



• Calendar •

Semmelweis University

Faculty of Medicine • Faculty of Dentistry • Faculty of Pharmacy
Faculty of Health Sciences

•
2018 / 2019
Budapest

www.semmelweis.hu

C A L E N D A R

SEMMELWEIS UNIVERSITY

2 0 1 8 / 2 0 1 9

B u d a p e s t

[h t t p : / / s e m m e l w e i s . h u /](http://semmelweis.hu/)

LEGAL SUPERVISING
AUTHORITY OF THE UNIVERSITY

IN THE FIELD OF HEALTH SERVICE,
SPECIALTY TRAINING AND
POSTGRADUATION
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SEMMELWEIS UNIVERSITY



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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 2018/2019 ACADEMIC YEAR

(Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmacy)

Opening Ceremony

September 2, 2018

First Semester

Date of registration - 1 st year	September 5, 2018
- the other years	September 3, 4, 6, 7, 2018
Place of registration	English Secretariat
Neptun Day – 1 st year	September 6, 2018
Freshman's Day – 1 st year	September 7, 2018
First day of the semester	
Faculty of Medicine (1 st – 5 th years)	September 10, 2018
Faculty of Dentistry	September 10, 2018
Faculty of Pharmacy (1 st – 4 th years)	September 10, 2018
Last day of the semester	
Faculty of Medicine (1 st – 5 th years)	December 14, 2018
Faculty of Dentistry	December 14, 2018
Faculty of Pharmacy (1 st – 4 th years)	December 14, 2018
5th year Pharmacy:	
Practical training	July 23 – September 21, 2018
The semester lasts for 5 th year Pharmacy (12 weeks)	September 24 – December 14, 2018
Examination period	
Faculty of Medicine (1 st – 5 th years)	December 17, 2018–February 1, 2019
Faculty of Dentistry (1 st – 5 th years)	December 17, 2018–February 1, 2019
Faculty of Pharmacy (1 st – 5 th years)	December 17, 2018–February 1, 2019

Second Semester

Date of registration (1 st – 5 th years)	January 28 – February 1, 2019
Place of registration	English Secretariat
First day of the semester for 1 st - 5 th years	
Medicine and Dentistry	February 4, 2019
Last day of the semester for 1 st - 5 th years	
Medicine and 1 st – 4 th years Dentistry	May 17, 2019
Last day of the semester for 5 th year Dentistry	May 3, 2019
Faculty of Pharmacy	
First day of the semester (1 st – 4 th years)	February 4, 2019
Last day of the semester (1 st – 4 th years)	May 17, 2019
First day of the semester (practice)	
for 5 th year	January 30, 2019
Last day of the semester (practice)	
for 5 th year	May 30, 2019

Examination period for Faculty of Medicine, Faculty of Dentistry

1 st – 5 th year Medicine	May 20 – July 5, 2019
1 st – 4 th year Dentistry	May 20 – July 5, 2019
5 th year Dentistry	May 6 – June 14, 2019

Faculty of Pharmacy

1 st – 4 th year	May 20 – July 5, 2019
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Exam held outside the academic year - EOAY Presumably August 27 – September 4, 2019

EOAY for Pharmacy 4th year	July 9-17, 2019
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2018/2019 Schedule for 6th year Medicine

July 16, 2018 – May 3, 2019

2019/2020 Schedule for 6th year Medicine

July 15, 2019 – April 30, 2020

General Board Examination Period

Faculty of Medicine

November 19-23, 2018

May 20 - June 14, 2019

Faculty of Dentistry

June 17 – 21, 2019

Faculty of Pharmacy

June 4 - 20, 2019

Graduation Ceremony for Dentistry

July 6, 2019 (Saturday)

Graduation Ceremony for Pharmacy

June 29, 2019 planned (Saturday)

Holidays:

October 23, 2018 (Tuesday)

November 1, 2018 (Thursday)

March 15, 2019 (Friday)

(Spring holidays)

April 15 – 18, 2019

April 19 (Good Friday)

April 22 (Easter Monday)

May 1, 2019 (Wednesday)

Research Students' Conference:

February 13 – 14 – 15, 2019

No lectures or seminars for years 2–5/6:

on February 13 – 14 at the Faculty of Medicine and

at the Faculty of Pharmacy (Wednesday – Thursday),

on February 13 (Wednesday) at the Faculty

of Dentistry, on February 14-15 solely for dental

students whose participation at the conference is

certified.

Faculty Day:

April 30, 2019 (Tuesday)

The Study and Examination Policy

Faculty of Medicine, Dentistry and Pharmacy

Section 1

The Scope of the Study and Examination Policy

1. The Study and Examination Policy applies to academic and examination matters of Hungarian and foreign students who participate in vocational higher education courses, Bachelor's programmes, Master's programmes, undivided programmes, graduate or postgraduate specialist training courses in Hungarian or in a foreign language, in state-funded or self-financed educational programmes, in credit-based full-time, evening or distance learning programmes.
2. The academic and examination matters of doctoral students are regulated by another policy.
3. Familiarity and compliance with the policy is mandatory for all lecturers, researchers, administrative staff and students who, directly or indirectly, participate in the education process.

Section 2

Basic concepts of the credit system

1. One credit corresponds to the performance of 30 hours of academic work by the student. Study hours include classes (contact hours) and individual study hours.
2. Credits may only be assigned to subjects graded with a mark on a scale of one to five or one to three.
3. Credits can be completed by obtaining at least a satisfactory (2) mark in an evaluation scale of one to five, and a pass mark in an evaluation scale of one to three. The value of a credit is independent of the mark the student received, provided that the student's performance has been accepted, but it can only be validated if the conditions of this Policy are met.
4. An additional 10% of credits can be recognised as completed in the term, in addition to the obligatory credits for the term. If the credit value of the obligatory, obligatory elective, and elective subjects that can be added by the student and the subjects dropped in the previous year exceeds the maximum value that the student can register, the student may have the credit(s) recognised during the following term or terms, in a manner favourable to them. Adding and completing additional subjects corresponding to 10% of the total credit value included in the qualification requirements for the programme is free of charge for state-funded students; self-funded students must pay a fee proportionate to the relevant number of credits.
5. In the credit system, a set number of credits must be completed from various groups of subjects and certain criteria must also be fulfilled within the time limits available for completing a Bachelor's or a Master's programme, or for obtaining a professional qualification. The student may progress according to an individual plan, subject to the preliminary courses completed and other rules, using the available options.
6. Criteria means the mandatory tasks specified in the training and outcome criteria, with no associated credits (e.g. performance of a work placement, fulfilment of language requirements, etc.).
7. The credits required for the degree can be obtained at Semmelweis University in a period two terms shorter than the training period if the student has completed preliminary courses.

Section 3

The curriculum

1. The detailed instruction and academic criteria, as well as the detailed rules of training are defined by the curriculum.
Completion of the obligatory subjects is mandatory for every student in the given programme, and these subjects may not be substituted by other ones.
2. Model curriculum means the choice of subjects recommended for completing a given programme based on the preliminary requirements, from which the student can deviate within the limits of the Policy. On average, the model curriculum contains subjects amounting to 30 credits per term.
3. The model curriculum contains, in a breakdown by teaching period,
 - a) all obligatory and obligatory elective and elective subjects,
 - b) the number of contact hours per week (or term) and the assigned credit value of a subject,
 - c) the type of assessment (signature, interim mark or end-of-term examination),
 - d) the terms in which the subject is available, the criteria and the deadline for their completion,
 - e) the terms and rules of selecting a programme,
 - f) the preliminary courses completed,
 - g) the requirements for adding and completing the thesis (diploma),
 - h) the detailed conditions for proceeding to take the final examination,
 - i) the subjects included in the final examination and the rules for selecting them.
4. Preliminary courses means the total of the requirements for the subjects specified in the syllabus for a programme.
5. The preliminary courses are defined by the council of the competent Faculty, and must be submitted to the Student Union for comment. Subjects added contrary to the preliminary requirements or the Study and Examination Policy will not count.
6. Preliminary criterion (precondition) means the knowledge from another subject, group of subjects or subject module and/or the proven fulfilment of a criterion required to understand the material of a course. A subject may only be added if the subject(s) and criteria identified as preliminary criteria for the subject were already completed prior to addition. It may be also specified as a requirement that certain subjects included in the curriculum must be added at the same time.
7. According to the model curricula, there are no more than 40 contact hours/week (in addition to basic language and physical education courses).
8. The curricula of the individual programmes are determined by the Faculty Council responsible for the training programmes concerned and, with regard to inter-faculty training programmes, by the Senate, in agreement with the councils of the faculties participating in the training programme concerned. The Faculty Council of the faculty responsible for the educational programme will recognise the obligatory and elective subjects from among the subjects accredited according to paragraphs (3) and (4) of Section 3.
9. Module means the multi-subject, back-to-back units (e.g. foundation module, core module) or the equivalent, interchangeable units (specialisation module) within the syllabus of a programme.
10. The student may choose between the specialisation modules simultaneously available in the programme. The number of students choosing a specialisation module may be limited and a minimum headcount for offering the subjects of a specialisation module can be set by the Dean.

Section 4

Subject programme, subject accreditation

1. The knowledge and skills to be acquired as part of the subjects are specified in the subject programmes.
2. The subject programme contains the following:
 - a) the code and the full and abbreviated name of the subject,
 - b) the number of classes per week (term) (in a breakdown by lecture, classroom practice, laboratory practice, clinical practice and sports practice),
 - c) the type of end-of-term assessments (signature, interim mark, practical mark or examination mark),
 - d) the credit value assigned to the subject,
 - e) the name of the educational organisational unit and the lecturer responsible for teaching the given subject and the preliminary criteria for adding the subject,
 - f) the role of the subject in realising the goal of the training, and the description of the syllabus.
 - g) a description of how marks (signatures) are given,
 - h) any examination criteria,
 - i) the written materials for the subject and the most important technical and other aids that can be used,
 - j) the number and type of tasks to be completed through individual work/self-study by the student.
3. The accreditation of a subject means the approval of the programme of the subject.
4. The programme for each subject is accredited by the Council of the Faculty concerned.

Section 5

Training periods

1. During term-time, the student participates in classes and performs tasks associated with the completion of the subject. The duration of the term-time is at least 13 weeks. Classes (lectures, practicals) last 45 minutes.
In term 9 of the pharmacy programme, the term-time lasts 12 weeks, supplemented by an 8-week work placement.
2. Examinations must be taken during the examination period, which consists of an uninterrupted period of at least 7 weeks.
3. Duration of the work placement:
Faculty of Medicine: the number of weekly hours of summer work placements and the work placement of students in year 6 is 35. In addition to this, students must be on duty for 24 hours once every two weeks.
Faculty of Pharmacy: the number of weekly hours of summer work placements is 35; the number of weekly hours of work placements preceding the final examination is 40.
4. The Faculty Council will make a decision regarding the schedule for every academic year after consulting the Student Union and it will notify the Rector of the University of that decision.
5. The Rector and the Dean may each authorise three (3) extra days per academic year for an academic break, in agreement with the Student Union and the relevant faculty committee of the Student Union. Preferably, the date of the academic break must be set before the start of term-time. The Dean and the Rector must consult before approving the academic break.

Section 6

Committees and persons responsible for academic matters

Section 7

Student status, obligation of registration

1. Students who gained admission or transferred to the Semmelweis University may establish a student status with the University.
2. Before commencing their studies, students with a Hungarian citizenship take an oath, while students with foreign citizenship make a ceremonial pledge.
3. Students who have become entitled to begin their studies must register for the first term of their studies. By registering, students confirm that they are familiar with and agree to comply with the rules of the University and the Faculty applicable to them.
4. Registration takes place and notifications of continued or suspended studies are made in the period specified for this purpose by the Faculties.
5. Students can register by completing the registration form and registering in the student information system; they can report that they intend to continue their studies by reporting this in the student information system and they can register or report their intention to continue their studies by submitting their grade-book to the Dean's Office concerned, completed in the following manner:
 - a) the subjects required by the curriculum (in the order specified by the Dean's Office),
 - b) obligatory elective subjects,
 - c) elective subjects,
 - d) the name of the course tutor,
 - e) the code, the credit value, the number of classes, and the examination criteria of the subjects.
6. In the event of an accident, illness, or any other unforeseeable, but reasonable circumstance, the student may withdraw their declaration of their intention to continue their studies.
7. Adding subjects means registering for the lectures and seminars announced for a subject. Adding subjects is conditioned on the fulfilment of the preliminary criteria for the subject.
8. Students completing a study period abroad in the given term are also required to report their intention to continue their studies.
9. For students required by a separate legal provision to finance their studies, compliance with this obligation is a precondition for registration or continuing their studies in the relevant term.
10. Students must promptly report any changes in their data registered in the student information system. No legal action can be taken to remedy any adverse effect caused by failure to do so. Students who fail to fulfil their obligation to report any change in their data may be charged a certain additional fee.
11. If the student continues their studies in the training period concerned, they will be entitled to:
 - a) add the subjects specified in the curriculum in accordance with their progression and take examinations in the subjects added,
 - b) use the University facilities available to students (library, cultural and sports facilities),
 - c) use services aimed at the protection of students' interests,
 - d) become a member of academic student workshops,

- e) **use the student card that proves their student status,**
- f) **apply for grants provided by the University, if they study in a state-funded programme.**

Section 8

Act CCIV of 2011 On Higher Education

Section 45 (1) The student's status shall be interrupted if the student declares that they do not intend to fulfil student obligations during the next semester, or fails to register for the next semester. The total combined duration of the period over which the student may interrupt their studies may not exceed two semesters. Students may suspend their status several times, in accordance with specifications stipulated in the course and examination regulation.

(2) Pursuant to the request of the student, the institution may equally authorise the suspension of student enrolment a) for a combined period exceeding the duration set out under Paragraph (1), or b) if relevant provisions have not been defined in this regard in the institution's regulation on condition that the student is unable to fulfil obligations ensuing from their student status for reasons beyond their control, because of child-birth, an accident or illness, or other unforeseen reason.

(3) The student's status shall be suspended if the student has been barred from continuing their studies after a disciplinary penalty was imposed against the student.

Suspension of student status

1. **The student must register in the student information system during the period specified by the Faculty, even if they do not intend to fulfil their student obligations during the next training period. If the student fails to request the suspension of their studies within a month after the term has started, the term will be regarded as an active term, even if the student fails to attend classes and does not fulfil any academic criteria included in the curriculum.**
2. **During the period when their student status is suspended, a student**
 - a) **may not receive any payments from the student grant fund,**
 - b) **cannot have their student card validated,**
 - c) **may not exercise their right to vote and to be elected, which means that they cannot be a member of the Student Union until they register again as an active student.**
3. **A person who has been admitted may postpone the commencement of their studies for a maximum of two terms upon request. Requests for suspended semesters must be made in writing, to the Dean's Office of the Faculty. After the period specified to request the suspension has passed, the admitted person must register without any special notice. Failing to do so will result in their losing the right to begin their studies.**
4. **Student status can be suspended on more than one occasion.**

Section 9

Termination of student status

Student status is terminated by dismissal if:

1. **the number of credit points obtained from obligatory and obligatory elective subjects in the fourth active term following registration is less than 50% of the credit points that can be obtained in the given period,**
2. **this point is not applicable to students studying at the programs in foreign languages**
3. **the student was unable to acquire the credits missing because of dropping an obligatory subject, in the term when the subject was offered for the second time at the latest after the first offer.**

- 3a. the student began their studies in the programme concerned in the autumn term of the 2012/13 academic year or later and they failed to pass the retake examinations or repeated retake examinations from a given study unit for the fifth time in a row.
4. If their student status has been terminated based on the provisions of Section 9 (1) and the student is admitted again during a new admission procedure, they may not request the recognition of their previous studies.

Section 10

Readmission

repealed by Senate Decision No. 125/b/2012. (XII. 13.)

Section 11

Transfer

1. A student of another higher education institution may request a transfer to Semmelweis University, to a programme with the same training specialisation, provided that the conditions of the termination of the student status are not met.
2. Transfers to the Faculty of Medicine may only be authorised from the same faculty of another university after the completion of the theoretical module or the preclinical module, to term 5 or 7 of the model curriculum. Requests must be submitted to the Dean's Office of the Faculty by the 15th of July every year. The request must be accompanied by the original, completed grade-book, the curriculum (model curriculum) of the university, and the certified translation of these documents, with regard to studies pursued abroad, if the documents have been issued in a language other than the language of teaching at the Faculty.

Transfers to the Faculty of Dentistry may be authorised from the same faculty of another university after the completion of the theoretical module or the preclinical module. Requests must be submitted to the Dean's Office of the Faculty by the 15th of July every year. The request must be accompanied by the original, completed grade-book, the curriculum (model curriculum) of the university, and the certified translation of these documents, with regard to studies pursued abroad, if the documents have been issued in a language other than the language of teaching at the Faculty.

Transfers to the Faculty of Pharmacy can be requested by pharmacology students from other universities. Transfers to the Faculty of Pharmacy may only be requested and authorised from the same faculty of another university, after the completion of at least two terms according to the model curriculum, provided that the conditions of mandatory expulsion or exclusion are not met. Transfer cases are decided in the first instance by the Academic Committee of the receiving faculty. Decisions upon comments and complaints in the second instance fall within the powers of the dean of the faculty. No appeal can be made against the decisions of the dean. The transfer request must be accompanied by the original, validly completed grade-book, the curriculum of the discharging university, and the certified translation of these documents, with regard to studies pursued abroad, if the documents have been issued in a language other than the language of teaching. The deadline for submitting transfer requests is the 15th of July. Before making a decision, the Academic Committee will interview students requesting their transfer from foreign universities and, taking the opinion of the head of the educational organisational unit concerned (the lecturer of the subject) into account, the Committee may order students to take a supplementary examination.

3. The condition of the transfer is that the adjusted credit index of the student submitting the transfer request must be at least 3.51-4.00 in the two terms preceding the transfer.
4. Transfers may also be requested at Semmelweis University between programmes, as well as between faculties and training levels. The minimum requirement for this is that at least 75% of the credits that can be obtained in the first four terms of the model curriculum must be obtained and the relevant weighted grade point average must be between 3.51 and 4.00.
5. With regard to transfers, the discharging institutions must declare whether the students concerned were state-funded or self-funded. For state-funded studies, the discharging institution must provide information on the number of state-funded and active terms used by the student in the course of their studies and must declare that the student's student status has been terminated and their name has been removed from the register as a result of the transfer.
6. Transfers between programmes, faculties and training levels will only be possible if the content of the subjects completed is at least 75% identical to the content of the subjects taught at the Faculty concerned. In all other cases, students may only begin their studies after a successful admission procedure has been conducted at the Faculty concerned, in accordance with the law on admission to higher education institutions.
7. The Educational, Credit, and Credit Transfer Committee of the receiving faculty will decide on the recognition of subjects completed and credits obtained in another programme, at another faculty, or in another institution according to Section 21.

Section 12

Parallel studies

1. In the event of successful admission, students from another programme, faculty or institution may pursue parallel studies at Semmelweis University.
2. Students of Semmelweis University may also participate in parallel training with another institution, which they must report to the dean of the Faculty.

Section 13

Visiting student status

1. Visiting student status is authorised for students of Semmelweis University by the Academic Committee of the Faculty, taking the opinion of the Educational, Credit and Credit Transfer Committee into consideration.
2. Requests for this purpose must be submitted to the Dean's Office of the Faculty concerned, always attaching the opinion of the head of the educational organisational unit concerned and the receiving institution's syllabus of the relevant subject.
3. Subjects completed as a visiting student may be recognised in accordance with Section 21.
4. The criteria for transfers and the establishment of visiting student status, as well as for joining programmes required for obtaining additional qualifications or specialisations, are specified by the receiving higher education institution.
5. Studying the following subjects taught at Semmelweis University may only be authorised for students of another university or faculty with the prior consent of the head of the relevant department and if the student concerned studies similar subjects at his own university:
 - anatomy,
 - pathology,

- forensic medicine and
- clinical subjects

6. Students who have been authorised as visiting students at any faculty of Semmelweis University may only join the relevant programme at the beginning of the study period.

Section 14

State-funded and self-funded educational programmes

1. There are two ways of becoming a self-funded student at Semmelweis University: by admission as a result of an admission procedure, or by transfer from the self-funded training of another programme, faculty or institution according to Section 11.
2. If the higher education institution establishes – regarding a state-funded student at the end of the academic year – that in the last two terms when their student status was not suspended, they failed to complete at least 50% of the credits specified in the recommended curriculum, the student may only continue his studies in the next academic year as a self-funded student.
3. Students funded through a (partial) grant by the Hungarian state must be reassigned to self-financed training if, in the last two terms when their student status was not inactivated they failed to reach the recommended grade point average of 2.0 calculated using mathematical average calculation from the marks received for subjects added, whereby subjects added but not completed are factored in as an unsatisfactory mark (1).
4. *repealed by Senate Decision No. 125/b/2012. (XII. 13.)*
5. Credits obtained later than in July during the examination period of the spring term or during the extended examination period should not be regarded as completed or obtained for the purpose of the provisions of this section.

Section 15

Assessment of the student's performance

Section 16

Announcement and registration of subjects

1. The obligatory subjects to be added are defined by the model curriculum for each term by programme in the order specified therein.
2. Based on the proposal of the educational organisational units, the Dean's Office of the Faculty concerned publishes the list of obligatory, obligatory elective, and elective, subjects for the next term in the student information system, by the last week of the previous study period.
3. The announcement must include the criteria, lecturer(s), schedule, the minimum and maximum headcount, and the ranking criteria in the event too many students register for the course unless ranking is determined by the order of registration. In addition to being centrally published, the announcement containing the data above is also published by the organisational units responsible for teaching the subjects.
4. Students must register for the offered obligatory, obligatory elective, and elective, subjects by the end of the examination period preceding the relevant term.
5. The maximum headcount for a given course may be limited by the reasonable capacity of the professor teaching the class, the limited number of available teaching materials, the capacity of laboratories and seminar classrooms, and, if agreed by the Student Union, other reasons.

6. Students may choose between subjects, lecturers and classes offered simultaneously (taking the requirements of the curriculum into account). The restrictions listed in paragraph (3) must be taken into account in this respect as well.
7. If the student was unable to complete the credits assigned to a subject added in a given term, they may add the subject again in two future terms, subject to the preliminary courses completed and the provisions of Section 17 (16) of the Study and Examination Policy. If the satisfactory fulfilment of the interim criteria is confirmed by the professor of the subject by their signature, the student only needs to take the exam in the next term. The student may request another opportunity to obtain the signature.
8. Obligatory subjects that are subject to an exam must be announced in each term with an adequate number of courses in the current term according to the model curriculum, and at least with examination opportunities in cross terms. In the cross term, the student may attempt to take the examination a number of times, corresponding to the number of possible attempts left from the previous term.
9. A sufficient choice of obligatory and elective subjects, of at least 120% of the credits, must be provided every academic year.
10. The announcement of subjects falls within the scope of responsibility of the Dean of the Faculty responsible for the programme.

Section 17

Assessment of knowledge and practical skills, class attendance

1. The student's performance may be assessed using
 - a) a five-point classification [excellent (5), good (4), average (3), satisfactory (2), unsatisfactory (1)]
 - b) a three-point classification: distinction (5), merit (3), fail (1).
2. No difference may be made in the assessment of students' work based on whether they are state-funded or self-funded.
3. Knowledge may be assessed using
 - a) oral or written accounts given during class, written (classroom) tests, or assessments of assignments completed outside classes during term-time,
 - b) practical marks,
 - c) end-of-term examinations,
 - d) comprehensive examinations,
 - e) final examinations.
4. End-of-term marks can be given as
 - a) mid-term marks – both for theoretical and practical subjects – based on assessments during term-time,
 - b) marks obtained during an examination; in this case, the mark is based on
 - only the performance at the examination or
 - the combination of mid-term assessments and the performance at the examination.
5. If the mid-term mark is established based on classroom tests or if the condition of taking the examination is any other interim assessment then the student must be provided at least two additional opportunities for meeting such requirements. If the student is still unable to obtain the mid-term mark using these additional opportunities, the student cannot be given the end-of-term signature in the subject concerned.
6. Fulfilment of the mid-term criteria of a subject that is subject to an examination is confirmed by the relevant signature in the grade-book. Proceeding to take the examination is conditional upon obtaining this signature. The signature may be conditional upon achieving 50% of the score (or a 2.50 grade average) that can be achieved in mid-term assessments.

7. In order to obtain an end-of-term signature for the given subject, attendance at at least 75% of practical sessions and lectures is required. If a tolerable absence rate of less than 25% is specified by the head of the educational organisational unit (the lecturer of the subject), an opportunity for making up for missed practical sessions before the start of the examination period at the latest must be provided.
8. The head of the educational organisational unit (the lecturer of the subject) will send a report to the Dean of the Faculty in the first week of the examination period, listing the students they taught who failed to attend at least 75% of the lectures and practical sessions, and those who are denied the end-of-term signature as they were unable to obtain a mid-term mark. The Dean's Office will record the fact of the refusal to sign the grade-book in the electronic student registration system, after which it will also record this fact in the appropriate section of the student's grade-book with the entry "Refused to sign". If the event of refusal to sign the grade-book, the student may not take the relevant exam.
9. The obtaining of a practical mark may be prescribed if the use of the subject in practice and an assessment of practical skills are possible and necessary for the purpose of the training goal. The requirements of subjects that can be assessed by practical marks must be fulfilled by students primarily during term-time. If the practical skills are assessed on a scale of five grades, the "unsatisfactory" mark, and if they are assessed on a scale of three grades, the "fail" mark will mean that the student must add the subject concerned again.
10. Examinations test students' knowledge of a subject acquired during a teaching period. They are evaluated on a scale of five grades. The final end-term examination is identical to the comprehensive examination in terms of content.
11. A comprehensive examination is the assessment of the knowledge of the synthesised materials of a subject taught over several terms, and the earliest time for taking it is when the last examination relating to the subjects of the comprehensive examination has been passed or the last relevant mid-term mark has been obtained.
12. For subjects that are to be tested by means of examinations and the lectures of which are supplemented by seminars (practical sessions) and also for subjects where the classes consist of seminars (practical sessions) only, the head of the educational organisational unit (the lecturer of the subject) may offer a student an excellent or good mark based on their performance in the relevant teaching period. The student is not obliged to accept this offered evaluation and may request to take an examination.
13. Students will obtain the credit if they are given a mark that is better than an unsatisfactory grade or a "fail" evaluation.
14. No redress is available regarding the marks or evaluations given through assessment.
15. A subject will be considered dropped if, for a subject added, the student
 - a) fails to obtain the end-of-term signature,
 - b) obtains the signature but fails to appear at the examination and does not attempt to take the examination in the examination period,
 - c) is unable to meet the examination requirements in the permitted number of retake examinations and repeated retake examinations (unsatisfactory mark) during the relevant examination period.
16. The latest date for obtaining the credits missing because of dropping a subject is the term in which the subject is announced again, for the second time, unless the student's status is inactive.
17. In the case of cumulative, multi-level subjects spanning multiple terms - *until the end of the registration period of the given term, based on the consent of the head of the educational organisational unit* - the head of the Faculty may authorise adding the next term's unit for solely for one subject, if the student has obtained the signature for the subject at the end of the previous term but has been unable to meet the examination requirements. However, the examination mark for the next term can only be obtained if the student has obtained the credits for the subject concerned for the previous term (prerequisite subject).

Section 18

Subject criteria

1. The subject criteria specify the responsibilities of students and the relevant deadlines, for the purpose of fulfilling the subject criteria.
2. The subject criteria contain the following:
 - a) the subject syllabus,
 - b) the criteria for participation in the classes and opportunities for making up for missed classes,
 - c) how to offer an excuse for absence from classes or the examination,
 - d) the number, topic and date of mid-term assessments (essays, classroom tests), and the manner of retaking missed or failed mid-term assessments,
 - e) the criteria for end-of-term signatures,
 - f) how marks are established,
 - g) the type of the examination,
 - h) how students can register for the examination,
 - i) how examination registrations can be amended,
 - j) how to offer an excuse for failing to attend the examination,
 - k) the list of notes, textbooks, aids and literature to be used for learning the subject.
3. The head of the educational organisational unit ensures that the subject criteria are prepared and sends them for approval to the dean of the faculty concerned by the end of the study period of the second term of the academic year.
4. The dean of the Faculty informs the head of the educational organisational unit concerned of the approval of the subject criteria within 15 days.
5. The subject criteria must be published in the Academic Information Booklet in the traditional form, as well as in an electronic format, at the beginning of the academic year. The educational organisational unit concerned must also post the information published about its subject in the Academic Information Booklet on its website and on the department's notice-board. The information in the information booklet may not be changed during the given teaching period.

Section 19

Rules of examinations and comprehensive examinations; the examination period

1. Examinations must be taken during the examination period, which consists of an uninterrupted period of at least 7 weeks.
2. A student who is unable to fulfil their examination obligation arising from their student status in the spring term of the academic year may also take an exam organised outside the academic year (hereinafter: EOAY). An EOAY shall be regarded as an exam taken in the examination period for the spring term of the academic year, but the student's current term will be closed in such a manner that the results and credit value of such examinations cannot be taken into account for the purposes of reassignment. In connection with the decision on reassignment, no application for changing the reassignment can be submitted based on the result of an EOAY. EOAYs can be taken for the spring term of the given academic year during the period referred to in item 2e).
- 2a) With regard to undivided master of science degree programmes in medicine and health science, a student may take an EOAY as specified in item 2 for any subject added but not completed during the given spring term, taking into account the number of exam opportunities, by notifying the Dean's Office/Registry Office, and listing the subjects for which they intend to take an EOAY, until the end of the work day following the last day of the

examination period and provided that the student had not been dismissed as per item 1–4 of Section 9 upon the closing of the examination period of the spring term, including exemption from the dismissal based on the equitable decision of the AEC.

- 2b) Taking the exam as specified in item 2) is not considered a subject addition.
- 2c) With EOAYs, the student may make as many attempts in the period as specified in item 2e) to take the exam for any subject as the number of exam opportunities remaining for the given subject in the given term.
- 2d) If the student passes an EOAY, the non-completion of the EOAY study unit(s) in the term in which the study subject was added is not considered a subject drop as defined in item 16 Section 17.
- 2e) The date of the EOAY must be set in such a manner that the student can use the examination opportunities as specified in item 12 of Section 19 in the 7-business-day period – from Tuesday on the week preceding the registration week until Wednesday on the registration week – in the two weeks immediately preceding the term following the spring term of the given academic year, also taking the general rules for the organisation of examinations pursuant to item 3 of Section 19 into account. At least two days must pass between each examination for the given subject. Examinations must be organised in such a manner that all students concerned can register for and take them.
- 2f) For EOAYs, the conditions of announcing a subject according to item 3 of Section 16 need not be fulfilled. If the student fails to complete the subject as part of the EOAY, they may use the CV course opportunity announced during the term as specified item 7 of Section 16, provided that they still have any remaining examination opportunities based on the difference between the number of failed EOAYs and the number of total examination opportunities as specified in item 12 of Section 19.
- 2g) Students may retake any failed EOAYs in the next term in which the subject is announced, based on the difference between the number of unsuccessful examinations for the given subject, the number of failed EOAYs and the number of examinations specified in item 12 of Section 19. The number of retake opportunities for a study unit may not exceed the number of fail opportunities specified in Section 59 (4) of the NHEA.
- 2h) If the student uses an active term in the cases specified in item 7 of Section 16 (FM course and CV course), in the given term and in the following term they may add 15 credits of obligatory elective and elective subjects per term.
3. The number of examination places must be at least double the number of students who added the subject. Educational organisational units must provide at least two examination days a week per course for each year (class) within the examination period for oral examinations, and at least one examination day per week for written examinations. The earliest date when a retake (comprehensive) examination or a repeated (comprehensive) examination can be taken is the third calendar day after the failed examination.
4. Students must register for the examination and they may amend their registration no later than 48 hours before the announced date and time of the examination.
5. If the student fails to appear at the examination, their knowledge cannot be assessed. An excuse for any absence from the examination must be offered to the head of the educational organisational unit (the professor of the subject) within three business days. If no excuse is offered or if it is not accepted, the department will enter the note “absent” into the mark-book; this, however, will not reduce the number of opportunities to take the examination in the given subject but the student will be obliged to pay an amount specified in the charges and benefits policy.
6. Comprehensive examinations will be conducted by leading lecturers (associate professors and university professors) but based on the proposal of the head of department the dean may also authorise the participation of senior lecturers. Comprehensive examinations must be taken before an examination board of at least two members if the comprehensive examination contains the bodies of knowledge of several subjects and if the

comprehensive examination is a repeated one. The head of the examination board must be a leading lecturer.

