

Within 30 days of your arrival in Hungary, you have to go to the Immigration Office to Clients' Service II. ("II. sz. Kirendeltség") to receive your residence permit and to register your accommodation in Hungary.

The following documents are required:

- your passport with your visa inside
- 1 passport-size photo
- your lease contract
- completed address registration form (signed by the owner of the property).

Please see below for how to reach the Immigration Office.

Application for residence permit for students from Non-EU countries with a permanent residence visa

After arriving in Budapest

Within **30 days** on arrival in Hungary, you have to go to the Immigration Office to Clients' Service II. ("II. sz. Kirendeltség") to receive your residence permit and to register your accommodation in Hungary.

The following documents are required:

- your passport with your visa inside
- 1 passport-size photo
- your lease contract
- completed address registration form (signed by the owner of the property)

Application for residence permit for citizens of Non-EU countries arriving without visa

You are required to submit your application for residence permit to the Immigration Office within 90 days after your arrival.

Documents required for the residence permit:

- passport valid for at least 3 more months longer than the period you are applying for (about 15 months)
- application form (Application for Residence Permit + INSET 14 – Purpose of Study or Student Mobility)
- address registration form („lakcímbejelentő”) signed by the owner(s) or an authorized person
- lease contract for the apartment (It has to specify the landlord's and your personal data: date and place of birth, mother's maiden name, permanent address, landlord's ID number, your passport number. The contract has to be signed by two witnesses.)
- 1 passport-size photo
- the administrative service fee charged for the issue of a registration certificate is HUF 18,000 payable by credit card at the Immigration office
- proof of funds to cover your expenses
- certification of valid medical insurance coverage in Hungary
- school certificate in Hungarian from the secretariat of your college /university.

Please see below for how to reach the Immigration Office.

Application for extension of residence permit for citizens of Non-EU countries

You are required to submit your application for extension of residence permit to the Immigration Office at least 30 days prior to the expiry of your present one.

Documents required for extension of residence permit:

- passport valid for at least 3 more months longer than the period you are applying for (about 15 months)
- application form (Application for Residence Permit + INSET 14 – Purpose of Study or Student Mobility)
- address registration form („lakcímbejelentő”) signed by the owner(s) or an authorized person
- lease contract for the apartment (It has to specify the landlord's and your personal data: date and place of birth, mother's maiden name, permanent address, landlord's ID number, your passport number. The contract has to be signed by two witnesses.)
- 1 passport-size photo
- the administrative service fee charged for the issue of a registration certificate is HUF 10,000 payable by credit card at the Immigration office
- proof of funds to cover your expenses
- certification of valid medical insurance coverage in Hungary
- school certificate in Hungarian from the secretariat of your college /university.

Please see below for how to reach the Immigration Office.

How to reach the Immigration Office in Budapest

The Immigration Office is located at the Twin Office Center Office Building, Szegedi út 35-37, 1135 Budapest (13th district), Hungary. Within the building, the Immigration Office is located at the Ground Floor, Clients' Service II. ("II. sz. Kirendeltség")

Office hours:

Monday	8:30 am to 1:00 pm
Tuesday	1:00 pm to 5:00 pm
Wednesday	8:30 am to 12:00 noon
Thursday	8:30 am to 1:00 pm
Friday	8:30 am to 12:00 noon

E-mail: bp2@bah.b-m.hu (It is possible to book an appointment in advance.)

To get there, please take buses number 20E, 30, 30A or 32 from the Keleti Railway Station („Keleti pályaudvar”) and get off at the bus stop named 'Szegedi út'.

REDUCTION OF TUITION FEE

1. Students may apply for a reduction after completing the first semester of the first academic year if their semester weighted average results were above 4.51. From the third semester the reduction is granted under an extra condition: from the end of the second semester, all their semester weighted average results have to be continuously above 4.51, including the weighted average of the second semester. The reduction is 10% of the tuition fee with average results above 4.51 and 15% with average result of 5.00. Students may apply for a reduction after completing each semester on condition they meet the above requirements, and in case they have completed all the obligatory semester subjects, and gained minimum 20 credits in each semester. No reduction is given in case of exemption from one or more subjects (except from PE). No reduction is given during retaken semesters on account of subjects already completed. Students eligible for the tuition fee reduction pay with 10-15% reduced tuition fee in the next semester.

Application deadlines:

first semester:	until the 15th of September
second semester:	until the 15th of February

2. Students taking just either one normal or one exempted "FM" course (regardless plus how many exam courses "CV") in a semester pay 50% of their semester tuition fee. Signing up solely for one or more exam courses "CV" also entitles for the 50% reduction. (Note: The permission can be granted upon the student's written request that has to be handed in at the English Secretariat before starting the semester!)
3. **Tuition fee for the 6th year:**
In case the student completes all the rotations regardless whether the 1 week Transfusion course is completed at Semmelweis University or abroad, he/she has to pay 80% of the tuition fee valid in the academic year. The relevant acceptance letters should be handed in latest until December 15, 2021. Otherwise the student is not entitled for the reduction!

Please write a letter of request addressed to the Director of the Directorate of International Studies when applying for the 20% reduction!

HOW TO GET A CERTIFICATE WHICH PROVES THAT THE DIPLOMA ISSUED BY SEMMELWEIS UNIVERSIT IS IN CONFORMITY WITH THE EU REQUIREMENTS, AND A CERTIFICATE OF GOOD STANDING

Compiled by **The National Healthcare Service Center (Állami Egészségügyi Ellátó Központ; ÁEEK)**

This brochure aims to briefly summarize the procedures of the ÁEEK that are needed to access the healthcare profession granted by your diploma, either in Hungary or abroad.

After graduation your University has 30 calendar days to report the diploma details of the newly graduated students to the ÁEEK's Department of Registration in order to get them listed in the National Basic Register of the Healthcare Professionals.

(The register is publicly available: <https://kereso.enkk.hu/>)

Once you have your diploma listed in the Basic Register, you should decide if you intend to

– **leave Hungary and work abroad** (see point A) **OR**

– **stay and work in Hungary** (see point B)

We hope you find the information provided in this publication to be informative and helpful.

National Healthcare Service Center
Directorate General of Human Resources Development

A) I INTEND TO WORK ABROAD

If you intend to work abroad, your Hungarian diploma has to be recognised by the Host Country's competent authority and thereafter you will be required to get further registrations or licences depending on the host country's regulation.

It is highly recommended to contact the host country's authority first to get detailed information on the recognition procedure, including the list of the necessary documents and the confirmation if licence to practice (operational registration) in Hungary is needed or not.

Amongst the requested documents there can be multiple certificates that are issued by the **National Healthcare Service Center (ÁEEK)**. The most frequently requested certificates are the certificate of conformity and good standing.

The procedure takes maximum 30 calendar days. Normally the certificates can be issued between 8-15 calendar days. Your patience is highly appreciated.

(You can visit the ÁEEK's website for **further information on all types of certificates:**

www.enkk.hu (switch to the English menu / Department of Recognition and Monitoring)

CERTIFICATE OF CONFORMITY

It attests that your diploma (in medicine, dentistry, pharmacy, nursing or midwifery) satisfies the training requirements laid down in European Parliament and Council Directive 2005/36/EC on the recognition of professional qualifications.

CERTIFICATE OF GOOD STANDING

It attests that the professional

- has a clean criminal record, and is not under the effect of a non-appealable sentence imposed for a criminal offence suspending the health care activity concerned on the day of issue of this certificate;
- is not under the effect of a non-appealable sentence imposed for the violation of the professional ethical rules;
- **is entitled or not to pursue healthcare activities in Hungary.**

The entitlement (right to practice) basically **depends on the membership in the professional chamber** (Hungarian Medical Chamber (MOK), Hungarian Pharmaceutical Chamber (MGYK), Hungarian Chamber of Health Care Professionals (MESZK) **and on the Operational Registration**.*

PROCEDURE IN RELATION TO THE CERTIFICATES

In order to get the necessary certificates (required by the host country's authority), the following documents have **to be submitted** to the ÁEEK's **Department of Recognition** and Monitoring **via e-mail to recognition@aEEK.hu** (or by post or in person)

- request form (available on www.enkk.hu at Department of Recognition and Monitoring / Certificates for recognition in a foreign country
- scanned copy or photo of your passport or ID card,
- scanned copy of photo of any official document that proves your current address in Hungary or abroad (if available)
- scanned copy or photo of your diploma,
- transfer receipt about the fee of the procedure.(15 000 HUF/requested type of certificate)

CONTACT DETAILS OF THE DEPARTMENT OF RECOGNITION AND MONITORING

E-mail:

recognition@aEEK.hu

Telephone:

(+36)-1-919-3336 (Mon-Thu: 8.30-16.00; Fri: 8:30-13:30)

Address of personal consultation:

1085 Budapest, Horánszky utca 24. (ground floor)

Opening hours:

Tuesday: 8.30-12.00. and 13.00-15.30

Postal address:

National Healthcare Service Center
Directorate General of Human Resources Development
Department of Recognition and Monitoring
1444 Budapest Pf.: 270.

* From 1st January 2017, if the **healthcare professional with foreign citizenship declares** that he or she does not intend to pursue healthcare activities in Hungary (currently), he or she can apply for the operational registration without the membership of the chamber. **(For further info please see Subsection 3 of point B) or contact the Department of Registration in e-mail: omn@aEEK.hu)**

Bank account details:

Állami Egészségügyi Ellátó Központ
10032000-01490576

From foreign account:

National Healthcare Service Center

Swift code: HUSTHUHB

IBAN number: HU06 1003 2000 0149 0576 0000 0000

Bank: Hungarian National Bank

Please note that the fee of the transfer and the exchange is also your cost!

B) I INTEND TO WORK IN HUNGARY

In order to start working as a health professional in Hungary, the following steps have to be taken:

1. Basic Register (automatic), medical stamp for doctors and dentists (by request)

After the graduation the University has 30 calendar days to report the diploma details of the newly graduated students to the ÁEEK's Department of Registration in order get them listed in the National Basic Register of the Healthcare Professionals.

Once you are registered in the Basic Register, you will have a unique registration number, which can be checked at the public database: <https://kereso.enkk.hu/>)

In case of doctors and dentists the ÁEEK's Department of Registration *ex officio* notifies the National Health Insurance Fund of Hungary (Nemzeti Egészségügyi Alapkezelő; **NEAK**) about the professionals personal details, address and basic registration number in order to prepare the professionals' medical stamps.

Despite the notification, **the medical stamp will not be prepared unless you apply for it by submitting a request form to the NEAK.** (web: <http://neak.gov.hu/>; e-mail: neak@neak.gov.hu; stamp request form can be downloaded: <http://www.oep.hu/nyomtatvanytar/> - Kérelem az első névre szóló orvosi bélyegző kiállítása iránt)

2. Membership to the competent professional chamber (by request)

Membership of the competent professional chamber is compulsory for those, who are intending to work in Hungary. For the details of the procedure (form, fees, etc.), please contact your chamber:

- **doctors, dentists:** Hungarian Medical Chamber (www.mok.hu; Magyar Orvosi Kamara)
- **pharmacists:** Hungarian Chamber of Pharmacists (www.mgyk.hu; Magyar Gyógyszerész Kamara)
- **healthcare professionals (physiotherapists, nurses, midwives, etc.):** Chamber of Hungarian Healthcare Professionals (www.meszk.hu; Magyar Egészségügyi Szakdolgozói Kamara)

3. Operational Registration ('működési nyilvántartás') (by request)

In order to provide healthcare services unsupervised, - besides the chamber membership - the professional has to hold a valid operational registration. The application should be submitted to the ÁEEK's **Department of Registration and Training.**

Further information can be found on the ÁEEK's website (www.enkk.hu / English menu / Department of Registration and Training) or you can contact our colleagues.

PROCEDURE in relation to the operational registration

For your first operational registration, please be informed that you need to submit the following documents:

- **filled out and signed application form**

The registration to the Operational Register is only possible upon request, therefore applicants are required to fill out the application form and submit it either by post (as a registered letter) or in person (at our customer service) (Download: www.enkk.hu – Department of registration and training (basic and operational registry/application forms or available at the customer service)

- **transfer receipt of the administrative fee**

Upon first registration **3.000,- HUF** administrative fee has to be paid by bank transfer to the bank account held by ÁEEK (**bank account number: 10032000-01490576-00000000**).

(The acknowledgment of the payment shall be attached to the application.)

- **Either the proof of membership of the chamber** (if you are intending to work in Hungary) **Or the declaration form for foreign citizens** (if you are intending to work abroad and the Hungarian registration is required by the Host Country)

Membership of the competent professional chamber is compulsory for those, who are intending to work in Hungary!

If you are a healthcare professional with foreign citizenship who do not intend to work in the area of healthcare currently in Hungary and the license for the healthcare activity – certificate of the Hungarian operational registration – is only necessary for the recognition of your professional qualification abroad, it is not obligatory to have the membership of the chamber.

As indicated above, healthcare professionals can obtain operational registration without the membership of the chamber, provided that the Hungarian or English version of the Declaration for foreign citizens has been attached to the application form. CONTACT DETAILS OF THE DEPARTMENT OF REGISTRATION AND TRAINING

Address:

1085 Budapest, Horánszky utca 24. (ground floor)

Opening hours:

Monday to Thursday 8.30-15.30

E-mail:

omn@aek.hu

Telephone:

(+36)-1-411-1146 (Mon-Thu: 8.30-15.30)

4. Working as a self-employed (by request)

If you intend to provide healthcare services as a self-employed, you are required to have an operational licence ('működési engedély') too, for which you can apply at the Policy Administration Service of Public Health of the territorially competent Government Office. (Contact details of the regional offices: <http://www.kormanyhivatal.hu/hu/elerhetosegek>)

5. Entering a specialist training programme

In case you have plans to enter a specialist training programme in Hungary, for detailed information (such as language requirements, training costs, opportunities for financial support) please contact the Continuing Education Center of your University.