7. A student may not take an examination without their grade-book if any.
8. The examination can only be taken if the fulfilment of the subject's requirements for the term are confirmed by a signature in the grade-book. The end-of-term signature can be given by the head of the educational organisational unit responsible for teaching the subject and the professor of the subject.
9. Oral examinations are open to all university citizens. The dean may limit such public access.
10. The announcement of the examinations and holding the announced examinations will fall within the scope of responsibility of the head of the educational organisational unit and the lecturer of the subject.
11. If an examination is unsuccessful, the examiner must record a mark "unsatisfactory" in the student's grade-book if any. An examination is considered commenced when the student has drawn a question from the examination topics, and, in the case of practical examinations, when the examination is actually started.
12. If a student does not appear at or fails an examination, they may attempt to pass the failed examination twice during the examination period concerned, in the form of retake and repeated retake examinations. A student may take a third repeated examination (a second repeated retake examination) in one subject per academic year. The student may not take a fourth repeated examination in the same subject in the same term, on the basis of equitable treatment.
13. Repeated retake examinations can be taken at the examination dates offered in the examination period, after the payment of the appropriate repeated examination fee specified in separate regulations. At the student's written request submitted to the head of the department, the student may take the repeated examination before another professor or board.
14. The student may retake successful examinations until the end of the examination period. Students must be informed that their results can also become worse at retake examinations. No additional credits can be obtained by improving the result of an already successful examination through retaking it. If the number of examination places is limited, students registering for a retake examination or a repeated examination will have priority over students registering for a retake of a successful examination.
15. After the written examination, within five business days after the examination day, students may inspect and make notes of the examination papers at the time specified by the educational and organisational unit responsible for teaching the study unit concerned and they may discuss matters relating to the examination questions with the lecturer (for example, regarding mock examinations), and during this discussion any legitimate comments affecting the assessment of the examination must be dealt with. The educational and organisational units must retain all written examination papers for a year.

Section 20

The registration and indicator numbers of academic achievement

- (1) The academic achievement of students must be recorded in the grade-book if any, and the student information system. The data in the student information system will be considered as authentic copies of the grade-book.
- (2) The student must receive a grade-book at certain faculties at the time of registration.
- (3) The dean of the competent faculty may confirm the admission and registration of students by signing the relevant document.

- (4) The student may enter their personal data, data on subjects and curriculum units, the fact of adding subjects and curriculum units and the name of the professor into the grade-book if any; the head of the dean's office (registry office) may confirm the authenticity of the entries by signing the grade-book if any.
- (5) The fulfilment of the requirements can be entered by the head of the educational organisational unit or the professor of the subject, or, if they are not available, the general deputy of the head of the educational organisational unit. All other entries can only be made by the dean's office (registry office).
- (6) After the closing of the academic period, the number of credits added and obtained by the student, the credit index and the grade point average must be entered into the grade-book if any. These data can be confirmed by the signature of the dean of the competent faculty.
- (7) The data in the grade-book may only be amended by a person who is entitled to make the entry to be amended.
- (8) Entries and amendments must be dated and signed.
- (9) The grade-book if any must be handed over to the student at the time of the termination of their student status, except in the case of a transfer.

Section 21

Recognition of substituting and elective subjects

1. The recognition of a subject offered by another faculty or institution involves the assessment of whether a subject can be substituted for another subject (or other subjects), and establishing in what respect a subject differs from other subjects.
2. A subject can be substituted for another if at least 75% of the programme of the substituting subject(s) matches the programme of the substituted subject.
3. A subject differs from another one if their programmes are at least 25% different.
4. A subject can only be taken into account for the fulfilment of a requirement related to the curriculum if it is different from all other subjects already taken into account for the fulfilment of the requirements.
5. Students may request the faculty to recognise a subject (subjects) added or completed previously at another faculty or higher education institution before registration or before they declare their intention to continue their studies. Decisions on such recognition are made by the Faculty's Educational, Credit and Credit Transfer Committee, taking paragraphs (1) and (4) into account. The Committee makes a decision on the applications submitted to it within a deadline that makes it possible for the student who requested the recognition to compile their individual course list for the following term while taking the decision into account.
6. Requests for the recognition of a subject must be submitted to the Dean's Office, addressed to the Educational and Credit Transfer Committee of the Faculty, always attaching the opinion of the head of the educational organisational unit concerned and the syllabus of the relevant subject of the receiving institution.
7. Each Faculty of the Semmelweis University recognise the credit value of the subjects offered by the other Faculties. Any subject offered at Semmelweis University can be added as an elective subject, provided that the preconditions of the subject make this possible.
8. If subjects completed previously are recognised, the time available for the student to finish their studies will be reduced by one term for every 30 credits recognised.
9. If the substituting subject can be assigned the credits as required by the faculty's curriculum, the mark obtained in connection with the substituting subject must be accepted. If there are multiple grades related to the subject, their rounded average must be taken into account.

Section 22

Work placements

1. Students must perform the work placement prescribed by the Faculty's curriculum at the educational organisational units of the University or at a training place accredited by the Faculty concerned, based on the syllabuses of the Faculty's programmes.
2. The dean of the Faculty concerned may authorise the performance of the work placement at another Hungarian university, in their teaching hospitals, or in a foreign health institution, provided that a letter of admission is issued. The student must submit the certificate issued by the receiving institution on the completion of the placement to the Dean's Office of the Faculty before registration.
3. The supervision of work placements is organised and managed by the head of the educational organisational unit responsible for teaching the subject. The head of the educational organisational unit will send a written report on their experiences relating to the work placements to the dean of the Faculty concerned by 15 September every year.
4. In the case of work placements, the signature cannot be given if the student was absent in more than 25% of the duration of the given work placement.
5. The mandatory work placement must be evaluated as "completed/not completed". The qualification "not completed" has a suspensive effect and means that the student may not continue their studies until they have completed the work placement.
At the Faculty of Pharmacy, the work placement completed before the final examination must be evaluated on a three-point scale: excellent (5), fair (3), and fail (1).

Section 23

Pre-degree certificate

1. For state-funded Bachelor's programmes and Master's programmes, students can have a maximum of two additional active terms above the training period until they obtain their pre-degree certificates, and for state-funded undivided programmes they can have a maximum of four additional active terms. The number of passive terms before obtaining the pre-degree certificate may not be more than two with regard to Bachelor's and Master's programmes and four for undivided programmes.
2. The pre-degree certificate is signed by the dean of the Faculty concerned.
The pre-degree certificate does not serve as a proof of any professional qualification.

Section 24

The dissertation and degree thesis

1. In Bachelor's programmes, Master's programmes and undivided programmes, students must prepare a dissertation or a degree thesis in order to obtain a degree. The purpose of the dissertation is to contribute to students' improving their ability of discernment and mastering the methods of using libraries and researching specialist literature, and their ability to formulate their opinions succinctly and accurately, by means of independently performing a scientific study of any problem in the given area of science.
2. The preparation of a dissertation (degree thesis) is guided by a thesis supervisor and occasionally also by a consultant. The thesis supervisor can be a professor or researcher of the faculty, or, if authorised by the dean, an external expert. The consultant is a university lecturer, a researcher or an external expert who supports the student's work. An external

thesis supervisor may only be used if an internal consultant is used. Both the fundamental and newest Hungarian studies relating to the subject must be used in processing the subject.

3. The rules for announcing and approving topics for dissertations (degree theses):
The educational organisational unit prepares a list of topics, which must also contain the names of consultants. The list of topics must be published both on the department's notice board and electronically by the last day of the examination period of the first term of every year, in the case of Bachelor programmes, Master programmes and undivided programmes at least four terms before the year of graduation.
4. Rules for applying for the topics:
Students may choose any of the announced topics. Students may also choose topics other than those announced subject to the approval of the head of the competent educational organisational unit. The student must choose and submit the topic of their dissertation to the head of the given educational organisational unit at least one year before graduation at the latest. If the topic is approved, the head of the unit will arrange its registration and provide a consultant. The chosen topic must discuss a current issue of the discipline concerned.
5. Formal requirements of the dissertation:
The minimum length of the degree thesis is 50,000 characters and it cannot be longer than 100,000 characters (without spaces). Font: Times New Roman, 12. Tables and the cited literature will be included in the length of the thesis but diagrams, other relevant literature and footnotes will not. The degree thesis must be submitted in 2 copies, stapled in a folder or bound as a book. The cover must show the title of the thesis, the student's name, year and study group, the date of submission and the consultant's name and workplace. If authorised by the head of department, the student may submit their degree thesis in a foreign language.
6. The submission deadline:
The student must meet the consultant at least three times:
 - for the first time no later than 1 October of the year of graduation: the consultant outlines the requirements relating to the preparation of the degree thesis and the possibilities inherent in the topic;
 - for the second time no later than 15 November of the year of graduation: the student gives an account of the work until that time;
 - for the third time no later than 1 January of the year of graduation: the consultant evaluates the results achieved by the student and advises the student on finalising the findings.
 The finished dissertation must be submitted to the department *in duplicate*, by January 15 of the year of graduation at the latest.
At the Faculty of Pharmacy this deadline is 1 March in the year of graduation.
7. The dissertation (degree thesis) must be assessed by a reviewer. The reviewer must be an external expert holding a university degree (college degree) or a university lecturer or researcher invited by the head of the educational organisational unit. The reviewer will also prepare a separate evaluation. The assessments must be sent to the candidate at least 5 days before the dissertation (degree thesis) defence. The reviewer and the thesis supervisor make a proposal on grading the dissertation (degree thesis).
8. The subject of dissertations (degree theses) must fall within obligatory subjects and they are evaluated on a scale of five grades (1-5). The extent of independent research demonstrated in the paper must be taken into account when assessing the dissertation (degree thesis). Dissertations are defended before a panel made up of three members from the educational organisational unit, the chairperson of which is the head of the educational organisational unit or a deputy, and its other members are the consultant and a lecturer

of the department. The department may also invite an external lecturer as the third member of the panel, for example from among the private lecturers of the university. In the event that the thesis is graded as "fail", the head of the educational organisational unit informs the student of this and the conditions of a repeat thesis.

A dissertation (degree thesis) marked as "unsatisfactory" can only be corrected once.

9. After the defence, the head of the educational organisational unit will hand over a copy of the dissertation to the student and the other copy, as well as a copy of the minutes certifying the defence, will remain with the educational organisational unit. Dissertations must be stored in the library of the educational organisational unit for five years.

A copy of the thesis defence minutes must be sent to the competent dean's office by 1 April at the latest.

10. Based on the proposal of the head of the educational organisational unit responsible for the subject of the dissertation, the dean of the competent Faculty may exempt the following students from the obligation of writing a dissertation:

- students who prepared an individual competition essay or a joint competition essay (with two authors) for a competition announced by the rector, and achieved first place.
 - students publishing a paper as the primary author in a peer-reviewed scientific journal.
- Students must submit their applications for exemption by the end of the academic year preceding the year of graduation. The exemption from writing the dissertation does not involve an exemption from the obligation to defend it.

11. The educational organisational unit will return a copy of the successfully defended dissertation (degree thesis) to the student after the defence, and the other copy must be stored in the organisational unit in accordance with the effective archiving rules.

A copy of the form specified in Annex 1, completed in duplicate, must be sent to the competent Dean's Office 60 days before the final examination period, while the other copy of the form will remain at the organisational unit.

Section 25

The final examination consists of the following:

1. The final examination prescribed in the qualification requirements consists of the following examinations (the parts of the final examination):
 - a) written examination
 - b) oral examination and
 - c) practical examination.

The dissertation (degree thesis) defence is part of the final examination but it is assessed and defended separately from the final examination.

At the Faculty of Pharmacy, defending the degree thesis is the condition for taking the (written, practical and oral) final examination.

2. The dean will determine at least two final examination periods per academic year. Final examinations may only be taken in such final examination periods.
3. The final examination board must have at least two members in addition to the chairperson. The chairperson and the members must be recognised external experts or university (college) professors or associate professors in the special field. At least one member of the board must be an external expert. The chairperson of the final examination board is appointed by the dean – in agreement with the Faculty Council – just like its members, for a period of one to three years.
4. Students must register for the final examination in the dean's office, on the 60th day before the first day of the final examination period at the latest.
5. The dean of the Faculty is responsible for organising the final examinations. The number of examination boards must be determined on the basis of the number of students who

registered for the final examination, assigning no more than 6 students to every examination board for every examination day.

At the Faculty of Pharmacy and the Faculty of Dentistry a maximum of 12 students can be assigned to a final examination board on an examination day.

6. Students will be assigned to their examination boards by way of an electronic lottery. The composition of the boards and students' distribution among them can only be disclosed on the day of the examination, through the usual method applied by the Faculty.
7. The final examination board establishes the marks of the examination subjects *in camera*. When the examination is finished, the chairperson of the board announces the results.
8. The result of the final examination is the simple arithmetic mean of the results of its different parts.
9. The result of the final examination is established by the final examination board and the chairperson of the board enters it into the student's grade-book.
10. The final examination will be successful if the parts of the final examination are at least "pass" marks.
11. If a subject or a section of the final examination is marked as "unsatisfactory", the candidate will only be required to repeat the final examination in the subject or section the candidate has failed.

Faculty of Pharmacy and Faculty of Dentistry: if the student fails any of the successive parts of the final examination (written, practical and oral parts), the final examination will be regarded as unsuccessful and it cannot be continued. However, it will only have to be repeated from the unsuccessful part.

12. The final examination can be repeated twice. Retake or repeated retake final examinations can only be taken in the following final examination period(s).
13. No credits can be assigned to the final examination.
14. If the final examination is taken after seven years from the issue of the pre-degree certificate, the condition of taking the final examination will be the successful completion of the last academic year.

Section 26

The degree (diploma)

The degree, the certificate

1. A condition of obtaining the degree or certificate issued by the university is that the credit value of subjects completed at another higher education institution and recognised by the university in a credit transfer procedure may not be more than 50% of the credits required by the qualification criteria for obtaining the degree.
2. The conditions of issuing the degree: a type "C" intermediate language certificate in English, German, French, Spanish, Italian or Russian, issued or recognised by the state, and passing at least one basic-level university final examination. (One of these must be English.)
The passing of that examination must be proved by presenting the original language certificate or a certified copy of it.
3. The rector of the University may delegate the right to sign degrees to the dean of the Faculty concerned.
4. If, because of the provisions of paragraph 1, the degree is issued after the final examination period, the degree will be signed by the head of the educational organisational unit instead of the chairman of the final examination board if the chairman of the final examination board is no longer employed by the University when the degree is issued.
5. The degree issued by the University must also contain the classification of the degree.

6. The certificates mentioned in Annex 2 and Annex 2/a are issued by the Dean's Office concerned and this Office keeps records of all certificates issued.
7. The relevant Dean's Office is responsible for issuing the diploma supplement.
8. The classification of the degree (diploma) is based on the cumulative, weighted grade point average, rounded to two decimal places.

Classification on a scale of five grades:

4.51 – 5.00 distinction

3.51 – 4.50 good

2.51 – 3.50 satisfactory

2.00 – 2.50 pass

Qualification on a scale of three grades:

4.51 – 5.00 summa cum laude

3.51 – 4.50 cum laude

2.00 – 3.50 rite

The subjects that do not end with comprehensive examinations but must be counted in the grade of the degree are specified by the curriculum of the Faculty concerned.

9. Method of calculation of the classification of degrees:

$$XD = \frac{Xn + D + I + Sz + Gy}{n + 4}$$

where:

XD = the figure serving as the basis for grading the degree

Xn = the sum of the grades of the required comprehensive examinations

n = the number of required comprehensive examinations

D = the grade of the degree thesis (on a scale of 5) (part of the complex FE)

I = the grade of the written examination (part of the complex FE)

Sz = the grade of the oral examination (part of the complex FE)

Gy = the grade of the practical examination (part of the complex FE)

10. At the student's request – against the payment of a fee – the university will issue an honorary degree, signed by the rector of the university, the dean of the faculty concerned and the chairman of the final examination board.

The relevant Dean's Office is responsible for calculating the grade of the degree.

Section 27

Equitable treatment

The Academic Committee of the Faculty concerned may, on the basis of equitable treatment, relieve the student once during the given training programme from obligations specified in a Section of this Policy that do not contain an academic or a payment obligation. Equitable treatment may only be provided in relation to the fulfilment of academic obligation without affecting the content of the academic criteria.

The resolution providing equitable treatment must contain the terms of the approval and an indication that no further equitable advantages can be provided.

Section 28

Provisions on students with disabilities

Support provided by the University based on the type and extent of the disability

The coordinator supporting students with disabilities (hereinafter referred to as the Coordinator)

The committee responsible for the affairs of students with disabilities (hereinafter referred to as the Committee)

The opportunities for students with disabilities to enforcing the concessions and support to which they are entitled

Normative funding for supporting students with disabilities

Section 29

Right of remedy in academic matters

1. The student may submit an appeal with a suspensive effect against decisions made by the Academic Committee of the Faculty in the first instance, within 15 days of receiving or being informed of the decision. The request for remedy must be addressed to the Review Board specified in Chapter VI of Section III (Student Criteria) of the Bylaws, and it must be submitted to the organisational unit appointed in Chapter II of the Student Criteria for receiving appeals.
2. Requests for remedy are adjudged by the Review Committee. The Committee will interview the student in person at least once during the procedure; however, if the student or their authorised representative fails to appear at the meeting of the Committee despite being delivered an appropriate notice, the personal hearing may be omitted. The decision of the Committee acting in the second instance must be recorded as a resolution and the reasons for its decision must also be stated. The resolution must always contain a reminder for the student that they may request the judicial review of the resolution made on the appeal, within 30 days of receiving such resolution, citing a violation of the law or the provisions of the policy on student status.
3. The resolution of the Committee will become final and enforceable at the time of its delivery unless the student requests a judicial review.

Section 30

The institution's obligation to provide information and advice

Section 22 of Government Decree 79/2006 (IV.5) relating to Section 57(5) of the Higher Education Act The dean must ensure that, before registration, all students starting their university studies receive the Academic Information Booklet in traditional form as well as in an electronic format.

In order to support students in compiling their unique timetables and to provide them with information on university policies, an advisory body including lecturers and students of the relevant faculty may be established.

Important addition to Section 17/17 of The Study and Examination Policy for the 1st and 2nd year students of Medicine, Dentistry and Pharmacy

The student must obtain the semester signature in the relevant subject. (It means that the number of absences cannot exceed 25%).

The average grade of the mid-terms has to be at least 2,00.

Recommendation, based on the student's semester academic achievements, from the practice teacher is required.

If the above conditions are fulfilled, the head of the department may give recommendation towards the Dean of the Faculty and the Academic Program Director. Based on it the final decision is made by the Academic Program Director in accordance with the decision of the Dean of the Faculty.

GROUP RULE

Please note, that in the 1st and 2nd year, you must attend the same study group you have been assigned to according to the alphabetical order at the beginning of your studies. Your registration will be continuously controlled, so if you register for another group than yours, your registration will be rearranged by the English Secretariat.

SEMMELWEIS UNIVERSITY'S RULES OF ORGANISATION AND OPERATION

Chapter 5

The procedure of students' disciplinary and liability cases; the rules applicable to the formation of the disciplinary committee, hearings, evidence, defence, publicity and exoneration

GENERAL PROVISIONS

PART 1. THE SCOPE OF THE RULES

Section 1 The Rules apply to any student of Semmelweis University, including students of higher vocational training, college or university-level bachelor courses, master's courses, undivided courses, advanced training and doctoral courses, regardless of the type of course they attend.

Section 2 Unless otherwise provided by law or agreement, the scope of the Rules also extends to students of foreign nationality.

DISCIPLINARY RULES

PART 2. DISCIPLINARY LIABILITY

Section 3 The professors, researchers, students and employees of the University are required to comply with the relevant laws and the rules of the University and to use the assets in their care and in their use properly and to protect such objects from harm.

Act, Section 70 (1) If the student violates their obligations severely and is personally responsible for the violation, a disciplinary sanction may be applied against the student. Disciplinary sanctions must be imposed in a disciplinary procedure and must be specified in a written decision.

Section 4 No disciplinary sanction is allowed if it is proven in the disciplinary procedure that the student has failed to fulfil their obligations or has violated the rules because they received instructions from a professor or an employee of the University supervising the student and the instructions infringed the law or a rule of the University.

Act, Section 70 (4) No disciplinary hearing may be initiated if a period of three months has passed since the violation or a one-month period has passed since the day the violation was recognised. For the purpose of this provision, 'recognition' is defined as the case when the circumstance giving rise to a disciplinary hearing becomes known to the person authorised to start the procedure.

Section 5 If a criminal procedure is started against the student, the deadlines specified in Section 70 (4) of the Act will start when the criminal case is closed.

Section 6 A procedural event related to the student (the order of starting a procedure, the issue of summons, a hearing is held, etc.) will interrupt the statute of limitations period. The statute of limitations period will restart from the day of the interruption.

PART 3. DISCIPLINARY SANCTIONS

Section 7 The purpose of imposing a disciplinary sanction is to educate the student and to prevent further violations.

Act, Section 70 (3) When a sanction is imposed, all circumstances of the violation must be taken into account, including but not limited to the number of injured parties, the severity of the violation and its consequences and whether the violation is a repeated violation.

Act, Section 70 (2) Disciplinary sanctions include:

- (a) reprimanding;
- (b) severe reprimanding;
- (c) reduction or withdrawal of benefits and facilities specified in the rules of reimbursements and benefits;
- (d) suspension of studies for a specific period (maximum two semesters);
- (e) expulsion from the institution of higher education.

Section 8 Under Section 70 (2) (c) of the Act, the following benefits may be withdrawn:

- (a) student grants;
- (b) bonuses and cash prizes;
- (c) the student's place in a hall of residence.

Act, Section 70 (3) The duration of the disciplinary sanction referred to in (2) (c) above may not exceed six months; the suspension specified in (d) may not be longer than two semesters. Social support may not be withdrawn as a disciplinary sanction under (2) (c). The disciplinary sanctions referred to in (2) (d) and (e) automatically result in a final or temporary withdrawal of benefits and facilities available to students. The student status will be suspended for the term of the sanction specified in (2) (d). The student's academic performance will have no effect on whether a disciplinary procedure is started or on what sanction is applied.

Section 9

- (1) The procedure may be terminated with a warning as an alternative to a sanction if the severity of the violation is moderate with regard to the circumstances of the case (the character of the student, the motives of the violation and the manner of committing the violation in particular) and therefore not even the mildest sanction is required and the educational effect of the warning will suffice.
- (2) By issuing a warning, the disciplinary board expresses its disapproval and communicates to the student that their actions were wrong and instructs them not to violate the rules in the future, thus avoiding future disciplinary procedures.

PART 4. DISCIPLINARY PROCEDURE

Act, Section 70 (1) The student may act in person or through a representative authorised through a power of attorney in accordance with Sections 222–223 of the Civil Code.

Section 10 The disciplinary procedure starts after a violation is reported or after a competent person officially learns of the violation.

Act, Section 71 (1) A disciplinary procedure may be started by the head of the institution or the person specified in the rules of organisation and operation.

Section 11

- (1) The disciplinary procedure is started by an order of the Dean or the Chair of the Doctoral Council.
- (2) If the Dean or the Chair of the Doctoral Council is permanently obstructed in starting the procedure, the deputy appointed for this purpose may initiate the procedure.

Act, Section 70 (5) The student and their authorised representative must be notified of the start of the procedure. The notification must specify the reason for the disciplinary procedure.

Section 12 The official decision on starting the procedure must include the name, address, faculty, major, year and doctoral programme of the student and also a brief description of the alleged violation.

Act, Section 70 (5) The student must be granted a hearing and must be allowed to present their defence and position. If, at the hearing, the student disputes the fact that the violation occurred, or if establishing the facts of the case is required, a trial must be held. If it is the student that has initiated the procedure, the procedure must be started and carried out. If the student's proposed evidence is rejected, the reason for the rejection must be specified in the decision, unless it is established that the student has not violated the rules.

Act, Section 70 (6) If the student violates their obligations during practical education, the disciplinary procedure will still be carried out by the institute of higher education.

Act, Section 71 (2) The disciplinary decision of the first instance is made by the disciplinary committee of the institution, which has at least three members. The students' representative council will appoint at least one third of the disciplinary committee members.

Section 13 (1) The disciplinary procedure of first instance is conducted by the disciplinary committee of the given faculty or doctoral school of the University.

Act, Section 73 (3) The appeal against the first-instance decision is heard by the head of the institution of higher education or a committee formed by the head of the institution for this purpose.

- (2) The appellate decision is made by a committee formed by the Rector of the University.

Section 14 (1) The affected faculty establishes a five-member disciplinary committee consisting of 2 professors and 3 students. The two professors of the disciplinary committee are chosen by the Faculty Council and the Doctoral Council for a 3-year term. The chair of the disciplinary committee is the lead professor appointed by the Faculty Council or the Doctoral Council. The professor members may only be re-appointed once after the expiry of their first term.

- (2) The 3 student members of the disciplinary committee will be elected by the Faculty Students' Representative Council and the Doctoral Students' Representative Council in accordance with their own rules. The representative councils will notify the Dean or the Chair of the Doctoral Council of the elected committee members. The student members will be elected for 1-year terms.

Section 15

- (1) The following persons may not be involved in making a decision in a disciplinary case:
 - (a) those who cannot be expected to make an unbiased decision in the given case;
 - (b) in the appellate procedure, those who participated in the first instance phase of the procedure.
- (2) The members of the disciplinary council must disclose any conflicts of interest to the Dean or the Chair of the Doctoral Council, whichever is applicable. Conflicts of interest in the appellate procedure must be reported to the Rector.

- (3) A conflict of interest motion may be brought by the student and their legal representative in any phase of the procedure. The motion must be recorded in the minutes of the procedure.
- (4) The decision on the motion will be made in a closed sitting of the committee. A formal decision must be made on the acceptance or rejection of the motion. If the motion is accepted, the disciplinary hearing must be adjourned until a new committee member is appointed.
- (5) The rule on excluding a member of the committee due to a conflict of interest must also be applied to the person keeping the minutes.

Section 16

If the student is a student at more than one institution of higher education or at more than one faculty of Semmelweis University (has multiple majors or is a guest student), the institution or faculty with the right to conduct the disciplinary procedure will be the one that the obligation the student has failed to fulfil is related to or the one that has been the injured party of the student's action.

In this case, the disciplinary committee of the institution or faculty conducting the procedure will notify the other institution or faculty.

Section 17 If it is discovered in the procedure that a crime has likely been committed, the Dean or the Chair of the Doctoral Council must report the case to the authorities.

Act, Section 71 (3) If there is a pending criminal procedure in the same case, the disciplinary procedure will be suspended until the criminal case is closed or if the student cannot be heard or tried (as described in Section 70 (5)) in the disciplinary case through no fault of their own.

(5) The disciplinary procedure must be completed within one month unless it is suspended under paragraph (3) above.

Section 18 The suspension of the disciplinary procedure will interrupt the period of the statute of limitations. In this case, the statute of limitations period will restart when the criminal case is closed.

Act, Section 70 (5) The student must be invited to the trial.

Section 19

- (1) The student must be summoned to the trial in a written form. The summons must specify the student's name, the venue and date/time of the hearing and the role the summoned person will have in the procedure. The summoned person must be reminded to bring their proof of identity documents to the hearing. The fact that summons have been issued in writing or orally must be recorded in the case documents.
- (2) The student must be informed in the summons that they have the right to submit written materials in defence and can use/select a legal counsel in the procedure. Also, the summons must contain a warning that the student's absence will not prevent the committee from holding a hearing and passing a decision.

Section 20

- (1) The student has the right to use the services of a legal counsel in the procedure.
- (2) The rights of the student and the counsel:
 - (a) they may have access to the documents of the procedure;
 - (b) they may put forward motions and submit comments;
 - (c) and they may ask questions of the witnesses and experts.

Act, Section 70 (5) The disciplinary trial may be held even if the student or their authorised representative does not attend the trial in spite of a repeated summons issued in accordance with the applicable rules.

Section 21 (1) The disciplinary trial is conducted by the chair of the disciplinary committee. It is the chair's responsibility to check if the disciplinary rules are complied with; he or she must keep the trial

in order, and make sure that the participants are able to exercise their rights. The chair will also appoint a person to record the minutes of the trial.

Section 22

- (1) Students, professors and employees of the University are allowed to attend the trial. Out of public interest or to protect the student's interest, the disciplinary committee may order a closed hearing or order that a part of the hearing will be closed to the public.
A closed hearing may be requested by the student or a witness if they render it probable that a public hearing would threaten their legitimate interests.
- (2) The disciplinary committee has a quorum if at least three members of the committee are present and at least one of them is a professor.
- (3) First, the chair of the disciplinary committee records who is present at the hearing and, if there is no legal obstacle to holding a trial, orders the witnesses to leave the room. Then the chair informs those present of the data on the basis of which the disciplinary hearing is held. After this, the committee hears the student's testimony.
- (4) If the chair is not present, the trial is chaired by the other professor member of the committee.
- (5) Witnesses or other students tried in the same disciplinary procedure and not yet heard may not be present during the student's testimony.

Section 23

- (1) If at the hearing the student admits their responsibility for the violation, and there is no doubt that the admission of guilt is frank, the trial must only be conducted to establish the circumstances (simplified trial).
- (2) If the student refuses to admit their responsibility, evidence must be presented.
- (3) The disciplinary committee hears the witnesses and experts if necessary and informs those present of the content of any documents obtained.
- (4) The witnesses must be asked whether they have any particular interest in the case and whether they are biased. They must be warned that they must tell the truth and that perjury has consequences under criminal law.
- (5) Witnesses not yet heard may not be present during the hearing of a witness. If the testimony of the witness contradicts the student's or other witness' statement, the persons making the contradictory statements must be allowed to confront each other to clarify the contradiction.

Section 24

- (1) Minutes must be kept of the disciplinary trial. The minutes must be signed by the chair of the disciplinary committee, the committee's members and the keeper of the minutes.
- (2) The relevant contents of the minutes must be presented to those heard at the trial and, after they have read the part that concerns them, they must sign the relevant part. The persons heard at the trial may request the correction or supplementation of the contents of the minutes. If the person refuses to sign the minutes, the reason for the refusal must be recorded in the minutes.
- (3) The minutes must be added to the disciplinary case documents.

Section 25

- (1) The disciplinary committee will make its decision after the evidence procedure. The decision will be made in a closed session of the committee and will be passed by a simple majority vote (Annex 2). The closed session may only be attended by the chair and members of the disciplinary committee and the keeper of the minutes.
- (2) The decision may either impose a disciplinary sanction or terminate the procedure.
- (3) The committee's decision may only be based on the testimonies heard at the trial and the evidence examined directly at the trial. If a fact is not proven beyond doubt, it may not be held against the student.

- (4) The introductory part of the decision must specify the case number, the faculty or doctoral school passing the decision and the name of the student against whom the disciplinary procedure has been started, the venue and date of the trial and whether the trial was open to the public.

Section 26

- (1) A decision imposing a disciplinary sanction must be made if the disciplinary committee establishes that the student is guilty of a disciplinary offence and believes a disciplinary sanction must be imposed.
- (2) The operative part of the decision imposing a sanction must include the following information:
 - (a) the name and other personal data (date and place of birth, permanent or temporary address, ID card number, year, major and type of course) of the student found guilty in the procedure;
 - (b) the disciplinary sanction imposed;
 - (c) reference to the possibility of appeal and the 15-day deadline for lodging the appeal;
- (3) The commentary of the decision imposing the penalty must briefly describe:
 - (a) the facts of the case established by the committee;
 - (b) a list of evidence and the assessment of the evidence;
 - (c) whether the act or omission qualifies as a severe violation of the student's obligations and whether the student is personally responsible for the violation, and the degree of the student's responsibility;
 - (d) the aggravating and extenuating circumstances taken into consideration when the penalty was imposed;
 - (e) reference to the rules on which the disciplinary sanction is based.

Section 27

- (1) The disciplinary committee will terminate the procedure if
 - (a) the student's actions do not qualify as a disciplinary offence, or it is not the student who has committed the offence;
 - (b) it has not been proven that the disciplinary offence was committed;
 - (c) it is not possible to establish that the student was personally responsible for the offence;
 - (d) the statute of limitation period has expired;
 - (e) a final and non-appealable disciplinary decision has already been passed regarding the student's same action; or
 - (f) the disciplinary committee chooses to issue a warning instead of imposing a sanction.
- (2) The operative part of the decision terminating the procedure must include the following information:
 - (a) the name and other personal data of the student;
 - (b) the alleged disciplinary offence due to which the procedure has been started;
 - (c) a statement that the disciplinary procedure has been closed;
 - (d) the reason for terminating the procedure;
 - (e) a reference to the fact that a warning has been issued if the committee decided to issue a warning;
 - (f) a reference to the possibility of appeal and the 15-day deadline for lodging the appeal;
- (3) The commentary section of the decision terminating the procedure must describe the facts of the case, the evidence and the reasons due to which the disciplinary committee terminated the procedure. Also, the decision must refer to the item of paragraph (1) on the basis of which the procedure has been terminated (Annex 3).

Section 28

- (1) The chair of the disciplinary committee will announce the disciplinary decision made at the closed session.
- (2) When the decision is announced, the operative part of the decision (which is put in writing at

the closed session) must be read out and the commentary of the decision must be summarised orally.

- (3) When the decision has been announced, the chair of the disciplinary committee will inform those entitled to lodge an appeal to make sure their appeal is filed before the deadline specified in the decision. After this, the chair closes the trial.
- (4) The disciplinary decision must be delivered in a written form to those affected but not present.

Section 29

- (1) The full decision must be put in writing within 8 days of the day it is announced.
- (2) The written decision is signed by the chair of the committee in the required number of copies.
- (3) The student and their legal counsel must be delivered a written copy of the decision even if it has been announced in their presence.
- (4) The disciplinary committee may not modify a decision that has already been announced. However, minor corrections irrelevant to the merits of the case (misspelt names, numbers, arithmetical and other typographical errors) may be made.

Section 30

- (1) The first instance decision may be appealed by the student or their legal counsel.
- (2) The person entitled to appeal the decision may lodge the appeal immediately after the decision is announced, may waive the right of appeal or may request time to consider whether to appeal a decision. In the latter case, the deadline for lodging the appeal is 15 days from the day the decision is delivered to the person. If the deadline for filing an appeal is missed, the person may file an appeal within an additional period of 8 working days if they can present a proper reason for the delay.
- (3) The written appeal must be submitted to the Dean's Office or the Doctoral School's Office but it must be addressed to the disciplinary committee of first instance.
- (4) The appeal will automatically suspend the execution of the decision.

Section 31

- (1) The disciplinary committee will forward the appeal and the case documents to the person authorised to make the appellate decision without delay when the deadline for appeal expires.
- (2) The person authorised to make the appellate decision will make a decision on the appeal within 15 working days from the day they receive the appeal.
- (3) As a general rule, the person authorised to make the appellate decision will make the decision on the basis of the documents available. If it is necessary to present evidence, the person authorised to make the appellate decision may summon the affected parties, hear their testimony or obtain other evidence. In the latter case, the deadline for making the appellate decision is 30 days.
- (4) The person authorised to make the appellate decision must contact the Faculty Students' Representative Council or the Doctoral Students' Representative Council and ask for the relevant Council's opinion.
- (5) The person authorised to make the appellate decision
 - (a) upholds the first instance decision;
 - (b) modifies the first instance decision; or
 - (c) quashes the decision and orders that a new procedure of first instance be conducted.
- (6) If the appeal is filed late or is not lodged by the person entitled to appeal the decision, the person authorised to make the appellate decision will reject the appeal.

Act, Section 73 (7) The student may request a judiciary review of the appellate decision within 30 days of the day the student is notified of the appellate decision. The decision may be reviewed by the court if it is against the law or violates the provisions regulating the students' legal status. The judicial review procedure is regulated by Chapter XX of Act III of 1952 on Civil Procedure. The court has the right to modify the decision. The court will make a decision in the case without delay.

Section 32

- (1) The abovementioned rules applicable to decisions of first instance will apply mutatis mutandis to the content and the delivery of the appellate decision (see sections 25 to 29 above). The affected person must be informed in the appellate decision of the possibility of requesting a judicial review.
- (2) The disciplinary committee will be responsible for making sure the decision is delivered. The disciplinary committee will also send a copy of the decision to the Dean and the Chair of the Doctoral Council for information purposes.

Section 33 (1) The decision may only be executed when it is final and non-appealable.

Section 34 (1) The decision will become final and non-appealable when

- (a) the persons entitled to appeal the decision declare that they do not wish to file an appeal or withdraw the appeal;
- (b) the deadline for appeal expires and no appeal is filed;
- (c) the person authorised to make the appellate decision has upheld the decision of first instance or has rejected the appeal.
- (2) The appellate decision will become final and non-appealable when it is announced.
- (3) A clause must be added to a final and non-appealable decision stating that it is final and may be executed. The day it became final and non-appealable must also be shown in this clause.
- (4) The final and non-appealable decision must be registered in the records and a copy of the decision must be added to the student's personal file.
- (5) The chair of the disciplinary committee will also send a copy of the final and non-appealable decision to the Dean and the Chair of the Doctoral Council.

PART 5. EXONERATION FROM THE DISCIPLINARY SANCTION

Section 35 The student will be exonerated automatically (i.e. without a specific request and a decision) and the negative consequences will no longer apply to the student

- (a) in the case of reprimanding, three months have passed since the day the decision became final and non-appealable;
- (b) when the period specified for the reduction/withdrawal of benefits and facilities has expired;
- (c) when the period of suspension has expired.

Section 36 If the disciplinary sanction specified in Section 70 (2) (e) of the Act is applied against the student, the student may ask to be exonerated. If such a request is made, it is accepted or rejected by an ad-hoc committee consisting of the Dean or the Chair of the Doctoral Council, a professor appointed by the Dean or the Chair of the Doctoral Council and a student representative delegated by the Faculty Students' Representative Council or the Doctoral Students' Representative Council.

Section 37 In the case of expulsion, the disciplinary committee of the first instance may exonerate the expelled student at the student's request if three years have passed since the day the decision of the first instance was passed.

TORT LIABILITY RULES

PART 6. THE STUDENTS' LIABILITY FOR DAMAGE

Act, Section 72 (1) If the student causes damage in relation to fulfilling their obligations as a student to the institution of higher education or to the entity organising the practical education, they will be liable to pay damages under the Civil Code with the exception specified in the Act on Higher Education.

Section 38 For the purpose of these rules, damage includes any decrease in the value of Semmelweis University's assets and the costs required to reduce or eliminate the material losses (reasonable costs) if these have been caused by the student's illegal and imputable conduct (actions or omissions).

Section 39 The University will be required to prove that damage has arisen, the extent of the damage, that the damage has been caused by the student's conduct, and the student's personal responsibility for the damage.

Act, Section 72 (2) If damage is caused by negligent conduct, the amount of damages to be paid by the student may not exceed 50% of the monthly amount of the national minimum wage effective on the day the damage is caused.

Section 40 The damage is deemed to have been caused by negligence if the person responsible can see the potential negative effects of their conduct but carelessly believes that they will not occur, or if the person responsible for the damage is unable to see the potential negative effects because they fail to pay attention or fail to act with due care as expected in the given circumstances.

Act, Section 72 (2) If the damage is caused intentionally, the student must pay full compensation for the damage.

Section 41 Damage is caused intentionally if the person responsible for the damage wants to produce the negative effects of their conduct or does not mind such negative effects.

Section 42 If more than one student cause the damage together, they will be jointly and severally liable to the University for the damage and, among themselves, will be responsible for a share of the compensation in proportion of how imputable their conduct was.

Act, Section 72 (3) If the student receives assets from the University on the basis of a list or certificate of receipt and must return these or otherwise account for them but there is a deficiency or the assets are damaged, the student will have full responsibility for the damage caused provided that the assets are in their custody or are used/handled by them exclusively. The student will be exempt from liability if the deficiency has been caused by a reason beyond the student's control.

Section 43 The student will be exempt from liability if the student can prove that they have acted in a manner that can be considered reasonable in the given circumstances.

Section 44

- (1) The student's liability under tort is established by the disciplinary committee in a procedure conducted by the committee. The procedure is the same as the disciplinary procedure.
- (2) If damage is caused but no disciplinary offence is committed, and the person required to pay damages accepts their liability in writing and the amount of damages (i.e. the factual and legal bases of the damages are clear), or if the damage caused by negligence does not exceed HUF 10,000, the disciplinary committee will conduct a simplified tort procedure.

Section 45 If the damage is caused intentionally, the committee will conduct a single procedure that will include both the disciplinary and the tort case and will make one decision in the disciplinary case and one in the tort case.

PART 7. THE UNIVERSITY'S LIABILITY FOR DAMAGE

Act, Section 72 (4) The institution of higher education, the hall of residence and the organiser of practical education will have full liability to the student for any damage caused to the student in relation to the student's legal status, admission into the hall of residence or practical education, regardless of any personal responsibility. The rules of the Civil Code will apply with the exception that the institution of higher education, the hall of residence and the organiser of practical education will only be exempt from liability if they can prove that the damage has been caused by a reason beyond their control. Damages need not be paid if they have been caused by the injured party's conduct beyond the other party's control.

Section 46 (1) If the student suffers damage under Section 72 (4) of the Act, they may formally demand compensation from the Dean or the Chair of the Doctoral Council. The letter of demand must include the student's data, the description of the facts of the case (as verified by witnesses and/or other evidence) and the amount of damages claimed (in HUF).

(3) The Dean or the Chair of the Doctoral Council will have discretionary powers to decide on the damage claim on the basis of the Financial Director's recommendation if the amount demanded does not exceed HUF 100,000. If the damage claim exceeds this amount, the Dean or the Chair of the Doctoral Council will request the disciplinary committee to conduct a procedure.

Part 8. ASSESSING THE VALUE OF DAMAGED OR LOST ASSETS

Section 47

- (1) If an event of damage occurs, the event must be recorded in the form of minutes as soon as possible, regardless of whether the student has caused it or suffered it.
- (2) When an asset is damaged, the value loss remaining after repair (due to amortisation) and the repair costs must be taken into consideration in the course of calculating the amount of the damage.
- (3) If the asset is destroyed, rendered unusable or cannot be located, the retail price on the day the damage occurs must be used to establish worth. If the retail price cannot be established, the purchase value should be used.
- (4) No lost profits can be taken into account when the damage is assessed.
- (5) Damages should be paid in cash, unless it is reasonable to provide the compensation in kind (i.e. the asset can be repaired or replaced).
- (6) If it is likely that the compensation will exceed HUF 10,000, the Financial Director's opinion must be obtained before the amount is assessed.

PART 9. ENFORCING THE CLAIM FOR DAMAGES

Section 48 The following forms/templates must be used for the purpose of enforcing claims for damages:

Annex 4: The student's notification of a hearing in a tort case

Annex 5: Decision on the claim for damages

Section 49 The decision issued on the basis of the minutes of the tort procedure contains the name and personal data of the person causing the damage, the description of the damaged, lost or destroyed asset, the amount of damages payable, the manner of providing compensation and the deadline for providing compensation (Annex 5).

The person responsible for the damage may be allowed to pay in instalments if this is reasonable due to their financial situation. A copy of the decision on the damages must be sent to the Financial Director. The minutes must be signed by the chair of the tort committee and the keeper of the minutes.

Section 50 If the deadline for the payment of the compensation expires and no payment is made, the person responsible for the damage must be sued in court and the documents of the case must be sent to the Legal Department for this purpose.

Section 51 The statute of limitations is three years. If the damage has been caused by a crime, the statute of limitations is five years, unless the statute of limitations of the particular crime is longer. In the latter case, the statute of limitations for the damage claim will expire when the statute of limitations for the criminal case expires.

Section 52

(1) The Civil Code will apply to all financial liability-related issues not regulated above.

(2) A judicial review of the final tort decisions may be sought in court.

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. 2018/19/1) 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. **Cancelling 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. This deadline varies according to institution: at AOK /Medicine/, FOK /Dentistry/ and ETK, it is 48 hours while at GYTK /Pharmacy/, it is 24 hours.) In such a case, the system attempts to remove you from the given exam date and will report on the success or failure of the operation.
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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Péter Vargha

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Assistant professor:

Assistant lecturer:

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Prof. Dr. Mátyás Papp, Prof. Dr. Imre Szirmai

Dr. Tibor Kovács, Dr. Zsuzsanna Arányi, Dr. Csaba Ertsey

Dr. Róbert Debreczeni (tutor)

Dr. Sándor Illiczky, Dr. Magdolna Simó, Dr. Ildikó Vastagh,

Dr. Erika Scheidl (tutor)

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Head of the Department:

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Teaching staff leader:

Prof. Péter Banczerowski M.D., Ph.D.

Professor Emeritus:

Prof. István Nyáry M.D., Ph.D.

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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Dr. Sándor Kiss

Assistant lecturer:

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Associate professor:

Assistant professor:

Assistant lecturer:

Clinical senior specialist:

Clinical specialist:

Clinical doctor:

Residents:

Psychologist:

External teachers with contract
in the English program:

Dr. János Réthelyi

Prof. Dr. István Bitter

Prof. Dr., Gábor Faludi

Prof. Dr. Dóra Perczel-Forintos

Prof. Dr. László Tringer

Dr. Brigitta Baran, Dr. Pál Czobor, Dr. Lajos Simon,

Dr. Judit Tolna, Dr. Zsolt Unoka (tutor for the fourth year)

Dr. Gábor Csukly, Dr. Xénia Gonda

Dr. Zoltán Hidasi (tutor for dentistry students)

Dr. Éva Jekkel, Dr. Beatrix Mersich,

Dr. Erika Szily (tutor for the sixth year), Dr. Bálint Szuromi

Dr. Judit Benkovits, Dr. Kinga Farkas, Dr. Máté Fullajtár,

Dr. Ádám Menus, Dr. Attila Pulay,

Dr. Imola Seres (tutor for the fifth year), Dr. László Tombor

Dr. Éva Csibri (part time), Dr. Andrea Sárosi

Dr. Csilla Bolyós (part time), Dr. Brigitta Blancz, Dr. Péter Döme,

Dr. Luca Egerváry, Dr. Mónika Eleméry, Dr. György Freschl,

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Dr. Livia Balogh

Dr. Anna Báthory, Dr. Nóra Brindza, Dr. Bodnár Katalin,

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Dr. Levente Hermán, Dr. Péter Oczella, Dr. Attila Simor,

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Assistant professor:

Assistant lecturer:

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Prof. Dr. György Losonczy

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Dr. Zoltán Bártfai, Dr. Gábor Horváth,

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Clinical chief doctor:

Clinical doctor:

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Senior resident:

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Dr. Ádám Mester

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Dr. Balázs Futácsi

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Dr. Péter Magyar, Dr. Tamás Györke,

Dr. Gyöngyvér Szentmártoni, Dr. Júlia Szilvási,

Dr. Éva Zergényi

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Dr. Krisztina Knézy,

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Dr. Anna Szamosi, Dr. Zsuzsanna Szepessy, Dr. Jeannette Tóth,

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Dr. Erika Maka, Dr. Otto Maneschg, Dr. András Schneider,

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Dr. Zsolt Ádám, Dr. Ervin Hruby, dr. Judit Jeager,

Dr. Gyula Richárd Nagy (tutor)

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Lecturer:

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Clinical specialist:

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Assistant lecturer:

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Administrator:

Klára Seregi

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Dr. Attila Keszthelyi

Assistant professor:

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Dr. Krisztina Szabó, Dr. Lajos Joós

Assistant lecturer:

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Deputy head of Department:

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Academic advisor:

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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

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Full professor:

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Professor Emeritus:

Prof. Dr. Tibor Fábián, Prof. Dr. Pál Fejérdy

Associate professor:

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Dr. Tibor Károly Fábián, Dr. Zsuzsa Szántó,
Dr. Judit Borbély (tutor 1st year)

Assistant professor:

Dr. János Gerle, Dr. László Kádár, Dr. Endre Somogyi,
Dr. Katalin Károlyházy (tutor 5th year)

Assistant lecturer:

Dr. Péter Faluhelyi, Dr. Marianna Jahn (tutor 4th year),
Dr. Katalin Kalocsa, Dr. Mercédesz Linniger,
Dr. Krisztina Mikulás (tutor 3rd year 2nd semester)
Dr. Zsuzsanna Tóth, Dr. Pál Sajgó, Dr. Katalin Nemes
Dr. Péter Schmidt (tutor)

Clinical specialist:

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Assistant professor:

Dr. Miklós Kaán, Dr. Gergely Balaton, Dr. Ibolya Kéri

Assistant lecturer:

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Dr. Attila Soós, Dr. Kinga Deseő

Department of Conservative Dentistry

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Head of the Department:

Professor Emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

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Prof. Dr. Árpád Fazekas

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

Dr. med. habil. Melinda Madlén

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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Assistant professor:

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Prof. Dr. György Simon

Prof. Dr. Tivadar Zelles

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

Dr. Kristóf Kádár (tutor – 1st semester),

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Assistant professor:

Associate lecturer:

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Dr. Attila Szűcs associate professor, Ph.D.

Prof. Dr. Zsuzsanna Suba, Prof. Dr. József Lajos Barabás

Prof. Dr. György Szabó, Prof. Dr. Tamás Divinyi

Dr. Árpád Joób-Fancsaly, Dr. Márta Ujpál

Dr. Sándor Bogdán, Dr. Tamás Huszár

Dr. Ferenc Koppány, Dr. Kinga Körmöczi, Dr. Mihály Vasziók

Dr. József Béla Barabás, Dr. Péter Barabás, Dr. Kinga Bérczy,

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Dr. Fanni Sára Kálmán, Dr. György Komlós,

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Assistant lecturer:

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Prof. Dr. Anna Blázovics

Prof. Dr. Ágnes Kéry

Dr. László Kursinszki

Dr. Andrea Böszörményi

Dr. Anna Bucsy-Sólyomváry (English coordinator),

Dr. András Darcsi

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Assistant lecturer:

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Prof. Dr. Béla Noszál

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

Dr. Gergely Völgyi (tutor)

Dr. Gergő Tóth

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The Department of Pharmacodynamics at the Faculty of Pharmacy 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 Nagyvárud 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 thought 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*.

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Engineer

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 Mátys was the head of the Department. Since 2016 to June 2017 Dr. Gábor Krajsovsky 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 Pharmacy. 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 special courses to its students (Advanced Organic Chemistry, and Computational Chemistry and QSAR Methods). 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 postgraduate programme in Drug Research and Development.

The main research fields at the Department are the synthesis and chemical properties of diazines, 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 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 research work is facilitated by separation, spectroscopic and computational methods.

The Department cooperates 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.

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Information on language courses - for students of Medicine and Pharmacy

(Information for Dentistry students in Study Program of 1st, 2nd and 3rd year of the Faculty of Dentistry!)

Hungarian is a compulsory subject. *Students of Medicine and Pharmacy* study Hungarian (Hungarian Medical Terminology) for 5 semesters.

Students who are in their 1st year:

At the end of the first semester students are required to take an exam (written and oral). Students have 4 classes a week, are expected to write minimum 2 tests during the semester and are granted 4 credits for the successful completion of the exam.

In semester 2 students take 4 classes a week, are required to write minimum 2 tests and are granted 2 credits for the successful completion of the semester.

Students who are in their 2nd year:

In semesters 3-4 students take 4 classes a week, are required to write minimum 2 tests and are granted 2 credits for the successful completion of the semester.

Students in their 3rd year:

At the end of semester 5 students are required to take the final exam and are granted 2 credits for the successful completion of the exam. The final exam is a prerequisite for starting the fourth year. For *students of Medicine and Pharmacy*, in semester 5 Hungarian (Hungarian Medical terminology) is compulsory with 4 classes per week, students are required to take the final exam at the end of the semester and will be granted 2 credits for the successful completion of the exam. The final exam is a prerequisite for starting the fourth year.

Medical terminology is compulsory in the first semester of the first year with 2 lessons per week and 2 credits for the semester.

FACULTY OF MEDICINE

BASIC MODULE



Faculty of Medicine
1st year

STUDY PROGRAMME

Important: New curriculum has been introduced since the 2016/2017 academic year!

1st semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFIZ325_1A	Basics of Biostatistics and Informatics	1	2	3	semi-final	-
AOKFIZ326_1A	Medical Biophysics I.	1,5	2	3	semi-final	-
AOKFIZ326_1A	Medical Chemistry	3	3,5	6	semi-final#	-
AOKGEN462_1A	Medical Biology	2	1	3	semi-final	-
AOKMAG425_1A	Medical Sociology*	1	1	2	semi-final	-
AOKANT461_1A	Anatomy, Histology, and Embryology I.	2,5	6	8	semi-final	-
AOKLEK228_1A	Hungarian Medical Terminology I.	-	4	4	pract. mark	-
AOVLEK229_1A	Medical Terminology (Latin)	-	2	2	pract. mark	-
AOKTSI009_1A	Physical Education I.	-	1	-	signature	-
Total Number of Credit Points from Obligatory Subjects				31 or 29	(in case Med. Soc. is taken in the 1st semester) (in case Med. Soc. is taken in the 2nd semester)	

4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory elective subjects and elective subjects after the 3rd year curriculum

* **The subject must be registered for, as well as completed, in the first or second semesters of the first year**

The grade influences the qualification of the Diploma.

STUDY PROGRAMME

First year						
2nd semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFIZ465_2A	Medical Biophysics II.	1,5	2	3	final#	Medical Biophysics I.
AOKOBI463_1A	Medical Biochemistry I.	2	1,5	3	pract. mark	Medical Chemistry
AOKOV464_1A	Molecular Cell Biology I.	2,5	4	6	semi-final	Medical Chemistry Medical Biology
AOKANT461_2A	Anatomy, Histology, and Embryology II.	3	6	9	semi-final	Anatomy, Histology, and Embryology I.
AOKOMS218_1A	First Aid	6 hours / sem.	8 hours / sem.	0	signature	–
AOKLEK228_2A	Hungarian Medical Terminology II.	–	4	2	pract. mark	Hungarian Medical Terminology I.
AOKTSI009_2A	Physical Education II.	–	1	0	signature	–
AOKNSG331_1A	Summer Nursing Practice	–	1 month / 170 hours	–	signature	–
AOKMAG425_1A	Medical Sociology*	1	1	2	semi-final	–
AOVINF244_1A	Introduction to Medical Informatics (Obligatory elective subject)**	–	1	1	pract. mark	–
AOVCSA248_1A	Medical Profession (Obligatory elective subject)**	0,67	1.33	2	pract. mark	–
Total Number of Credit Points from Obligatory Subjects				28 26	(in case Med. Soc. is taken in the 2nd semester) (in case Med. Soc. is taken in the 1st semester)	

4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory elective subjects and elective subjects after the 3rd year curriculum

***The subject must be registered for, as well as completed, in the first or second semesters of the first year**

****** The subject must be registered for, and must be completed during the first 2 years of studies

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. Mitchell 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 Lodish: Molecular Cell Biology, 8th edition (2016); ISBN-13: 978-1-4641-8339-3
- 22 Alberts et al.: Essential Cell Biology. Garland Science/Taylor & Francis Group Publ. 2013. (4th edition, ISBN: 9780815344544)
- 23 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

ANATOMY, HISTOLOGY AND EMBRYOLOGY I – II.

Department of Anatomy, Histology & Embryology

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

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 lectures in cell biology and histology: Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic tissues (epithelial, connective, muscle and nervous). 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 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 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.

Discussion of the more complicated chapters of embryology is presented on small group discussions connected to the practical sessions in the dissecting room.

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.

The knowledge of the students will be checked by mid-term tests.

TOPICS OF THE LECTURES:

Lectures: first semester: 3×45 min; second semester: 3×45 min; third semester: 3×45 min; fourth semester: 1×45 min.

First semester: Gross anatomy of musculoskeletal system (i.e. bones, joints and muscles), basic cytology, general histology, general embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera and body cavities; integrated gross anatomy, cytology, histology and embryology.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology.

Fourth semester: Topographical anatomy of the head, neck, limbs and trunk including body cavities (thorax, abdomen, pelvis), ventral and dorsal regions, cross sectional anatomy.

PRACTICAL COURSE

6×45 min; second semester: 6×45 min; third semester: 4×45 min; fourth semester: 2×45 min;

First semester: Gross anatomy of the musculoskeletal system (i.e. bones, joints, muscles, vessels and nerves), basic cytology, general histology, general embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera, topography of body cavities; integrated gross anatomy, cytology, histology and embryology.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology. Topographical anatomy of the dorsal regions of limbs and the trunk, including spinal cord. Topographical anatomy of the viscerocranium, neurocranium and the internal organs of the neck.

Fourth semester: Topographical anatomy of the ventral and dorsal regions of the body, including the limbs and body cavities (thorax, abdomen, pelvis), cross sectional anatomy.

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 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

Type of exams: oral and written

First, second and third semesters: semifinal examination, fourth semester: final exam

Semifinal examinations consist of written and oral (practical and theoretical) parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Histology (digitized slides)
3. Anatomy (prosected specimens)

Final examinations consist of written and oral (practical and theoretical) parts:

- 1 Written pretest (e-learning module – access to SeKA account is obligatory)
- 2 Histology (2 slides) including relevant theoretical questions
- 3 Oral theoretical question in Maxillofacial Anatomy
- 4 Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions

Topics: Subject matter of all the 4 semesters in Anatomy, Histology and Embryology

First semester: semifinal; second semester: semifinal; third semester: semifinal;

fourth semester: final exam from the subjects of the four semesters.

ECTS credits: four semesters together: 27 (first semester: 8; second semester: 9; third semester: 7; fourth semester: 3)

Anatomy books

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. Mitchell 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 **Stevens & Lowe's Human Histology** , Elsevier, 4th ed ISBN 978-0-723435020, 2015.

- 10 **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- 11 **Fitzgerald's Clinical Neuroanatomy and Neuroscience**, 7th Edition, Elsevier, 2015.
- 12 **Histology: A Text and Atlas: With Correlated Cell and Molecular Biology**; 7th Edition by MH Ross and W Pawlina; Wolters Kluwer 2015, ISBN 9781451187427

Recommended textbooks:

- 1 **Gray's Anatomy. The Anatomical Basis of Clinical Practice**; 41st edition by S. Standring: 2015 ISBN : 9780702052309
- 2 **Anatomy, A Photographic Atlas**, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2
- 3 **Bräuer: Sobotta Flashcards** (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
- 4 **KL Moore–AF Dalley: Clinically Oriented Anatomy**. 4th ed. Lippincott William and Wilkins, 1999.
- 5 **RMH McMinn: Last's Anatomy, Regional and Applied**. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
- 6 **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
- 7 **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
- 8 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033
- 9 The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
- 10 Regional Anatomy, by T Tömböl, Medicina 2008, ISBN 963 242 186 8
- 11 Imaging Atlas of Human Anatomy, 4th Edition by Jamie Weir, Peter Abrahams, Jonathan D. Spratt, and Lonie Salkowski ISBN: 9780723434573 Copyright: 2011
- 12 Sectional Anatomy – Workbook, by A. Nemeskéri; István Apáthy's Foundation, 2001.
- 13 Histology Manual 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2001.
- 14 Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864

1st year 1st semester

English Program

Anatomy: 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.

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.

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 onset of fetal circulations. and the development of the limbs, together with the trunk and the skull. Factors inducing congenital malformations.

Credits: 8

Lectures: 2,5 hours/week

Dissection classes: 4 hrs/week

Histology laboratory classes: 2 hrs/week

Week	Lectures	Practical sessions	
		Dissection room	Histology laboratory
Week 1.	1. The role of anatomy, histology and embryology in the medical curriculum. Terminology 2. The cell , cellular membrane, endoplasmic reticulum 3. Cell nucleus, mitochondrion, peroxysome	General introduction to practical work in the dissection room, tools and rules Upper limb Bones	Light and electron microscopical techniques, the principles of practical histology classes
Week 2.	4. Adhesion molecules, intercellular connections, epithelial cells 5. Types of epithelia. Glandular epithelium 6. The cellular framework, microtubules, IM filaments, actin microfilaments	Upper limb Bones and joints	Simple epithelia Stratified epithelia I.
Week 3.	7. Exocytosis, Golgi apparatus, vesicular transport, sorting. Endocytosis, cellular organelles. Apoptosis 8. General arthrology and myology. Joints, muscles and movements of the shoulder and the upper girdle 9. Muscles and actions of the elbow joint	Upper limb Dissection of the muscles, vessels and nerves of the flexor side	Stratified epithelia II. Glandular epithelium
Week 4.	10. Joints, muscles and actions of the wrist and the hand 11. Connective tissue cells 12. Connective tissue fibres, types and formation. Extracellular matrix	Upper limb Dissection of the muscles, vessels and nerves of the flexor and extensor sides	Connective tissue I. Cells
Week 5.	13. The principles of cell division, differentiation. Cell cycle, mitosis, meiosis 14. Supporting tissues (cartilage, bone) 15. Ossification, bone remodelling	1. Upper limb Dissection of the muscles, vessels and nerves of the extensor side, dissection of joints 2. Midterm test 1 Upper limb	Connective tissue II. Fibrous elements
Week 6.	16. Components, muscles, joints and ligaments of the vertebral column. Intervertebral, atlantooccipital and atlantoaxial joints 17. Ribs, components and movements of the thorax. Abdominal muscles, rectus sheath. 18. Muscles, fasciae and movements of the neck. Back muscles, occipital muscles	Bones and muscles of the trunk. Demonstration of the muscles of the neck, back and abdomen.	Connective tissue III. Connective tissue types
Week 7.	19. Bones, joints, construction of the pelvis. 20. Muscles and actions of the hip joint 21. Muscles and actions of the knee joint	Lower limb and pelvis Dissection of joints of the lower limb	Supporting tissues Cartilage, bone

Week	Lectures	Practical sessions	
		Dissection room	Histology laboratory
Week 8.	22. Sublingual hiatus. Inguinal canal. Adductor and femoral canals 23. Muscles and joints of the foot. Architecture of the foot 24. Blood. Corpuscular elements. Red bone marrow, erythropoiesis, Formation of leukocytes	Lower limb Dissection of the muscles, vessels and nerves of the dorsal side	Types of ossification
Week 9.	25. Muscle tissue 26. Gametes, fertilization, cleavage and blastulation 27. Implantation, bilaminar embryo. Fetal membranes, umbilical cord. Structure of the placenta, placental circulation	Lower limb Dissection of the muscles, vessels and nerves of the dorsal side	Blood and red bone marrow
Week 10.	28. Molecular basis for gastrulation. Formation, differentiation and derivatives of the germinal layers. 29. Neurulation, folding of the embryo. Body axes, left-right lateralization asymmetry. 30. Formation of the primary tissues. Homeobox genes, stem cells	Lower limb Dissection of the muscles, vessels and nerves of the ventral side	Smooth, skeletal and cardiac muscle types Revision
Week 11. Nov. 14-18.	31. Histology of vessels. 32. Bony framework of the skull. Sphenoid and ethmoid 33. Temporal bone. Internal and external skull base	Lower limb Dissection of the muscles, vessels and nerves of the ventral side	Midterm test 2: Epithelia, connective and supporting tissue. General embryology
Week 12.	34. Facial skeleton. Orbit, nasal cavity 35. Skull. Infratemporal and pterygopalatine fossae 36. Nervous tissue. Glial cells	Bones of the skull Internal and external skull bases	Vessels: arteries, veins, arterioles, venules, capillaries.
Week 13.	37. Temporomandibular joint, muscles of mastication; muscles of facial expression 38. Development of the skull, fontanelles. 39. Development of the limbs and the vertebral column together with the trunk	Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa Temporomandibular joint	Nervous tissue
Week 14.	40. Developmental malformations 41. Clinical anatomy of the musculoskeletal system 42. Clinical anatomy of the musculoskeletal system	Muscles of mastication and facial expression	Placenta, umbilical cord Revision

Topic lists for the semifinal examination

Histology

- Concept of basic tissues
- Definition and classification of epithelial tissue
- Simple epithelia
- Stratified epithelia
- Membrane specializations of epithelia
- Glandular epithelia
- Cells of connective tissue
- Ground substance and fibres of connective tissue
- Types of connective tissue
- Umbilical cord and placenta
- Blood and the formed 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
- Histology of the peripheral nervous system (sensory and autonomic ganglia)
- Supporting cells in the peripheral nervous system
- Nerve fibers, myelin sheath
- Motor end-plate