SAMPLE APPLICATION FORM IN ENGLISH AND IN HUNGARIAN

- Attention, forms are informational only, original letterhead documents are to be required from the office of ÁEEK or to be downloaded from their website.

REQUEST concerning the issue of a certificate to be used in the recognition of the diploma, qualification in another country

I'm (name) applying for the following certificate(s) that I need to get my diploma, qualification recognised in (name of the host country).

(Please put an X before the requested certificates):

- ☐ certificate of conformity issued for doctors, specialists in medicine, dentists, specialists in dentistry, pharmacists, nurses, midwives (with reference to Article 24., 25., 28., 29., 31., 34., 35., 40-41., 44. of Directive 2005/36/EC)
- ☐ certificate of acquired rights issued for doctors, specialists in medicine, dentists, specialists in dentistry, pharmacists, nurses, midwives (with reference to Article 23., 27., 30., 33., 37., 43. of Directive 2005/36/EC)
- ☐ certificate which attests the length of the healthcare activity pursued in Hungary
- ☐ certificate of good standing (Pursuant to Section. 110/A of Act CLIV of 1997)
- ☐ certificate which attests the level of the qualification (with reference to Article 11. of Directive 2005/36/EC)
- ☐ other

Personal data (Please write with capitals):

Surname:
Given name:
Name at birth:
Mother's maiden name:
Place and date of birth:
Registered address:
Postal address:
Telephone:
E-mail:
Basic register number:

I enclose the following documents (Please put an X before the selected ones):

- ☐ copy of the passport/ID card
- ☐ copy of the proof of evidence concerning the applicant's registered address
- ☐ copy of the diploma/qualification
- ☐ fee (by postal cheque or bank transfer)
- ☐ original certificate from the employer or its certified copy (in case of the certificate of acquired rights, or in case of the certificate which attests the length of the healthcare activity pursued in Hungary)
- ☐ other

I'd like to get the issued certificates (Please put an X before the selected one):

- ☐ personally
- ☐ by post
- ☐ by an authorised person (please attach an authorisation)
- ☐ other way:

Other remarks, requests:

I hereby declare that the information contained in my application are true, and I agree with the use of the aforementioned data by the Center with regards to my application. Furthermore, I authorise the Center to obtain the necessary information from the competent authority in connection with the Certificate of Good Standing.

Date:

.....
signature

APPLICATION

for medical doctors, dentists, pharmacists and clinical health workers

(Kérelem orvosok, fogorvosok, gyógyszerészek és klinikai szakképesítéssel rendelkezők részére)

Before filling out the application please read the instructions first!

(Kérjük az adatlap kitöltése előtt olvassa el a kitöltési útmutatót!)

I. Personal details (*: *It is obligatory to fill out*)

*[Kérelmező adatai (A *-gal jelölt adatok kitöltése kötelező)]*

Basic and Operational registration number:

(Alap és működési nyilvántartási szám)

***Name (your name in the ID card or passport):**

[Családi és utónév (személyi igazolványban szereplő név)]

***Surname (Vezetéknév):**

*** Given name (Utónév):**

***Name at birth (Születési név):**

***Surname (Vezetéknév):**

***Given name (Utónév):**

***Mother's maiden name (Anyja születési neve):**

*** Place and date of birth (Születési hely, idő):**

***Sex (Neme):**

*** Nationality (Állampolgársága):**

*** During the health activity I would like to use:**

(Az egészségügyi tevékenység során használt név)

{ } My name (Családi és utónév) { } My name at birth (Születési név)

*** I would like to use the title 'Dr': { } Yes (Igen) { } No (Nem)**

(Doktori címemet használni kívánom)

*** Registered address (Lakóhely):**

*** Mailing address (if it is different from the registered address):**

(Levelezési cím (amennyiben a lakóhelytől eltér))

Retired (Nyugdíjas): { } Yes (Igen) { } No (Nem)

*** E-mail address (E-mail cím):**

Phone number (Telefonszám):

The subject of the application

(A kérelem tárgya)

The applicant's qualification (A kérelmező szakképzettsége):

{ } Medical doctor (Orvos) { } Pharmacist (Gyógyszerész)

{ } Dentist (Fogorvos) { } Specialist in clinical psychology (Klinikai végzettség)

{ } Other specialist training (Egyéb)

The subject of the request (Please put an X before the requested case):

(A kérelem tárgya (a megfelelőt kérjük x-elni))

{ } First registration (Első felvétel)

{ } Renew the operational registration (Megújítás)

{ } Registration of the new qualification (Új szakképesítés felvétele)

{ } Extend the operational registration (prolongation because of child-raising allowances, incapacity due to illness, etc.) (Meghosszabbítás)

{ } Registration after cancellation (Törlést követő újrafelvétel)

- { } Change in personal details (*Adatváltozás bejelentése*)
- { } Replace the card of the operational registration (*Működési nyilvántartási igazolvány pótlása*)
- { } Declaration of pursuing the health activity with supervision (*Felügyelet bejelentése*)
- { } Cancellation from the operational registration (*Működési nyilvántartásból történő törlés*)

I present my application in the following qualification(s):

(Kérelmemet az alábbi szakképesítés(ek) tekintetében terjesztem elő)

II. Details of the qualification(s)

(Szakképesítés adatok)

Diploma

1) Title of the Diploma (Diploma megnevezése):

Number of the diploma (number/year) (*Diploma száma*):

Issuing body:

(*Kiállító szerv*)

Place and date of issue:

(*Kiállítás helye, ideje*)

Language of the training:

(*Képzés nyelve*)

Nostrified, recognised by:

(*Honosító/elismerő intézmény*)

Number of recognition, nostrification:

(*Honosító/Elismerő határozat száma*)

Place and date of recognition, nostrification:

(*Honosítás/Elismerés kiállításának helye, ideje*)

2) Title of the Diploma (Diploma megnevezése):

Number of the diploma (number/year) (*Diploma száma*):

Issuing body:

(*Kiállító szerv*)

Place and date of issue:

(*Kiállítás helye, ideje*)

Language of the training:

(*Képzés nyelve*)

Nostrified, recognised by:

(*Honosító/elismerő intézmény*)

Number of recognition, nostrification:

(*Honosító/Elismerő határozat száma*)

Place and date of recognition, nostrification:

(*Honosítás/Elismerés kiállításának helye, ideje*)

Specialist qualifications (Szakvizsgák adatai)

1) Name of the qualification (Szakvizsga megnevezése):

Number of the qualification (number/year) (*Szakvizsga száma*):

Issuing body:

(*Kiállító intézmény*)

Place and date of issue:

(*Kiállítás helye, ideje*)

Language of the training:

(*Képzés nyelve*)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Number of recognition, nostrification:

(Honosító/Elismerő határozat száma)

Place and date of recognition, nostrification:

(Honosítás/Elismerés kiállításának helye, ideje)

2) Name of the qualification (Szakvizsga megnevezése):

Number of the qualification (number/year) *(Szakvizsga száma):*

Issuing body:

(Kiállító intézmény)

Place and date of issue:

(Kiállítás helye, ideje)

Place and date of issue:

(Kiállítás helye, ideje)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Place and date of recognition, nostrification:

(Honosítás/Elismerés kiállításának helye, ideje)

3) Name of the qualification (Szakvizsga megnevezése):

Number of the qualification (number/year) *(Szakvizsga száma):*

Issuing body:

(Kiállító intézmény)

Place and date of issue:

(Kiállítás helye, ideje)

Place and date of issue:

(Kiállítás helye, ideje)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Place and date of recognition, nostrification:

(Honosítás/Elismerés kiállításának helye, ideje)

4) Name of the qualification (Szakvizsga megnevezése):

Number of the qualification (number/year) *(Szakvizsga száma):*

Issuing body:

(Kiállító intézmény)

Place and date of issue:

(Kiállítás helye, ideje)

Place and date of issue:

(Kiállítás helye, ideje)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Nostrified, recognised by:

(Honosító/elismerő intézmény)

Place and date of recognition, nostrification:

(Honosítás/Elismerés kiállításának helye, ideje)

III. Membership of the Chamber

(Kamarai tagság)

I have membership (*Rendelkezem kamarai tagsággal*): { } Yes (Igen) { } No (Nem)

If yes, the name of the Chamber

(*Kamara megnevezése*):

If yes, the beginning of the membership

(*Kamarai tagság kezdete*)

If yes, the end of the membership:

(*Kamarai tagság vége*)

If no: I am a health worker with foreign citizenship and I do not intend to work in the area of health in Hungary, the permission for the health activity – certificate of the Hungarian operational registration – is only necessary due to the recognition of professional qualification abroad. I attach the declaration for foreign citizens about working out of Hungary to the application form.

(Külföldi állampolgársággal rendelkező egészségügyi dolgozó és az egészségügyi szakképesítés megszerzését követően egészségügyi tevékenységet Magyarországon nem kívánok folytatni, az egészségügyi tevékenység végzésére való jogosultság igazolása kizárólag a szakképesítése külföldön történő elismerése miatt szükséges. Ennek megfelelően kérelmemhez csatoltam a "Nyilatkozat külföldi állampolgárok részére" elnevezésű nyomtatványt)

IV. Details of the language exam(s):

(*Nyelvvizsgák adatai*)

1. Language:

(**Nyelv**)

Level (Szint):

{ } basic (*alap*)

{ } intermediate (*közép*)

{ } advanced (*felső*)

Type (Típus):

{ } A { } B { } C

{ } General (*Általános*)

{ } Professional (*Szakmai*)

Issuing body:

(*Kiállító szerv*)

Issuing place and date:

(*Kiállítás helye, ideje*)

Number:

(*Száma*)

2. Language:

(**Nyelv**)

Level (Szint):

{ } basic (*alap*)

{ } intermediate (*közép*)

{ } advanced (*felső*)

Type (Típus):
{ } A { } B { } C
{ } General *(Általános)*
{ } Professional *(Szakmai)*
Issuing body:
(Kiállító szerv)

Issuing place and date:
(Kiállítás helye, ideje)

Number:
(Száma)

3. Language: (Nyelv)

Level (Szint):
{ } basic *(alap)*
{ } intermediate *(közép)*
{ } advanced *(felső)*

Type (Típus):
{ } A { } B { } C
{ } General *(Általános)*
{ } Professional *(Szakmai)*

Issuing body:
(Kiállító szerv)

Issuing place and date:
(Kiállítás helye, ideje)

Number:
(Száma)

V. Declarations

(Nyilatkozat)

1. I apply for that the National Healthcare Service Center

(Kérem, hogy az Állami Egészségügyi Ellátó Központ (a továbbiakban: ÁEEK) a kérelmemben foglaltak alapján)

{ } make my first registration into the Operational Registration;

(regisztráljon a működési nyilvántartásba)

{ } renew my operational registration;

(újítsa meg a működési nyilvántartásomat)

{ } make the registration of my new qualification

(a kérelemben megjelölt szakképesítés tekintetében bocsásson ki működési nyilvántartási igazolványt)

{ } extend my 5-year-period registration;

(hosszabbítsa meg a működési nyilvántartásomat)

{ } registrate me again in the Operational Registration after cancellation;

(törlést követően ismételt regisztráljon)

{ } change the informations and my datas in the operational registration database;

(adatváltozásomat rögzítse a működési nyilvántartásba)

{ } replace my stolen, missing or spoiled card of operational registration;
(pótolja az elveszett, elloptott vagy megrongálódott működési nyilvántartási igazolványomat)
{ } put into the operational registration database that I am pursuing the health activity with supervision;
(rögzítse a nyilvántartásba a felügyelet melletti tevékenységgyakorlást)
{ } cancel me from the operational registration.
(töröljön a működési nyilvántartásból)

2. I hereby declare that I have clean criminal record and that I am not under the effect of a non-appealable sentence imposed for a criminal offence suspending the health care activity.

(Felelősségem tudatában kijelentem, hogy nem állok olyan bűncselekménnyel kapcsolatban büntetett előlélethez fűződő hátrányos jogkövetkezmények hatálya alatt, amely miatt egy évet meghaladó végrehajtandó szabadságvesztésre ítélték, illetve nem állok az egészségügyi tevékenység folytatását kizáró foglalkoztatástól eltiltás hatálya alatt.)

3. I contribute to the National Healthcare Service Center verifies permanently the informations which mentioned previously in point 2. The National Healthcare Service Center has national and exclusive competence to demand informations from the authority of criminal registration.

(Hozzájárulok ahhoz, hogy az ÁEEK hatósági ellenőrzés keretében a 2. pontban foglalt tények fennállására vonatkozó adatokat a működési nyilvántartásban szereplésem időtartama alatt folyamatosan ellenőrizze. Tudomásul veszem, hogy az ÁEEK a hatósági ellenőrzés céljából adatot igényelhet a bünygyi nyilvántartási rendszerből.)

4. I hereby declare that

{ } I am not under the effect of any decree declaring that I am unfit to pursue the healthcare activity permanently (due to my health condition),

{ } I am not under the effect of any auhtority's decision forbiding me to pursue the health care activity.

(Felelősségem tudatában kijelentem, hogy

{ } nem állok (egészségügyi állapotom miatt) az egészségügyi tevékenység folytatására véglegesen alkalmatlanná nyilvánító határozat hatálya alatt,

{ } nem állok az egészségügyi tevékenység gyakorlásától eltiltó hatósági határozat hatálya alatt.)

5. I contribute to the National Healthcare Service Center verifies the datas which have been declared by me in the application form.