Anatomy

- General osteology, classification of bones
- 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)
- Bones of the axial and appendicular skeleton
- Vertebrae, ribs, sternum
- Bones of the girdles and limbs
- General arthrology
- Fibrous and cartilaginous joints
- Components of the synovial joints
- Classification of synovial joints; movements and mechanisms
- 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
- Elbow joint, the gross anatomy of the muscles acting upon it
- Structure and movements of the radiocarpal joint, gross anatomy of the muscles acting upon it
- Metacarpophalangeal and interphalangeal joints, the gross anatomy of the muscles concerned with the movements
- Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb, the gross anatomy of the muscles concerned with the movements

- Hip joint and the gross anatomy of the muscles concerned with the movements
- Knee joint and the gross anatomy of the muscles concerned with the movements
- Ankle joint together with the gross anatomy of the muscles acting upon it
- Subtalar and talocalcaneonavicular joints, the muscles acting upon them
- Temporomandibular joint and the gross anatomy of the muscles acting on it
- Architecture and classification of bones
- Structure and actions of somatic muscles
- Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)
- Muscles and movements of the thorax
- Muscles of the back and nape (occipital region)
- Axilla, the quadrangular and triangular spaces
- Cubital fossa
- Muscles and cross section of the arm
- Muscles and cross section of the forearm
- Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths
- 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)
- Osteofibrous compartments, muscles and cross section of the thigh
- Popliteal fossa
- Subinguinal hiatus, vascular and muscular compartments; adductor canal, femoral canal
- Osteofibrous compartments, muscles and the cross section of the leg
- Structure of the foot, arches of the foot
- Osteofibrous compartments of the foot, tendinous sheaths
- Muscles of mastication
- Superficial muscles of the neck and the muscle triangles
- Deep muscles of the neck and the laminae of the cervical fascia
- Muscles of facial expression

Embryology

- Spermatogenesis, spermiogenesis
- Oogenesis
- Fertilization, cleavage of the zygote
- Blastocyst formation; the bilaminar embryonic disc
- Implantation
- Formation of the intraembryonic mesoderm; the notochord
- Neurulation (neural tube and neural crest)
- Differentiation of the intraembryonic mesoderm; formation and derivatives of the somites
- Derivatives of the intermediate mesoderm
- Lateral plate mesoderm and its derivatives
- Folding of the embryo
- Development of the primitive cardiovascular system, the fetal circulation
- The structure and function of the placenta
- Development of the fetal membranes (chorion and amnion) and the umbilical cord
- Periods of embryonic / fetal life
- Twin formation
- Development of the limbs
- Development of the vertebral column
- Development of the skull
- Development of the skeletal muscular system

1st year 2nd semester

English Program

Anatomy: Morphology, topography and clinically oriented anatomy of the internal organs (i.e. cardiovascular, gastrointestinal, respiratory and the urogenital systems)

Histology: Microscopical structure of the internal organs (cardiovascular, gastrointestinal, respiratory and the urogenital systems)

Embryology: Development of the internal organs together with their malformations

Credits: 9

Lectures: 3 hours/week

Dissection class: 6 hours /week

Histology laboratory: 2 hrs/week

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
Week 1	1. Lymphatic tissue and cellular elements. Thymus, tonsils, MALT. 2. Lymph node, spleen. Structure and circulation 3. Muscles, triangles and fasciae of the neck	Dissection of head and neck region	Lymphatic organs: thymus, tonsils
Week 2.	4. Gastrointestinal tract. Oral cavity, morphology and histology of the tongue and salivary glands 5. Morphology, histology and development of teeth. 6. Morphology and histology of soft palate, isthmus of fauces and pharynx	Dissection of head and neck region	Lymphatic organs: lymph node, spleen
Week 3.	7. Development of the branchial apparatus, congenital malformations 8. Morphology of the nasal cavity and paranasal sinuses 9. Larynx, cartilages, joints, muscles connective tissue skeleton, mucous membrane.	Oral cavity, tongue, salivary glands, teeth, nasal cavity, larynx	Gastrointestinal tract: lip, tongue, including the filiform, fungiform and vallate papillae
Week 4.	10. Development of the face, and palate, congenital malformations 11. Morphology of the trachea and the lung. Pleura 12. Histology of the respiratory tract. Development of the lungs,	Surface projections of the internal organs of the thorax, dissection of the thoracic cavity. Lungs, pleura, mediastinum	Ground teeth, tooth bud. Submandibular, sublingual glands

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
Week 5.	13. Chambers of the heart, external features. Structure of heart wall, myocardium, valves, anuli fibrosi 14. Vessels, conducting system, surface projection of the heart, pericardium. Auscultation points. Divisions of the mediastinum. 15. Structure and development of the diaphragm	Dissection of the heart	Respiratory system: larynx, trachea, lung
Week 6.	16. Development of the heart (primitive heart tube, development of atria) 17. Development of the heart (development of ventricles, malformations). Fetal circulation 18. Morphology and histology of the esophagus and the stomach.	Dissection of the heart	Heart Esophagus, cardia, fundus, pylorus of the stomach
Week 7.	19. Morphology and histology of the duodenum and the pancreas 20. Morphology and histology of the jejunum and ileum 21. Morphology and histology of the large intestine and rectum.	1.Revision 2. Midterm test 1 Heart, great vessels, development of the heart . Morphology and development of the internal organs of the head, neck, thorax and diaphragm.	Duodenum, jejunum ileum, colon, vermiform appendix
Week 8.	22. Morphology of the liver and biliary system. Portal vein 23. Histology of the liver and biliary system 24. Development of the mid- and hindgut. Development of the liver and the pancreas	Dissection of abdominal internal organs Dissection of the visceral complex. Celiac trunk, liver, duodenum	Liver, gall bladder, pancreas
Week 9.	25. Peritoneum. Development of the serous membranes and the omental bursa. Separation of body cavities 26. Morphology and topography of the kidney. Capsules. Urinary passages, urinary bladder 27. Histology of the urinary system	Cadaver dissection Organs supplied by the superior mesenteric artery	Urinary system: kidney, ureter, urinary bladder
Week 10.	28. Morphology and coats of the testicle. 29. Histology of the testicle. Spermatogenesis 30. Morphology and histology of the epididymis, spermatic cord, seminal vesicle and prostate	Cadaver dissection Organs supplied by the inferior mesenteric artery	Midterm test 2 , Lymphatic organs, respiratory system, gastrointestinal tract , urinary system

Easter break

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
Week 11.	31. Development of the arteries; malformations. 32. Development of the veins. 33. Morphology and histology of penis and male urethra.	Cadaver dissection Retroperitoneum, pelvic organs Dissection of the visceral complex	Male genital system: testis, epididymis, spermatic cord
Week 12.	34. Structure of pelvic floor, male perineum 35. Morphology and histology of the ovary and the uterine tube, oogenesis 36. Morphology and histology of the uterus, divisions and content of the broad ligament	Cadaver dissection Male genital system	Male genital system: Seminal vesicle, prostate, penis, glans penis.
Week 13.	37. Morphology and histology of the vagina and the external genital organs, female perineum 38. Development and malformations of the urinary system 39. Development and malformations of the genital system. Disorders of the sexual differentiation.	Cadaver dissection Female genital system	Female genital system: ovary, corpus luteum, uterine tube
Week 14.	40. Major lymphatic ducts 41. Lymphatic drainage of the head&-neck, thoracic and abdominal regions 42. Clinical and radiologic anatomy of the internal organs	Revision Abdominal and pelvic organs	Female genital system: uterus (proliferation, secretion), vagina, placenta

TOPICS OF THE SEMIFINAL EXAMINATION

LYMPHATIC ORGANS

Tonsils (anatomy, histology, embryology)

- Spleen (anatomy, histology, embryology)
- Thymus (anatomy, histology, embryology)
- Lymphatic vessels and nodes of head and neck
- Lymphatic vessels and nodes of mediastinum
- Lymphatic vessels and nodes of retroperitoneal space
- Lymphatic vessels and nodes of pelvis
- Thoracic duct and right lymphatic duct
- Microscopic structure of lymphatic system (reticular cells, lymphocytes, plasma cells, antibodies, lymphatic follicles)
- Microscopic anatomy of lymph nodes

CIRCULATORY SYSTEM

- Shape, external features of heart
- Chambers of heart
- Endocardium, ostia, valves of heart
- Skeleton of heart, anuli fibrosi
- Structure of heart wall

- Cardiac muscle, myocardium
- Impulse 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
- Development of heart tube
- Development of atria (septum primum and secundum, foramen ovale)
- Development of ventricles (interventricular septum)
- Pulmonary circulation
- Ascending aorta, arch of aorta and its branches
- Common and external carotid artery and their branches
- Maxillary artery and its branches
- Subclavian artery and its branches
- Thoracic aorta and its branches
- Abdominal aorta and its branches
- Coeliac trunk and its branches
- Superior mesenteric artery and its branches
- Inferior mesenteric artery and its branches
- External and internal iliac artery and its 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
- Veins of face and neck
- Cutaneous veins and lymphatic vessels of trunk
- Microscopic structure of arterial and arteriolar wall
- Microscopic structure of capillary wall
- Development of aorta and branchial (pharyngeal) arch arteries
- Development of great veins (caval, portal, azygos)
- Fetal circulation
- Microscopic structure of the wall of venules, veins and lymphatic vessels

DIGESTIVE SYSTEM

- Oral cavity (divisions, boundaries)
- Floor of mouth, sulcus lateralis linguae
- Types and morphology of teeth
- Orientation and supporting structures of teeth
- Dental arch and dental formula, blood and nerve supply of teeth
- Microscopic anatomy of oral tissues (enamel, dentin, cementum, periodontal ligament, alveolar bone, gum)
- Development of teeth
- Microscopic anatomy of dental development
- Tongue (parts, vessels, innervation)
- Microscopic anatomy and development of the tongue
- Salivary glands (anatomy, histology, embryology)
- Isthmus of fauces
- Palate, palatine muscles
- Development of face, hare lip
- Development of nasal cavity and paranasal sinuses
- Development of palate, cleft palate

- Pharynx, (shape, position, parts, muscles)
- Topography of the pharynx, para and retropharyngeal spaces
- Structure and development of branchial (pharyngeal) arches
- Derivatives of branchial (pharyngeal) arches
- Development and derivatives of branchial (pharyngeal) pouches
- Branchial (pharyngeal) grooves
- Esophagus (anatomy, histology, embryology)
- Derivatives of foregut (pharynx, oesophagus, stomach, duodenum)
- Stomach (shape, position, parts)
- Peritoneal relations of stomach
- Blood supply and innervation of stomach Microscopic anatomy of stomach
- Microscopic anatomy of the stomach
- Duodenum (shape, position, divisions, vessels)
- Jejunum-ileum (shape, position, vessels)
- Microscopic anatomy of small intestine
- Fine structure of the intestinal villi
- Rectum, anal canal (shape, position, vessels)
- Microscopic anatomy of rectum and anal canal
- Liver (shape, position; development)
- Gall bladder and biliary passages (anatomy, histology, embryology)
- Liver (peritoneal relations, vessels)
- Microscopic anatomy of the liver
- Circulation of liver, liver sinusoids
- Microscopic anatomy of gall bladder and extrahepatic biliary tracts
- Pancreas (shape, position, vessels)
- Microscopic anatomy and development of the pancreas
- Peritoneum omenta, mesentery, omental bursa
- Rotation and derivatives of midgut, physiological umbilical hernia
- Development of hindgut

RESPIRATORY SYSTEM

- Nose, nasal cavity (boundaries, nasal meatus, vessels)
- Paranasal sinuses (connections, vessels)
- Larynx (shape, position, vessels, nerves)
- Skeleton and joints of larynx
- Laryngeal ligaments (fibroelastic membranes, mucous membrane)
- Muscles of larynx, innervation
- Microscopic structure and development of the larynx
- Trachea and bronchial tree (anatomy, histology and development)
- Lung (shape, parts, surfaces, hilum)
- Lung (position, topography, vessels, nerves)
- Surface projection of pleura and lung
- Microscopic structure and development of the lung

BODY CAVITIES

- Thoracic wall
- Pleura, pleural cavity
- Mediastinum (divisions and content)
- Diaphragm
- Abdominal cavity (divisions and surface projections)
- Abdominal wall (muscles, fasciae)
- Rectus sheath

- Hernia sites
- Development and separation of body cavities
- Development of the diaphragm
- Development of the peritoneum

UROGENITAL SYSTEM

- Kidney (shape, position, hilum, sinus, capsules)
- Kidney (section, vascular architecture)
- Microscopic anatomy of kidney
- Microscopic anatomy of juxtaglomerular apparatus
- Vascular architecture of kidney
- Development of kidney and ureter (pronephros, mesonephros, metanephros)
- Renal pelvis and calyces
- Ureter (anatomy, histology and embryology)
- Urinary bladder (shape, position, muscles, vessels)
- Microscopic anatomy and development of the urinary passages
- Differentiation of the urogenital sinus
- Female urethra (anatomy, histology and embryology)
- Testis (shape, position, vessels)
- Microscopic anatomy of testis, spermatogenesis
- Development of testis
- Epididymis, vas (ductus) deferens, spermatic cord (anatomy, histology and embryology)
- Scrotum, coats of testis
- Seminal vesicle (anatomy, histology and embryology)
- Prostate (anatomy, histology and embryology)
- Development of male genital ducts and glands
- Male urethra, bulbourethral gland (anatomy, histology and embryology)
- Penis (shape, position, mechanism of erection, vessels, nerves)
- Microscopic anatomy of penis and male urethra
- Pelvic floor, male perineum
- Hernia canals (inguinal and femoral)
- Development of the male external genital organs
- Ovary (shape, position, vessels)
- Microscopic anatomy of ovary, oogenesis
- Microscopic anatomy of corpus luteum
- Development of ovary
- Uterine tube (shape, position, vessels; histology, embryology)
- Uterus (shape, parts, wall, cavity)
- Uterus (position, supporting structures, vessels)
- Broad ligament (lig. latum) and its components
- Microscopic anatomy of uterus, menstrual cycle
- Vagina, female perineum
- External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)
- Development of female genital tracts
- Microscopic anatomy of vagina and external genitalia
- Development of the female external genital organs

BASICS OF BIOSTATISTICS AND INFORMATICS

Tutor: *Dr. István Voszka*

Week Lecture (1 hour/week)

- 1 Introduction
- 2 Role of „change” in theory and in practice
- 3 Descriptive statistics
- 4 Elements of probability calculus
- 5 Probability calculus and statistics
- 6 Principles of hypothesis testing
- 7 Parametric and non-parametric tests for comparison of two groups
- 8 Comparison of more groups, analysis of variance
- 9 Examination of dependence relations of variables
- 10 Evaluation of diagnostic tests
- 11 Human body as signal source, signal processing
- 12 Concept of information, databases
- 13 Clinical databases
- 14 Evidence based medicine, role of mathematical logics in diagnostics

Practice (2 hours/week)

Graphical representation of functions
 The most important functions and their representation by computer
 Use of excel tables
 Mean, standard deviation, variance, standard error
 Descriptive statistics
 Hypothesis testing 1.: t-tests
 Hypothesis testing 2.: non-parametric tests
 Hypothesis testing 3.: Mann-Whitney U-test
 Analysis of variance
 Categorical variables, contingency table
 Regression analysis
 Calculation of correlation
 Bioinformatical databases
 Publication databases, clinical databases

MEDICAL BIOPHYSICS I.

Tutor: *Dr. István Voszka*

First Semester

Week	Lecture (1.5 hours per week)	Laboratory (2 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	Optical lenses; light microscope
6	Thermal radiation, thermography. Biological effects of light	Detection of nuclear radiations
7	Production and spectrum of X-radiation	Oscilloscope
8	Cyclotron; Linear accelerator; Attenuation of X-radiation, interactions	Special light microscopes
9	Atomic structure; Radioactive decay law	X-ray diagnostics
10	Gamma-radiation and its detection	Optics of the eye
11	Radiotherapy, radiosurgery; Isotope diagnostics	Polarimeter
12	SPECT, PET	Coulter counter
13	Beta-radiation, beta-decay	Determination of skin-impedance
14	Alpha-radiation, alpha-decay	Concentration determination with refractometer
	Interaction with matter	Repetition
	Dosimetry	
	Radiation protection; estimation of risk	

MEDICAL BIOPHYSICS II.

Second Semester

Week	Lecture (2 hours per week)	Laboratory (2 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

MEDICAL CHEMISTRY

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

First Semester

credits: 6

Director of the course:

Prof. Gábor Bánhegyi M. D., Ph. D., D. Sc.

Description of the curriculum

The principal aim of the course is to prepare students for the understanding of Biochemistry and Molecular Biology. This requires a firm knowledge of the basics of general, organic and inorganic 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, σ and π 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 redoxi 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. Inorganic chemistry

Properties of non-metals

Group of halogens, their biological significance. Oxygen group, oxygen, free radicals containing oxygen, air, air pollution, ozone. Sulfur, its compounds. The nitrogen group. Nitrogen, its important inorganic compounds. Nitrogen cycle. Phosphorus and its compounds. Carbon group, carbon and its important inorganic compounds. The air polluting effect of carbon dioxide. Hydrogen and noble gases. Inorganic compounds of medical importance.

Properties of metals

Alkali metals and their compounds. Alkali earth metals and their compounds, the biological significance of calcium and magnesium. Earth metals. Heavy metals and their biological importance. Precious metals. Medically important metals and metal-containing compounds.

III. 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. Hydrocarbons containing more double bonds, delocalization of π -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

- I. Classification of organic compounds according to their functional groups. Halogenated hydrocarbons, their physicochemical properties.
- II. Organic compounds containing hydroxyl groups. Classification. Alcohols, physical properties, chemical reactions. Enols and phenols, their chemical reactions. Synthesis of ethers, their reactions.
- III. 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.
- IV. 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.
- V. Organic compounds containing sulfur: thiols, thiophenols and thioethers, their synthesis and physicochemical properties.
- VI. 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.

Lectures and practical lessons

Two lectures and a laboratory lesson (practical) are held every week; schedules can be found in separate uploaded files.

Students are expected to keep records and write protocols on the performed experiments (suggested structure: aim of the experiment, applied methods/devices/reactions, results and evaluation). Hand-written protocols might be presented either at the end of the lab lesson or at the beginning of the next practical to the lab teacher. Students might get two points for each acceptable protocol, and points collected this way are added to the total score they achieve in the corresponding midterm exams. Thus, bonus points collected in weeks 2 – 4 (at most 6) are added to the scores of midterm I and those obtained in weeks 7 – 11 (at most 10) to midterm II, respectively. Importantly, these bonus points not only improve your midterm grades but might help you pass the midterm, too.

Requirements for acknowledgement of the semester

(1) Participation in the laboratory practicals is obligatory; students should sign the attendance sheets at the end of the practicals. In case of more than three absences from the practicals for any reason, the semester will not be acknowledged and the student is not going to be allowed to sit for the semifinal exam. Missed practicals can be completed only in the same week at another group; certificate from the host teacher should be presented by the student to the assigned teacher.

(2) It is compulsory to pass both midterm examinations; see next paragraph for details.

Midterm examinations

Two midterm written examinations will be held in weeks 6 and 12 of the semester, respectively, during regular laboratory practicals.

Midterm tests consist of four theoretical questions (10 points each) and four problems (calculations; 10 points each). The material of midterm I covers that of lectures given in the first 5 weeks, while midterm II is based on the lecture material of weeks 6-11. Midterm tests will be evaluated by lab teachers and marked as 0, 2, 3, 4 or 5. These 'midterm bonus points' are added to the scores achieved at the semifinal exam (see below).

Grading of midterms (total scores including points obtained from lab reports):

0 – 40 points:	0
41 – 50 points:	2
51 – 60 points:	3
61 – 70 points:	4
71 or more points:	5

Passing both midterms is a prerequisite to acknowledgement of the semester.

Failed midterms might be retaken twice.

The first retake is written, comprising four theoretical questions and four calculations. It should be performed in week 7 (retake of midterm I) and week 13 (retake of midterm II), supervised by the student's own lab teacher.

Students having failed the first retake might sit for the second retake in the last week of the semester. The second retake is an oral exam conducted by an examination committee. Students having failed the first retake of both midterms I and II will be examined in the material of both midterms at the same time.

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 a written exam that consists of two theoretical parts and a practical exam.

First theoretical part (50 min): drawing 10 structures within 15 min (both inorganic and organic, 1 point each), answering two short questions (providing definitions of two 'important terms' taken from the topic list; one point each) and solving four chemical calculations (2 points each).

The list of structures to be memorized can be found on the last page of this document. Please note that any inorganic base or salt might be asked that can be formed by combining any cations and anions provided there. Moreover, any normal or branched-chain alkane, alkene or alkyne (up to eight carbon atoms) can be asked such as 2,3-dimethyl-pentane, 3-methyl-2-hexene etc.

Second theoretical part (80 min): 40 multiple choice questions (1 point each).

Lab exam (practical exam) (15 min): writing an essay on a laboratory experiment performed during the semester (evaluation: 0, unacceptable; 1 point, minor mistakes; 2 points, clear, detailed and correct). Exact quantities (mass, volume of reagents, incubation times etc.) are not expected here.

Therefore, the maximal score is $20 + 40 + 2 = 62$.

The exam is unsuccessful with

- 10 or less points in part 1, OR
- 20 or less points in part 2, OR
- 0 point from the practical exam.

Students who pass both part 1 AND part 2 but fail the practical essay have to retake only the practical essay when they repeat the semifinal exam. Those who want a better grade are entitled to rewrite the first 2 parts as well; however, risking that they might perform worse.

Students who pass the practical exam but fail either part 1 or part 2 (or both parts) are obliged to retake both theoretical parts but not the practical exam.

In case of successful exams, i. e. when both theoretical units and the practical exam are successfully completed (at least 11, 21 and 1 points are obtained in blocks 1, 2 and the practical essay, respectively), bonus points from the midterms (at most 10) are added to the scores acquired during the exam. Therefore, successful semifinals are evaluated as follows:

33-39 points = grade 2 (pass)

40-49 points = grade 3 (satisfactory)

50-59 points = grade 4 (good)

60-72 points = grade 5 (excellent).

It is possible to write the practical essay in week 14, in the first 15 minutes of the last laboratory practical of the semester. Students successfully completing this test (getting 1 or 2 points) are exempted from writing the practical exam at the semifinal exam.

It is to note that this is an extra opportunity for passing the practical exam prior to the beginning of the exam period and in case of failure the semifinal exam should proceed as outlined above.

For CV and FM students

CV students might keep their partial results for the CV exam (either the lab or the theoretical part). In contrast, FM students have to retake the lab or the theoretical part of the exam even if they successfully passed either of them previously.

Competition

Those students who have passed BOTH midterm examinations with a grade of 3 or better are entitled to participate in the competition. Eligible students should sign up at their lab teachers. The competition is organized in week 14 (the exact date and venue will be announced later). It is based on the whole material of the semester and has the same format as the written semifinal except that no lab essays will be asked. Students achieving at least 75% of the maximal score will be exempted from the semifinal exam.

Exemption from the semifinal exam

Students who learned general, inorganic and organic chemistry at a university level prior to the commencement of their studies at Semmelweis University might sit for an exemption exam that takes place in the middle of September. Students are kindly asked to present their official documents (transcripts with exam results and a detailed syllabus on the courses they completed) to the tutor (Gergely Keszler, EOK building, room 2.132).

The exemption exam encompasses parts 1 and 2 of the semifinal (structures, short definitions of important terms, calculations and multiple choice questions); lab essays will not be asked.

Registration and modification of examination dates:

Electronically, via the Semmelweis University Neptun System.

Retakes are not possible within 3 days following the exam.

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

Recommended textbooks, manuscripts, handouts:

General chemistry: Ebbing-Gammon: General Chemistry, latest edition

Mortimer: Chemistry

Organic chemistry: Hrabák-Csermely-Bauer: Principles of Organic Chemistry (2nd edition, 2007, editor: A. Hrabák); Sasvári: Bioorganic compounds (manuscript)

Inorganic chemistry: Tóth: Concise inorganic chemistry for Medical Students (manuscript)

Laboratory: Hrabák: Selected Collection of Chemical Calculations and Biochemical Exercises (2007); Hrabák: Laboratory Manual - Medical Chemistry and Biochemistry (third edition, 2007)

Manuscripts and textbooks can be purchased in the bookshops of Semmelweis Publisher (on the ground floor of the NET and EOK buildings).

TOPIC LIST AND IMPORTANT TERMS

GENERAL CHEMISTRY TOPICS (1 – 37)

Note: Chapter numbers correspond to the 9th edition of D.D. Ebbing – S. D. Gammon: *General Chemistry* (2009)

Important terms are written in italics.

ATOMIC STRUCTURE

(Ebbing: Chapter 7. Quantum theory of the atom)

1. Atomic structure: The nuclear structure and the electronic structure of atoms. The Bohr theory of the hydrogen atom. Quantum numbers and atomic orbitals.

Nucleus, electrons, proton, neutron, atomic number, mass number, atomic weight, isotopes, atomic orbitals, principal quantum number, angular momentum quantum number, magnetic quantum number, spin quantum number

ELECTRON CONFIGURATION OF ELEMENTS

(Ebbing: Chapter 8. Electron configurations and periodicity)

2. Electronic structures of atoms: electron configurations and orbital diagrams.
3. Periodic properties of the elements (atomic radius, ionization energy and electron affinity) and the electronic structure of main-group elements.

Orbital diagram, Pauli exclusion principle, building-up (Aufbau) principle, Hund's rule, noble gas core, pseudo-noble-gas core.

Periodic law, effective nuclear charge, first ionization energy, electron affinity; electronegativity

Skills: Writing the orbital diagram for the ground state of any atom if the mass number is given.

IONIC AND COVALENT BONDING

(Ebbing: Chapter 9. Ionic and Covalent bonding. Chapter 10: Molecular geometry and chemical bonding theory)

4. Formation of ionic bonding and description of ions.
5. The covalent bond. Transition between ionic and covalent bonding.

Cation, anion, lattice energy, ionic radius.

Bonding and non-bonding (lone) electron pairs, coordinate covalent bond, octet rule, multiple bonds, polar covalent bond, electronegativity, delocalized bonding, resonance, bond length (bond distance), covalent radius, bond energy.

Skills: Writing the Lewis-electron-dot symbols and valence-shell electron configurations for the atoms of the second and third periods.

INTERMOLECULAR FORCING

(Ebbing: Chapter 11: States of matter: Liquids and solids/11.5. Intermolecular forces: explaining Liquid properties)

6. Intermolecular forces: dipole-dipole forces, London (dispersion) forces, Van der Waals forces. Importance of hydrogen bonding in biology.

Dipole-dipole forces, London (dispersion) forces, Van der Waals forces, hydrogen bonding.

CHEMICAL EQUILIBRIA

(Ebbing: Chapter 14: Chemical equilibrium)

7. Chemical equilibria (basic principles): The equilibrium constant. The law of mass action. Predicting the direction of a reaction. Changing the reaction conditions: LeChatelier principle. Chemical equilibrium, equilibrium constant, law of mass action, homogenous equilibrium, heterogeneous equilibrium, reaction quotient, LeChatelier principle. Exergonic vs. endergonic reactions, reversible vs. irreversible reactions.

CONCENTRATIONS OF ACIDS AND BASES

(Ebbing: Chapter 3: Calculations with chemical formulas and equations: Mass and moles of substance; Chapter 4: Molar concentrations; Diluting solutions.

Chapters 15 and 16: Electrolytes; Acids and Bases, Neutralization. Equivalents and normality)

8. Concentrations (basic principles): The mole concept. Neutralization. Calculation of various concentrations (percentage concentrations, molarity and normality). Molecular weight, formula weight, molar mass (mole, "mol"), Avogadro's number, molar mass, mass percentage, molar concentration (molarity, M), titration

ACID-BASE CONCEPTS

(Ebbing: Chapter 15. Acid-base concepts; Chapter 16: Acid-base equilibria; Lecture)

9. Acid base theories: The Arrhenius concept. Self ionization of water, the pH and pOH of a solution. The pH scale. Calculation of pH for strong acids and bases.
10. Titration curves of strong electrolytes. Relative strength of acids and bases. Acidic strength and the molecular structure of hydrides and oxoacids.
11. Acid-base equilibria: pH of weak acids and bases. Degree of ionization and the ionization constants (K_a and K_b). Definition of pK_a and pK_b . Acid base theories: Bronsted-Lowry concept. Conjugated acids and bases. Lewis concept of acids and bases.
12. Common ion effect: The Henderson-Hasselbalch equation. pH dependence of acid/base equilibria. Acid-base indicators
13. Buffers. Principle of maintaining a constant pH (examples). Buffer capacity. Comparison of acid and base capacity. Titration curves of monoprotic and polyprotic (phosphoric and carbonic acid) weak acids.
14. Buffers of physiological importance. Buffer effect of the phosphate group. The carbonic acid / hydrogen carbonate buffer. The pH-bicarbonate diagram. Effect of stabilization of carbon dioxide and bicarbonate concentration on the buffer capacity. Total acidity of the urine. Respiratory acidosis. (Lecture)
15. Acid-base properties of salt solutions (hydrolysis). Anion-hydrolysis (example: acetate) and cation-hydrolysis (example: ammonium ion). pH of acidic salts (examples: NaHSO_4 , NaHCO_3 , NaH_2PO_4 and NaHPO_4).
Acid (Arrhenius theory), base (Arrhenius theory), self ionization of water, ion-product constant for water (water product, K_w), pH, pOH, the pH scale; acid-base titration curve, equivalence point.
Acid (Bronsted-Lowry theory), base (Bronsted-Lowry theory), conjugate acid-base pair, Lewis-acid, Lewis base.
Acid ionization (dissociation) constant, base ionization (dissociation) constant, degree of ionization.
– common ion effect, buffer, Henderson-Hasselbalch equation
– acid-base indicators, buffer capacity (acid capacity and base capacity)
Skills: Drawing the titration curves of strong and weak (monoprotic and polyprotic) acids/ bases (Lecture): Intracellular and extracellular buffer systems of the body, average charge of phosphoric acid at various pH, components of the bicarbonate buffer in the blood, role of the ventilation in pH stabilization role of the red blood cells in pH stabilization, role of the kidney in pH sta-

bilization, metabolic acidosis, metabolic alkalosis, respiratory acidosis, total acidity of the urine; anion-hydrolysis (example), cation-hydrolysis (example), cation and anion hydrolysis (example), acidic salts with acidic pH (example), acidic salts with basic pH (example)

SOLUBILITY AND COMPLEX IONS

(Ebbing: Chapter 17: Solubility and complex-ion equilibria)

16. Solubility of salts. The solubility product. Saturated solutions, solubility. Conditions for precipitation. Examples of well soluble and mainly water insoluble compounds.
17. Complex ions. Lewis theory and complex formation. Central ions and ligands, coordination number. Geometry and isomerism of complexes. IUPAC nomenclature of complexes. Principles of valence shell and crystal field theory.
18. Unidentate, bidentate, ambidentate and polydentate ligands in complexes. Chelate complexes, complexometric titration. EDTA and biological complexes (heme, vitamin B₁₂, calmodulin, EF hand). Elimination of heavy metal ions from the body.
Solubility, solubility product constant (K_{sp}), ion product (Q), conditions for precipitation
Complex salts, double salts, ligands, central ions, coordination number of complexes, unidentate-, bidentate-, ambidentate- and multidentate ligands (examples), chelate complexes (examples), Lewis acid-base theory, geometric isomerism, chiral isomerism, crystal field theory, high and low spin complex; structure of EDTA, biological complexes of iron and calcium, EF hand protein motif

SOLUTIONS

(Ebbing: Chapter 11: States of Matter; Liquids and Solids; Chapter 12: Solutions)

19. Solutions. Solute, solvent. Solubility. The solution process. Solubility of iodine in organic solvents and in water. Lugol solution. Solution of ionic crystals (NaCl) and crystals of polar substances (glucose) in water. Hydrated ions.
20. Enthalpy of solution of solids and gases. Lattice energy and enthalpy of hydration. Enthalpy of solvation. Role of the change of entropy in the solution process. Effects of temperature and pressure on solubility of solids and gases. Henry's law. Bunsen (absorption) coefficient. Calculation of molar concentration of dissolved gases.
21. Vapor pressure of solutions. Raoult's law. Ideal and "real" solutions, vapor pressure depression of solutions of nonvolatile solutes. Mole fraction and molality. Vapor pressure depression of dilute solutions of nonvolatile solutes.
22. Solutions of gas in gas. Partial pressure. Composition of air. ppm as concentration unit. Decompression sickness. Artificial air.
23. Boiling point and freezing point of solutions. Molal freezing point depression and boiling point elevation of aqueous solutions. Colligative properties. Anomalous behavior of ionic solutions, interionic attractions, van't Hoff factor. Formula mass of ionic compounds. Determination of concentration or molar mass by freezing point depression measurements.
24. The phenomenon of osmosis. Osmotic pressure, dependence on temperature, solute concentration and ionic dissociation. Isotonic, hypertonic and hypotonic solutions. Determination of molecular mass or concentration by measuring osmotic pressure. Biological and medical significance of osmosis.

*Change of state (phase transition), melting, freezing, vaporization, sublimation, condensation, vapor pressure, boiling point, freezing point, heat of vaporization, phase diagram, surface tension
Solute, solvent, hydration of ions, Lugol solution, Henry's law, Bunsen (absorption) coefficient, colligative properties, molality, mole fraction, vapor-pressure lowering, Raoult's law, boiling-point elevation, freezing point depression, osmosis, osmotic pressure, isotonic-, hypertonic-, hypotonic solutions
Partial pressure of gases, ppm, decompression sickness, artificial air*

THERMODYNAMICS

(Ebbing: Chapter 6: Thermochemistry; Chapter 18: Thermodynamics and Equilibrium)

25. System and surroundings. Internal energy, mechanical work and reaction heat, the first law of thermodynamics. Enthalpy and Hess's law. Standard enthalpy change.
26. Enthalpy change of physical processes (phase transitions, temperature change, solution process).
27. Enthalpy change of chemical processes (formation, combustion). Average bond enthalpy. Energy diagrams and thermochemical equations.
28. Entropy change, spontaneous and reversible processes, the 2nd law of thermodynamics. The 3rd law of thermodynamics, absolute and standard entropies.
29. Gibbs free enthalpy change, exergonic and endergonic processes. Free enthalpy change under standard and non-standard conditions. The equilibrium constant. Thermodynamic coupling.
*Internal energy, work, heat, enthalpy change, standard enthalpy change.
Standard enthalpy of fusion/vaporization/sublimation/solution/solvation, lattice enthalpy, molar heat capacity.
Standard enthalpy of formation/combustion, average bond enthalpy.
Entropy change, standard and absolute entropy.; Standard free enthalpy change, exothermic-, endothermic-, exergonic-, endergonic reactions.
First, second and third laws of thermodynamics.*

REACTION KINETICS

(Ebbing: Chapter 13: Rates of reaction)

30. Spontaneity and speed of chemical reactions. Reaction rate. Rate equation, rate law. Rate constant and its unit, initial rate. Collision and transition state theories of the mechanism of chemical reactions.
31. Molecularity and order of chemical reactions. Determination of reaction order. Single and multi-step reactions. First, pseudo-first, second, third, zero and fractional orders. Half-life of chemical reactions.
32. Reaction rate and temperature. Activation energy. Potential energy diagrams. Catalysis. Enzymes as biocatalysts; strong specificity of enzymes
*reaction rate, rate law, rate constant, rate equation, initial rate, collision theory, transition-state theory, frequency factor, reaction order, molecularity, reaction mechanism, mono- bi- and termolecular reactions, first, pseudo-first, second, zero orders, overall order of a reaction, rate determining step, half-life.
catalysis, catalyst, activation energy, activated complex, Arrhenius equation; energy diagrams of catalysed and non-catalysed reactions, homogeneous and heterogeneous catalysis, chemisorption, enzyme, substrate, stereospecificity*

ELECTROCHEMISTRY

(Ebbing: Chapter 19: Electrochemistry; Lectures)

33. Voltaic cells: Notation for a voltaic cell. Electrode potentials (reduction potentials) and the electromotive force. Normal and standard electrode potential. Calculation of equilibrium constants from the electromotive force.
34. Dependence of electrode potentials on concentrations: the Nernst equation. Concentration cells. The hydrogen electrode. Measurement of pH, the glass electrode.
35. Non-polarizable electrodes. Principle of maintaining constant concentration in reference electrodes. Examples: the calomel electrode and the silver electrode.
36. Direction of redox reactions. Biologically important redox systems (examples for reversible and for irreversible redox reactions).
37. Specific and equivalent conductance. Determination of the degree of dissociation and the ionization constant by conductometry. (Practice book and lecture)

Voltaic (galvanic) cell, half cell, salt bridge, electromotive force, standard electrode potential, Nernst equation, concentration cell, hydrogen electrode, glass electrode, non-polarizable electrodes, calomel electrode, silver electrode; specific and equivalent conductance; Daniell element; non-polarizable electrode

INORGANIC CHEMISTRY TOPICS (1 – 14)

Important terms are written in italics.

- Alkali and alkaline earth metals and their compounds.
structure of sodium and potassium chloride, hydroxide, alkali and alkali earth metal ions, structure of magnesium and calcium chloride, sulfate and carbonate, role of calcium in biological systems, structure and utilization of barium sulfate
- Boron and aluminium family metals. Arsenic, antimony, bismuth and their compounds. *boric acid as a Lewis acid, Amphoteric hydroxides. Double salts of aluminium. Poisonous property of arsenic.*
- Carbon. Allotropes of carbon. CO and carbon dioxide, carbonic acid, cyanides.
different hybridization of diamond and graphite, coordinative bond in CO, CO as a poison, structure of carbon dioxide, green house gases, equilibrium of carbonic acid, hardness of water caused by alkali earth metal hydrocarbonates; cyanides as poisonous compounds.
- Silicon and derivatives. Tin and lead and their compounds.
silicon as semiconductor, poisonous effects of lead, removal of lead ions by EDTA, different oxidation states of Sn and Pb
- Properties of nitrogen. The nitrogen cycle. Ammonia, hydrazine and hydroxylamine. Oxides of nitrogen. Oxiacids containing nitrogen. Nitrites and nitrates.
structures of nitrite/nitrate, oxides of nitrogen, ammonia, possible oxidation states of nitrogen.
- Phosphorus and its compounds: allotropes, oxides, oxiacids, phosphates.
different phosphoric acids, biological role of phosphates
- Oxygen and its compounds: allotropes, oxides, peroxides, superoxides.
ozone, ozone shield, free radicals of oxygen, Haber-Weiss reaction, Fenton-reaction.
- Properties of water.
surface tension, maximal density at 4°C, hydrogen bondings and their role in the high boiling point, constant and removable hardness of water
- Sulfur and its compounds: allotropes, oxides, oxiacids, sulfides, sulfites, sulfates, thiosulfates.
structures of sulfide, sulfite, sulfate, thiosulfate ions, practical aspects of the dilution of sulfuric acid
- Characteristics of halogens. Fluorine, bromine, iodine and their compounds.
electron configuration of halogens, H-bond formation of fluorine in compounds, fluorine in teeth, structures of the oxyanions of bromine and iodine, Lugol solution, reaction of iodine with starch, principles of iodometry
- Chlorine and its compounds.
structures of oxyanions of chlorine, formation of NaOCl, properties of HCl and NaCl
- Hydrogen. Noble gases. Air and air pollution.
isotopes of hydrogen, ions of hydrogen, explosive mixtures of hydrogen, electron configuration of noble gases, artificial air, composition of air, main pollutants (NO, CO, carbon dioxide, oxides of sulfur)
- Transition elements. Manganese, iron, cobalt and their compounds. Copper, zinc, mercury and their compounds. Precious metals.
role of KMnO₄, different oxidation states of iron, organic iron compounds, poisonous effect of heavy metals, photosensitivity of silver halogenides, utilization of platinum electrodes
- Nomenclature of inorganic compounds.
system of the endings of differently oxidized salts of inorganic acids, nomenclature of acidic and basic salts, names of compounds containing more identical atoms or ions.

ORGANIC CHEMISTRY TOPICS (1 – 22)

Note: Chapter numbers correspond to the 2nd edition of Bauer-Csermely-Hrabák: Principles of Organic Chemistry (2007).

Important terms are written in italics.

COVALENT BONDING IN ORGANIC COMPOUNDS

(Chapter 2)

1. The central role of carbon atoms in organic chemistry. Chemical bonds. Hybridization of atomic orbitals, the hybrid states of carbon, resonance and delocalization in organic compounds.
sp, sp², sp³ hybridization, promotion of carbon, aromatic compound, antiaromatic compounds, benzenoid compound

DIPOLE MOMENTUM AND GENERAL ACID-BASE PROPERTIES OF ORGANIC COMPOUNDS

(Chapter 3)

2. Polar covalent bond, dipole moment, molecular dipoles. Acid-base character of organic compounds.
Dipole momentum, Debye unit, polar covalent bond, resonance structure, resonance energy, ring strain, torsional strain

THE STERIC STRUCTURE OF ORGANIC MOLECULES. ISOMERISM AND TERMINOLOGY.

(Chapter 4)

3. Principles of constitution, configuration and conformation isomerism
4. Types of constitution isomerism: branching (backbone) isomerism, position isomerism and tautomerism.
5. Configuration in organic chemistry: geometric (cis-trans) and optical (stereo) isomerism. Chirality and prochirality, stereogenic (chiral) centers, enantiomers and diastereomers. Racemic mixtures and meso compounds.
6. Terminology of chiral compounds: relative and absolute configuration, the D/L and the R/S systems. Stereochemical numbering.
7. Conformation in organic chemistry
Configuration, conformation, connectivity, isomer, constitutional isomer, chiral molecule, achiral molecule, angle strain, asymmetric carbon, absolute configuration, relative configuration, enantiomers, meso compound, Newman projection, optically active compound, plane of symmetry, plane polarized light, prochiral, R/S system, D/L system (Fisher projection), racemic mixture, stereogenic center, geminal substituents, vicinal substituent, disjunct, conjugated double bonds, cumulated double bonds, isolated double bonds, prochirality, diastereomers

CLASSIFICATION OF ORGANIC COMPOUNDS

(Chapter 5)

8. Classification of organic compounds according to the main functional groups
9. Reaction types and reaction mechanisms in organic chemistry.
S_N1 reaction, S_N2 reaction, functional group, homologous series, homolytic bond breaking, heterolytic bond breaking, nucleophile reactant, electrophile reactant, electrophilic, nucleophilic, radical reactions, addition, substitution, elimination, Markownikow rule, 1-1 example for fundamental reaction types in organic chemistry (e.g. nucleophile addition), rearrangement reactions, regioselective reaction

MAJOR FUNCTIONAL GROUPS AND THEIR REACTIONS

(Chapter 6)

10. Structure and reactions of alkanes: nomenclature, conformational analysis, radical reactions.
11. Structure and reactions of alkenes and alkynes: nomenclature, sigma and pi bonds, the triple bond, the cis-trans and the Z/E nomenclature of isomers. Electrophilic addition type of reactions. Hydrohalogenation. Markownikow's rule. Dienes, conjugation and resonance. Electrophilic addition of 1,3-butadiene.
12. Structure, synthesis and typical reactions of alkyl halides. Nucleophilic substitutions: the S_N1 and S_N2 reactions.
13. Structure and reactions of homoaromatic compounds. Benzene and polycyclic compounds. Resonance stabilization in aromatic compounds and the Huckel's rule.
14. Mechanism of electrophilic substitution of aromatic compounds. Effect of substituents of the aromatic ring on the reaction rate and product formation in further electrophilic substitution type of reactions.
15. Classification, structure, physical and chemical properties and reactions of organic hydroxyl compounds (alcohols, enols, phenols). Formation of ethers and esters.
16. Classification and nomenclature of ethers (epoxides, hemiacetals, acetals). Electronic structure of open-chain and cyclic ethers; physical properties, miscibility, chemical reactivity: coordinative bonding, basicity, Zeisel test, nucleophilic attack of epoxydes, peroxyethers.
17. Structure, nomenclature, chemical-physical properties, biological role and characteristic reactions of carbonyl compounds (aldehydes, ketones). Important nucleophilic addition reactions (addition of simple inorganic molecules; dimerisation, polymerisation, aldole formation, acetal formation, formation of ketimines, oximes, hydrazones, Schiff's bases).
18. The electronic structure of the carboxylate anion, the most important mono-, di- and tricarboxylic acids. Condensation type reactions of organic acids: ester- and anhydride-formation, lactones. Decarboxylation of organic acids. The decarboxylated products of amino-, hydroxy- and keto acids.
19. Halogen-, hydroxy-, oxo- and amino derivatives of carboxylic acids.
20. Organic thio-compounds. Thioalcohols, thioethers, sulfinic and sulfonic acids.
21. Amino- and imino-derivatives of hydrocarbons: their formation, classification and basic character. The principal reactions of organic amines: acylation, reaction with HNO_2 , deamination, transamination.
22. The most important representatives of organic amines in living organisms. The amine derivatives of carbonic acid: carbamoyl-P, urea, guanidine, creatine, barbiturate.
Alkane, alkene, alkyne, Huckel's rule, olefin, paraffin, alcohols, enols, phenols, bond order, alkoxy, aryloxy, tautomer, α -unsaturated alcohol, ether formation, ester formation, dehydration, epoxide, hemiacetal, acetal, Zeisel test, peroxyethers, thiol, thion, thioether, disulfide, sulfide, sulfoxide, sulfone, sulfonate, carbonyl group, aldehyde, ketone, quinone, β -unsaturated carbonyl compounds, amphoterism, desmotropism, protective groups, dimerization, paraformaldehyde, glycosides, furanose, pyranose, Schiff-base, hydrazine, oxime, strong and mild oxidation of oxo-compounds; Tollens test; Fehling test, Cannizzaro reaction
ester, anhydride, amide, halogenide, azide, aminoacid, fatty acid, carboxylate, dimerization of carboxylic acids, nucleophilic acylation, alpha substitution, driving forces of esterification, cyclic esters, soaps, transesterification, transamination, polyesters
nitroso, nitro, oxime, amine, imine, amide, nitrile, isonitrile, cyanate, isocyanate, imide, hydrazine, hydrazide, azo, electron distribution within the most important functional groups: acid-base properties (primary, secondary... amines), conjugation effect, amphoterism of imidazole, structure of the amide bond, restricted rotation and isomerism, tautomerism of nucleotide bases, Schiff-base formation, isocyanate formation

TOPICS FOR THE LAB EXAM (1 – 19)

1. The factor of titrating solutions; factorization of HCl
2. The factor of titrating solutions; factorization of NaOH
3. Titration of strong acids with NaOH
4. Titration of acetic acid with NaOH
5. Titration of gastric fluid
6. Principles of the electrometric titration of phosphoric acid and plotting the titration curve
7. Determination of Cl^- concentration by means of precipitation titration
8. Permanganometry: principles, factorization of the titrating solution
9. Permanganometry: determination of Fe^{2+} concentration
10. Iodometry: principles, factorization of titrating solution
11. Iodometry: principles, determination of sodium hypochlorite concentration
12. Complexometric titration: determination of unknown Cu^{2+} concentration
13. Complexometric titration: determination of Ca^{2+} and Mg^{2+} concentration of the same solution
14. Conductometry: description of the conductometer, determination of the cell constant
15. Determination of the ionization constant of acetic acid by conductometry
16. Spectrophotometry: determination of the absorption spectrum of phenol red and plotting the calibration curve of the dissociated phenol red anion
17. Spectrophotometric determination of the ionization constant of phenol red
18. Electrochemistry: measurement of the electromotive force of the Daniell element; studying the effect of electrolyte concentration on the electromotive force
19. Electrochemistry: experiments with iron redox electrodes as well as with redox systems of biological relevance

The 10 structures asked in the semifinal exam will be selected from the following list

Inorganic acids and other compounds: sulfuric acid, sulfurous acid, nitric acid, nitrous acid, hydrochloric acid, hydrobromic acid, hypochlorous acid, chlorous acid, chloric acid, perchloric acid, hypobromous acid, bromous acid, bromic acid, perbromic acid, hydrogen cyanide, metaphosphoric acid, orthophosphoric acid, boric acid, carbonic acid, water, ammonia, hydrazine, hydroxylamine, hydrogen peroxide, superoxide anion, pyrophosphate anion, hydrogen sulfide, carbon monoxide, carbon dioxide, nitrous oxide, nitric oxide, sulfur dioxide, sulfur trioxide, hydroxyapatite, fluoroapatite, ferrous ammonium sulfate

Any inorganic salts and bases consisting of the following cations and anions:

Cations: ammonium, sodium, potassium, magnesium, calcium, ferrous, ferric, cuprous, cupric, zinc, silver, aluminium, mercurous, mercuric, manganese

Anions: hydroxide, oxide, fluoride, chloride, bromide, sulfide, sulfate, sulfite, hydrogen sulfate, thio-sulfate, nitrate, nitrite, hypochlorite, chlorite, chlorate, perchlorate, hypobromite, bromite, bromate, perbromate, cyanide, phosphate, monohydrogen phosphate, dihydrogen phosphate, carbonate, hydrogen carbonate (bicarbonate), permanganate, chromate, ferricyanide

Hydrocarbons: alkanes, alkenes and alkynes (up to carbon number 8, both normal- and branched-chain isomers); 1,3-butadiene, 2-methyl-1,3-butadiene (isoprene)

Aromatic rings: benzene, naphthalene, phenanthrene, pyrrole, thiophene, furane, thiazole, oxazole, imidazole, pyrazole, pyridine, pyrane, pyrazine, pyrimidine, purine, indole, pteridine, acridine

Small organic compounds: methanol, ethanol, propanol, isopropanol, n-butanol, ethylene glycol, glycerol, inositol, phenol, diethylether, formaldehyde, acetaldehyde, acetone, mercaptoethanol, aniline, urea, guanidine

Organic acids: formic acid, acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, oxalic acid, malonic acid, succinic acid, glutaric acid, maleic acid, fumaric acid, lactic acid, β -hydroxybutyric acid, pyruvic acid, acetoacetic acid, citric acid, cis-aconitic acid, isocitric acid, α -ketoglutaric acid, malic acid, oxaloacetic acid

Types of bondings and derivatives: ether, phenolether, thioether, ester, lactone, thioester, anhydride (including mixed and phosphoric acid anhydrides), hemiacetale, hemiketale (cyclic forms included), Schiff-base, oxime, hydrazone, hydroxamic acid, amide, thiol, sulfinic acid, sulfonic acid, sulfoxide, acyl chloride.

Teaching Secretary	Dr. Gergely Keszler Tel.: (+36-1) 4591500/ext. 60132
Student Affairs Secretary	Mr. Zsolt Ozsváth Tel: 4591500/ext. 60061
Lab coordinator	Dr. Gergely Keszler
Lab Staff	Mrs Mária Kövecses Mrs Márta Stroe Mrs Kinga Pelczer

Laboratory programs are on the 1st floor, Department of Medical Chemistry, Molecular Biology and Pathobiochemistry, „D” passage.

MEDICAL BIOCHEMISTRY I.

Department of Medical Biochemistry

Second (spring) semester

Neptun code: AOKOBI463_1A

Credit: 3

Director of the course: Tretter László MD, PhD, DSc

End semester requirement: practice mark

The aim of the curriculum is to learn and understand the structure-function aspects of biologically important macromolecules (proteins, nucleic acids, lipids and complex carbohydrates) and that of their building blocks (amino acids, nucleotides, sugars and lipids). The enzymology module deals with the mechanism and efficiency of the *in vivo* biochemical reactions focusing on their organization into metabolic pathways, their regulation and effectivity. The bioenergetics module focuses on the energy and metabolite fluxes of the human body and also settle the basis of the thermodynamically approach of intermedier metabolism.

- The role of proteins in the living world. The chemical structure of proteinogenic amino acids. – Nucleotides and their carbohydrate components.
- *The peptide bond. The primary, secondary and tertiary structure of proteins.* Acid-base characteristics of amino acids, their titration curves. The isoelectric point of amino acids and their calculation.
- *The quaternary structure of proteins. The biochemical basis of protein-nucleic acid interactions. Covalent modifications of proteins.* Important methods in protein chemistry.
- Preprotein forms of proteins eg. procollagen-collagen. Comparison of the structure-function

aspects of myoglobin and haemoglobin. – Methods of protein purification and the determination of concentrations of proteins.

- *General characteristics of enzymes. The thermodynamics of enzymatic reactions. Activation energy, transitional state. Isoenzymes. The role of coenzymes in the enzymatic reactions. Biochemical calculations*
- *Enzyme kinetics. The initial rate. The Michaelis-Menten equation. The Michaelis-Menten constant and its meaning. Double reciprocal representation of the Michaelis-Menten equation. The quaternary structure of proteins. The biochemical basis of protein-nucleic acid interactions. Covalent modifications of proteins*
- *Serine proteases and their mechanism of action. Reversible and irreversible inhibition of enzymes. Competitive, non-competitive and uncompetitive inhibition of enzyme activities. The theory of allostery and cooperativity. – Determination and biological importance of kinetic parameters in theory and in clinical practice.*
- *Different levels of the regulation of enzymatic activities: regulation through compartmentalization, by the transcriptional regulation of enzyme protein expression and with the modification of their catalytic activities. Regulation of enzyme activity by proteolysis. The enzyme kinetics and thermodynamics of metabolic pathways. The strategy to find the regulated step(s) of metabolic pathways. Enzymology 1. The most important carbohydrates of the body and their presence in foodstuffs. Enzymology 2.*
- *The most important lipids of the body and their distribution in various foodstuffs. Role of the structures of carbohydrates and lipids in the human body*
- *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. The macrocomponents of nutrients: carbohydrates, lipids and proteins.*
- *The synthesis of ATP. ATP production by substrate level phosphorylation. Oxidative phosphorylation, the production of ATP in mitochondria. The redox reactions of terminal oxidation (electron transport chain, ETC). The enzyme complexes of ETC. The microcomponents of nutrients.*
- *Exergonic reactions in the ETC and the production of ATP. The mechanism of action of ATP synthase. The regulation of ATP production by the energy demand of cells. The P/O ratio. The inhibitors of oxidative phosphorylation. Uncoupling agents. Heat production in special tissues of the body. Bioenergetics I*
- *The connections of mitochondrial energy production and different biochemical pathways of cells.*
- *The reactions of the citric acid cycle and the regulation of the pathway. Bioenergetics II.*
- *The sources of acetyl-CoA in the citric acid cycle*

Participation at the practices and consultations are compulsory. There will be no make-up practices or consultations offered. If you miss more than three practices or consultations (unexcused absence) your semester will be taken as invalid. You must be on time when practices are started. Arriving more than ten minutes later than the start time that practice or consultation will be taken as a missed one (you can stay in the room and listen to the teacher or lecturer but cannot carry out the experiment at that occasion).

At each practice between the third and twelfth weeks small quizzes will be written (altogether ten times). The questions will be selected from the previous weeks' lecture and practice material. There are no make-ups given. Answers will be graded as passed (between 55-100%) or failed (below 55%) by your lab teacher. At the end of the semester failed quizzes can be corrected in an exam having a written and an oral part. At least eight successful quizzes have to be collected in order to get a signature validating your semester. Grading $\geq 75\%$ excellent (750 points from the possible 1000); 74 – 55% satisfactory; 54 – 0 % fail. Failed students have to repeat the semester. Ps. **Unexcused absences from a quiz will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from a quiz, your final grade will be based on a percentage of the total possible points for the quizzes you have taken.**

MOLECULAR CELL BIOLOGY I.

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Director of the course:

Prof. Gábor Bánhegyi M. D., Ph. D., D. Sc.

Mandatory course

credit: 6

Second (Spring) Semester

Description of the curriculum

1. Eucaryotic and procaryotic cell, the genetic information.
2. Basic concepts of molecular cell biology, structure and function of nucleic acids.
3. The chromosomes and the organization of DNA.
4. The replication, repair and recombination of DNA.
5. Mobile genetic elements, viruses.
6. Transcription, RNA processing and modification, snRNA, hnRNA. The RNA world.
7. The genetic code and translation.
8. Posttranslational modification of proteins, folding and quality control.
9. Proteostasis, the ubiquitin-proteasome system, the types of autophagy.
10. The regulation of gene expression, nuclear receptors.
11. Transcriptional factors, DNA-binding domains.
12. Evolution of genes and the genome, epigenetics.
13. Methods in molecular biology.
14. Bioinformatics, systems biology.

Textbooks

Lodisch, Berk, Kaiser, Krieger, Bretscher, Ploegh, Amon, Scott: Molecular Cell Biology
Alberts, Johnson, Lewis, Morgan, Raff, Roberts, Walter: Molecular Biology of the Cell

MEDICAL PROFESSION

Lecturer: Prof. László Kalabay MD PhD
Institute: Department of Family Medicine
Duration: One semester, lectures: 6x2 hours, practices: 6x3 hours/semester
Exam: Practical mark (written exam)
Credit value: 2 credit points
Minimum/maximum group size: 55/210

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.

Application: Péter Torzsa MD Tel: 355-8530 e-mail: ptorzsa@gmail.com

Application date: 30th January

Precondition: Only for students in the 1st year.

MEDICAL SOCIOLOGY

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

Director of the course: Prof. Dr. József Kovács

Credit: 2

Course leader: Zsuzsa Szanto (szanto.zsuzsa@med.semmelweis-edu.hu)

Teachers: Bence Döbrössy e-mail: dobrossy.bence@chello.hu

Katalin Kovács e-mail: kovacs@demografia.hu

Week	Class type	Themes
Week 1	Introduction: the changing patterns of disease; basic concepts of sociology	lecture
Week 2	Health and illness behaviour	lecture
Week 3	Professions and professional socialization	Lecture
Week 4	Social inequalities in health and in mortality	Lecture
Week 5	Health care	Lecture
Week 6	Contemporary problems of health care	Lecture
Week 7	Midterm exam	
Week 8	Introduction to practices, guide to reading the literature and doing the presentations	Practice
Week 9	Social class, income and work	Practice
week 10	Age, gender and marital status	Practice
Week 11	Ethnicity and migration	Practice
Week 12	Labelling and stigma	Practice
Week 13	Doctor-patient relationship, medicalization, pharmaceuticalization	Practice
Week 14	Social movements in the field of health	Practice

The course consists of: (lecture, seminar, laboratory exercise):
7 lectures, 7 seminars.

Course requirements, methods of monitoring:

To obtain signature for absolving the course students have to participate at a minimum of 10 classes. Participation is documented through catalogues. A midterm exam is taken after the 6th lecture. It is also required to submit a home paper or a class presentation in course-related topics by the end of the semester. The course ends with an exam; the grade may include the results of the midterm and the home assignment.

Supplement possibilities: based on the SE's exam regulation.

Absence may be justified by a medical a medical document at the next class. One seminar per semester can be supplemented by an extra assignment given by the teacher or attending the same class with another group.

Textbook:

1. Graham Scambler (2008): Sociology as Applied to Medicine. Saunders, London
2. Handouts for the lectures will be accessible on the homepage of the Institute of behavioural Sciences: www.magtud.sote.hu.

INTRODUCTION TO MEDICAL INFORMATICS

Institute of Digital Health Sciences

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)

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.

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. Substitution is possible according to a discussion with the teacher.

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.

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):

Suitable percentage of participation.

The mode of acquisition of the mark:

Practical exercise

Order of the modification of exam application:

According to Studies and Exams Code.

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 use of educational materials on the institute website is obligatory: www.semelweis.hu/dei

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”.

TERMINOLOGY OF MEDICINE (1st semester)

Responsible organisational unit:

Faculty of Health Sciences, Division of Foreign Languages and Communication

Programme director:

Zöldi Kovács Katalin PhD, Head of the Division

2 lessons per week, 2 credits

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.

Basics of Foreign Language (module 1.)

Magyar orvosi szaknyelv 1.

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, 4 credits,

Assessment: end-term written and oral exam

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 first module students acquire basic structures and the vocabulary for everyday topics / e.g. shopping, food, housing etc./, language for „survival.“ The course places special emphasis on phrases essential for everyday communications, e.g. introductions, greetings, getting/giving information etc. Grammar is of less importance in this phase of language studies.

Course content of practical lessons:

Lesson 1-2:	The alphabet
Lesson 3-4:	Greetings
Lesson 5-6:	Where are you from?
Lesson 7-8:	Introducing people
Lesson 9-10:	Numbers-phone numbers
Lesson 11-12:	What time is it?
Lesson 13-14:	Practising telling the time
Lesson 15-16:	Days
Lesson 17-18:	When do you study?
Lesson 19-20:	What is it? - food
Lesson 21-22:	Consolidation
Lesson 23-24:	Test 1 + situations
Lesson 25-26:	What is the food like? - adjectives
Lesson 27-28:	What do you think of English tea?- giving opinions
Lesson 29-30:	I would like a tea
Lesson 31-32:	Shopping for food
Lesson 33-34:	Ordering food- in a café
Lesson 35-36:	Rooms in the flat
Lesson 37-38:	Furniture in the rooms
Lesson 39-40:	Where are the furniture?
Lesson 41-42:	As a guest
Lesson 43-44:	At a party
Lesson 45-46:	Where can I find the library?
Lesson 47-48:	When shall we meet?

Lesson 47-48:	Asking for information, setting programs
Lesson 49-50:	Places in the city
Lesson 51-52:	Consolidation
Lesson 53-54:	Test 2 + situations and communication practice
Lesson 55-56:	Assessment

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

Gyöngyösi Livia – Hetesy Bálint. *Hungarian language: Jó reggelt!* Semmelweis Egyetem Egészségtudományi Kar, 2010.

Basics of Foreign Language (module 2.)

Magyar orvosi szaknyelv 2.

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 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 second module students acquire basic structures and the vocabulary for everyday topics (e.g. family, relatives, at the doctor's etc.) language for "survival". The course places special emphasis on phrases essential for everyday communications, e.g. likes, dislikes, offering help, etc. Grammar is of less importance in this phase of language studies.

Course content of practical lessons:

Lesson 1-4:	Forming questions
Lesson 5-6:	Plural forms
Lesson 7-8:	What do you like doing in your free time?
Lesson 9-10:	I would like to.....
Lesson 11-12:	Communication skills
Lesson 13-14:	A date – what do you like?
Lesson 15-16:	I like dancing, swimming etc.
Lesson 17-18:	I can ride a bike, drive etc.
Lesson 19-20:	Communication practice
Lesson 21-22:	Can I help you? In a clothes shop
Lesson 23-24:	Can I give you something else?
Lesson 25-26:	Communication practice
Lesson 27-28:	Consolidation
Lesson 29-30:	Test 1 + situations
Lesson 31-32:	I have a headache – at the doctor

- Lesson 33-34: At the chemist's
- Lesson 35-36: Communication practice – at the doctor, at the chemist's
- Lesson 37-38: My family, family members
- Lesson 39-40: Family relations
- Lesson 41-44: Communication practice- introducing your family
- Lesson 45-48: My boss' wife – social relations
- Lesson 49-50: Consolidation
- Lesson 51-54: Test 2 – situations, communication practice
- Lesson 55-56: Assessment

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

Gyöngyösi Livia - Hetesy Bálint. *Hungarian language: Jó napot kívánok!* Semmelweis Egyetem Egészségtudományi Kar, 2011.

Syllabus of Physical Education

Department of Physical Education

Subject: Physical Education I.

Type of Subject: Compulsory

Code of Subject: AOKTSI009_1A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

School year: 2018/2019

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: AOKTSI009_2A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

School year: 2018/2019

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

Nursing Course - 1 month, 170 hours

Proof of completion (Certification of completed famulus practice) must be submitted prior to registration to the next academic year.

Students who do not submit the certificate of completion on time will have their registration placed on hold until the proof of completion is received by the English Secretariat. Certificates can be downloaded at http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101

Please read more about the rules concerning the criteria of selecting the foreign clinical practice positions and accepting the practice period spent abroad: <http://www.semmelweis-english-program.org>

Week 1

- An introduction to the structure of a hospital as an institution for attending patients.
 1. In-patient department
 2. Out-patient department
 3. Auxiliary departments (X-ray, labs, physiotherapy, etc.)
 4. Departments of Administration (warden's office, cashier's office, etc.)
 5. Service departments (kitchen, storeroom, laundry, etc.)
- Getting acquainted with the ward and its connected parts
- The structure and hygiene of the ward
- Daily active participation in keeping order in the ward
- Getting acquainted with the equipment of the ward
- Cleaning beds and bedside tables after discharging of patients (cleaning, disinfection)
- Making beds with help and alone (for walking cases)
- Helping with discharging patients

Week 2

(practicing the things learnt in the previous week)

- Making beds with turnable bedcase (first with nurse's help)
- Use of comfort equipment (under supervision)
- Disinfectants in the ward
- Cleaning and sterilization of bedpans, urinals and spittoons
- Helping with taking temperatures, sterilization of thermometers
- Helping with serving food
- Helping with feeding bed patients

Week 3

(practicing the things learnt in the previous two weeks)

- Helping with making the beds of patients unable to move
- Helping with changing beds of patients unable to move
- Helping with moving active and passive patients in bed
- Helping with the patients' placing in chairs, stretchers and wheelchairs
- Helping with the washing of not seriously ill patients, mouth hygiene and nail care
- Helping with the dressing and undressing of the patients
- Taking temperatures
- Practicing how to feel the pulse
- Helping with keeping linen cupboards, wardrobes and equipment clean and tidy

Week 4

(practicing the things learnt in the previous 3 weeks)

- Attending patients in the morning without help (washing, cleaning the mouth and nails, combing, making beds)
- Helping with comfort equipment without help
- Helping with cold and warm treatment, applying compresses, stupes, ice bags, thermofors
- Practicing to keep temperature and pulse charts
- Working with syringe, practicing pumping
- Helping to sterilize the syringe (the importance of sterilization)
- Helping with preparing and sending samples to the labs, filling up guide slips
- Staying in the lab for one or two days, or 12 hours per day favourably in the department's lab helping and practicing urine analysis

Before starting the practice, it is advisable that the head nurse or an experienced nurse should give introductory explanations.