(Hozzájárulok, hogy a kérelmemben általam, vagy a munkáltatóm által szolgáltatott adatokat az ÁEEK ellenőrizhesse.)

6. I hereby declare that out of Hungary

{ } I have never worked and I am not working in the area of health;

{ } I worked in the area of health;

{ } I am working now in the area of health

and according to the law of the foreign country I have clean criminal record and I am not under the effect of a nonappealable sentence imposed for a criminal office suspending the health care activity.

(Felelősségem tudatában kijelentem, hogy Magyarországon kívül egészségügyi tevékenységet

{ } nem végeztem és jelenleg sem végzek;

{ } végeztem;

{ } jelenleg is végzek

és az egészségügyi tevékenység végzésének helye szerinti állam(ok) jogszabályai alapján nem állok az egészségügyi tevékenység gyakorlását kizáró vagy korlátozó intézkedés, büntetés, büntetőjogi intézkedés hatálya alatt.)

7. I hereby declare that the informations contained in my application are true and correct at the moment of signing.

(Felelősségem tudatában kijelentem, hogy a kérelemben feltüntetett adatok a valóságnak megfelelnek.)

Done in:(place).....(day/month/year)

(Kelt) (hely) (nap/hónap/év)

.....
original signature of the applicant
(Eredeti aláírás)

Without the original signature the application is not valid and unacceptable.
(Eredeti aláírás hiányában a kérelem érvénytelen és elfogadhatatlan)

The application can be sent:
- by post as a required letter to the address 1444 Budapest, P.O. Box 270.;

- by personal at our customer service during the opening hours

- Monday-Thursday: from 8:30 to 15:30

- Friday: from 8:30 to 13:00

Availability:

- Phone: +36-1/411 1146; Fax: +36-1/411-3768

- E-mail: omn@aeek.hu

- Account number: 10032000-01490576-00000000

- Swift code: HUSTHUHB

- **IBAN number: HU06 1003 2000 0149 0576 0000 0000**

DECLARATION

for foreign citizens intending to work outside of Hungary

Personal details

Basic registration number:

Surname:

Given name:

Name at birth:

Mother's maiden name:

Place and date of birth:

Nationality:

I, (name) hereby declare that I am a healthcare professional with foreign citizenship and I do not intend to work in the area of healthcare in Hungary currently, the license to pursue healthcare activities – getting registered in the Operational Registry – is only necessary for the recognition of my professional qualification abroad. Due to the abovementioned it is not obligatory to have the membership of the chamber. I, furthermore, acknowledge that in case I return to Hungary to pursue healthcare activities, I will be required to become a member of the chamber.

Date:

.....
Signature

STUDENT CARD

How to order a new student card

1. To obtain a new student card, you must first have an official photo taken and provide your official signature at „Központi Okmányiroda” (Central Document Office) Address: 13th District, 110 – 112 Visegrádi utca.
You must take your residence permit and passport with you to the Központi Okmányiroda.
2. There you will be given a NEK (Nemzeti Egységes Kártyarendszer) datasheet. This form has a 16-character identification number in the upper right corner.
3. Log on to your Neptun site, go to 'Administration' and click on 'Student Card request' in the drop-down list.
A smiley:) will warn you not to add the hyphens when typing in your 16 character NEK identifier into yellow text box!
- 3/a. Click on the grey tab 'Add new' and type your 16 character NEK identifier into the blank called 'NEK azonosító'
- 3/b. then choose 'Demand type'. Check that your permanent (home) address is correct and shows up in the 'Street, number' text box.
Please note that you will also need your temporary (Hungarian) address written in the Neptun. This will serve for your temporary, A4-format student card you will receive at the English Secretariat.

The plastic card **takes** about **6-8 weeks** to be produced after being ordered from the English Secretariat. You will need to **use** the **temporary, A4-format certificate** until you receive your official card. Please note that the temporary certificate is valid only for 2 month, after which time it must be renewed.

INSURANCE

By paying the tuition fee, and signing the insurance contract during - *or after* - registration, students are entitled to use the services offered under the insurance policy established on September 1, 2017 between Generali Biztosító Zrt and Semmelweis University.

You will receive an information sheet about the details of this insurance policy during the registration itself (*or alternatively, you can also acquire the information sheet at the front desk of the English Secretariat, or online through <https://semmelweis.kft.hu>*).

Throughout the duration of your studies, this insurance will cover the medical bills of outpatient and inpatient treatments provided by the designated health care service providers, as well as emergency medical care during the active semester(s). Details about terms and conditions found in „Customer information and General Provisions Governing Insurance Policies” as well as in the „Product Information on Generali's Fee-for-Service Health Insurance”.

Living Costs

In addition to tuition, students may have the following expenses:

- In addition to tuition, students may have the following expenses:
- Expenses related to studies (student ID card, books, photocopying, etc.) about 200 EUR/semester
- Accommodation (depending on the size and the location of the flat, as well as on the number of students sharing it) about 250-350 EUR/month/person
- Living expenses (food, transport, miscellaneous) 200-250 EUR/month

FREQUENTLY ASKED QUESTIONS - FAQ-s

- **Where can I find the Foreign Students' Secretariat?**

EOK (Basic Medical Science Center) 37-47 Tűzoltó utca, 1st Floor, room 1.604

What are the Foreign Students' Secretariat's office hours?

Monday	13.00 – 15.00
Tuesday	13.00 – 15.30
Wednesday	closed
Thursday	9.30 – 12.00
Friday	10.00 – 12.00

- **How do I get my class schedule for the next term?**

You can check your schedule in your Neptun under Studies/Class schedule after subject registration.

- **How do I get a Student card?** – Read detailed information for the students of all faculties – Student Card Request (pdf)

- **How many credits do I need to graduate?**

General Medicine	360 credits
Dentistry	300 credits
Pharmacy	300 credits

- **How many credits do I have to earn per semester?**

Please see your semester curriculum in the Calendar. The amount of the required credits are set out by each semester's curriculum under the curriculum schedule.

Attention!

Training and Examination Regulations

Section 26. The certificate of degree (Diploma)

The diploma, the certificate.

1. The credit value of subjects accomplished in other institutions of higher education and recognized by the University in a credit transfer procedure shall not exceed two-thirds of the credits required for the award of the diploma as defined by the qualification requirements.

- **How can I apply for the approval of the place of the summer practice?**

1. Summer practice at an Institution/Clinic of Semmelweis University

No approval or certificate on completion is needed in this case. The completion is recorded in the Neptun system by the host Institution/Clinic. To organize your practice and ensure that you will be accepted, you should contact the relevant Institution/Clinic and speak with your tutor. *Please note:* some Semmelweis departments require that you do a special registration via Neptun for their summer practice. About details and departmental regulations, please consult your tutor.

2. Summer practice at an Institution/Clinic outside of Semmelweis University

Approval of such summer practice is needed beforehand, and a certificate on completion must be submitted at registration to the next term. Please contact your registrar for details with specifics.

- **When and how do I have to submit the certification on my completed summer practice?**

Certificates on a completed summer practice outside Semmelweis University should be submitted to the English Secretariat at the registration to the next term.

Please note: students are not allowed to proceed to the next year unless the form of completion is submitted to the English Secretariat at registration.

Please use the downloadable forms at each Faculty.

Compulsary summer practices by Faculties:

year/Faculty	General Medicine	Dentistry	Pharmaceutical Sciences
1st	Summer Nursing Practice* (1 month) (*after 1st or 2nd year)	Summer Nursing Practice (2 weeks) Summer Dental Laboratory Practice (2 weeks)	–
2nd		–	Summer Practice I. (4 weeks)
3rd	Summer Internal Medicine Practice (1 month)	Summer Dento-Alveolar Practice (1 week)	Summer Practice II. (4 weeks)
4th	Summer Surgery Practice (1 month)	Summer General Dentistry Practice (4 weeks)	–

• How much is the tuition fee per semester?

The tuition fee is determined by the year of enrollment to the Program. Students who complete their studies continually (without failing a year) pay the same tuition fee every year (see the table below). Students who repeat a year due to failure or a passive semester, and students transferred from another university have to pay the tuition fee according to the year of enrollment at the course they are joining. Eg. a student enrolled in 2015/2016 academic year and failed a semester has to pay the tuition fee of those enrolled in 2016/2017.

year of enrollment/ Faculty	General Medicine	Dentistry	Pharmaceutical Sciences
2006.	6 100 USD	5 400 USD	5 400 USD
2007.	6 100 USD	5 400 USD	5 400 USD
2008.	6 100 USD	6 600 USD	5 400 USD
2009.	7 200 USD	8 000 USD	5 800 USD
2010.	8 000 USD	8 000 USD	6 000 USD
2011.	8 200 USD	8 200 USD	6 000 USD
2012.	8 500 USD	8 500 USD	6 000 USD
2013.	8 750 USD	8 750 USD	6 000 USD
2014.	8 750 USD	8 750 USD	6 000 USD
2015.	8 950 USD	8 950 USD	6 000 USD
2016.	9 100 USD	9 100 USD	6 000 USD
2017.	9 100 USD	9 100 USD	6 000 USD
2018.	9 100 USD	9 100 USD	6 000 USD
2019.	9 100 USD	9 100 USD	6 000 USD

• When is my tuition fee due?

Generally:

Fall semesters: 31st of August

Spring semesters: 31st of January

The current deadlines of payment are *announced by the registrars* before the beginning of every semester.

Rules regarding **tuition fee payment** and penalty.

- Students have **one month** (counted from the first day of the semester) for paying the tuition fee of the given semester **without penalty**. (Please note that students cannot get a student certificate, a valid insurance or validation of their student card until their tuition fee is completely settled.)
- **After the semester's first month** has passed, the tuition fee can be paid with a default **penalty of 500 USD**.
- The **latest deadline** for paying the tuition fee and penalty is **the last day of the study period**. (Please note that students cannot register for any exam until their tuition fee plus penalty are completely settled.)

- **If the above final deadline is missed**, i.e. the tuition fee plus penalty are not settled by the end of the study period, the **tuition fee for the current semester can no longer be paid**, student's **status will remain active**, but **every signature** acquired and **every grade** earned by the student during the semester **will be deleted**.

Please take the above rules and deadlines seriously as they will be strictly enforced.

- **What is my tuition per semester?**

All continuing students will remain on the same fee rate as when they first enrolled in the program. Students who take a semester off, failed a year, or transferred from another university has to pay the tuition fee of that specific year they join the program (again).

- **How can I ensure full payment of the tuition fee on time by bank transfer?**

To ensure full payment, please consider that a transfer fee is usually applied when sending money by bank transfer. When transferring the exact amount for the tuition fee, a transfer fee might be deducted from that amount, rendering your tuition fee deficient. Therefore, please contact your home bank prior to transferring the tuition fee and find out whether the bank deducts a transfer fee from the transferred amount. If yes, please pay the transfer fee in addition to the tuition fee.

Payment by wire transfer:

all payments can be made by wire transfer to Semmelweis University's below bank account. Payments have to be made in USD.

Account details of Semmelweis University are as follows:

Account holder: **Semmelweis University**

Account Number (IBAN): **HU67 1000 4012 1000 8016 0051 4534**

Bank name: **Magyar Államkincstár (Hungarian State Treasury)**

Bank address: **Hold utca 4, 1054 Budapest, Hungary**

SWIFT code (BIC): **HUSTHUHB**

Correspondent SWIFT code (BIC): **MANEHUHB**

It is your responsibility to ensure timely and full payment of your tuition fee. It is important for you to keep in mind that checking whether the tuition fee has been paid properly is your responsibility. You are recommended to contact your registrar each term before the payment deadline to find out whether the tuition fee has arrived without any problem.

- **Am I eligible for a reduction of the tuition fee?**

Tuition fee reduction in the following case:

Excellent study record

Students may apply for a reduction if they completed all the obligatory subjects and gained at least 20 credits in the semester, and their weighted average is 4,51 or above continuously started from the first or the second semester of the first year. If the weighted average is 4,51 or above in the first semester a reduction can be granted in the second semester. If the weighted average is 4,51 or above only from the second semester then the reduction can be granted from the third semester. The reduction is 10% for students having a weighted average between 4,51 and 4,99, and it is 15% for students having a weighted average 5,00. Students who have a weighted average below 4,51 during their studies after the first year are no longer eligible for a reduction of the tuition fee. No reduction is given in case of exemption from one or more subjects.

Please write a letter of request addressed to the Academic Program Director when applying for the reduction!

- **How do I calculate my average?**

Study average means the *weighted average*, which is a way to measure a student's academic success in school. The weighted average is calculated from the grades and the credit points belonging to each subject. For each completed course for the previous semester, the number of credit points must be multiplied with the grade received. All subjects are added up and then this amount is divided by the total number of credits collected in the semester.

Example for one semester:

Anatomy:	grade of 3 for 9 credits	= 27
Basics of Biostatistics and Informatics:	grade of 4 for 3 credits	= 12
Hungarian Medical Terminology I.:	grade of 5 for 4 credits	= 20
Basics of Medical Physics:	grade of 5 for 3 credits	= 15
Medical Chemistry:	grade of 4 for 6 credits	= 24
Basics of Medical Chemistry:	grade of 5 for 3 credits	= 15
Medical Terminology:	grade of 5 for 2 credits	= 10
Physical Education I.		none

Σ : $27 + 12 + 20 + 15 + 24 + 15 + 10 = 123$

Number of credits earned in the semester: 30

Weighted average from the first semester: $123 / 30 = 4.1$

- **What is the difference between weighted average and cumulative weighted average?**

The weighted average and cumulative weighted average are based on grades given for each course taken and the number of credit hours specified for those courses over the specified period of time (one term for weighted average; more or all terms for cumulative weighted average). The difference between the two is that *weighted average* is calculated for one semester of the year and *cumulative weighted average* is based on two or more semesters of the individual.