BASIC MODULE



Faculty of Medicine
2nd year

STUDY PROGRAMME

Second Year

3 rd semester					
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination
AOKANT003_3A	Anatomy, Cell, Histology and Embryology III.	3	4	7	semi-final
AOKELT226_1A	Medical Physiology I.	6	5	10	semi-final
AOKOBI290_2A	Medical Biochemistry II.	3	2,5	5	semi-final
	Molecular Cell Biology II.	3	0	3	final
AOKLEK228_3A	Hungarian Medical Terminology III.	-	4	2	pract. mark
AOKTSI009_3A	Physical Education III.	-	1	-	signature
AOKMAG398_2A	Medical Communication	1	1	2	semi-final
Total Number of Credit Points from Compulsory Subjects				29	
Obligatory elective subjects					
AOVCSA249_1A	Introduction to Clinical Medicine	-	2	2	pract. mark
4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory electives and electives after the 3rd year curriculum					
Total Number of Credit Points from Obligatory elective / Elective Subjects				4	

* The prerequisite is that registration has been done for the marked subject – corequisite – as well

Second Year

4 th semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKANT003_4A	Anatomy, Cell, Histology and Embryology IV.	1	2	3	final#	Anatomy, Cell, Histology and Embryology III.
AOKELT226_2A	Medical Physiology II.	6	4,5	10	final#	Medical Physiology I.
AOKOBID290_3A	Medical Biochemistry III.	3	2,5	5	final#	Medical Biochemistry II.
AOKLEK228_4A	Hungarian Medical Terminology IV.	–	4	2	pract. mark	Hungarian Medical Terminology III.
AOKTSI009_4A	Physical Education IV.	–	1	0	signature	–
AOKNSG331_1A	Compulsory Nursing Practice (in summer, either after the 1st year or the 2nd year)	–	170 hours workload	–	signature	–
Total Number of Credit Points from Compulsory Subjects				20		

4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory electives and electives after the 3rd year curriculum

* The grade influences the qualification of the Diploma

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 Cockerham, William C.: Medical Sociology. Prentice Hall, Upper Saddle River, 2006.
- 4 Marthy A. & Végh Á. Egészségére! Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.

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.

ANATOMY, HISTOLOGY AND EMBRYOLOGY III– IV.

Department of Anatomy, Histology & Embryology

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

Dr. Sándor Katz

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 lectures in cell biology and histology: Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic tissues (epithelial, connective, muscle and nervous). 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 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 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.

Discussion of the more complicated chapters of embryology is presented on small group discussions connected to the practical sessions in the dissecting room.

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.

The knowledge of the students will be checked by mid-term tests.

TOPICS OF THE LECTURES:

Lectures: first semester: 3×45 min; second semester: 3×45 min; third semester: 3×45 min; fourth semester: 1×45 min.

First semester: Gross anatomy of musculoskeletal system (i.e. bones, joints and muscles), basic cytology, general histology, general embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera and body cavities; integrated gross anatomy, cytology, histology and embryology.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology.

Fourth semester: Topographical anatomy of the head, neck, limbs and trunk including body cavities (thorax, abdomen, pelvis), ventral and dorsal regions, cross sectional anatomy.

PRACTICAL COURSE

6×45 min; second semester: 6×45 min; third semester: 4×45 min; fourth semester: 2×45 min;

First semester: Gross anatomy of the musculoskeletal system (i.e. bones, joints, muscles, vessels and nerves), basic cytology, general histology, general embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera, topography of body cavities; integrated gross anatomy, cytology, histology and embryology.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology. Topographical anatomy of the dorsal regions of limbs and the trunk, including spinal cord. Topographical anatomy of the viscerocranium, neurocranium and the internal organs of the neck.

Fourth semester: Topographical anatomy of the ventral and dorsal regions of the body, including the limbs and body cavities (thorax, abdomen, pelvis), cross sectional anatomy.

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 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

Type of exams: oral and written

First, second and third semesters: semifinal examination, fourth semester: final exam

Semifinal examinations consist of written and oral (practical and theoretical) parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Histology (digitized slides)
3. Anatomy (prosected specimens)

Final examinations consist of written and oral (practical and theoretical) parts:

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Histology (2 slides) including relevant theoretical questions
3. Oral theoretical question in Maxillofacial Anatomy
4. Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions

Topics: Subject matter of all the 4 semesters in Anatomy, Histology and Embryology

First semester: semifinal; second semester: semifinal; third semester: semifinal;

fourth semester: final exam from the subjects of the four semesters.

ECTS credits: four semesters together: 27 (first semester: 8; second semester: 9; third semester: 7; fourth semester: 3)

Anatomy books

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
- 3 Elsevier; 2014; ISBN 9780702051319
- 4 **THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System**, 2014 by Schuenke, ISBN: 9781604069228
- 5 **THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy**, 2016 by Schuenke, ISBN: 9781626231207
- 6 **THIEME Atlas of Anatomy, Internal Organs**, 2016 by Schuenke, ISBN: 9781626231665
- 7 **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
- 8 **Netter: Atlas of Human Anatomy**, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.
- 9 Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.

- 10 **Stevens & Lowe's Human Histology**, Elsevier, 4th ed ISBN 978-0-723435020, 2015.
- 11 **Langmann's Medical Embryology**, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- 12 **Fitzgerald's Clinical Neuroanatomy and Neuroscience**, 7th Edition, Elsevier, 2015.
- 13 **Histology: A Text and Atlas: With Correlated Cell and Molecular Biology**; 7th Edition by MH Ross and W Pawlina; Wolters Kluwer 2015, ISBN 9781451187427

Recommended textbooks:

- 14 **Gray's Anatomy. The Anatomical Basis of Clinical Practice**; 41st edition by S. Standring; 2015 ISBN : 9780702052309
- 15 **Anatomy, A Photographic Atlas**, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2
- 16 **Bräuer: Sobotta Flashcards** (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
- 17 **KL Moore–AF Dalley: Clinically Oriented Anatomy**. 4th ed. Lippincott William and Wilkins, 1999.
- 18 **RMH McMinn: Last's Anatomy, Regional and Applied**. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
- 19 **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
- 20 **Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition** by B Young, G O'Dowd and P Woodford
- 21 Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
- 22 **Junqueira's Basic Histology: Text and Atlas**; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033
- 23 **The Developing Human – Clinically Oriented Embryology**, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
- 24 **Regional Anatomy**, by T Tömböl, Medicina 2008, ISBN 963 242 186 8
- 25 **Imaging Atlas of Human Anatomy**, 4th Edition by Jamie Weir, Peter Abrahams, Jonathan D. Spratt, and Lonie Salkowski ISBN: 9780723434573 Copyright: 2011
- 26 **Sectional Anatomy – Workbook**, by A. Nemeskéri; István Apáthy's Foundation, 2001.
- 27 **Histology Manual** 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2001.
- 28 **Neuroanatomy An Illustrated Colour Text**, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864

2nd year 1st semester

English Program

Anatomy: Morphology, topography and clinically oriented anatomy of the central and peripheral nervous systems (CNS, PNS), organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology

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, mammary gland.

Embryology: Development of the central and peripheral nervous system, development of the organs of senses, together with their malformations

Credits: 7

Lectures: 3 hours/week

Dissection class: 4 hours /week

Histology laboratory: 12 hrs/semester

Week	Lectures	Dissection room	Histology lab
Week 1	1. Introduction to the study of the nervous system Meninges, hemispheres, the lateral ventricles 2. Differentiation of the neural tube, development of the spinal cord. Neural crest. Cranio-caudal and dorsoventral differentiation, malformations 3. Differentiation of the brain vesicles. Gross anatomy of the diencephalon, the III. ventricle.	Divisions of the brain, meninges, arteries and veins of the brain, surface structures of the hemispheres, basis cerebri. Specimen demonstration: dura mater, sinuses	–
Week 2	4. Macroscopy and development of the brain stem and cerebellum, IV. ventricle 5. Development and derivatives of the placode ectoderm and the neural crest 6. Blood supply to the brain, CSF circulation	Lateral ventricles, third ventricle Brain stem, fourth ventricle, cerebellum	–
Week 3	7. Gross anatomy and blood supply of the spinal cord, spinal segment. Dermatomes. 8. Microscopical structure of the spinal cord, Rexed zones. Spinal reflexes, receptors and effectors, proprioceptive reflex arc. 9. Nociceptive (withdrawal) and autonomic reflex arcs. Spinal pathways, injuries, symptoms	Cross sections of the brain. Specimen demonstration: spinal cord together with the membranes	–
Week 4	10. Cells of the CNS: neurons, glia cells. Axon, dendrite, synapses, synaptic transmission, 11. Microscopy of the cerebral cortex. Cortical fields, Brodmann areas 12. Sensory systems	1. Revision 2. Midterm test 1: Anatomy and development of the brain and the spinal cord	–
Week 5	13. Motor systems and tracts, pyramidal tract 14. Structure and connections of the basal ganglia. Motor pathways arising from the brain stem 15. Microscopy of the cerebellum, pathways. Functional considerations	Dissection of the back muscles, suboccipital trigone.	Nervous system I. Peripheral nerve, motor end plate, spinal cord, brain-stem
Week 6	16. Diencephalon, thalamic nuclei 17. Introduction to cranial nerves. Classification of sensory, motor and autonomic nuclei 18. Reticular formation, monoaminergic systems	'In situ' dissection of the spinal cord. Demonstration of the spinal ganglia, spinal nerves, membranes.	Nervous system II. Cerebellar and cerebral cortices Pineal body
Week 7	19. Microscopy of the brainstem 20. Trigeminal nerve, trigeminal neuralgia 21. Cranial nerves 3, 4, 6, 7. Central and peripheral paresis	'In situ' brain dissection, Demonstration of the membranes, ventricles, thalamus, brain stem, cranial nerve exits.	–
Week 8	22. Glossopharyngeal, vagus, accessory and hypoglossal nerves 23. Sympathetic nervous systems 24. Parasympathetic nervous systems. Autonomic innervation and reflexes of pelvic organs	Cranial nerves 5, 7 and 9. Dissection of the superficial and deep regions of the head (frontal, infraorbital, buccal, infratemporal, parotidomasseteric regions and the parapharyngeal space)	–
Week 9	25. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation 26. Inner coat of the eyeball, retina. Morphological basis for colour vision. 27. Optic nerve, visual pathway, visual cortex, disorders. Visual reflexes	Cranial nerves 10, 11 and 12 Dissection of the submandibular, carotid, median cervical regions	–

Week	Lectures	Dissection room	Histology lab
Week 10	28. Extraocular muscles and eye movements, conjugated eye movements, strabism. 3D vision 29. Protective and lacrimal apparatus of the eye. Development of the eye. Malformations. 30. Skin and appendages. Mammary gland	1. Midterm test 2. (written) Microscopy of CNS, cranial nerves 2. Dissection of the eye (coats and muscles, chambers, optic nerve)	-
Week 11	31. The organ of hearing in general. External ear, auditory tube, tympanic cavity, tympanic membrane, auditory ossicles 32. Bony and membranous labyrinth. Vestibular system 33. Spiral organ of Corti. Auditory pathway, auditory cortex	Dissection of orbit, extraocular muscles	Organs of special senses I. Eyeball, retina, lacrimal gland
Week 12	34. Development of the auditory and vestibular system. Clinical relevances 35. Olfactory and gustatory systems 36. Limbic system	Dissection and demonstration Tympanic cavity, inner ear, temporal bone	Organs of special senses II. Organ of Corti, palm skin, scalp skin, mammary gland
Week 13	37. The hypothalamo-hypophysial system. The pituitary gland 38. Endocrine organs: pineal body, thyroid, parathyroid, adrenal glands 39. Patient demonstration	Midterm test 3: Organs of special senses, head and neck regions	Endocrine organs Pituitary, thyroid, parathyroid, suprarenal glands, Endocrine cells in the testicle, ovary, corpus luteum and pancreas
Week 14	40. Drugs of abuse, opiates, endogenous cannabinoids and receptor mediated actions in the CNS 41. Research in the field of neuroscience 42. Research in the field of neuroscience	Revisions Brain in situ, cranial nerves	Revision

TOPICS OF THE SEMIFINAL EXAMINATION

Endocrine organs

- Gross and microscopical anatomy of the pituitary gland; development of the posterior lobe
- Blood supply, histology and development of the anterior and intermediate lobes of the pituitary gland
- Gross and microscopical anatomy of the pineal gland
- Gross and microscopical anatomy and the development of the thyroid gland
- Gross and microscopical anatomy and the development of the parathyroid gland
- Gross and microscopical anatomy and the development of the suprarenal gland
- Histology of the Langerhans islets
- Endocrine cells and function of the male and female gonads
- Microscopical structure of the eyeball
- Histology of the lacrimal gland
- Microscopical structure of the cochlea
- Microscopical structure of the skin (scalp and palm)
- Histology of the mammary gland (lactating and non-lactating)

Microscopical structure and development of the central nervous system

- Development and primary differentiation of the neural tube
- Development of the spinal cord; neurohistogenesis
- Differentiation of the prosencephalon vesicle; development of the hemispheres and the lateral ventricle
- Differentiation of the diencephalon vesicle, development of the third ventricle
- Differentiation of the mesencephalon and rhombencephalon vesicles, development of the fourth ventricle
- Roots, branches and components of the spinal nerves; spinal segment
- Fine structure (microscopy) of the spinal cord
- Neurons and function of the spinal proprioceptive (stretch) reflex
- Neurons and function of the spinal flexion (withdrawal) reflex
- Neurons and functions of the visceral reflexes
- Microscopical anatomy of the medulla
- Microscopical anatomy of the pons
- Microscopical anatomy of the midbrain
- Nuclei of the cranial nerves
- Microscopical anatomy of the cerebellum
- Afferent and efferent cerebellar connections
- Microscopical anatomy of thalamus, divisions, connections and transmitters
- Hypothalamus, hypothalamo-hypophyseal systems
- Microscopical anatomy of the basal ganglia, divisions, connections and transmitters
- Histology of the cerebral cortex; cortical fields
- Internal capsule, divisions
- Tracts of the protopathic sensibility (anterolateral system)
- Tracts of the epicritic sensibility (posterior funiculus/medial lemniscus)
- Corticospinal tract (pyramidal tract)
- Extrapyrarnidal system
- Limbic system (nuclei and tracts)

Gross anatomy and development of the peripheral nervous system

- Development, fate and differentiation of the cells in the neural crest
- Development of the peripheral nervous system
- Nuclei and branches of the IIIrd, IVth and VIth cranial nerves
- Nuclei of the trigeminal nerve; course and fiber composition of the branches of the ophthalmic (V/1) nerve
- Course and fiber composition of the branches of the maxillary nerve (V/2)
- Course and fiber composition of the branches of the mandibular nerve (V/3)
- Nuclei, course and fiber composition of the branches of the facial nerve (VII)
- Nuclei, course and fiber composition of the branches of the glossopharyngeal nerve (IX)
- Nuclei, course and fiber composition of the branches of the vagus nerve (X)
- Nuclei, course and fiber composition of the branches of the accessory (XI) and hypoglossal nerves (XII)
- Cervical plexus and its branches
- Brachial plexus and its short branches to the neck and shoulder girdle
- Lumbar plexus and its branches
- Sacral plexus and its branches
- General organization of the autonomic nervous system
- The sympathetic trunk
- Cranial part of the parasympathetic nervous system

Gross anatomy, histology and embryology of the organs of special senses

- Gross anatomy and microscopic structure of the fibrous coat of the eye ball (cornea, sclera)
- Gross anatomy and microscopic structure of the vascular coat of the eye ball (choroid, ciliary body, iris)
- Gross anatomy, microscopic structure and development of the nervous coat of the eye ball (retina)
- Neurons of the visual pathways; localization and microscopic structure of the visual cortex
- Gross anatomy, microscopic structure and development of the lens, accommodation
- Gross anatomy and content of the chambers of the eye, circulation of the aqueous humor; gross anatomy of the vitreous body
- Gross anatomy and function of the external ocular muscles.
- Visual reflexes
- Gross anatomy, microscopic structure of the eye lids; conjunctiva, Tenon's capsule and periorbit
- Gross anatomy, microscopic structure and development of the lacrimal apparatus
- Gross anatomy and development of the external ear and the tympanic membrane
- Gross anatomy and development of the tympanic cavity and the auditory tube
- Gross anatomy and development of the auditory ossicles; joints, muscles, and the mucous membrane of the tympanic cavity
- Sensory innervation and blood supply of the tympanic cavity
- Gross anatomy of the bony labyrinth
- Gross anatomy and development of the labyrinth
- Morphology, development and divisions of the vestibular apparatus
- Receptors and neuronal connections of the vestibular system
- Gross anatomy, microscopic structure and development of the cochlear duct and the organ of Corti
- Neurons of the auditory pathways
- Internal acoustic meatus
- Organ and pathways of olfaction
- Organ and pathways of taste

2nd year 2nd semester

English Program

Anatomy, Histology and Embryology: Topographical anatomy of the head, neck, limbs and trunk including body cavities (thorax, abdomen, pelvis), ventral and dorsal regions, cross sectional anatomy. Integrated approach including developmental and histological relevances.

Credits: 3

Lectures: 1 hours/week

Dissection class: 2 hours /week

Week	Lectures	Dissection room
Week 1	Topographical anatomy of the lower limb, gait mechanism	Ventral regions of the limbs (<i>prosections</i>) Lower limb (bones, joints, muscles, vessels, nerves)
Week 2	Topographical anatomy of the upper limb, axillary fossa	Ventral regions of the limbs (<i>prosections</i>) Upper limb (bones, joints, muscles, vessels, nerves)
Week 3	Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma.	Ventral regions of the thorax, mammary region (<i>prosections</i>) Topography and sectional anatomy. Mediastinum. Heart, valves, pericardium, lung, pleura.
Week 4	Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures.	Muscles and skeletal elements of the thorax. Diaphragm (<i>prosections</i>). Abdominal surface projections. Topography of intraperitoneal organs.
Week 5	Topographical and surface anatomy of the abdomen. Projection of internal organs, peritoneal relations	Abdominal wall, rectus sheath, hernia canals (<i>prosections</i>). Retroperitoneum. Urinary system. Cross sections of the abdominal cavity.
Week 6	Topography and sectional anatomy of the abdomen and the retroperitoneum. Arterious and venous anastomotic systems	Topography of the lesser pelvis. Syntopy and blood supply of the rectum. Portocaval anastomoses. Ventral regions of limbs (<i>prosections</i>)
Week 7	Topographical and sectional anatomy of the male pelvis and perineum.	Midterm test 1. Ventral regional anatomy of the trunk and the limbs. Body cavities, internal organs (except for the head&neck and the superficial perineal structures.
Week 8	Topographical and sectional anatomy of the female pelvis and perineum.	Dorsal regions of limbs and the trunk (<i>prosections</i>) Nape and nuchal region, spinal cord 'in situ', gluteal region.
Week 9	Topographical and sectional anatomy of the head. Spaces and content of the neurocranium.	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the male pelvis and perineum.
Week 10	Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve.	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the female pelvis and perineum.
Easter break		
Week 11	Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances.	Midterm test 2. Dorsal regions Topography of the head, neck, nuchal regions, trunk, limbs and perineum.

Week 12	Histological revision of ground tissues. Histology of vessels and lymphatic organs including cell biological relevances.	Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses.
Week 13	Histology of the respiratory system and the gastrointestinal tract including cell biological relevances.	Topographical anatomy of the nasal cavity¶nasal sinuses, oral cavity, muscles of facial expression and mastication, TMJ. Oral diaphragm, para- and retropharyngeal spaces. Muscles, fasciae, viscera and cross section of the head&neck region.
Week 14	Histology of the urinary and genital systems including cell biological relevances.	Prosected specimen demonstration of the final examination. Cross sections, placenta, fetus.

TOPICS OF THE FINAL EXAMINATION

See above at the semifinal examinations.

Furthermore

Regional anatomy

- Topographical anatomy of the lower limb, gait mechanism
- Topographical anatomy of the upper limb, axillary fossa
- Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma.
- Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures.
- Topographical and surface anatomy of the abdomen. Projection of internal organs, peritoneal relations
- Topography and sectional anatomy of the abdomen and the retroperitoneum. Arterious and venous anastomotic systems
- Topographical and sectional anatomy of the male pelvis and perineum.
- Topographical and sectional anatomy of the female pelvis and perineum.
- Topographical and sectional anatomy of the head. Spaces and content of the neurocranium.
- Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve.
- Topography of cervical fasciae and spaces, sectional anatomy of the neck.
- Clinical relevances.
- Topographical anatomy of the nape and nuchal region.

MEDICAL PHYSIOLOGY I.

Department of Physiology

Name of subject: Medical Physiology I.

Type of subject: Compulsory subject

Subject code: AOKELT466_1A

Credit Points: 10

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

Course Director: Dr. Péter Várnai, Full Professor

Tutor: Dr. András Balla

Year: 2018/2019

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:

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Trans-epithelial 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. Autonomic neurotransmitters and physiology of smooth muscle. Neuromuscular junction and physiology of skeletal muscle. Physiology of the heart I.: origin and spread of cardiac excitation.
5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).
6. Physiology of blood circulation: introduction. Hemodynamics, systemic circulation. Microcirculation.
7. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.
8. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.
9. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.
10. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.
11. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.
12. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. Acid-base balance: role of lungs and kidneys.
13. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
14. Secretory functions of the gastrointestinal tract. Digestion and absorption of food. Energy balance, quality and quantity requirement of food.

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 6; the practice hours per week are 5. The attendance of a minimum of 75% of practices (including seminars) 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.

Grading Performance in Seminars and Practices:

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. The following rules will be enforced during the short tests: electronic devices must be kept in the baggage; any form of communication is disallowed; students not complying with these rules will be disqualified immediately. Evaluating the work of the student is based on his/her classroom tests and performance practice in the regular period of the semester. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of the best written tests (the tests in the semester minus the three worsts) and the practical grade (also is expressed as a percentage) result a five-point scale:

0-54 %	= 1,
55-64 %	= 2;
65-74 %	= 3,
75-84 %	= 4,
85-100 %	= 5.

This grade is taken into account in the exams.

Obtaining signatures:

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.

Semi-final exam:

In the examination period the students have to give semi-final exam in the first semester.

Type and grading of exams:

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 and the lab work grade but a failed (1) theoretical question results in an overall failed (1) final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. 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 lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Requirements of the exams:

Semi-final exam: material of the Medical Physiology I.

Registration for the exam:

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

Modification of the registration for the exam:

Modification in the registration must be recorded through the NEPTUN system not later than 48 hours before the start of the exam.

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: AOKELT466_2A

Credit Points: 10

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

Course Director: Dr. Péter Várnai, Full Professor

Tutor: Dr. András Balla

Year: 2018/2019

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:

1. Haematopoiesis. Haemostasis, overview of immune system. Principles of the innate immunity.
2. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
4. Function of the adrenal cortex. Function of the thyroid gland.
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:

- 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 6; the practice hours per week are 4.5. The attendance of a minimum of 75% of practices (including seminars) 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.

Grading Performance in Seminars and Practices:

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. The following rules will be enforced during the short tests: electronic devices must be kept in the baggage; any form of communication is disallowed; students not complying with these rules will be disqualified immediately. Evaluating the work of the student is based on his/her classroom tests and performance practice in the regular period of the semester. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of the best written tests (the tests in the semester minus the three worsts) and the practical grade (also is expressed as a percentage) result a five-point scale:

0-54 %	= 1,
55-64 %	= 2;
65-74 %	= 3,
75-84 %	= 4,
85-100 %	= 5.

This grade is taken into account in the exams.

Obtaining signatures:

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.

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.

Type and grading of exams:

The final exam consists of practical, written and oral part. 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 final exam, but failed lab exam is taken into account in grading the final exam as fail (1) partial grade. The written and oral part of the final exam is held on the same day. The oral part consists of two theoretical questions (I-II). Failed (1) theoretical question results in an overall failed (1) final exam. The mathematical average of four or five partial grades (lab grade, written exam grade, two oral exam grades, and lab exam grade) gives the grade of the final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. 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 lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Requirements of the exam:

Final exam: material of the Medical Physiology I. and Medical Physiology II.

Participation in the final exam requires the completed "Anatomy, Cell, Histology and Embryology III" course with a successful exam.

Registration for the exam:

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

Modification of the registration for the exam:

Modification in the registration must be recorded through the NEPTUN system not later than 48 hours before the start of the exam.

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

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MEDICAL BIOCHEMISTRY II

Teaching Secretary: **Dr. István Léránt**

Fall Semester

Lecture topics	
Week 1	Transformation of energy, group transfers in metabolism. Biological oxidation. Role of mitochondria.
Week 2	Glycolysis. Formation of acetyl-CoA – pyruvate-dehydrogenase. The citrate cycle.
Week 3	Terminal oxidation, oxidative phosphorylation. Gluconeogenesis. Glycogen metabolism.
Week 4	Regulation of glycolysis and gluconeogenesis. Regulation of glycogen metabolism.
Week 5	Regulation of blood glucose level. Diabetes mellitus.
Week 6	Degradation and synthesis of various carbohydrates. Metabolism of lipids – overview. Absorption of lipids.
Week 7	Oxidation of fatty acids, ketone bodies. Synthesis of fatty acids.
Week 8	Lipoprotein metabolism. Cholesterol homeostasis: sources of cholesterol in the cell, absorption of dietary cholesterol and inter-organ transport of cholesterol. Disposal of cholesterol and the role of bile acids.
Week 9	Regulatory mechanisms in cholesterol homeostasis, metabolic receptors and their function in the liver, intestine and blood vessel wall. Biochemistry of atherosclerosis.
Week 10	Metabolism of amino acids: the fate of the amino group. Metabolism of amino acid: the fate of the carbon skeleton.
Week 11	Biosynthesis of nonessential amino acids and other amino acid derivatives. Synthesis and catabolism of purine nucleotides.
Week 12	Pyrimidine nucleotide metabolism. Synthesis of deoxyribonucleotides. Metabolism of porphyrins and bile pigments
Week 13	Metabolism of red blood cells. Red blood cell enzymopathies. Metabolism of skeletal and cardiac muscle, the role of SREBP, PPAR alpha and beta
Week 14	Intermediary metabolism of kidney, metabolism in kidney cortex and medulla. Regulation of the well-fed state and starvation.

Laboratory program and seminars – Fall Semester

Laboratory lessons and Seminars	
Week 1	Safety rules for work in the laboratory & Amidolytic activity of trypsin (laboratory lesson)
Week 2	Competitive inhibition of succinate dehydrogenase (laboratory lesson)
Week 3	Enzyme kinetics – computer simulation (laboratory lesson)
Week 4	Gene therapy (seminar)
Week 5	Oxidative phosphorylation in mitochondria (laboratory lesson)
Week 6	Lactic acidosis (seminar)
Week 7	Allosteric regulation of pyruvate kinase (laboratory lesson)
Week 8	Fructose intolerance & McArdle's disease (seminar)
Week 9	Digestion of lipids, role of bile acids (laboratory lesson)
Week 10	Signal transduction of insulin (consultation)
Week 11	Determination of serum cholesterol and triglyceride (laboratory lesson)
Week 12	Lipoprotein lipase, & carnitine deficiency (consultation)
Week 13	Purification of trypsin by affinity chromatography & Substrate specificity of trypsin and chymotrypsin. (laboratory lesson)
Week 14	Hereditary hyperammonemias & Vitamin B12 deficiency, methylmalonic acidemia (consultation)

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Student Affairs Secretary Mr Zsolt Ozsváth
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Lab coordinator Dr Katalin Bartha
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Lab staff Mrs Éva Vallinger
Mrs Ildikó Mártonffy

Laboratory programs are on the 1st floor, Department of Medical Biochemistry, 'C' passage.
Office of student affairs - 1.508 room, 1st floor, 'C' passage

MEDICAL BIOCHEMISTRY III

Teaching Secretary: **Dr. István Léránt**

Spring Semester

Lecture topics	
Week 1	Na^+ / K^+ ATP-ase. The permeability of cell membranes, P-type ATP-ase. Structure of Na^+ / K^+ ATP-ase. Na^+ / K^+ -ATP-ase isoforms. Regulation. Secondary active transports. Na-H exchange
Week 2	Chemical neurotransmission. Cholinergic neurotransmission. Biosynthesis of acetylcholine, receptors, acetylcholine esterase. Molecular mechanism of exocytosis
Week 3	Noradrenergic neurotransmission. Biosynthesis and metabolism of norepinephrine. Synaptic uptake. Molecular mechanisms of adrenergic, dopaminergic and serotonergic neurotransmission
Week 4	GABAergic neurotransmission. NO: Regulatory role of NO. Nitric oxide synthase. Guanylate cyclase. Molecular effects of nitric oxide
Week 5	Glutamatergic neurotransmission. General properties of ion channels. General properties of ion channels. Methods for studying ion channels.
Week 6	Structure of the K^+ channels. Methods for studying ion channels. The molecular mechanism of gating and permeation. <i>Haemostasis</i> : Pathobiochemistry of atherothrombosis and atherosclerosis. The role of cholesterol in the formation of atherosclerotic plaques. LDL oxidation and scavenger receptors. Risk factors of atherosclerosis related to cholesterol homeostasis (diabetes, hypertriglyceridemia). Biochemical background for prevention of atherosclerosis (Plant oils and alcohol consumption, exercise).
Week 7	Initiation of blood coagulation – Protein C and thrombomodulin. Termination of blood coagulation: inhibitors (antithrombin – heparin, hirudin, TFPI). Alternative pathway of blood coagulation: Factor XII. Fibrinolysis. Degradation of fibrin (D and E fragments): fibrinolytic enzymes (plasmin, elastase). Fibrin substrates, D-dimers. Activation of plasminogen: Glu-plasminogen (native), conformational and proteolytic modifications. Plasminogen activators (tPA and cofactors, uPA, streptokinase) Inhibitors of fibrinolytic enzymes, α_2 -plasmin inhibitor, plasminogen activator inhibitor-1 (PAI-1). Regulation of plasminogen activation and fibrinolysis, TAFI. Functions of PMN and fibrinolysis.
Week 8	Adhesion molecules. Cadherines, selectins, IgSF cellular molecules. Integrins. Platelets. Structure and function (adhesion, vWF and aggregation, fibrinogen) Activation, triggers (thrombin, collagen, PAF). Secondary activators (ADP, TXA_2). Receptors (thrombin receptor). Activation, inhibitors. PGI_2 and TXA_2 , platelet activation. The endothelium. Structure and haemostatic role. Procoagulant components. von Willebrand Factor (vWF). Anticoagulant components. NO, Endothelin, PAR1, ACE, MMP-9. Angiogenesis. Angiogenin and angiostatin. Thrombophilia. Anticoagulant therapy: Vitamin K antagonists, INR. Heparin. Hirudin. Aspirin and platelets. Plasminogen activators. Acute myocardial infarcts. Stroke.
Week 9	<i>Biotransformation</i> : reactions of the first and second phase, biological significance, clinical aspects. Reactions and significance of cytochrome P450 isoenzymes. Conjugation of xenobiotics and of endogenous substrates.
Week 10	Mechanisms of signal transduction processes mediated by cAMP. Formation, degradation of cAMP, PKA, cAMP and regulation of gene expression. Signal transduction processes mediated by intracellular receptors: steroid, thyroid, retinoid receptors.
Week 11	Therapeutic targeting of signal transduction pathways. Calcium signalling
Week 12	<i>The role of thyroid hormones</i>
Week 13	<i>Biosynthesis of steroid hormones in the adrenal cortex</i> . Effects of mineralocorticoids and glucocorticoids, regulation of their biosynthesis. Signal transduction of steroid hormone receptors, genomic and non-genomic actions of steroid hormones. Congenital adrenal hyperplasias.
Week 14	<i>Biosynthesis of sexual hormones</i> . Cyclic changes in the ovaries, the cooperation of granulosa and theca interna cells. Placental progesterone and estradiol synthesis. <i>Eicosanoids</i> : <i>prostaglandins, thromboxanes and leukotrienes</i> . The cyclooxygenase and the lipoxigenase pathways. Effects of eicosanoids on: platelet aggregation, gastric mucosal protection, myometrial contractility, inflammation.

Laboratory program and seminars – Fall Semester

Laboratory lessons and Seminars	
Week 1	The isoenzyme profile of lactate dehydrogenase http://semmelweis.hu/biokemia/files/2014/01/EN_lab_LDH_or_BAK-KOK_20150130.pdf (Laboratory lesson)
Week 2	Acute and chronic liver disease (seminar)
Week 3	Determination of transaminase enzyme activities and determination of creatine kinase activity in serum (Laboratory lesson)
Week 4	Metabolism of exercise (seminar)
Week 5	Bioinformatics (computer skills)
Week 6	Cystic fibrosis (seminar)
Week 7	Determination of blood glucose level and determination of glycosylated haemoglobin (Laboratory lesson)
Week 8	Cell adhesion (seminar)
Week 9	Experimental models of blood coagulation (Laboratory lesson)
Week 10	The K ⁺ , Na ⁺ Transport ATP-ase
Week 11	Haemostatic abnormalities (seminar) (Laboratory lesson)
Week 12	Extracellular matrix (seminar)
Week 13	Investigation of microsomal drug metabolism (Laboratory lesson)
Week 14	Research of specific literature of Biochemistry. Presentation of research at our department (Consultation)

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Office of student affairs - 1.508 room, 1st floor, 'C' passage

Exemption: Students who have certificates of their previous studies at other universities in biochemistry may apply for exemption under the following conditions:

1. They have to present their certificates regarding the courses to the responsible tutor of the course during the first two weeks of the semester. (Dr. István Léránt Department of Medical Biochemistry)
2. Exemptions are given only after a "checking" exam during the first month of the semester. At this exam one of the lecturers will check whether the student's knowledge is sufficient to complete the semesters without attending lectures and laboratory programs. This exam is based on the question list of the final examination, and can be obtained from the tutor of the course. After a successful exam students are exempted from the final exam at the end of spring semester of the second academic year, including attending both lectures and laboratory programs. If students fail they must attend both lectures and laboratory programs and they have to sit for the semifinal or final exam at the end of the semesters.
3. Partial exemption is not permitted.

List of textbooks

- 1 Biochemistry Laboratory Manual. Ed. Gy. Szabados, Budapest <http://semmelweis.hu/biokemia/for-students/medical-biochemistry-iii/laboratory-lessons/>
- 2 Consultation manual. Ed. L. Tretter, Budapest <http://semmelweis.hu/biokemia/for-students/medical-biochemistry-iii/laboratory-lessons/>

MOLECULAR CELL BIOLOGY II.

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Director of the course: Prof. Gábor Bánhegyi M. D., Ph. D., D. Sc.

Mandatory course; credit: 3

Detailed program to be given by the department later – online!

BEHAVIORAL SCIENCES I. (MEDICAL COMMUNICATION) REQUIREMENTS

Educational Unit: **Institute of Behavioural Sciences**

Name of the course: Behavioral sciences I. (medical communication)

Type of the course:

code: AOKMAG398_2A

credit: 2 credits

Course director: Dr. József Kovács

Course leader: Dr. János Pilling

Study affairs: Dr. Adrienne Stauder (stauder.adrienne@med.semmelweis-univ.hu)

Secretary: Jozefa Barreto (secretariat) barreto.jozefa@med.semmelweis-univ.hu

Secretariat: NET Building, 20th floor, Room-2015; Tel: 210-2930/56114, 56501

With any request concerning the course, please first contact Jozefa Barreto, course secretary.

Semester: 2018/19 I.

Course objectives:

Proper communication is essential in effective healing. The aim of the course is to teach communication strategies that can make the doctor's everyday tasks more effective: how to listen, ask, inform and collaborate with the patient. The subject also contains some recent elements of the doctor-patient relationship, like shared decision making, patient education, and suggestive communication. We emphasize difficult situations in medical practice: communicating bad news, communication with aggressive patients, communicating about sexual problems, and analyzing cultural differences in medical practice. 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.

Course Syllabus:

LECTURES: Week 1-7

Week 1: Introduction. Communication difficulties and possible solutions in the everyday medical practice.

Week 2: The development of patient-physician collaboration, promote behavior change.

Week 3: Suggestive communication in medical practice.

Week 4: The specialties of age in medical communication: communication with ill children

- Week 5: Communication about functional complaints
- Week 6: Communicating bad news. Communicating with people with disabilities.
- Week 7: Telemedicine.

SEMINARS: Week 6-12

- Week 6: Seminar. Communication in everyday life and in the medical practice. The role of non-verbal and metacommunicative signs in communication.
- Week 7: Seminar. The active listening. Communication aspects in empathy.
- Week 8: Seminar. Patient information, patient education.
- Week 9: Seminar. Creating and maintaining compliance.
- Week 10: Seminar. Communicating bad news (practice). How to recognize communication signs of suicide?
- Week 11: Seminar. Communication with agitated patients, strategies to prevent violence. Communication about sexual problems.
- Week 12: Seminar. Cultural aspects in medical communication. Review

Participation and making up for absences:

A signature will be given with the prerequisite of participation (minimum 75% of the lectures and 75% of the seminars). Participation list will be recorded at the end of every lecture/seminar. 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!).

Justification of the absence in the lectures and examinations: medical certificat

Checks during the semester (reports, written checks) : -

Requirements for the signature at the end of the semester:

Regular participation on the lectures and seminars.

Method of the calculation of marks: performance on the oral exam. The Medical Communication Teaching Group will organize a competitive examination at the end of the seminar period. Those students who obtain a good or an excellent grade at this exam, can be exempted from the oral exam,

Type of the exam: oral

Requirements for the exam:

Exam topics:

„A“ list

1. Basic definitions in communication and their role in medical practice: basic elements, axioms and levels in communication; verbal communication.
2. The role of non-verbal communication.
3. The role of active listening and the role of empathy.
4. The doctor-patient consultation.
5. Communication issues in patient information.
6. Patient education and shared decision making.
7. Convincing strategies in medical practice: learning theories and cognitive models;
8. Convincing strategies in medical practice: the role of arguments, behavior change model.
9. The role of suggestive communication in the doctor-patient interactions.

„B“ list

1. Communication with acute patients.
2. Communication with sick children.
3. Communication with older patients.
4. Communication with somatizing patients.

5. Communication with alcohol- and drug-dependent patients.
6. Communication about sexual problems.
7. Communication aspects with patients committing suicide attempt.
8. Prevention and management of violence
9. Communicating the diagnosis of incurable disease.
10. Breaking news of death and congenital disorders.
11. Telemedicine.

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:

Course and recommended text books:

Course text book:

János Pilling (ed.): Medical Communication. Medicina Könyvkiadó, Budapest, 2011.

Recommended text books:

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

Tate, P. (2009): The doctor's communication handbook. Radcliffe Publishing, 6th edition

Hall, J.A.; Roter, D. (2006): Doctors talking with patients / Patients talking with doctors. Praeger; 2nd edition

Williams, D. (1997): Communication skills in practice: a practical guide for health professionals. Jessica Kingsley Publishers.

INTRODUCTION TO CLINICAL MEDICINE

Lecturer: Prof. László Kalabay MD PhD

Institute: Department of Family Medicine

Duration: One semester, practices: 12x2,5 hours/semester

Exam: Written. Practical mark (written exam)

Credit value: 2 credit points

Minimum/maximum group size: 55/210

Thematic:

Formation of the consciousness of profession.

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 treatment and care for acute and chronic diseases.

Effective cooperation with patients. Means to improve compliance.

The importance of prevention of disease.

Team work in medicine.

Overview of the scientific activity of the clinical department. Raising interest on joining to it.

Application: Péter Torzsa MD Tel: 355-8530 e-mail: ptorzsa@gmail.com

Application date: 1st September

Precondition: Only for students in the 2nd year, following completion of Medical Profession

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 Oldh

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

Basics of Foreign Language (module 3.)

Magyar orvosi szaknyelv 3.

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 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.

Course content of practical lessons:

Lesson 1-2:	What was your weekend like?
Lesson 3-4:	What did you yesterday?
Lesson 5-6:	Did you like the city?
Lesson 7-8:	Have you ever been to England?
Lesson 9-10:	What did you do on Monday?
Lesson 11-12:	Communication practice: What did you do?
Lesson 13-14:	What did your neighbour say?
Lesson 15-16:	Practising past tense
Lesson 17-18:	He didn't know that we were there. –Past tense
Lesson 19-20:	Communication practice- Practising past tense
Lesson 21-22:	Consolidation
Lesson 23-24:	Test 1 + situation
Lesson 25-26:	I'd like a ticket to London.
Lesson 27-28:	Travelling by train
Lesson 29-30:	Travelling abroad
Lesson 31-32:	Communication practice: travelling
Lesson 33-34:	Accommodation
Lesson 35-36:	Booking accommodation
Lesson 37-38:	Booking accommodation- conversations
Lesson 39-40:	At a hotel
Lesson 41-42:	Communication practise: travelling and booking accommodation
Lesson 43-46:	Customs and festivities – modal auxiliaries
Lesson 47-48:	At the dentist
Lesson 49-50:	Healthy lifestyle
Lesson 51-52:	Consolidation
Lesson 53-54:	Test – situation, communication practice
Lesson 55-56:	Assessment

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

Gyöngyösi Livia - Hetesy Bálint. *Hungarian language: Jó napot kívánok!* Semmelweis Egyetem Egészségtudományi Kar, 2011.

Basics of Foreign Language (module 4.)

Magyar orvosi szaknyelv 4.

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.

Course content of practical lessons:

Lesson 1-4:	Revision
Lesson 5-6:	Family history – asking for family members, names
Lesson 7-8:	Family history – describing state
Lesson 9-10:	Family history – communication practice
Lesson 11-12:	Social history – habits
Lesson 13-16:	Social history – expressing frequency
Lesson 17-18:	Body parts, internal organs
Lesson 19-20:	Symptoms
Lesson 21-22:	Consolidation
Lesson 23-24:	Test 1 + situation
Lesson 25-28:	Asking the patient about the pain
Lesson 29-30:	Describing pain and symptoms
Lesson 31-32:	Names of diseases
Lesson 33-36:	Taking medical history
Lesson 37-40:	Medication
Lesson 41-48:	Giving advice, doctor's recommendations
Lesson 49-52:	Consolidation
Lesson 53-54:	Test – situation, communication practice
Lesson 55-56:	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.

SYLLABUS OF PHYSICAL EDUCATION

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

School year: 2018/2019

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!

Additional Resources:

Subject: Physical Education IV.

Type of Subject: Compulsory

Code of Subject: AOKTSI009_4A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

School year: 2018/2019

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!

NOTE

PRE-CLINICAL MODULE



Faculty of Medicine
3rd year

STUDY PROGRAMME

Third year

5 th semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKKOR510_1A	Pathophysiology I.	1,5	3	4	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKMIK022_1A	Medical Microbiology I.	1,5	2,5	4	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKPTK023_1A ¹ AOKPAT024_1A ²	Pathology I.	3	4	7	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKGEN470_1A	Immunology	2	1,5	3	semi-final#	Medical Biochemistry, Molecular and Cell Biology III.
AOKBL3307_1A ³	Internal Medicine – Propedeutics	2	5	7	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKBV1026_1A	Medical Aspects of Disaster Preparedness and Response I.	1×2/semester	–	0	signature	
AOKLEK228_5A	Hungarian Medical Terminology V.	–	4	2	final	Hungarian Medical Terminology IV.
Total Number of Credit Points from Compulsory Subjects:				27		
Obligatory elective / Elective subjects: At least 4 credit points from the obligatory electives/electives must be collected in each semester. See the detailed list of obligatory electives and elective subjects after the 3rd year curriculum						

¹ 1st Department of Pathology

² 2nd Department of Pathology

³ 3rd Department of Internal Medicine

The grade influences the qualification of the Diploma.

Third year						
6 th semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKKOR510_2A	Pathophysiology II.	1,5	2,5	4	final#	Pathophysiology I., Immunology
AOKMIK022_2A	Medical Microbiology II.	1,5	2	3	final#	Medical Microbiology I., Immunology
AOKPTK023_2A ¹ AOKPAT024_2A ²	Pathology II.	3	4	7	final#	Pathology I.
AOKBL3029_1A ³	Internal Medicine I.	1,5	3	5	semi-final	Internal Medicine – Propedeutics, Pathophysiology II.*, Pathology II. *
AOKMAG398_2A	Behavioral Sciences II. (Medical Psychology)	1	2,5	3	final	Behavioral Sciences I. (Medical Communication) Medical Sociology,
AOKBVI026_2A	Medical Aspects of Disaster Preparedness and Response II.	1x2/ semester	–	0	signature	
AOKKMI020_1A	Basic Surgical Techniques	0,5	1,5	2	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II.
AOKFIZ036_1A	Medical Imaging	12 hours / semester	16 hours / semester	2	semi-final	Medical Biophysics, Anatomy, Cell, Histology, and Embryology IV.
AOKGEN030_1A	Genetics and Genomics	2	2	4	semi-final#	Medical Biochemistry, Molecular and Cell Biology III.
AOKNSG332_1A	Internal Medicine Practice (in summer)	–	170 hours workload	–	signature	–
Total Number of Credit Points from Compulsory Subjects:				30		
Obligatory elective / Elective subjects: At least 4 credit points from the obligatory electives/electives must be collected in each semester. See the detailed list of obligatory electives and elective subjects after the 3rd year curriculum						
AOKLMI033_1A	Laboratory Medicine	0,75	–	1	semi-final	–

¹1st Department of Pathology²2nd Department of Pathology³3rd Department of Internal Medicine

* The prerequisite is that registration has been done for the marked subject – corequisite - as well

The grade influences the qualification of the Diploma.

LIST OF TEXTBOOKS (The list may change!)

- 1 Cecil's Essentials of Medicine. Ed. Andreoli, Carpenter, etc. 5th ed. W.B. Saunders, 2001. ISBN 0-7216-8179-4
- 2 Bickley, L.S.-Hoekelman R.A: Bates' Guide to Physical Examination and History Taking. 7th ed. J.B. Lippincott Williams & Wilkins, 1998. ISBN 0-7817-1655-1
- 3 Current Medical Diagnosis and Treatment. Tierney, McPhee, Papadakis, Appleton and Lange McGraw-Hill 2002. ISBN 0-07-136466-8
- 4 Marshall: Illustrated Textbook of Clinical Chemistry. Mosby. 2nd ed. Gower Med. 1992
- 5 F.Heckner et al.: Practical Microscopic Hematology. 4th ed. 1993. Williams and Wilkins Trade Cldh. ISBN: 0-8121-1711-5
- 6 Peter E.S.-Freund-Meredith B.McGuire:Healts, Illness, and the Social Body. (A Critical Sociology. Prentice Hall. Upper Saddle River, New Jersey.
- 7 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
- 8 Murray, Rosenthal, Kobayashi, Pfaller: Medical Microbiology. 8th ed. Elsevier, 2016. ISBN 9780323299565
- 9 Robbins: Basic Pathology, 2008. V. Kumar, A. K. Abbas, N. Fausto, R. Mitchell Saunders; 8 edition
- 10 Szende B, Suba Zs.: Introduction to Histopathology. Bp. Medicina, 1999.
- 11 Katzung: Basic and Clinical Pharmacology. Lange 10th ed, 2007
- 12 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
- 13 Immunology seminars (e-book): <http://gsi.semmelweis.hu>
- 14 Medical Genetics and Genomics (e-book)
- 15 Pathophysiology of Disease An Introduction to Clinical Medicine / Gary D. Hammer, Stephen J. McPhee. – 7th edition, McGraw Hill, 2014. – 762 p. ISBN: 978-0-07-180601-5
- 16 Pathophysiology, Damjanov I. ed. Saunders 2009. 464 p. ISBN 978-1-4160-0229-1

Recommended textbooks:

- 1 Harrison's Principles of Internal Medicine. Companion Handbook. 12/1997 14th ed. 096009. Ed. by Anthony Fauci, E.Braunwald, K.J. Isselbacher et al. Paper Text ISBN 0-07-021530-8 LCCN:97-042634
- 2 Harrison's Principles of Internal Medicine. 15th ed. McGraw Hill Inc. 2001. ISBN 0-07007272-8 (Combo) 0-07-007273-6 (Vol.1.), 0-07-007274-4 (Vol.2.), 0-07913686-9 (Set)
- 3 Cecil Textbook of Medicine. Ed. Goldmann, L. Bennett, J.C. 21st ed. W.B.Saunders 2000. ISBN 0-7216-7995-1 Vol.1-2. ISBN 0-7216-7996-X (Single Vol.)
- 4 Concise Oxford Textbook of Medicine. Ed.Ledingham, Warrell. Oxford University Press, Oxford, 2000. ISBN 0192628704
- 5 The Merck Manual. 16th ed. Merck Research Laboratories, 1996.
- 6 William J. Marshall, Stephen K.Bangert: Clinical Chemistry. 5th ed. Elsevier Health Sciences 2004. ISBN: 0723433283.
- 7 Stephen J. McPhee, William F. Ganong: Pathophysiology of Disease: An Introduction to Clinical Medicine, 5th ed. McGraw-Hill.2006. ISBN 10: 0-07-144159-X
- 8 H. Thieml, H. Diem, T. Haferlach: Color Atlas of Hematology 2nd ed. Georg Thieme Verlag 2004. ISBN: 9783136731024
- 9 Kathryn L. McCance, Sue E. Huether: Pathophysiology: The Biologic Basis for Disease in Adults And Children 5th ed. Mosby Inc 2005 ISBN-10: 0323036236
- 10 N. Goldschlager et al.: Principles of Clinical Electrocardiography. 3rd ed. 1989. Appleton and Lange ISBN: 0-8385-7951-5.
- 11 Mahta, Atul B. Hoffbrand, A. Victor: Haematology at a Glance 2nd ed. Blackwell Publishing 2005. ISBN: 1405126663
- 12 Carl A. Burtis: Tietz Textbook of Clinical Chemistry. W.B. Saunders 3rd 1999 ISBN 0721656102
- 13 Carl A. Burtis: Tietz Fundamentals of Clinical Chemistry. WB. Saunders 5th 2001 ISBN 0721686346
- 14 Davis et al.: Clinical Laboratory Science. (Strategies for Practice.) 1988. Lippincott-Raven Cldh Text. ISBN: 0-397-50860-3
- 15 E.Rubin-J.L. Farber: Pathology (J.B. Lippincott 1994). – 3rd edition (1999)
- 16 Nemes Z.: Atlas of Histopathology (TEMPUS edition, Debrecen 1998)

- 17 C.P.L. Wheater, H.G. Burkitt, Stevens J.S. Lowe: Basic Histopathology, a Colour Atlas and Text. (Churchill Livingstone; 4Rev Ed edition, 2002)
- 18 Zalatnai A.: 500 Practice Questions about Pathology (Simmelweis University of Medicine)
- 19 Illyés Gy.: Path Nebulo 2000. Version 1.0 (English-Hungarian)
- 20 Székely E.: Practice on Histopathology I-II. (Simmelweis University of Medicine) - video
- 21 Alan Stoudemire: Human Behaviour: An Introduction for Medical Students. Lippincott Company, 1994. 2nd ed. ISBN 0-397-51337-2.
- 22 Kopp M. - Skrabski Á.: Behavioural Sciences Applied in a Changing Society, Corvina, 1996.
- 23 Fadem B: Behavioural Science., Lippincott Williams & Wilkins, 5th ed., 2008.
- 24 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6th ed., New York, Wiley, 2008.
- 25 Behavior & Medicine, 4th Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.

PATHOPHYSIOLOGY AND CLINICAL LABORATORY DIAGNOSTICS

I-II.

Department of Pathophysiology

Director: **Dr. Attila Tordai**

Tutor: **Dr. Miklós Molnár**

5th semester

Week	Lectures (1.5 hours/week)	Practical seminars (3 hours/week)
1	Introduction. Pathophysiology of inflammation	Normal electrocardiogram
2	Pathophysiology of heart failure, cardiomyopathies	Arrhythmias I: disorders of impulse generation
3	Coronary heart disease. Cardiac arrhythmias	Arrhythmias II: disorders of impulse conduction
4	Peripheral circulatory failure. Pathophysiology of circulatory shock	Diagnosis of ischemic heart disease and myocardial infarction
5	Pathophysiology of Hypertension	ECG abnormalities of cardiac hypertrophy and electrolyte disorders
6	Alterations of energy balance: starvation, obesity, protein deficiencies	Multiple abnormalities of ECG, practice
7	Alterations of lipid metabolism, hyperlipoproteinemias	Midterm (ECG and lectures)
8	Atherosclerosis, metabolic X syndrome	Evaluation of alterations in carbohydrate metabolism
9	Pathophysiology of diabetes mellitus types I and II	Evaluation of alterations in hepatobiliary diseases
10	Liver diseases	Evaluation of alterations in lipid and purine metabolism
11	Diseases of the gastrointestinal system, malabsorptions, exocrine pancreas diseases	Diagnostic approaches to gastrointestinal diseases
12	Pathophysiology of pituitary and sexual function	Evaluation of hypothalamic-pituitary and gonad disorders
13	Pathophysiology of thyroid function	Evaluation of thyroid gland function
14	Diseases of the adrenal gland	Evaluation of adrenal gland function

6th semester

Week	Lectures (1.5 hours/week)	Practical seminars (2.5 hours/week)
1	Metabolism of calcium and phosphate, metabolic bone diseases	Evaluation of calcium and phosphate metabolism and metabolic bone disorders
2	Connective tissue disorders	Kidney diseases and their diagnostics
3	Pathophysiology of acute and chronic kidney failure	Differential diagnosis of fluid and electrolyte disorders
4	Disturbances in fluid, Na ⁺ and K ⁺ balance	Pathophysiology of acid-base disorders
5	Disorders of acid-base balance	Alterations of the respiratory system
6	Alterations of the respiratory system	Diagnostic importance of plasma proteins and tumor markers
7	Disorders of hemostasis	Diagnostic approaches to hemostatic disorders
8	Disorders of the immune system	Midterm (lab)
9	Pathophysiology of erythropoiesis	Evaluation of corpuscular elements of blood, morphology of red and white cell developmental forms
10	Malignant diseases of the bone marrow	Pathophysiology of erythropoiesis (anemia, polycythemia)
11	Pathophysiology of pain	Chronic leukemias (myeloid and lymphoid)
12	Disturbances in higher CNS function	Acute leukemias, infectious mononucleosis
13	Pathophysiology of aging	Midterm (hematology)
14	Trends in medical diagnosis and treatment	Monoclonal gammopathies, multiple myeloma, consultation

MEDICAL MICROBIOLOGY I.

Institute of Medical Microbiology

Program Director: **Dr. Dóra Szabó**

Tutor: **Dr. Ágoston Ghidán**

First Semester

Week	Lectures (1,5 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 enteric 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>Actinomycetes</i>
13.	Spirochaetales: <i>Treponema</i> , <i>Borrelia</i> , <i>Leptospira</i> .
14.	Rickettsiales, Chlamydiales, Mycoplasmatales

First Semester

Week	Bacteriology Practicals (2,5 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 MICROBIOLOGY II.

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)
- Emollition 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 H&E (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)

14. Environmental and nutritional pathology	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)
15. Blood vessels	Fatty infiltration of the myocardium H&E (41)
16. Blood vessels	Myocardial infarction, early H&E (42) Myocardial infarction, old H&E (43) Myocarditis H&E(44) Endocarditis H&E(96)
17. Heart	IRDS H&E (50)
18. Heart	Lobar pneumonia H&E(51) Bronchopneumonia H&E (52) Pneumoconiosis H&E (54) Pleuraefibrosis H&E (97)
19. Respiratory system	Miliary tuberculosis in lung H&E (55)
20. Respiratory system	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)
21. Respiratory system	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)
22. Infectious diseases	Villous atrophy in small intestine (65)
23. Infectious diseases	Ulcerative colitis H&E(68)
24. Infectious diseases	Crohn's disease H&E (69) Carcinoid H&E (53) Peritoneal carcinosis H&E (99)
25. Gastrointestinal tract	Organ demonstration
26. Gastrointestinal tract	
27. Gastrointestinal tract	
28. Pancreas	

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)

45. Endocrinology	Peri- and intracanalicular fibroadenoma of the breast H&E (33) Phylloid 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)
46. Skin	Normal bone marrow H&E (127)
47. Skin	Leukemic bone marrow H&E(128) Leukemic infiltration of parenchymal organs (slide demonstration) Multiple myeloma H&E (106) Amyloidosis Congo (21)
48. Head and neck	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)
49. Bones and joints	Colloid goiter H&E(110)
50. Bones and joints	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)
51. Bones and joints	Osteosarcoma H&E (114) Rhabdomyosarcoma H&E (115) Rheumatoid arthritis H&E (116) Autoimmun diseases (slide demonstration)
52. Eye	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)
53. Skeletal muscle	Purulent meningitis H&E(117)
54. Nervous system	Encephalitis H&E (118)
55. Nervous system	Meningeoma H&E (119) Glioblastoma multiforme H&E(120) Schwannoma H&E (121) Neuroblastoma H&E (122) Ganglioneuroblastoma (slide demonstration) Paraganglioma (slide demonstration)
56. Nervous system	Review
57. Clinicopathologic conference	

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 AND HISTOPATHOLOGY I - II.

2nd Department of Pathology

Head of Department: **Prof. Dr. András Kiss**

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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-2018

	LECTURES	HISTOPATHOLOGY
Week 1	<p>10/9 Introduction (Kiss)</p> <p>12/9 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 <p>Cell injury, adaptation, storage disorders</p> <ul style="list-style-type: none"> Necrosis, coagulative Necrosis, liquefactive Apoptosis Hypertrophy Hyperplasia Fatty degeneration Amyloidosis
Week 2	<p>17/9 Hemodynamic disorders I. (Madaras) Basic notions in hemodinamics. Hemorrhage, active and passive hyperemia. Disorders of water and electrolytes. Edema.</p> <p>19/9 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>24/9 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>26/9 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>01/10 Neoplasia I. (Schaff) Neoplasia-definition. Characteristics of benign and malignant tumours. Histological classification of tumours.. Grading.</p> <p>03/10 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>08/10 Neoplasia III. (Tímár) Molecular mechanisms of tumour development: protooncogenes, oncogenes, tumor suppressor genes, growth factors.</p> <p>10/10 Neoplasia IV. (Tímár) Tumor growth, tumor progression, metastasis. Familiar cancer</p> <p>13/10 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>15/10 Childhood tumours (Halász)</p> <p>17/10 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) 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>24/10 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>29/10 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>31/10 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

	LECTURES	HISTOPATHOLOGY
Week 9	<p>05/11 Cardiovascular pathology III. (Glasz) Congenital heart diseases. Cardiomyopathies. Heart failure. Systemic diseases involving the heart. Cardiac tumors.</p> <p>07/11 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 • Acute myocardial infarction • Myocardial infarction-healing • Endocarditis
Week 10	<p>12/11 Respiratory system I. (Székely E) Diseases of conducting airways and lung parenchyma. Diffuse alveolar damage. Chronic obstructive pulmonary diseases. Restrictive lung diseases.</p> <p>14/11 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)</p> <p>Pulmonary pathology I. - non-neoplastic</p> <ul style="list-style-type: none"> • IRDS • Bronchopneumonia • Tuberculosis • Boeck sarcoidosis
Week 11	<p>19/11 Immunopathology (Kiss) Constituents of the immune system. Hypersensitive reactions. Allergy. Transplantation. Immunodeficiency. AIDS.</p> <p>21/11 Autoimmune diseases (Glasz) Etiology. Monosystemic diseases (e.g. chronic atrophic gastritis, myasthenia gravis, Basedow disease, Hashimoto thyroiditis, Addison disease, insulin-dependent diabetes mellitus, Scleritis 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>26/11 Infectious diseases (Lotz) Diseases caused by viruses (tick-borne viruses, polio, variola, herpes, CMV, EBV, rubella, varicella, mumps, influenza), Rickettsiae, Spirochetes. Bacteria (tularemia, pertussis, legionella, brucellosis, listeriosis, clostridial infections (tetanus, botulism), Streptococci) Actinomycosis. Mycobacteria (tuberculosis, leprosy). Protozoa (malaria, toxoplasmosis, amebiasis).</p> <p>28/11 Skin pathology (Székely T./Kovács A.) Basic notions in skin pathology. Primary lesions. Dermatitis. 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

	LECTURES	HISTOPATHOLOGY
Week 13	<p>03/12 Environmental and nutritional pathology (Kerényi) Smoking, alcoholism, drugs. Iatrogenic injuries. Environmental chemical and physical factors. Obesity, protein malnutrition, vitamins.</p> <p>05/12 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>10/12 Clinical pathology I. (Székely E) Tumor Screening, Cytodiagnosics. Basic cytopathological morphology of benign and malignant lesions. Case presentations.</p> <p>12/12 Clinical pathology II. (Kiss) Diagnostic parameters, requirements, which guide the clinical protocols. Molecular diagnostics of tumors. Targeted therapy</p>	Practical exam

2nd Semester-2019

Week 1	<p>04/2 Gastrointestinal tract I. (Kiss) Esophagus (anatomy and developmental disorders, inflammation, trauma, tumors). Stomach- part I.</p>	Practice 1- The pathology report
Week 2	<p>11/2 Gastrointestinal tract II. (Madaras) Pathology of the stomach(-part 2) and small bowel. Appendix.</p> <p>13/2 Gastrointestinal tract III. (Madaras) Colon (congenital disorders, infections, diverticular disease, inflammation, Crohn-disease, ulcerative colitis, vascular diseases, neoplasms, other disorders). Peritoneum.</p>	<p>Practice 2- Gastrointestinal pathology I.</p> <ul style="list-style-type: none"> • Pleomorphic adenoma- parotis • Peptic ulcer-stomach • Gastritis chronica (H. pylori) • Carcinoma sigillocellulare • GIST
Week 3	<p>18/2 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.</p> <p>20/2 Pathology of the liver II. (Schaff) Alcoholic liver disease, toxic liver injury. Hemochromatosis. Vascular disorders.</p>	<p>Practice 3-Gastrointestinal pathology II.</p> <ul style="list-style-type: none"> • Celiac disease • Pseudomembranous colitis • Ulcerative colitis • Crohn disease

Week 4	<p>25/2 Pathology of the liver III. (Kiss) Neoplasms. Gallbladder and bile ducts (congenital anomalies, cholecystitis, cholelithiasis, cholangitis, neoplasms).</p> <p>27/2 Pathology of the exocrine pancreas (Székely E) Developmental abnormalities, inflammations, tumors of the exocrine pancreas.</p>	<p>Practice 4- Liver pathology</p> <ul style="list-style-type: none"> • Alcoholic hepatitis • Viral hepatitis • Cirrhosis • Hepatocellular carcinoma • Cavernous hemangioma • Liver metastasis
Week 5	<p>04/3 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.</p> <p>06/3 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.</p>	<p>Practice 5- Pathology of the pancreas</p> <ul style="list-style-type: none"> • Acute pancreatitis • Chronic pancreatitis • Adenocarcinoma of the pancreas • Neuroendocrine tumour
Week 6	<p>11/3 Renal pathology I. (Kardos) Anatomy. Clinical syndromes. Glomerular diseases. Tubulointerstitial diseases. Renal disease and systemic disorders. Kidney transplantation.</p> <p>13/3 Renal pathology II. (Somorácz) Hydronephrosis. Lithiasis. Pyelonephritis. Congenital abnormalities. Tumors of the kidney.</p>	<p>Practice 6- Endocrine pathology</p> <ul style="list-style-type: none"> • Adrenal cortical adenoma • Goiter • Autoimmune thyroiditis (Hashimoto) • Thyroid gland-follicular adenoma • Thyroid gland-papillary carcinoma
Week 7	<p>18/3 Uro pathology I. (Székely E) Congenital abnormalities of the urinary tract. Inflammations. Urinary bladder (malformations, inflammations, tumors). Urethra.</p> <p>20/3 Uro pathology II. (Székely E) Diseases of the epididymis, testis, prostate, penis and scrotum.</p>	<p>Practice 7- Midterm III (GI, liver, pancreas, endocrine) Renal- and uro pathology</p> <ul style="list-style-type: none"> • Acute pyelonephritis • End stage kidney • Renal cell carcinoma • Transitional cell carcinoma
Week 8	<p>25/3 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>27/3 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>01/4 Gynecologic pathology III. (Kulka) Pathology of the fallopian tube and ovary. Pregnancy related pathology of the uterus.</p> <p>03/4 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>08/04 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>10/4 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 • Serosus cystadenoma-ovary • Serosus papillary (cystadeno-)carcinoma-ovary
Week 11	Spring break	
Week 12	<p>22/4 Easter-Public Holiday</p> <p>24/4 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>29/4. 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>01/5 Public Holiday.</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>06/5 Hematopathology III. (Székely E) Lymphomas (Hodgkin, non-Hodgkin). Metastatic tumors in bone marrow and lymph nodes. Clinicopathological case demonstrations</p> <p>08/5 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 uropathology, 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>13/5 Central nervous system II. (Reiniger) Neoplasms (neuroectodermal, embryonic, ectopic tissue, metastasis). Peripheral nervous system (neuropathies, inflammations, trauma, tumors). 15/5</p>	Consultation

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 useage: 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.3dhitech.com/>

4D pathology and auxilliary materials at: www.4dpathology.hu

Panoramic Viewer free download: <http://www.3dhitech.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 demonstrations 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 should 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.