- **What if I can't attend an exam or class at the time scheduled?**

Students are required by university regulations to present written justification stating the reasons of their absence. Upon returning to school after an absence, students should report to the department's office and present a doctor's note, if their absence was caused by medical reasons. Excuses not provided within 3 days after the missed exam or class will result in the absence being marked as an unexcused absence.

It should be noted that the student will be recorded absent even if s/he is absent for a valid reason such as sickness. In the case of absence with a valid reason, an official document that proves the reason of absence should be provided. The department has the right to reject any document of questionable credibility. If you are sick and cannot take the exam or class, you should telephone your tutor immediately and leave a message for the department office even if this is not the first day of your absence.

- **Do I have to pay a fine if in case of my absence from an exam remains uncertified?**

Yes. Please see „Extra curricular fees” on the home page.

- **How do I pay my missed exam fees online?**

Go to Finances/ Payment

Transcribe item

Payment titles: Service

Service type: Missed exam fee (4000 HUF)

If you choose to pay by check please visit the Foreign Students' Secretariat to collect your check. The check must be paid at the post office.

- **Do I have to pay for exams?**

Students have to pay for their second and third retake exam (3rd and 4th exam) for a given subject. Please see „Extra curricular fees” on the home page.

- **How do I order a check for my 3rd or 4th exam in a given subject?**

Log on to your Neptun account, go to „Finances”, choose „Payment”, then „Transcribe item”. Choose „Retake exam”, choose „Semester” then the relevant subject from the list and finally click on „Create item”.

You can choose to pay your retake exam fees online via the Neptun system or by check. To pay online you will have to select 'Payment by credit card' from the two payment options offered to you.

If you choose to pay by check please visit the Foreign Students' Secretariat to collect your check. The check must be paid at the post office, the check stub is to be presented on site prior to the exam.

EXEMPTION

- **Should I go directly to the department when applying for an exemption?**

Yes, except in case of Physical Education, summer practices and First Aid. Physical education medical certificates and certificates/degree proving the completion of summer practices/first aid course must be submitted to the Foreign Students' Secretariat by registration to both semesters each year. For a physical education exemption you must also submit a letter of request describing your problem in a few words and apply for a permission to be exempted from the subject. The request letter must be addressed to the Foreign Students' Secretariat. For other subjects you must first get a blank exemption form from the Foreign Students' Secretariat. Then, you must show the form and certificate of your previous studies to the competent department, which will be reviewed before granting an exemption from the subject. You need to get your exemption form signed and stamped at the department.

Important: the teacher must indicate the grade for the subject on the form. After having the form completed and stamped, you have to return it to the Foreign Students' Secretariat for processing. If everything is OK with the form, your registrar will enter the given grade into the Neptun system and indicate it in your grade book. If you successfully complete the above, you have no further obligations regarding that particular subject.

Approved exemptions must be submitted to the Foreign Students' Secretariat by the start of the semester!

- **Can I be exempted from Physical Education if I have a gym membership?**

No. You will not be exempt because of your gym membership so please do not apply for an exemption on these grounds.

What is the process of submitting a doctor's note for Physical Education exemption?

If you are requesting an exemption from physical education due to medical complications that inhibit you from partaking in physical activity for an indefinite time; you then must submit evidence to the Foreign Students' Secretariat in Hungarian or in English language from a licensed health care practitioner that documents a diagnosis of a temporary physical or mental disability.

- **What do the so-called CV and FM exams mean?**

CV and FM are abbreviations. CV stands for the Hungarian term „Csak Vizsga”, meaning „Exam only”. The term indicates that the student has already received the signature for taking the course, that is, fulfilled the semester requirements and only the exam is missing, which can be taken in the following semester.

FM stands for the Hungarian term „Felmentett”, meaning „Exempt”. This term also indicates that the subject requirements have been fulfilled and student only needs to take the exam. The student is not obliged to take the course again, however since the subject is offered again, he/she can decide to do so. (Should the student decide to attend the course again, even though he/she has already fulfilled the requirements, the same rules shall apply to him/her as to those attending the class for the first time (Absence, attendance at classes, etc.))

- **Do I have to fail a course at least once in order to be allowed to take the CV course in the next term?**

No. You can roll over all 3 exam opportunities to the following semester and take them as a CV course.

- **How many retake opportunities do I have in a semester and in an academic year?**

There are 3 exam opportunities in each subject per semester (1 exam, and 2 retakes) when the subject is offered as a normal or FM course. In the following semester – when the subject is offered as a CV course – only the remaining chances left from the previous semester can be used. There is a special 4th try once a year (the 3rd retake), which may be used exclusively in 1 chosen subject. After using this 4th exam opportunity in one subject, the student shall not have a 4th try in any other subjects; they also will not be granted “special permission” for a 5th opportunity. Please count your remaining exam opportunities carefully!

For example, if you use 2 exam opportunities for Biophysics II in the 2nd semester, you will have only one remaining opportunity for the retake in the following semester (plus the one extra (4th) chance, if you haven't used it already in that specific academic year in another subject).

- **What is a prerequisite?**

Prerequisites are courses that must be taken before another course. For example, Medical Chemistry is a prerequisite for Medical Biochemistry, Molecular and Cell Biology I.

Students must successfully complete Medical Chemistry before registering for Medical Biochemistry, Molecular and Cell Biology I. Please note that prerequisites are clearly listed in the curriculum.

- **What is a corequisite?**

Corequisites are courses that must be taken at the same time as normal courses. Registration for corequisites must be done prior to registration for normal courses in the given term. Corequisites are marked with a star symbol in the Calendar of each semester's curriculum affected (e.g. 3rd and 4th year)

- **What do I need to do if I am planning to take a leave of absence?**

If you take a semester off you will need to email your registrar and register for a 'passive' semester via the Neptun system during the registration period for the next semester.

For details, please see the Neptun manual/ Registration in the beginning of the Calendar

- **What do I need to do if I am returning from a leave of absence?**

Contact your registrar for procedures regarding returning from an official leave of absence and check your Neptun account on a regular basis. Make sure your tuition fee is paid by the relevant deadline.

TRANSCRIPT

- **What is a transcript? How do I request my transcript?**

The transcript is an official statement of all results achieved through study at Semmelweis University as of the date of printing. You cannot have a transcript until all grades are posted in the Neptun student information system by the departments and your grade book is submitted to the Foreign Students' Secretariat with all results. It is the department's responsibility to upload the exam results to the Neptun system.

Transcript requests must be made in writing. To make your request, you may stop by the Foreign Students' Secretariat or send it via e-mail. You can indicate in your request if you would like us to forward the transcript to your email address. Processing of transcript requests takes approximately 5 business days. However, during certain times of the year there will be a slight delay, 2-3 days, due to the heavy volume of requests. The fee for the transcript must be paid for prior to the issuance of the transcript(s). Please be sure to allow sufficient processing time for your request.

Please note: the university may discontinue or suspend this service at any time without notice if the fee for the transcript is not paid.

STUDENT COUNSELLING

The Institute of Behavioural Sciences at Semmelweis University is providing student counselling in English and German as well. Coming to university can be a very exciting and rewarding time. It can also be a time of change and stress, especially if you study in Budapest, left your home country and have to face a new culture, language and environment. There may be a whole range of difficulties and dilemmas affecting your life and studies.

These may be the result of either past or present experiences. The University Counselling Service is one of the services which are there to help. One way of starting to with things is to see a counsellor. This involves meeting with a trained person to talk about the issues that are important for you.

There are a number of ways in which counselling can help, such as:

- Dealing with a crisis or immediate concern
- Support with longer term difficulties
- Getting access to specialist help
- Referring on to other resources

Counselling is an active process that is designed to give you the time, space and encouragement to explore and understand the issues you bring. The counsellor will be able to help you think about your problems from a different perspective. Their role is to provide you with a secure framework in which to reflect upon your circumstances. The aim is, that in time this will increase your awareness of yourself, your situation, and the choices that are open to you. Coming for counselling can take courage as it involves facing yourself and asking someone else for help.

Counselling provides a safe place, separate from your daily life, where you can explore issues or feelings which are causing you difficulty. The counsellor will aim to relate to you in a supportive and purposeful manner and assist you in the task of finding your own way forward. Your use of counselling remains confidential to the service within the limits agreed with your counsellor.

Emotional and psychological problems encountered by student counselling services include:
anxieties about aspects of study including exams and presentations

- general stress and anxiety
- depression
- relationship difficulties
- eating problems
- bereavements and parental separations
- loneliness and homesickness
- lack of self confidence or low self esteem
- managing transitions
- making difficult decisions
- traumatic experiences including rape, assault and abuse
- difficulties with alcohol or drugs
- issues around sex, sexual orientation and sexuality
- self-injury
- suicidal thoughts
- anger management
- worries about appearance
- any other topic or problem you wish to talk about

Contact:

If you have any question, need to talk to someone on the phone in advance, or want to book an appointment to see a counsellor, just send us an email and we will get back to you within 48h:

Dr. János Kollár

E-mail: studentcounselling@net.sote.hu

Home page: <http://behsci.hu/health/student-counselling>

Institute of Behavioural Sciences

Nagyvárad tér 4, 20th floor,

1089 Budapest

Appointments are available between Monday and Friday (16-20 o'clock) upon request (via mail)

ERASMUS Program

<http://semmelweis.hu/english/education/erasmus/>

Office Hours and Contacts

Office Hours

Monday:	9 a.m. – 12 p.m.
Tuesday:	1 p.m. – 3 p.m.
Wednesday:	9 a.m. – 12 p.m.
Thursday:	1 p.m. – 3 p.m.
Friday:	CLOSED

For the efficient and continuous work of the office, we kindly ask that you respect our office hours! In case of an urgent matter, please contact the ERASMUS office either by phone or email, in order to obtain a personal appointment.

Address

H-1085 Budapest, Üllői út 26. Room 202

Contact Information

Ms. Katalin F. Tóth
ERASMUS Institutional Coordinator
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Ms. Márta Honvéd
Coordinator Assistant
Tel: (+36 1) 459-1500, ext. 55828
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E-mail: erasmus@semmelweis-univ.hu

SEMMELWEIS ALUMNI

<http://alumni.semmelweis.hu/eng/semmelweis-alumni>

Mission Statement

Semmelweis Alumni's mission is to help build long-lasting and mutually beneficial relationships between the University and its current students, alumni, faculty and researchers.

Membership

To become a member of Semmelweis Alumni, you need to complete a registration form. Registration is free of charge and memberships remain valid indefinitely.

You may become a member if you meet any of the following criteria:

- You are currently a student at Semmelweis University and have successfully completed at least four semesters;
- You are a former student of Semmelweis University or one of its legal predecessors and successfully completed at least four semesters;
- You are currently a faculty member or researcher at Semmelweis University
- You were formerly a faculty member or researcher at Semmelweis University

INTERNATIONAL STUDENT ASSOCIATION - ISSA

It is an association made up of students from different faculties at Semmelweis University in different years with very different nationalities and backgrounds. Their aim is to give voice to the international student community at Semmelweis University and support them in different methods. Their reach includes but is not limited to the following:

1. Organizing international student events two of which is the Freshmen's Day event for the incoming students every year and also the Semmelweis Carnival
2. Creating a bridge between the students and staff (teaching and non-teaching) through conducting interviews
3. Listening to students concerns through Student Affairs and handling case by case
4. Creating a magazine dedicated to international student committee Review which is full of information for the students and also from students
5. and many more...

The association is actively working to create a pleasant life for the students at Semmelweis University and give voice to their needs. Our mission statement is as follows:

- **Learning** – We compliment and enhance the academic experience.
- **Service** – We are dedicated to serving students and our broader community. We provide good customer service and resources for events/event planning and offer leadership development opportunities.
- **Advocates** – We strive to serve as student advocates.
- **Balance** – We strive for wellness and balance in our activities and events.
- **Ethical Decision Making** – We believe in honesty and integrity during all interactions.
- **Stewardship** – We strive to use all resources effectively and efficiently.
- **Community** – We strive to build a supportive and inclusive office environment/campus community where everyone feels welcome.
- The **Student Affairs Committee (SAC)** is a student-run organization within ISSA. Our express goal is to improve lines of communication between students and members of faculty, as well as advocate on behalf of students' opinions and interests. The backbone of the Student Affairs Committee is the representatives from each year and faculty (Dentistry, Medicine, Pharmaceutical Sciences). Representatives are responsible to both their classmates and their fellow committee members. They are the first to be approached should any issues arise among students within their year. They then bring these problems to the committee so that the SAC team may resolve them. At times, the representative may be responsible for resolving the problems themselves; at times they will be charged with handing over the responsibility to a higher up. Class reps may also be called on to speak with members of the administration, something they are able to do with confidence and professionalism.

STUDENTS' SCIENTIFIC ASSOCIATION (TDK)

<http://semmelweis.hu/english/student-life/clubs-and-organisations/students-scientific-association/>

A unique feature of Hungarian universities is that undergraduate students have the opportunity to be involved in top-level scientific research starting in their undergraduate years. To facilitate this, students maintain their own organisation, the Students' Scientific Association (in Hungarian: Tudományos Diákkör – TDK). TDK activities, which include organising scientific conferences, are overseen by the TDK Council. During the last ten years, the number of students involved in scientific research has grown twofold, while the number of lecturers attending TDK conferences has increased threefold. Currently, over 1000 Semmelweis University students pursue science in addition to their regular studies, more than 400 of whom present their research results at the annual TDK conferences.

The University's students often receive great honours at national and international conferences and many of them publish scientific research articles in international journals as either first or co-authors. Each year, the ten best graduating students receive the "Outstanding TDK Student of Semmelweis University" distinction.

It is pleasing to see that the University is attracting ever more students who had started doing research during their high school years. To encourage the continuation of this practice, the TDK Council promotes the involvement of students in scientific research from their very first year at university.

The TDK Council also promotes close contacts with fellow TDK organisations abroad. Students are sent to international TDK conferences and cooperate with the Hungarian Medical Students' International Relations Committee (HuMSIRC), through whom longer study tours can be organised.

TALENT SUPPORT PROGRAM OF SEMMELWEIS UNIVERSITY

To support the talented and gifted students the Senate of Semmelweis University initiated a Talent Support Program named after the former professor of our University, Ödön Kerpel-Fronius.

Participants of the program will be recruited after a personal assessment interview of the students on the Excellency List organized by the Talent Support Council of the University.

The Excellency List contains not more than the best 5% of the students of the university.

Application for the inclusion in the Excellency List is possible by filling in the Application Form, which can be downloaded from the kerpel.sote.hu/kivalosagi_listara_kerules_szabalyrendszere or kerpel.sote.hu/kivalosagi_lista web-sites.

Applications should be sent electronically to the tehetsegpont.se@gmail.com email address as an attached file until **March** of each year.

Students on the Excellency List will be called for an interview by the Talent Support Council of the Semmelweis University and approximately half of them will be included to the Kerpel-Fronius Ödön Talent Support Program.

POSTGRADUATE MEDICAL STUDIES AT SEMMELWEIS UNIVERSITY

General information on Ph.D. studies, resident training and postgraduate studies for foreign applicants

In principle, there is no possibility to continue medical (or dental) studies at Semmelweis University with an undergraduate degree obtained at a foreign university, due to the differences in the structure of the curriculum and that of the degree system. It must be noted that **there is no Bachelor level in the medical (and dental) education in Hungary** and therefore such foreign degrees do not enjoy automatic acceptance in our country.

The general medical education in Hungary is a single, 6-year-long full time course that is divided into three modules: the basic medical sciences module (2 years), the preclinical module (1 year) and the clinical module (2 years). The sixth year of education is an internship year. After successfully completing the sixth year and passing all the exams, medical students in Hungary obtain the Doctor of Medicine (MD) degree.

Against this background, **holders of Bachelor-level degrees are not entitled to study at Semmelweis University as postgraduate students.**

However, one may sit for the entrance examination for the first academic year and after being accepted and enrolled, one may ask for exemptions on the documented previous studies and examinations of his/her Bachelor-level course.

For further information on our English language undergraduate programmes please visit the website at <http://semmelweis.hu/english/education/english-language-program/>

Those who already hold a **Doctor of Medicine (MD)** degree and wish to continue their studies in order to obtain a **Ph.D. degree**, may send an application to the School of Doctoral Studies. For further information please visit <http://phd.semmelweis.hu/en/>

School of Ph.D. Studies

Office: 1085 Budapest VIII. Üllői u. 26. fszt. 9.

Phone: +36 1 266-7483 és +36 1 266-2343

Fax: +36 1 317-4888 (only fax!)

Office hours:

Monday: closed

Tuesday, Thursday, Friday: 8.30-12.00

Wednesday: 13.00-16.00

Those persons who hold a **Doctor of Medicine** degree obtained at a non-Hungarian university and wish to join a medical **Residency Training** at Semmelweis University have to go through a special application procedure. Please note that **a good command of the Hungarian language is a precondition to join the Residency Training.** Further information can be obtained from

<http://semmelweis.hu/english/education/continuing-education/>

Directorate of Continuing Education

Phone: +36-1-210-1784, +36-1-459-1446

Address: 1091 Budapest, Üllői út 25. (City Corner Office Block)

Mailing address: 1085 Budapest Üllői út 26.

E-mail: szakestovabbkepzes@semmelweis-univ.hu

Postgraduate Courses at Faculty of Dentistry

Address: 1088 Budapest, Szentkirályi u. 47. VII/751.

Phone: 36 1 266 7006

E-mail: szkepz@dent.semmelweis-univ.hu

Office hours:

Thursday: 09.00-11.00

Postgraduate Courses at Faculty of Pharmaceutical Sciences

Address: 1092 Budapest, Hőgyes Endre u. 7-9. B

Phone: + 36 1 266 8411

E-mail: szakkepzes@pharma.semmelweis-univ.hu

Office hours:

Monday, Tuesday, Thursday: 13.00 - 15.00

Wednesday: 10.00 - 13.30

Friday: 09.00 - 12.00

Group of Unprompted Instructors

We are happy to announce, that from this year the famous Spring Training of IÖCS (Instruktor Öntevékeny Csoport – Group of Unprompted Instructors) is open for international students as well. It is one of the oldest student association of the university, and certainly the one with most members. We help organising most of the biggest events for Freshmen like the Summer Camp and the Ball, we also take a huge part in the Carnival and many others. It is a strictly non-profit organisation; our greatest reward is the time and fun we spend together. What can you expect from the spring training?

- Meetings every other week, where you will learn about the association, our structure and programs, you can improve your social skills, get to know an immense amount of new people and form a strong group together.
- Teambuilding games, workshops.
- Spend a weekend together with every newcomer in the organisation at the end of the training, it's a lot like a mini Freshmen's Camp.
- Eventually you will be an Instructor, you can take part in all of our events, work together and welcome the freshmen at the university so we can help them finding their way in this big community.

Lóránt Csehi (csehi.lorant@iocs.hu)

FACULTY OF HEALTH SCIENCES



*Faculty of Health
Sciences*

Brief History of the Faculty of Health Sciences

The University's second largest Faculty is the Faculty of Health Sciences. The Faculty started its first academic year in 1975 with the aim of training highly accomplished, skilled, committed and open-minded health care professionals. This was the first higher-level school in Hungary that trained dietitians, health visitors, physiotherapists, public health and epidemiology inspectors, vocational teachers and paramedics. During the past years both the structure of education and the curriculum have undergone changes in the spirit of modernization. The Faculty continuously expands the range of its Hungarian and English language training programmes. To its prospective students, the Faculty offers study rooms, lecture halls, specialist laboratories, demonstration rooms and a public library that are all equipped with state-of-the-art technology, as well as a great variety of opportunities for an active student life, and a motivating environment. Following graduation, students of the Faculty can immediately be involved in various areas (ex.: health care, tourism, education, sociology) and they are able to have a positive impact on their close and broad environment.

Facts and Figures

The Faculty of Health Sciences celebrated its 40th anniversary in 2015. Since its foundation, more than 30.000 students graduated from the Faculty and today about 3.200 students are studying at this institution. The Faculty is very proud of its library containing more than 50.000 volumes.

During the last four decades the Faculty has developed extensive international relations, and as a result, we have connections with about 50 higher educational institutions throughout Europe, Asia and America. Many students and staff members have the opportunity to take part in short- and long-term exchanges in the framework of the Erasmus+ programme in our partner institutions.

The Faculty's Asian relations have also been largely extended by establishing a fruitful relationship with Shanghai Jiao Tong University School of Medicine (SJTU) and with Heilongjiang University of Chinese Medicine (HLJUCM), that launched its off-campus BSc Traditional Chinese Medicine training at our Faculty. In the framework of the programme, students study in Hungary during the first 4 years, while they can get acquainted with the practical aspects of Chinese Medicine at the Chinese university in the last year in China.

We are also proud of having operated our bilingual (Italian and English) B.Sc. Physiotherapy training in Lugano, Switzerland since 2009. So far, over 250 students participate in our programme there. The extent of our international relationships is growing on a daily basis and we accept several groups of students from different countries on our 2-3 weeks advanced programmes mainly from the USA, China and Japan. In these programmes our students have the opportunity to participate in, and to build international professional connections.

Leadership, Dean's Office

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Dean **College Professor Dr. Gabriella Dörnyei PhD**
Vice Deans **College Professor Dr. Klára Gadó PhD – Deputy General Dean**
College Professor Dr. István Vingender PhD – Vice Dean Responsible for Academic Affairs
College Professor Dr. Zoltán Balogh PhD – Vice Dean Responsible for Clinical Relations

Director of the English Language Programmes

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Dean's Office

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Foreign Students' Secretariat

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Ms. Orsolya Neszt	– Administrator
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Information about the B.Sc. and M.Sc. programmes

Training system

Hungary, as a member of the European Union, belongs to the unified European Higher Education Area, which in principal follows the multi-cycle (bachelor, master and doctorate) training system. In this system it is much easier for students, lecturers and researchers to travel and build international relations, moreover, as citizens of the European Union they can continue their studies and plan their future as employees or entrepreneurs in any of the member states.

These opportunities open up a wider field for non-European citizens studying in Hungary as well, since the possibilities of internal mobility inside the unified Europe are based on the training channels and close relationships between countries in the labour market and among institutions.

Programmes of the Faculty

I. Bachelor of Science (B.Sc.) Programmes

1. Nursing and Patient Care B.Sc. Programme

Specialized programmes: Physiotherapy (Hungarian, English), Nursing (Hungarian, English), Midwifery (Hungarian, English), Dietetics (Hungarian, English), Paramedics (Hungarian), Voice, speech and swallowing therapy (Hungarian)

Physiotherapy

Physiotherapists act as autonomous practitioners who are able to perform functional examinations, identify impairments, functional limitations, abilities and disabilities by using clinical decision-making processes. Physiotherapists treat patients with therapeutic exercises, manual techniques and other therapeutic modalities as the professionals' chief task is to improve the functions of the musculoskeletal system. The therapists develop movement therapies and apply electrotherapeutic treatment, therapeutic ultrasound, and various manual and massage treatments for the sake of healing and rehabilitation or for the prevention of health damage. Graduates take part in healing locomotor (orthopaedic, rheumatologic, traumatologic), cardiovascular, obstetrical, gynaecological, neurological and psychiatric disorders. Prevention and health promotion belong to the specialists' profession, too. Physiotherapists plan, explain, carry out, and adapt an examination-based treatment, draw conclusions from the examination as a whole and rank the main problems according to priority.

Qualification

Physiotherapist

Nursing

The occupation of nurses is a vocation that is pursued for the sake of health preservation, promotion and patient healing. Nurses observe patients in the hospital and continuously monitor their needs, take part in disease prevention and act as active contributors to the process of the patient's recovery and rehabilitation. They help patients absorb and understand the information on their health status. Nurses holding a B.Sc. degree can organise, manage and supervise all their internal medical, surgical, obstetric-gynaecological, psychiatric, intensive nursing and primary care tasks in every area of health care. They are responsible for conducting the healing-nursing activities prescribed by the physician, and help the patient and the physician perform certain examinations. Graduates of the speciality are able to provide health care treatment for each age group from premature infants to elderly patients, explore the special needs of the patient and the person cared for, prepare nursing diagnoses and perform the tasks professionally on the basis of priorities, participate in planning, developing and implementing health care and social services.

Qualification

Nurse

Midwifery

Midwives fulfil caring and nursing tasks during pregnancies, in the postpartum period and on the occasion of gynaecological problems. Their responsibilities are to monitor pregnancies, labours and the postpartum progress while cooperating with other health care professionals in order to achieve the best possible outcome for each family. From the start of the parturition, midwives prepare and continuously support and encourage the woman during labour, monitor the process of delivery and the mother-infant connection, assess and register their observations. Midwives individually assist deliveries, take care of the pro-

tection of the perineum and of the treatment of the woman and the new-born baby during the post-delivery period. Graduate midwives look after, nurse and care for female patients and perform the required specialised treatment. State of the art skill laboratories help the preparation of the students for their future profession.

Qualification

Midwife

Dietetics

Dietitians deal with the questions of human nutrition and possess knowledge about healthy diet and diseases caused by unhealthy nutrition. Graduates are able to practise diet therapy independently, or perform dietetic and catering tasks as members of a therapist team. The specialist's tasks include individual and group counselling, preventing nutrition related chronic and non-contagious diseases, organising diet plans according to the client's sensitivity and disease type. They manage catering units: lead the catering service, organise catering work procedures, and establish appropriate and acceptable conditions for catering. Dietitians play an important role in teaching how to lead a preventive and healthy life as they can also develop and implement programmes for health promotion.

Qualification

Dietitian

Paramedics

Graduates are able to approach professionally and safely patients or victims in prehospital emergency care (oxyology), able to perform triage, on an individual basis and during a catastrophic event. On the scene, paramedics familiarise themselves with the nature of the emergency, examine the patient, and make a primary diagnosis. They stabilise and care for the patient, decide on the possibilities of leaving the patient on the scene. Paramedics observe and monitor the patient during transport, communicate appropriately with the patient and his/her relatives, complete the necessary interventions, and provide psychological support for the suffering patient. Paramedics holding a BSc degree also complete standby on-call duties, organise teamwork in the system of emergency care within health institutions, teach First Aid, and participate in the further training of emergency nurses and ambulance car drivers. Paramedics work in close alliance with the control staff, ambulance assistants, physicians, and health care professionals of hospital emergency care.

Qualification

Ambulance Officer (Paramedic)

Voice, speech and swallowing therapy

Voice, speech and swallowing therapists perform diagnostic and therapeutic tasks in otolaryngology, phoniatrics, neurology, paediatrics, geriatrics and rehabilitation units as well as in outpatient services and can treat certain functional disorders in private practice. Their responsibilities include the functional examination and therapy of phoniatrics, articulation, speech-language abilities, nutrition intake (chewing, swallowing). Graduates are able to treat the disorders of two fundamental functions of human life: the disorders of communication and of food intake. They are able to contribute to the rehabilitation of persons suffering from these functional disorders, thus enabling them to manage their social responsibilities and to integrate into society. Graduates are able to participate in preventive, curative, nursing and rehabilitating professional work on any level of the health care and/or social care system.

Qualification

Voice, speech and swallowing therapist

2. Health Care and Disease Prevention B.Sc. Programme

Specialized programmes: Health Visitor (Hungarian, English), Public Health Care Inspector (Hungarian, English)

Health Visitor

The health visitor is present in the families' life during the most important steps of life: during pregnancy, reception of the new-born baby, formation of family life and at the time of enrolment to nursery and elementary school. Graduates are able to provide counselling concerning family planning and parenthood, help and provide nursing care to the pregnant woman, and perform screening tests. After childbirth, the health visitor teaches the mother the ways of breastfeeding and her tasks related to the child. They monitor the health condition and development of neonates, provide community health care for children (aged 3-18), aid in the prevention of behavioural disorders and bad habits, solve the problems of teenagers and direct them to the appropriate professional. Health visitors give mental hygiene support to families and organise vaccinations. Health visitors take part in planning, organising and conducting health development and promotion programmes for individuals and communities. They perform their duties either independently or in cooperation with doctors and other medical experts.

Qualification

Health Visitor

Public Health Care Inspector

A public health inspector deals with epidemiological tasks that consist of the organisation of public health investigations and the analysis of data retrieved during the investigations. Graduates of the speciality are able to perform public health related municipal activities, conduct appropriate municipal supervision based on current regulations, initiate, plan and manage epidemiological tasks, analyse, interpret, use and critically apply the results of epidemiological examinations, process and realize local and central health policies in order to improve the health status of the population. Public health supervisors plan and realize nosocomial surveillance, monitor the health status of the population, plan, organize, realize and evaluate preventive programmes.

Qualification

Public Health Supervisor

3. Medical Diagnostic Analysis B.Sc. Programme

Specialized programmes: Optometry (Hungarian, English), Radiography (Hungarian)

Optometry

Optometrists are able to utilise their optic, optometric, measuring and clinical knowledge gained during the training programme, conduct the examination and correction of the eye individually and prescribe optical aids (eyeglasses, contact lenses) with the aim of attaining the optimal visual acuity in patients. The professionals are able to estimate the refractive medium, refractive ability, errors of refraction, the way eye muscles function, and the ability of heterophoria and convergence. Professionals examine binocular vision, the chamber of the eye, crystalline lens, vitreous humour and the eye fundus with the help of a slit lamp, and they estimate ocular tension. Optometrists utilize their clinical and nursing knowledge during their daily activities, actively participate in improving the culture of vision of individuals, communities and the population. Through examinations, the optometrist recognises and evaluates the disorders of the eye and so contributes to the immediate receipt of specialised care.

Qualification

Medical Diagnostic Analyst (Optometrist)

Radiography

Medical diagnostic analysts individually operate modern diagnostic imaging appliances (e.g. X-ray, ultrasound, computer tomography /CT/) while keeping the related regulations and procedures. They process, evaluate and archive diagnostic imaging information, establish a daily contact with patients and prepare them for diagnostic imaging therapies. The specialists observe patients during examinations, perceive pathological situations, participate in therapeutic examinations, recognize health damaging effects as results of radiological interventions, and other technological errors, and they prevent them.

Qualification

Medical Diagnostic Analyst (Radiographer)

4. Health Care Management B.Sc. Programme

Specialized programme: Health Tourism Management (Hungarian)

Health Tourism Management

Graduates of the training take part in organising and managing health promotion activities, prepare projects that aim at developing health tourism and strengthening international cooperation, and they participate in the implementation of tourism development programmes of the European Union. The health care manager is a versatile professional who is proficient both in health care processes and in the field of tourism. Their acquired knowledge comprises information on health, tourism and business, therefore they are not only able to see through, organise and coordinate the operation of health care institutions but with appropriate business knowledge they are able to market and manage them, too. The speciality provides the necessary knowledge to create health tourism, health preservation, curative and rehabilitation programmes.

Qualification

Health Care Manager (Health Tourism Management)

Traditional Chinese Medicine B.Sc. Programme – in cooperation with Heilongjiang University of Chinese Medicine

Heilongjiang University of Chinese Medicine organizes its Traditional Chinese Medicine B.Sc. training programme in Hungary at Semmelweis University Faculty of Health Sciences.

The programme based on traditional Chinese medicine is a unique training in Hungary as it is a 5-year bachelor training programme. In this framework, students study in Hungary during the first 4 years, while they can get acquainted with the practical aspects of Chinese Medicine at the Chinese university in the last year. Students who successfully complete the programme receive the B.Sc. degree of the university of Harbin.

Qualification

Bachelor of Chinese Medicine – Accupuncture, Moxibustion and Tuina

II. Master of Science (M.Sc.) Programmes

Physiotherapy M.Sc. Programme

Master's level physiotherapists develop therapeutic procedures and protocols based on their extensive national and international knowledge and skills, recognise and analyse physical, anatomical, physiological and pathological factors affecting physical ability and capacity. They participate in solving scientific problems in physiotherapy, and finding new skills and knowledge in their expertise. The specialists perform scientific evaluation of the effectiveness of physiotherapeutic methods, organise and realise clinical research in physiotherapy, publish new scientific results and act as leaders in hospital units of physiotherapy, apply fundamental regulations and quality control principles in the management of health institutions and private enterprises. The promotion of health education on local, community, national and international levels also belongs to the tasks of a physiotherapist.

Qualification

Physiotherapist

Languages

Hungarian, English

Nursing M.Sc. Programme

Master's level nurses characterise the health status of the population, formulate problems, priorities and aims in public health. They conduct research and analyse technical literature, interpret the results of modern statistical methods, perform tasks of organisation and management related to the nursing process. They are able to perform human resource management tasks related to nursing. Planning budget and writing tenders, planning, realising and evaluating programmes, and establishing co-operation between institutions and individuals belong to the tasks of nurses, too. The health care professionals are acquainted with the role and the possibilities of the improvement of health sciences in the life of society, and they are able to characterise the health status of the population. Master's level nurses formulate problems, priorities and aims in public health, they take part in solving the scientific problems of nursing, in finding new and constructing ideas about the profession and in the promotion of their practical usage.

Specialisations within the Nursing M.Sc. programme

Emergency Nursing (Hungarian)

Geriatric Nursing (Hungarian)

Community Nursing (Hungarian, English)

Qualification

Nurse

Languages

Hungarian, English

Nutritional Sciences M.Sc. Programme (Joint training of Semmelweis University and Hungarian University of Agriculture and Life Sciences)

Nutritionists develop quality food, functional food, food supplements, special nutrients, eco products and organic food. They develop food industrial innovations, determine food qualities considering hygienic aspects, take part in professional and counselling tasks in the field of nutrition sciences and catering. Master-level dietitians determine the composition of food and diets for healthy people and those with different diseases, perform innovative research and development work preferred by the support system of the European Union. Master's level dietitians are able to understand and solve professional problems assertively, come up with reform ideas, and carry out innovative activities. The nutrition specialist plans and compiles healthy diets in the field of health industry, wellness, medical tourism and hotel industry. Nutritionists promote the achievements of nutrition science in order to improve public health figures, work as highly qualified nutritionists, researchers, advisors and health educators.

Qualification

Nutritionist

Language

Hungarian

Teacher of Health Sciences and Health Care M.Sc. Programme

Master's level health care teachers are capable of educating people about healthy lifestyle using their knowledge gained in the fields of health sciences and pedagogy. For the sake of improving the quality of life of people, professionals plan, develop and adopt prevention programmes in the specialist training, suggest problem solving and up-to-date life models in accordance with the altered health statuses. They give advice on career orientation, career choices and career planning. While applying health education methods, the teachers are able to recognize those negative effects that arise from harmful environment or poor social situation and lifestyle. In specialised health related interpersonal relationships, their activity is characterised by high communication standards and didactic preparedness. Master's level health care teachers possess the ability to educate, and to demonstrate good example while teaching, moreover, they are able to recognize the relationship and development opportunities between the training institutions, the economy, the labour market and the social environment.

Qualification

Teacher of Health Sciences and Health Care

Language

Hungarian

III. Postgraduate specialist training courses

Addictology Counselling (Hungarian)

Special Translation and Interpretation in Health Sciences (Hungarian)

English Language Medical Communicator (Hungarian)

Podiatrist (Hungarian)

DEPARTMENTS

Department of Nursing

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Background

The Department was founded in 1975 as a part of the College of Health Care of the Postgraduate Medical School (now Semmelweis University Faculty of Health Sciences). It was the first college in Hungary to award degree to health care teachers in 1977. Academic level training of nurses began with part-time courses in 1989/90; since 1990/91 a full-time course has been offered as well. The College of Health Care was also the first to introduce a four-year baccalaureate certificate programme in nursing. The Masters-level programme in nursing was introduced in Academic Year 2002/2003.

Education

B.Sc. in Nursing is an eight-semester programme, either a full-time or part-time, which provides students a general knowledge of science related to nursing, health and social sciences. The Nursing B.Sc. programme is based on the Directive 2005/36/EC of the European Parliament and the one of the European Council of 7 September 2005 on recognition of professional qualifications. Our programme has been running in English since the 2011/2012 academic year.

M.Sc. in Nursing is a three-semester part-time programme based on a former bachelor degree in nursing. During their studies, students learn the planning of nursing in all areas of health care, the organisation of the nursing work, the teaching of the basics of nursing and health care, the organisation of research projects in nursing, and the supervision of quality assurance in nursing care.

Research

The previous members of the Department's staff supported projects such as the development of a nursing curriculum with the introduction of distance education methodology into nursing training programmes (in collaboration with Columbia University, School of Nursing (USA) in 1995-98 and a Hungarian-Canadian nursing programme for a methodology and model of prior learning assessment and recognition (PLAR) of nurse-candidates (Douglas College, Canada) in 1999-2000.

In co-operation with the Chamber of Hungarian Health Care Professionals, the present members of the Department performed investigative research into the Hungarian situation with regard to needle-stick injuries in 2006, 2008, 2013, 2018 among health care professionals. The objectives of the study were twofold: to reveal the trend in the extent to which health workers are affected, and to draw the attention of economic and education decision-makers to the importance and prevalence of the issue.

The other research programme aims to explore from an international perspective the meaning of care from the point of view of nurses and patients and to find common and shared definitions between these partners of caring. In addition, it aims to identify the relationship between nurse caring and patient satisfaction and to clarify the opinion of nurses and patients on individualized nurse caring. In this study (2008-2014), participants from 6 EU countries: Cyprus, Czech Republic, Finland, Greece, Hungary and Italy united their efforts in order to achieve the aims of the study. Europe faces severe population ageing in the near future. A new positive vision of ageing and promotion of possibilities in older age is needed. The challenge is how to transfer this vision into practice. Higher Education Institutes and associations agreed to launch a project. Funding was received from Lifelong Learning Program-Erasmus Academic Networks for a project for the years 2013-2016.

Department of Clinical Studies in Obstetrics and Gynaecology

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Background

The Department of Clinical Studies in Obstetrics and Gynaecology was founded in 2014. Earlier, the training of midwives was performed by the Division of Midwifery of the Department of Nursing. Academic level training of nurses began through part-time courses in 1989/90; since 1990/91 a full-time training programme is offered as well. Additional programmes have been introduced in recent years, including the training of midwives (2002) and a masters-level programme in nursing (2003). The English language midwifery training programme was introduced in the 2011/12 academic year.

Education

The B.Sc. midwifery training programme can be completed on either a full-time or part time track. Those who receive a midwifery degree upon successful completion of this programme are able to carry out communicational/informational/documentation activities, provide a safe and hygienic environment, complete general midwifery tasks, and provide first aid, complete tasks related to antenatal care, conduct deliveries, care for female patients, and care for the new-born and the postpartum mother. The Midwifery B.Sc. programme is based on the Directive 2005/36/EC of the European Parliament and of the European Council of 7 September 2005 on the recognition of professional qualifications. Duration of the training: 8 semesters, number of credits: 240 ECTS.

Research

Members of the Department's staff support projects and conduct research in different fields of health care and health care education, e.g.: health behaviour of practising midwives, simulation education and curriculum development, and the impact of maternal depression on pregnancies and early attachment.

Department of Physiotherapy

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Master teacher Ms. Zsuzsanna Gerencsér

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Background

Underwater therapy equipment was used in the Császár baths as early as 1891. The first physiotherapy training in Hungary, which was more like an artistic movement therapy, was started by Alice Madzsar in 1912. The need for physiotherapy arose during the time of the Poliomyelitis epidemic, resulting in the foundation of a proper physiotherapy school in Budapest in 1955. At this time, the training was two years long, the duration of studies increased to four years only in 2000.

Education

The Department's aim is to train physiotherapists who can be valuable members of a health care team of prevention, care and rehabilitation. The Physiotherapy undergraduate programme consists of 240 credits, which corresponds to the requirements of a Bachelor's degree. The Department also offers the Master's Programme for another 90 credits in 3 semesters. Each term consists of courses corresponding to 30 credits. Courses are divided into theoretical and practical units, each unit covering a particular field of physiotherapy. At the B.Sc. programme the supervised clinical practice takes place from the 1th to the 7th semester (two to three weeks), and in the 8th semester (12 weeks) at a variety of medical centres. The physiotherapy programme comprises an independent graduate project corresponding to 1152 clinical practice hours, which is equal with 48 credits. The Master's programme's last semester can be divided into two halves. At the beginning the students have theoretical and practical courses and in the last 8 weeks they attend specialised clinical practice and scientific research.

Successful completion of the programme requires that students:

- acquired sufficient knowledge and skills to be able to work independently as physiotherapists;
- acquired knowledge and skills of physiotherapeutic methods of assessment and treatment, as well as knowledge of the connection between science and long-established experience;
- developed their self-recognition and capacity for empathy, thereby paying attention to ethical considerations;
- and familiarised themselves with conditions in society which affect people's health, and gained an ability to initiate and take part in the health-promoting and preventive efforts.

Biomechanical Lab

The biomechanical lab is equipped with the latest technology. With these modern pieces of equipment we can perform dynamic and kinematic measurements to demonstrate the discrepancies of musculoskeletal, neurological and other problems, moreover, we can compare the physiological and pathological movement patterns. The use of these devices helps us to test the validity of traditional physiotherapy examination methods, as well as measuring the effectiveness of the therapies by objective data. In addition, our laboratory with the new visual stimulation biofeedback equipment can be used not only to analyse the walking but to correct and develop it. So now it is suitable for therapeutic interventions.

Both the B.Sc. and M.Sc. programmes' curriculum include subjects that instruct the students how to use these devices for their thesis, dissertation research and for projects in the Students' Scientific Association.

Research

Some areas of research interests at the Department:

- the biomechanical characteristics of standing stability and balance maintenance, testing by biomechanical equipment and therapeutic possibilities with physiotherapy;
- examination of posture with ultrasound-based 3D movement analyser equipment, correction of posture by physiotherapy;
- treatment of incontinence with complex physiotherapy methods;
- effects of positive end-expiratory pressure in cystic fibrosis;
- conservative therapeutic options of the knee-instabilities;
- chest physiotherapy in cystic fibrosis with the specific features of childhood;
- clinical features of paraneoplastic syndrome in the musculoskeletal system;
- the effect of exercise in cardiac rehabilitation;
- the effect of exercise in musculoskeletal rehabilitation;
- gait analysis according to the ultrasound- based 3D method.

Division of Physical Education

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The Division of Physical Education teaches the 4-semesters long criteria subject, the Physical Education (PE) for each full-time B.Sc. student. PE classes enable students to several opportunities for sport (swimming, volleyball, handball, basketball, football, floorball, conditioning, aerobic) in different locations (gym, swimming pool).

Apart from the PE course, therapeutic swimming that is highly demanded by our students is also launched as a selective subject in each semester.

Colleagues of the Division participate in the operation of the Student Sport Association (DSE). Primarily, the Association provides student participation in the university's system of sport competitions.

Department of Dietetics and Nutrition Sciences

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Background

Education of dietetics in Hungary dates back to the 1920s and was initiated by Aladár Soós. The Department of Dietetics was founded in 1975 as part of the newly established College of Health Care (now Semmelweis University Faculty of Health Sciences). The main task of the Department is the undergraduate and graduate training of dietitians while providing courses on nutritional sciences and dietotherapy for other health professionals educated at the Faculty. The Department of Dietetics and Nutrition Sciences is responsible also for the training of Masters of nutrition and food sciences. The programme is carried out in collaboration with Magyar Agrár-és Élettudományi Egyetem.

Education

Over the last 40 years, as many as 2000 dietitians completed their studies here. The undergraduate training course consists of eight semesters, with a total number of 240 ECTS, of which 40% is devoted to theoretical training and 60% to practice. During the education students are taught about each scope of dietetic practice such as clinical, administrative and public health/community dietitians. Graduate students can be employed in different areas of public health nutrition and nutritional research fields. Postgraduate training programmes are also available for dietitians.

In the 2009/2010 academic year a new training programme, the Master of Nutrition and Food Sciences was launched. Students are taught by experienced teachers who are recognized as experts in the field of nutrition and food technology as well as in research methodology. The duration of the training is 4 semesters with a total number of 120 ECTS. Graduate students can be employed in different areas of public health nutrition and nutritional research fields.

Postgraduate training programmes are also available for dietitians. Graduating as Masters of nutrition and food sciences allows students to continue their studies at PhD level at Semmelweis University Doctoral School in Health Sciences.

The Department of Dietetics and Nutrition Sciences has collaborative partnership with the European Federation of the Associations of Dietitians (EFAD).

Research

The Department has been involved in several projects sponsored by, for example, the EU: the “Ageing Nutrition” project (2004-06, organised by the Department), the “PORCROW” project (2004-06), furthermore, the Department participated as partner institution in the thematic network called DIETS1, „Dietitians Improving the Education and Training Standards (2006-09)” and DIETS2, ‘Dietitians ensuring education, teaching and professional quality’ (funded by the EACEA 2010-13). The Department is involved in the preparation of the Hungarian version of EPODE Project collaborating with the Association of Hungarian Dietitians (2014).

Members of the Department’s staff are involved in the PhD education as tutor teachers.

Research area:

- Food production by fermentation for patients with food allergy and intolerance
- Nutrition Science Analysis and Diethoterapic Interventions
- Innovation in public catering
- Disease Specific Nutrition Therapy and Communication Method
- Examination of the nutrition and nutritional status of the elderly

Fields of scientific interest are:

- Investigation of biologically active component of vegetable and fruit during cultivation, post harvesting, food technology and food preparation
- Determination of mycotoxin contamination in foodstuffs
- Monitoring of allergen contamination of equipment, tools and food preparation process
- Role of food labelling in order to improve informed and safe food choice of people with special dietetic needs
- Monitoring of different groups’ nutritional status and nutrient intake for the purpose of health preservation and to identify risk factors of diet-related diseases
- Assessment and analysis of the fluid consumption habits, attitudes and product choice preferences and education of theme for the purpose of health preservation
- Teaching correct dietary habits in children’s catering, development of eating behaviours
- Members of the Department’s staff are actively involved in the boards of various professional organizations in the field of nutrition, such as Hungarian Society of Nutrition, Association of -Hungarian Dietitians, Hungarian Food Allergy and Food Intolerance Databank, College of -Health Dietetics and Human Nutrition Council, National Association of Catering Managers.
- Moreover, they hold positions in the editorial boards of several professional periodicals.

Department of Oxyology and Emergency Care

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Background

Oxyology – the science of rapid intervention as described by the famous Hungarian physician Aurel Gabor - is a specialisation that has been recognized since 1975. The main task of the Department of Oxyology and Emergency Care is the training of paramedics at the highest possible level. It is our mission to qualify health care providers not only for the National Ambulance Services but also for the national emergency departments. The department is also responsible for the first aid teaching at the Faculty of Medicine in English and German language, and for first aid classes held at the Faculty of Dentistry.

Besides theoretical and practical B.Sc. trainings, we offer postgraduate specialist trainings for qualified nurses and paramedics, and regular accredited courses in various areas of acute care for physicians and nurses. We have been participating in the training of the Doctoral School of the Faculty with an independent research subject since 2009, while regularly offering advanced education for the students of Semmelweis University's School of PhD Studies.

The Department manages its tasks with four full-time members and a number of highly qualified consulting teachers. Practical teaching is organized with the co-operation of the National Ambulance Service, hospital practices are completed in accredited teaching hospitals.

Education

- Regularly provides vocational and postgraduate trainings.
- Is closely connected with the new University Emergency Centre where practical teaching takes place.
- Has an established relationship with the University of Massachusetts, Department of Emergency -Medicine in the area of research and development.
- Members of the Department participate in numerous professional and societal organizations of acute care and hold leading positions in the Society of Emergency Medicine and Oxyology.
- The leader of the Department is an active Examiner in Emergency Medicine for the European Board of Emergency Medicine.
- Students can join the PhD School offering participation and thesis work on "Point-of-care technologies in emergency medical care".
- An M.Sc. training programme targeting the intrahospital emergency care has been started resulting in the qualification of advanced practice nurses (APN), those capable health care professionals who work in the emergency departments under the supervision of the lead physician.

- We have launched a monthly meeting named OxyNox for trainee and graduate paramedics. This event is held in the Vas utca building where a well-known representative of prehospital care is invited as guest speaker followed by case discussions from everyday practice.
- The Paramedic Day is organised each May, where students demonstrate their practical skills during a competition.

Research

PhD research topic:

- Point of Care technologies in emergency medical care.

Students' Scientific Association research topics:

- Acute Coronary Syndrome;
- First aid training;
- Position and activities of paramedics in the Emergency Department;
- Care of the multiple injured patients;
- Shock management;
- Mental aspects of rescue/emergency work;
- Complex cardiopulmonary resuscitation;
- Communication in emergency situations;
- Role players and standardized patients in HiFi simulation.

Department of Family Care Methodology

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Background

Academic level training of health visitors (similar to district or family nurse) started in 1975 in Hungary.

Education

The aim of this eight-semester programme is to train health visitors who can give assistance to children and pregnant women in social care and in the prevention of illnesses. Practical training takes place under clinical and real-life circumstances (e.g. in hospitals and district consulting rooms).

The basic subjects (e.g. anatomy, physiology, pathology, biology) are followed by special studies in paediatrics, nursing, obstetrics, sanitation and nursing methodology. Pedagogy, psychology, health education, social sciences and information sciences are integrated into the curriculum. After submitting a thesis, students are tested in theoretical, practical and professional skills before attaining their diploma. Upon completion of the programme health visitors are entitled to work in municipal primary health care facilities, or in schools and in the area of primary preventive medical services. They can perform their duties either independently or in cooperation with doctors and other medical experts.

Research

- Preventive/visiting nurse system in Europe
- The characteristics of childhood onset depression according to depressive symptoms, co-morbidities and quality of life
- Influence of smoking during pregnancy on preterm-birth and low birth-weight
- Connection between childhood obesity, IDDM and physical activity

Department of Public Health Sciences

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Background

The overall duty of the Department of Public Health Sciences, the legal successor of the Department of Epidemiology, is to provide appropriate training for health practitioners in the field of public health and carry out different research projects. Our aim is to equip students with the knowledge and skills to make valuable contribution to public health.

The Department offers undergraduate degree programmes at B.Sc. level and a master programme will be introduced in the near future.

Courses of disease prevention and health promotion are available in English for full time students of physiotherapy. The Department for Epidemiology offers a wide range of research topics with professional assistance for students, and they also contribute to the improvement of our doctoral degree programme.

A well-equipped laboratory belongs to the Department for laboratory practices of microbiology and infection control investigations.

Education

Within epidemiology, students are taught both general and specific aspects of pest control and disinfection techniques, including insect and rodent control. Following the fourth and sixth semesters, students take part in four-week practice sessions, and during the eighth semester they participate in a thirteen-week practicum.

Research

Infection Control Centre

In order to prevent nosocomial and healthcare associated infections, the Department forms an infection control centre in collaboration with external public health partners.

The key elements of active laboratory surveillance system:

- molecular biology methods for comparison/characterization of strains isolated from different sources;
- monitoring infections;
- computer data analysis of bacterial isolates including antimicrobial-resistance patterns.

Burial customs and funeral practices

- Treatment of dead persons according to the law and the process of mourning
- Dead people – from a public health and cultural historical view
- Characteristics and forms of burial from an intercultural perspective

Research Projects for the Students' Scientific Association

- Epidemiology and prevention of infectious diseases
- Epidemiology of diseases of civilization
- Profile of secondary prevention in Hungary and in the EU
- Appropriate food hygiene practice, infestation of food, food poisoning
- Probiotics and their effects on the human body
- The impact of climate change on food safety
- Research on natural antimicrobial proteins

Department of Clinical Studies

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Background

The tasks of the Department of Clinical Studies are: instruction of clinical knowledge in the frame of the bachelor and master degree programmes of the Faculty of Health Sciences, and participation in health sciences programmes of Semmelweis University's School of PhD Studies as consultant or reviewer.

Education

- The Department's educational activities include:
 - transmission of evidence-based, modern, medical-clinical knowledge, and familiarization with the etiology and pathomechanism of different diseases;
 - enabling students to recognize the signs of diseases, evaluate symptoms, and complete adequate patient care based on competences;
 - providing basic pharmacological knowledge, therapeutic possibilities and effects, side effects, therapeutic responses;
 - helping students to gain insights into the clinical significance of most important laboratory, radiological and endoscopic examinations, into the methods of clinical problem-solving, and into the pharmacological basis of medical therapy;
 - preparation for the assistance in advanced diagnostic and therapeutic methods, the understanding of current medical science, and the acquirement of the competences required for health practitioners;
 - the development of the solid approach of prevention-remedy-nursing-care-rehabilitation.
- The Department actively participates:
 - in the preparation of student-focused didactical strategies;
 - in the development of new subjects and training programmes;
 - in the preparation of textbooks and lecture books;
 - and in special didactical and applied clinical researches.

Research

- Hemostasis changes in pregnancies
- Diagnosis and therapy of thrombophilias
- The methodology of teaching clinical knowledge
- Fitting the level of higher education to the European Qualification Framework
- Development of validation processes in higher education
- Family planning, family care
- Social and cultural background of health care employees
- The support of parents expecting their first child; application of the APP model (PhD research)
- Family planning and maternity plans of Health Visitor students
- Anaesthesiology and Intensive therapy – patient security/safety, monitoring
- Clinical nutrition and its management with pharmaceutical aspects
- Risk screening, nutritional assessment, oral nutrition support, enteral and parenteral nutrition,
- Parenteral nutrition compatibility and incompatibility
- Methods of examination of TPN emulsions, physicochemical stability of TPN
- Role of nutrition team

Department of Clinical Ophthalmology

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Background

The education of optometry started in 1992 in Hungary at the College of Health Care (now Semmelweis University Faculty of Health Sciences). The Department of Clinical Ophthalmology was established in 2008. Prior to this, the education of optometry belonged to the tasks of the Department of Clinical Studies. The Department is responsible for training optometrists. This includes developing the curriculum of the optometry training, organising clinical and optical trainings for students, and keeping connection with educators and institutions who participate in the practical training.

Education

The training is the one and only optometry training in Hungary and runs as a part time training programme. The undergraduate training programme consists of eight semesters and 240 ECTS with a total number of 1062 of contact hours and 6138 individual hours, of which 40% is devoted to theoretical training and 60% to practice.

Graduate training programmes are also available after completion of the basic training.

Research

The Department conducts scientific research activities in two ways:

- 1 In cooperation with the Department of Ophthalmology at the University in the following fields:**
 - Femtolaser in the surgery of cataracts;- Development of a new intraocular lens in surgery of cataracts.
- 2 The Department's individual scientific work is carried out in the following fields:**
 - Correction of presbyopia with contact lens;
 - Screening of the visual acuity and ametropia of children of age 7 to 14;
 - Contact lens related dry eye;
 - Contact lens wearing in childhood;
 - Computer Vision Syndrome and its connection with ametropies.

Department of Imaging and Medical Instrumentation

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Background

The Department of Imaging and Medical Instrumentation conducts teaching, scientific and supplemental activities. The Department is responsible for the education of imaging diagnostic analyst specialists corresponding to the task of training highly qualified radiographers who are experienced in every sub-field of radiology.

Education

In the four-year part-time B.Sc. education, the first three basic semesters are followed by specialist courses (Conventional radiology, US, MRI, Nuclear Medicine, Interventional therapy, Radiation therapy).

Students attaining the degree are able to use imaging tools to plan and perform examinations on their own, and to process and apply the obtained information.

Teaching is performed by leading radiologists and radiographers, mainly of Semmelweis University and of large teaching hospitals. Practical training takes place in these hospitals as well.

The Medical Engineering group teaches “Basics of Biophysics and Medical Technology” and “Info-Communication” to dietitian, nurse, health visitor, physiotherapist, paramedics and public health supervisor students.

The Department continuously produces innovative books, image collections and other teaching materials necessary for the education. For this purpose, the Department works in collaboration with the other 3 similar departments in the country to harmonize the teaching materials and the requirements.

An emphasized task of the Department is the graduate teaching of radiographers including the organisation of courses.

Research

The professors of the Department have leading positions in associations of radiology, radiography and medical technology inside and outside Hungary, and they are in the editorial boards of various scientific papers. The focus of the researchers is on clinical decision support, medical informatics, self-monitoring, on developing an immersive learning environment, or a virtual learning environment. Significant focus is put on emergency care systems, on the reduction of supply times and on successful cooperation with emergency departments.

Moreover, the Department joined the European Association of Radiographers.

Department of Applied Psychology

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Education

The main task of the Department is to offer basic psychological knowledge for all departments of the Faculty of Health Sciences in four modules which are as follows:

- *Basics of Psychology* – theoretical course including general psychology, developmental psychology, theories of personality.
- *Social Psychology* – theoretical course including group dynamics, social phenomena, attitudes, prejudices, attributes, stereotypes.
- *Communication and Personal-Development* – We use structured exercises to develop skills in the following fields: enhance group cohesion, basic communication skills, assertive communication, emphatic communication, stress managing methods, conflict management, and profession-specific communication strategies.
- *Health Psychology* – Health psychology is the field within psychology devoted to understanding psychological influences on how people stay healthy, why they become ill, and how they respond when they do get ill. It focuses on health promotion and maintenance; prevention and treatment of illness; the ethology and correlates of health, illness, and dysfunctions; and improvement of the health care system and the formulation of health policy. Health psychologists' fields of work: behavior risk factors/"pathogens" (possibilities of intervention for correction of risk behavior) behavior health preservation / „immunogenic". Conducting research into what are the views, opinions, attributes of health and illness among everyday people. Communication, cooperation, decision-making (health professional – patient interaction). The environment of treatment (how the work environment influences the health worker). Psychology of patients with chronic diseases (disabled, dying).

Division of Applied Pedagogy

Another task of the Department is promoting the basic knowledge of theoretical and practical health education and prevention for students in B.Sc. and M.Sc. trainings; emphasising the pedagogical aspects of patient-care; improving the indispensable skills in counselling and education in paramedical professions; teaching methods of health promotion, and the possibilities of development of health culture, lifestyle and health behaviour.

Research

Since the Department's scope is necessarily broad, staff members have been participating in research activities of various psychological fields:

- Nutritional and sport habits of students;
- Stress among the Professional helpers;
- The exploration of the learning attitude among 19-26 years old students;
- The relationship between burn out, emotion regulation and empathy among health professionals;
- Assessment of ethical and legal issues regarding professional tasks of doctors and nurses working in perinatal centres from the point of view of dilemmas related to the beginning and the end of life

Department of Addictology

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Background

The Department of Addictology coordinates the educational and research activities of the Faculty related to addictive disorders. Some of our fields are the symptomatology, therapy, and prevention of addictive problems. Addiction medicine is present at every specialization of our Faculty; secondary topics like intravenous drug-use, models of preventive medicine are especially practical and optional courses. Our students are involved in many of our research programmes in collaboration with other institutions in Hungary or abroad. The new fields of addiction medicine like gambling and Internet-addiction are also present in our teaching and research activities.

We have close contacts with therapeutic and rehabilitation institutions in Hungary, preventive and outpatient centers (Blue Point Center).

Education

Our Department coordinates the „Addiction Counsellor” specialization, which is the first and only opportunity to study addiction counselling in our country. The most important specialists of this field are our invited teachers. Our counsellors are also taught economics and management, which are necessary for their everyday work as coordinators of therapeutic and financial processes. They are also able to organize preventive courses on alcohol and illegal drug abuse fields.

Research

Our research interests include the application and adaptation of counselling methods in the health and social care of alcohol and drug abusers, the analytic epidemiological study of deviant behaviour, biological and ethic sides of human behaviour, the social background of medical organizations, and researches about the newest therapeutical approaches for intravenous drug users and dependent patients as well as the qualitative and quantitative approaches in the study of hidden substance users (epidemiological, qualitative and quantitative studies on the users of new psychoactive substances).

Department of Morphology and Physiology

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Background

The Department of Morphology and Physiology as a unit of the Institute of Basic Health Sciences has been operating at Semmelweis University Faculty of Health Sciences since its foundation in 1975. The Department participates in the education of the full time English language physiotherapy B.Sc. programme since 2005. The full time English language training of nurses and midwives was introduced in the 2011/2012 academic year.

Education

The Department's educational tasks include the teaching of core and optional subjects to students participating in the full- and part time trainings of the Faculty, as well as to students taking part in the Master's level programmes, in the doctorate courses and in vocational trainings. Members of the Department's staff contribute to different medical and health care research projects, too.

The Morphology Working Group teaches Anatomy and Applied Biology, whilst the Physiology Working Group teaches Physiology-Pathophysiology, Chemistry and Biochemistry in the first, second and third semesters. The following optional subjects are offered in English language:

- Biology of stem cells;
- From classical genetics to epigenetics;
- Chapters of venous circulation and hemodynamics;
- The genetic basis of muscle disorders;
- Functions of hormone receptors: scientific research and clinical practice, health and disease,
- Applied sport physiology and sport health sciences.

Research

The main research areas of the teaching staff are as follows:

- Maintaining of functional abilities and prevention of falls among older adults;
- The examination of decreased function due to low back pain with validated, self-reported questionnaires;
- The examination of posture balance and talent parameters of high school student age group;

- Signalling pathways and autophagy in cancer;
- Stem cells: prospects and challenges;
- Statistical analysis of Hungarian twin data;
- Signal transduction pathways in maternal-fetal interactions in normal and complicated pregnancies;
- A possible model of venous varicosity in rats;
- Effects of hormones on vascular remodelling;
- Roles of G protein-coupled receptor signalling in the vascular function;
- Roles of physical activity in prevention of chronic diseases;
- Signs of cardiovascular sport adaptation;
- Gerontokinesiology – translational animal models: organization of motor control and cognitive functions,
- Walking assessment and dementia prediction;
- Prevention of falling and fracture in elderlies;
- Movement/sport nutrition;
- Active and passive exercise (experimental and human studies);
- Bariatric and metabolic surgery in rats;
- Neurocardiological aspects of exercise-driven rehabilitation in rats,
- Survey of environmental factors influencing ADHD symptoms among elementary school children.

Department of Social Sciences

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Background

The Department of Social Sciences belongs to the Institute of Basic Health Sciences, furthermore it has a specialised unit, the Division of Foreign Languages and Communication. The role of the Department is to support all students to recognize and to prepare for the social, cultural and economic embeddedness of their future health care professions. Our Department offers theoretical and practice-oriented knowledge – discussing general and special health care related problems – in the fields of Sociology, Social Anthropology, History of Health Sciences, Law, Ethics, Scientific Research Methods, as well as Medical Economy and Management. These modules – as essentials in health care labour market – are to improve conscious employee

competencies and social responsibility. Our Department actively participates in an extended Europe-wide network, CO-HEHRE, by delegating one of the council members for its management who serves as vice president of the organization. The members of the Department of Social Sciences occupy leading positions in several professional and social organizations and take part in their work (Hungarian Association of Medical History, Public Body of Hungarian Academy of Sciences, Hungarian Sociological Association, American Anthropological Association, The European Association for the History of Medicine and Health (EAHMH), Hungarian Association of Sport Studies). Furthermore, our colleagues have a hand in the edition of different scientific journals, such as Development and Financing, Central European Studies, Kaleidoscope – Journal of History of Culture, Science and Medicine, and the newly initiated Developments of Health Sciences.

Education

The Department takes part in the educational development of all B.Sc. and M.Sc. programmes of the Faculty and in the elaboration of curricular directives. As a participant of full time and part time trainings in Nursing and Patient Care, Health Care and Disease Prevention, and Medical Laboratorial Diagnostic Imaging programmes, the Department is responsible for teaching the following subjects: Health and Society, Introduction to Health Care Economics, Health Care Management, Health Care Law, Bioethics and Professional Ethics, Philosophy of Health, Thesis Methodology. Additionally, the Department has been organising the Health Care Project Manager postgraduate course (in Hungarian) since 2008, which enables graduates of the course to successfully (project) manage tasks and situations in every area of the health system. As a result of an educational cooperation between Semmelweis University Faculty of Health and Public Services, Semmelweis University Faculty of Health Sciences and the Budapest Metropolitan University, the Health Care Management B.Sc. started in Hungarian language (with Health Tourism Management speciality) in a form of part time programme in September 2014. The programme is supervised by the Faculty of Health and Public Services (the programme supervisor is Dr. Miklós Szócska). Our Department is involved in the coordination and teaching work related to the programme.

The Health Care Management B.Sc. programme enables graduates of the course to successfully design and construct client-centred health tourism programs, to analyse statistical data related to tourism, and to coordinate touristic and health touristic projects with the implementation of knowledge about the system of health care and touristic institutions.

One of the main concerns of the Department is to provide adequate and flexible knowledge in the most suitable ways, therefore we devote special attention to the innovation of our methods of instruction. To keep a continuous interdisciplinary discussion about this topic, we have organized eight 'Professional Days on Teaching and Research Methodologies' so far. Most of our staff have experience in teaching abroad, which has broadened our perspectives and made us more conscious about the approaches we apply.

Research and professional forums

With the aim of building networks of knowledge relating to social sciences and health, the Department of Social Sciences highly engaged with the creation of forums for interdisciplinary and inter-professional discussion. As a result, the Department hosted various professional days and conferences in the past years.

As a result of this work, in 2016 the Department organized the 5th Professional Day and Conference on Patient Rights. The next edition of this bi-yearly event was in the fall of 2018. The aim of the conference was to examine the current ethical and legal issues arising in the everyday practice of health care with the involvement of a wide circle of scientific and professional audience. The highlighted topics of the conference are the ethical and legal questions of health care for children, the dilemmas related to informed consent and communicational gaps during health care delivery, the questions of legal liability in emergency care and the opportunities for implication patients' rights during health care delivery.

In 2018, the Department gave place for the Professional Day on Health Tourism. The programme of the event put emphasis on the facilitation of discussion about the opportunities, weak points, results and possible legal regulation of health tourism.

With the initiation of the Faculty of Health Sciences, Department of Social Sciences a conference has been organized since 2017 with the title of 'Harmful/Protective Society'. The conference is a fruit of cooperation between three organizational units of Semmelweis University: the Faculty of Medicine Institute of Behavioural Sciences, the Faculty of Health and Public

Service, Institute of Mental Health and the Faculty of Health Sciences Department of Social Sciences. The primary aim of the conference is to build a scientific community for those researchers who work on better understanding of the interconnectedness of health and society. The programme of the conference represents the results of ongoing research projects in the fields of Medical Sociology and Sociology of Health, with the emphasis on the mental, physical, and social dimension of health. Furthermore, the participants may share their experiences about challenges of teaching social sciences in health care training programmes.

Main research areas of the Department include: labour migrants in the health care sector; health and social care of migrants and minorities in Europe; comparative analysis of archive sources, legal sources on health care of the 18-19th centuries; epistemology of interpretive anthropology; developing intercultural competences; minority education and its effects on cultural connectedness; comparative analysis of dentistry business income producing capability; typology of ancient votive uterus-representations; analysis of the archival sources related to the birth-control and the midwife training; ethical and legal dilemmas in the practice of perinatal intensive care from the point of view of the beginning and the end of life; the socio-economic status of nurses and its sociocultural context; modern pedagogical approaches of Hungarian health promotion by peer education (TANTUdSZ Programme).

Our department provides external review and evaluation for the Healthy Diversity project, which is an international consortium of 7 different organisations aiming at developing training materials for health care professionals in VET sector.