Schedule

Lectures		1st semester	2nd semester
Monday		11:50 – 13:00	10:50 – 12:00*
Wednesday		8:00 – 9.10	8:00 – 9.10*
Practices		1st semester	2nd semester
Group 1-6	Wednesday	9:30 – 12:50	9:30 – 12:50
Group 7-8	Monday	15:20 – 16:50	15:00 – 16:30
	Thursday	11:10 – 12:40	11:10 – 12:40

* preliminary data

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

Schedule for the academic year of 2018/2019

1st semester:	10 th September-14 th December, 2018
Official holidays:	23 rd October (Tuesday) – National Day
	1 st November (Thursdaysday) – All Saints Day

Examination period:	December 17, 2018- February 1. 2019.
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2nd semester:	February 4 - May 17, 2019
Official holidays:	February 7-8. (Simmelweis Student Research Group Conference),
	March 15 (Friday)- National Day
	Apryl 15-19 Spring break
	April 22 (Monday) - Easter Monday
	April 30 (Tuesday) Dean's Day

Examination period:	May 20. – July 05, 2019
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August examination period: August 21-29, 2019

Budapest, 1st September, 2018.

INTERNAL MEDICINE Propedeutics

3rd Dept. of Internal Medicine Tutor: **Dr. Katalin Keltai**

In 2018/19 Internal Medicine Propedeutics and Internal Medicine I. are taught by the 3rd Department!

First Semester

Course: Internal Medicine

Type: compulsory

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 3, seminar 0, practical 4

Form of tuition: lecture, bedside practice

Mode of assessment: practical course grade (semi-final)

Aim: The teaching offers the essential information required in performing the most comprehensive and diagnostic type of patient history and physical examination (an introduction to internal medicine).

The syllabus: The course is concerned with the clinical approach to evaluation of the patient including history taking and bedside physical examination (inspection, palpation, percussion, auscultation, taking vital signs). General symptoms and signs of the respiratory and cardiovascular diseases, the most common abdominal syndromes.

INTERNAL MEDICINE I.

Second Semester

Course: Internal Medicine

Type: compulsory

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 3, seminar 0, practical 4

Form of tuition: lecture, bedside practice

Mode of assessment: theoretical exam (semi-final)

Aim: Acquisition of the basic principles of endocrinology. Diagnostic and therapeutic approach to the endocrin diseases. The neuroendocrin regulation and its disorders.

Acquisition of knowledge of medical toxicology.

Syllabus: Disorders of hypothalamus causing disturbances of the neuroendocrin system. Disorders of the adenohypophysis and the neurohypophysis. Regulation of thyroid gland. The laboratory evaluation of the thyroid function. Hyperthyreosis. Disorders of the thyroid gland accompanied with decreased function. Thyreoidites. The question of sporadic and endemic goiter. Tumors of the thyroid gland. Laboratory evaluation of the adrenal cortex and medulla in their disorders. Adrenocortical hypofunction. Disorders causing hyperfunction of the adrenal cortex. Disorders of the adrenal medulla and the sympathetic nervous system. Disorders of the parathyroid glands. Disorders of the gonads of clinical importance. Etiology, pathomechanism and classification of the diabetes mellitus. Its clinical presentation, complications and therapy. Diseases producing hypoglycaemia. Disorders of the endocrin pancreas. Hyperlipoproteinaemias. Nutritional diseases. Malnutrition. Obesity. Anorexia nervosa and bulimia. Disorders of the purine metabolism (gout). Medical aspects of the vitamin deficiency states. Disturbances of the water and electrolyt metabolism.

Special forms of poisonings: consequences of narcotic drug-abuse, the question of drug-dependency. Prophylactic measures. Food poisonings, differential diagnosis of the diarrhea.

IMMUNOLOGY

Department of Genetics, Cell and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Tutor: **Dr. Marianna Csilla Holub**

Subject code: AOKGEN470_1A

Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III.

Credits: 4

	Lectures (2 hr / week)	Practicals / Seminars (1,5 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	Case studies I
6.	T lymphocytes and cell-mediated immune response	Complement assays, HLA typing
7.	B lymphocytes and humoral immune response	Vaccination I.
8.	Mucosal immunity	Vaccination II.
9.	Midterm exam (written)	Biological therapies I
10.	Immune response in infections; immunodeficiencies	Biological therapies II
11.	Hypersensitivity	Hypersensitivity I.
12.	Immunological tolerance; natural and pathological autoimmunity	Hypersensitivity II-IV.; Immunological databases
13.	Antitumor immunity	Screening methods for autoantibodies
14.	Immunology of transplantation and pregnancy	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.

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.)

BASIC SURGICAL TECHNIQUES

Department of Surgical Research and Techniques

Theoretical Block at Nagyváradi Square, Operating training center,
1089 Budapest, Nagyváradi sq. 4.

Lecturer: **Professor Dr. György Wéber**

Tutor: **Dr. Györgyi Szabó**

Credit: 2

Second Semester

Prerequisites: Pathology and Histopathology II., Surgery I.

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. Knotting and suturing on in vitro models.
3. Knotting 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)

BEHAVIORAL SCIENCES II.

(Medical Psychology)

General Medicine, 3rd year Medical Students

Institute of Behavioral Sciences

Head of the Department and Course Director: **Prof. Dr. József Kovács**

Tutor: **Dr. Gyöngyvér Salavecz**

Credit: 3

2nd Semester

Lectures:

1. Introduction to Human Behaviour and Eating Disorders
2. Affects, emotion, motivation
3. Stress and illness; behavioral interventions
4. Conscious states, sleep, dreaming and general anesthesia
5. Breaking bad news
6. Disclosing medical errors
7. Age related specialties in Medical Psychology: patients and families in Paediatrics

Seminars:

1. Developmental psychology, attachment theories (Freud, Erikson, Mahler, Bowlby, Ainsworth)
2. Personality theories (the definition of personality, personality theories: behavioural theories – Pavlov, Skinner; cognitive theories – Beck; Big Five; psychoanalytic theories – Freud, Jung; humanistic theories: Rogers, Maslow. Personality tests.)
3. Human sexuality and sexual disorders; psychology of reproduction, psychology of birth.
4. Depression and mood disorders.
5. Anxiety and medical illnesses.
6. Psychosomatic disorders – case studies; somatization and dissociative disorders.
7. Eating disorders.
8. Personality disorders.
9. Sleep disorders.
10. Addiction, substance use.
11. Suicide, cry for help, crisis intervention.
12. Psychology of death, grief, and dying.
13. Behaviour change and psychotherapy. Stress management in medical practice.
14. Mental health of medical doctors. Prevention and management of burn-out. Bálint-groups.

Department:

Institute of Behavioral Sciences

Department of Psychology

NET Building, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room – 2005. tel: 2102930/ 56114.

Participation and making up for absences:

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. (The maximum number of absences permitted: one absence from the lectures and two absences from the seminars.) Content of the lectures may appear in the exams.

Certifying absence from lesson:

Medical certificate

Semester requirements:

To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (The maximum number of absences permitted: one absence from the lectures and two absences from the seminars.) 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.

Type of exam:

Final

Exam requirement:

Classroom activity and paper presented in the group.

Sign up for exam: Through the NEPTUN system.

Method of sign up: Through the NEPTUN system.

Certifying absence from exam:

A telephone or email message to the seminar leader.

Sign up for exam: Through the NEPTUN system.

Course Textbook:

- 1 **Behavior & Medicine**, 4th Edition, Danny Wedding, Hogrefe & Huber publishers, Seattle, 2006.

Recommended text books:

- 1 Kopp M. - Skrabski Á.: 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.

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 Czirják 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.

MEDICAL IMAGING METHODS

Tutor: **Dr. István Voszka** (Department of Biophysics and Radiation Biology)

Altogether 12 hours lecture and 16 hours practice/semester which is distributed between the Department of Biophysics and Radiation Biology, the Department of Nuclear Medicine and the Department of Anatomy/Department of Human Morphology and Developmental Biology

Lectures on the first 5 weeks of the semester (2 hours/week)

- Digital image (parameters and properties).Histogram, contrast manipulation. Binary image analysis. Processing of three dimensional information, tomography, projection. Principles of CAT scan
- NMR and MRI. Magnetic properties of the nucleus. Nuclear spin, orientation. Excitation, resonance condition. Relaxation mechanisms (T1, T2). MR imaging. Contrast in MRI. Special techniques (angiography, spectroscopy, diffusion MRI, fMRI)
- Ultrasonic imaging. Characteristics of ultrasound. Production and detection of ultrasound. Acoustic impedance. Reflection and refraction. A-, B-, TM-images, 3D and 4D imaging. Doppler-method.
- Imaging in nuclear medicine. Basic principles of nuclear medicine. Radiopharmacocons. Instruments (SPECT, PET, hybrid equipments)
- Molecular imaging. Optical techniques. Functional imaging methods. Multimodal techniques. Correlation of functional and morphological information.
- Practices in the Department of Biophysics (3 x 2 hours) the exact date of them is announced at the beginning of the semester.
- Digital image processing
- Ultrasonic imaging
- Molecular imaging

Practices in the Department of Anatomy/Department of Human Morphology and Developmental Biology

1. **Abdomen:** internal organs of the abdominal cavity, peritoneal relations, retroperitoneum, pelvis, spaces
2. **Thorax:** internal organs of the thoracic cavity, pleural spaces, and mediastinal relations
3. **Locomotor system:** Muscles and fascial relations, vascular/nervous canals, articular components
4. **Neurocranium:** Bony and membranous borders, dural duplication, meningeal spaces (i.e. cerebrospinal fluid spaces) and vasculature, including venous sinuses. Topography of the brain, passage and exits of the cranial nerves.
5. **Viscerocranium:** Topography of the oral cavity, para- and retropharyngeal spaces, nasal cavity, paranasal sinuses and the orbit, vascular and nervous supply, viscera and muscles&fasciae of the neck.

The week after the last practice there will be the final test in sectional anatomy part.

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

Code: AOKBVI026_1A, 2A

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 – 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)

GENETICS AND GENOMICS

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. F. Ágnes Semsei**

Subject code: AOKGEN030_1A

Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III.

Credit:4

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. Chromosomal aberrations
5. Genetic variations
6. Epigenetics
7. Genetics of biological processes
8. Introduction to genomics. Methods in genomics
9. Genomic approach of complex inheritance
10. Midterm
11. Population genetics and genomics
12. Evolution genetics and genomics
13. Pharmaco- and nutrigenomics
14. Genome and environment

Practices (2 hours 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. Consultation
10. Complex inheritance
11. Gene therapy
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)

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 aneurysms, 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.

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 after a successful written exam.

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.

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

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 lifesaving 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 (module 5.)

Magyar orvosi szaknyelv 5.

Hungarian Medical Terminology (module 5.)

Magyar orvosi szaknyelv 5.

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 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.

COMPULSORY SUMMER PRACTICE

Internal Medicine - 1 month, 170 hours

Proof of completion (Certification of completed famulus practice) must be submitted prior to registration to the next academic year.

Students who do not submit the certificate of completion on time will have their registration placed on hold until the proof of completion is received by the English Secretariat. Certificates can be downloaded at http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101

Please read more about the rules concerning the criteria of selecting the foreign clinical practice positions and accepting the practice period spent abroad:

<http://www.semmelweis-english-program.org>

Practical syllabus of the famulation

Cognition of the department of internal medicine, and the hospital.

Examination of patients, especially physical examination, and the examination of patients suffering cardiovascular and respiratory diseases.

Attendance of patients as an assistant physician assigned by the Head of the Department of Internal Medicine, under the supervision of the Head of Department, on the level of a 3rd year student without any pharmacology training

Practice of the most important medical interventions.

Dosage of medicines. (Methods)

Examining the pulse, blood pressure measurement, body temperature measurement, weight-measurement, height-measurement.

Technique of cupping, learning and applying of injecting (i.m., i.v., s.c. insulin).

Knowledge of instruments (ECG, Doppler and/or oscillometry, monitors, supply of oxygen – according to the local possibilities.)

Compilation of infusion and the technique of infusion wiring (under supervision). Transfusions (under supervision).

Cognition of the patient documentation and independent documenting.

Learning of contacting patients and their relatives, especially informing patients and the medical confidentiality.

Practising the so-called small laboratory tests.

Participation in medical consultation, especially if it is about their patient.

Participation in the meetings of the institution.

On-call service.

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 Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVNEI263_1A	History of Medicine	2	–	2	pract. mark	–
AOVANT457_1A	Developmental Biology I.	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology II.
AOVRPK088_1A	Library Informatics	2	–	3	pract. mark	–
AOVKIK099_1A	Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.
AOVGEN083_1A	Basic Cell Biology	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
AOVDEM156G1A	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
AOVDEM215G1A	Teaching assistance II. (Demonstrator)*	1	–	1	pract. mark	–
AOVTDKI58G1A AOVTDKI64G1A *	Work within the union of research students (TDK munka)	1	–	1	pract. mark	–
AOVCSA249_1A	Introduction to Clinical Medicine	2	–	2	pract. mark	Medical Profession
AOVCSA248_1A	Medical Profession	0,67	1,33	2	pract. mark	–
AOVFIZ475_1A	Mathematical and Physical Basis of Medical Biophysics	1	–	1	pract. mark	–

2nd semester						
AOVNEI263_1A	History of Medicine	2	-	2	pract. mark	-
AOVANI7458_1A	Clinical anatomy – propedeutics	2	-	2	pract. mark	Anatomy, Cell, Histology and Embryology III.
AOVANI7457_2A	Developmental Biology II.	2	-	3	pract. mark	Developmental Biology I.
AOVKIK102_1A	Clinical cardiovascular physiology	2	-	2	pract. mark	Medical Physiology II.
AOVINI7244_1A	Introduction to Medical Informatics	-	1	1	pract. mark	Medical Profession
AOVKPK088_1A	Library Informatics	2	-	3	pract. mark	-
AOVDEMI56H1A	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
AOVDEM215H1A	Teaching assistance II. (Demonstrator)*	1	-	1	pract. mark	-
AOVTDK158H1A AOVTDK164H1A*	Work within the union of research students (TDK munka)	1	-	1	pract. mark	-
AOVGVI198_1A	Predclinical and clinical neuropsychopharmacology and psychopharmacogenetics	1	-	1	pract. mark	Previous attendance of courses in Biology, Physiology and Biochemistry
	The Scalpel and the Paragaph: Special Issues of Medical Practice in Light of the Law	2	-	2	pract. mark	

* 2nd TDK research and/or demonstrator activity

ELECTIVE SUBJECTS

1st semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOSMAG392_1A	Art of Learning	2	-	2	pract. mark	-
AOSMAG318_1A	Social media in medicine	2	-	2	pract. mark	-
AOSMAG505_1A	The theory and the practice of Mindfulness Based Stress Reduction	2	-	2	pract. mark	-
AOSGEN134_1A	Introduction to Epigenetics	2	-	2	pract. mark	Immunology
AOSMAG506_1A	Lessons in Digital Health	2	-	2	pract. mark	-
AOSMM5174_1A	Traditional Chinese Medicine	2	-	2	pract. mark	basic module
AOSMAG507_2A	Highlights on Mental Health and Mental Treatment (Culture in Medicine II.)	2	-	2	pract. mark	-
AOSMAG336_1A	Culture in Medicine, Culture of Medicine	2	-	2	pract. mark	-
AOVGEN083_1A	Basic Cell Biology	2	-	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
AOSKIK151_1A	Cardiorespiratorical and neurophysical measuring techniques	2	-	2	pract. mark	Medical Physiology II.
AOSMAG139_1A	Jewish Medical Ethics I.	2	-	2	pract. mark	-
AOSNEI562_1A	History of Medical Professionalism	2,5	-	2	pract. mark	-
AOSFRM394_1A	Introduction to Pharmacological Research	2	-	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I.
AOVOVM093_1A	Basics of Medical Chemistry	2	-	3	pract. mark	-
	Medical Genomics	2	-	2	pract. mark	Medical Biochem., Molecular and Cell Biology I, II, III

2nd semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOSMAG392_1A	Art of Learning	2	-	2	pract. mark	-
AOSLEK340_1A	Clinical Hungarian	-	4	2	pract. mark	Hungarian Medical Terminology V.
AOVLEK229_2A	Medical Terminology II.	-	2	2	pract. mark	-
AOSGR374_1A	Disruptive Technologies in Medicine	2	-	1	pract. mark	-
AOVOVM414_1A	Pathobiochemistry	2	-	2	pract. mark	Medical Biochemistry II.
AOSMAG318_1A	Social media in medicine	2	-	2	pract. mark	-
AOSMM5174_1A	Traditional Chinese Medicine	2	-	2	pract. mark	basic module
AOSMAG336_1A	Culture in Medicine, Culture of Medicine	2	-	2	pract. mark	-
AOVELT101_1A	Problem based medical physiology	2,5	-	4	pract. mark	Medical Physiology II.
AOVKIK102_1A	Clinical cardiovascular physiology	2	-	2	pract. mark	Medical Physiology II.
AOSNEI246_1A	History of Medical Professionalism	2,5	-	2	pract. mark	-
AOSGEN142_1A	Sexual genetics	2	-	2	pract. mark	Anatomy, Cell, Histology and Embryology II. Biochemistry, Molecular and Cell Biology I.
AOSMAG139_2A	Jewish Medical Ethics II.	2	-	2	pract. mark	-
AOSGEN176_1A	Chemotaxis – Its significance in biology and clinical sciences	2	-	2	pract. mark	Medical Chemistry
AOSFRM394_1A	Introduction to Pharmacological Research	2	-	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I. or Medical Biochemistry I.
AOSANT494_1A	Systems Neuroscience	-	2	2	pract. mark	-
	Clinical Gastroenterology	2	-	3	pract. mark	Internal Medicine – Propedeutics
AOSMAG372_1A	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.

NOTE

CLINICAL MODULE



Faculty of Medicine
4th year

STUDY PROGRAMME

Fourth Year

		7th semester				
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFRM034_1A	Pharmacology and Pharmacotherapy I.	2.5	2.5	5	semi-final	Medical Physiology II. Medical Biochemistry and Molecular Cell Biology III. Pathophysiology and Clin. Lab. Diagn. II.
AOKNEI335_1A	Public Health and Preventive Medicine I.	1	2.5	4	semi-final	Pathology II., Pathophysiol. and Clin. Lab. Diagn. II.
AOKBL2028_2A ¹	Internal Medicine II.	1.5	3	4	semi-final	Immunology, Pathophysiol. and Clin. Lab. Diagn. II.
AOKSB1343_1A	Surgery I.	1,5	1	2	semi-final	Pathology II., Basic Surgical Techniques Pathophysiology and Clin. Lab. Diagn. II.
AOKKAR292_3A	Internal Medicine III. - Cardiology	1	2	3	semi-final	Internal Medicine II. *, Medical Microbiology II. Pharmacology and Pharmacotherapy I. *
AOKFUL042_1A	Otorhinolaryngology (either)	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques, Surgery I. *
AOKBOR043_1A	Dermatology (or)	1.5	2.5	4	semi-final #	Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I. Pharmacology and Pharmacotherapy I. *
AOKGR474_1A	Clinical Genetics	2	0	2	semi-final	Genetics and Genomics
AOKLMI033_1A	Laboratory Medicine	0.75	-	1	semi-final	-
AOKPUL047_1A	Pulmonology (either in the 1st or in the 2nd semester)	1	2	3	semi-final	Pathology II. Internal medicine - propedeutics
AOKPSI050_1A	Psychotherapy in medical practice	1	1	2	semi-final	Medical Psychology Medical Communication Internal medicine - propedeutics
AOKSZB044_1A	Oral Surgery and Dentistry	2	0	2	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques, Surgery I. *
AOKRAD049_1A	Radiology	2	2	4	semi-final #	Medical Imaging Anatomy, Cell, Histology and Embryology IV. Pathology II.
AOKHKT026_3A	The Medical Fundamentals of Disaster Resolution III.	1x2 / semester	-	0	signature	criteria requirement
Total Number of Credit Points from Compulsory Subjects					39 (if all above subjects are taken)	
4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory elective subjects and elective subjects of the Clinical Module after the fifth year curriculum						
Total Number of Credit Points from Obligatory elective / Elective Subjects				4		

Fourth Year						
8th semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKSIF538_1A	Infectology	2	0	2	semi-final	Pharmacology and Pharmacotherapy I. Medical Microbiology II.
AOKFRM034_2A	Pharmacology and Pharmacotherapy II.	2.5	2.5	5	final #	Pharmacology and Pharmacotherapy I. Medical Microbiology II. Internal medicine – propedeutics
AOKNEB35_2A	Public Health and Preventive Medicine II.	1	2.5	4	final #	Public Health and Preventive Medicine I.
AOKSB1343_2A	Surgery II.	2	2	4	semi-final	Surgery I. Pharmacology and Pharmacotherapy I.
AOKORT048_1A	Orthopaedics	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Pathology II., Surgery I.
AOKMAG045_1A	Bioethics – Medical Ethics	2	0	2	semi-final	Medical Psychology
AOKFUL042_1A	Otorhinolaryngology (either)	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques Surgery I. *
AOKBOR043_1A	Dermatology (or)	1.5	2.5	4	semi-final #	Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I.
AOKPUL047_1A	Pulmonology (either in the 1st or in the 2nd semester)	1	2	3	semi-final	Pharmacology and Pharmacotherapy I. * Pathology II. Internal medicine – propedeutics
AOKHK7026_4A	The Medical Fundamentals of Disaster Resolution IV.	1x2 /semester	–	0	signature	criteria requirement
AOKNSG333_1A	Summer surgery practice	–	1 month/ 170 hours	–	signature	Surgery II. *
Total Number of Credit Points from Compulsory Subjects				30 (if all above subjects are taken)		
4 credit points from obligatory elective/elective subjects must be collected in each semester. See the detailed list of obligatory elective subjects and elective subjects of the Clinical Module after the fifth year curriculum.						
Total Number of Credit Points from Obligatory elective / Elective Subjects			4			

1 2nd Department of Internal Medicine

The grade influences the qualification of the Diploma

* 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 B.G. Katzung, A.J. Trevor: Basic and Clinical Pharmacology, ed. 13th, McGraw-Hill Education, 2015 ISBN: 978-1-25-925290
- 7 Churchill's pocketbook of cardiology. Grubb, NR-Newby,D.E. Edinburgh 2006.
- 8 Richard B. Gunderman: Essential Radiology: Clinical Presentation · Pathophysiology · Imaging 3rd Edition, Thieme Medical, 2014. ISBN-10: 1604065737, ISBN-13: 978-1604065732
- 9 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!
- 10 Adams,J.C-Hamblen,D.L.:Outline of Orthopaedics. 12th ed. Churchill Livingstone, Edinburgh, 1995. ISBN 0443 05149 6
- 11 Horst Cotta: Orthopaedics. Georg Thieme Verl. New York, 1980. ISBN 3-13590001-0
- 12 Szendrői Miklós (szerk.): Orthopaedics. Semmelweis Kiadó, 2008. ISBN 978 963 9656 93 2
- 13 Bourne, Brewis: Lecture Notes on Respiratory Disease. Blackwell. 5th ed. 1998. ISBN 0-632-04968-5
- 14 Sabiston Essentials of Surgery. Saunders. 1994. ISBN 0-7216-3492-3.
- 15 Szabó Gy.ed: Oral and Maxillofacial Surgery. Semmelweis Kiadó, Budapest, 2001.
- 16 Szende B.-Suba Zs.: Introduction to Histopathology. Medicina, Budapest, 1999.
- 17 Koerner KR: Manual of Minor Oral Surgery for the General Dentist, Blackwell Munksgaard, 2008
- 18 Conrad Fischer—Caterina Oneto (2012): Master the Boards+. USMLE Medical Ethics. (Third edition) New York: Kaplan Publishing 13-ISBN: 978-1-60714-904-0

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 / Synopsis 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
- 16 full-text online access:
<http://gateway.ut.ovid.com/gw1/ovidweb.cgi?New+Database=Single|0&S=IDNJHKIDNGILPL00>
- 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 P u b l i s h e r : 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, Eppley 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. E. Erkonen, W. L. Smith: Radiology 101: the basics and fundamentals of imaging, 2nd ed, Lippincott Williams & Wilkins, 2004. ISBN 0781751985, 9780781751988
- 25 R. A. Novelline: Squire's fundamentals of radiology, 6th ed, Harvard University Press, 2004. ISBN 0674012798, 9780674012790
- 26 W. Becker, H.H. Naumann, C.R. Pfaltz: Ear, Nose and Throat Diseases Georg-Thieme Verlag, Stuttgart 1994. ISBN: 3-13-671202-1

**IMPORTANT: Practical part of the clinical subjects is held in block system in the 4th year!
Information will be given by the departments in the beginning of the 2018/2019 academic year.**

PHARMACOLOGY AND PHARMACOTHERAPY I – II.

Tutor: **Dr. Pál Riba**

First and Second Semester

Department of Pharmacology and Pharmacotherapy

Code: AOKFRM034_1A, AOKFRM034_2A

Total credits: 10

Course Director: *Dr. Ferdinandy Péter*

Thematics:

Pharmacology and Pharmacotherapy (two semesters)

Topics of Pharmacology and Pharmacotherapy I (Year 4, 2018/2019, first semester):

1. *Introduction into the Pharmacology* (history of pharmacology, pharmacogenomics, general principles of toxicology). *General Principles of Pharmacodynamics* (drug receptors, signaling mechanisms and drug action, pharmacodynamic principles, dose-response curves and quantal dose-effect curves, therapeutic index, tolerance).
2. *Pharmacokinetics* (drug absorption, distribution, elimination). *Clinical pharmacokinetic principles* *Drug interactions*
3. *Development and Regulation of Drugs* (clinical trials: phase I. II. III. IV.). *Evidence Based Medicine* (ethic disciplines, role of placebo in clinical trials). *Pharmacovigilance* (reports on adverse events and reactions). *Registration of Drugs*. *ATC code*. *Biological Drugs*. *Orphan Drugs*. *Generic products*, *biosimilar products*. *Drug formulations*. *Prescription writing*.
4. *Introduction to the Neurotransmission* (central and autonomic system). *General Anesthetics*
5. *Pharmacology of Cholinergic Transmission*. *Skeletal Muscle Relaxants*. *Local Anesthetics*.
6. *Pharmacology of Adrenergic Transmission* (sympathomimetic drugs). *Pharmacotherapy of COPD*. *Drugs Used in Bronchial Asthma*. *Antitussive Drugs*. *Expectorants*. *Pharmacotherapy of Asthma*.
7. *Pharmacology of Adrenergic Transmission* (sympatholytics drugs). *Antipsychotics*.
8. *Sedative-hypnotic and Anxiolytic Drugs*.
9. *Antidepressants and Mood-stabilizing Agents*. *Antiepileptic Drugs*.
10. *Treatment Strategy of Psychiatric/Neurological Disorders*. *Pharmacological Management of Neurodegenerative Disorders*. *Nootropic Drugs*. *Centrally Acting Skeletal Muscle Relaxants* (spasmolytics).
11. *Antiviral Agents*. *Pharmacotherapy of Viral Infection*
12. *Pharmacotherapy of Bacterial Infections*. *Cell Wall- and Membrane Active Antibiotics*.
13. *Pharmacotherapy of Bacterial Infections*. *Antibiotics Inhibiting the Protein- and Nucleic Acid Synthesis*. *Miscellaneous Other Antibiotics*.
14. *Antifungal and Antiprotozoal Agents*. *Drugs against pathogen insects*. *Disinfectants*. *Antiseptics*.

Topic of Pharmacology and Pharmacotherapy II (Year 4, 2018/2019, second semester):

1. *Drugs Used in Coagulation Disorders*. *Agents Used in Cardiac Arrhythmias*
2. *Drugs Used in Angina Pectoris*. *Antihyperlipidemic Agents*. *Diuretics and antidiuretics*.
3. *Drugs Used in Heart Failure*. *Antihypertensive Agents*.
4. *Treatment Strategy of Cardiac Failure*. *Treatments Strategy of Ischemic Heart Disease*. *Drugs Used in Peripheral Vascular Diseases*. *Agents Used in Anemias*.
5. *Pancreatic Hormones and Antidiabetic Drugs*. *Hypothalamic and Pituitary Hormones*. *Adrenocorticosteroids and Adrenocortical Antagonists*. *Thyroid and Antithyroid Drugs*. *The Gonadal Hormones and Inhibitors*. *Hormonal contraception*.
6. *Treatment Strategy of Hypertension*. *Metabolic Syndrome*. *Treatment Strategy of DM Type II*.
7. *Basic Pharmacology of Inflammation and Fever*. *Non-opioid Analgesics*. *Non-steroid Anti-inflamma-*

tory Drugs. Drugs Used in Gout. Agents that Affect Bone Mineral Homeostasis. Treatment Strategy of Osteoporosis.

8. *Basic Pharmacology of Opioid Analgesics. Drugs of Abuse. Drugs Acting on Smooth Muscles. Autacoids. Agents Affecting the Function of Uterus. Drugs Used for Treatment of Migraine and Cluster.*
9. *Treatment Strategy of Pain. Agents Acting via the Opioid Receptors. Adjuvant analgesics.*
10. *Immunopharmacology (immunosuppressive and immunomodulatory agents). Treatment Strategy of Rheumatoid Arthritis. Pharmacology of Nutrition (appetizers, agents improving digestion, prokinetic drugs). Laxatives and Antidiarrheal Drugs. Drugs Affecting the Liver and the Biliary Function. Vitamins, antioxidants, dietary supplements, traditional plant medicines.*
11. *Pharmacology of the Gastrointestinal System (agents for treatment of peptic ulcer, gastroesophageal reflux disease (GERD), irritable bowel syndrome and inflammatory bowel diseases (IBD)). Emetics and Antiemetics. Treatment strategy of peptic ulcer, GERD and IBD.*
12. *Cytotoxic and cytostatic anticancer drugs, other agents used within the frame of cancer chemotherapy. Treatment strategy of cancer. General and Detailed Toxicology.*
13. *Pharmacokinetic Differences and Variations in Drug Responsiveness according to Age or State of Health. Factors Affecting the Drug-body Interaction. Drug Treatment in Pregnancy.*
14. *Pharmacological Aspects of Emergency Medicine..*

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 (in both semesters on the 6th and 10th week). The results of the midterm exams influence the marks of the semifinal and final exam. 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. If the result of both midterms in the first semester reaches 80% the student will be offered a third, oral midterm. According to the student's knowledge in the 3rd midterm we can offer either 4 or 5 as the result of the semifinal exam in the last week of the first study period.

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 (Eds. B. G. Katzung, A. J. Trevor), 13th edition, McGraw-Hill Education, 2015. ISBN 978-1-25-925290
- 2 Materials discussed during lectures and seminars.

PUBLIC HEALTH AND PREVENTIVE MEDICINE I.

Institute: Department of Public Health

Location: NET building, 1089 Budapest, Nagyváradi tér 4., 13th, 14th, 19th and 21st floors.

NET 13th floor, room 1314

Tel.: 061 210-2930, extension 56313

Email: terand@net.sote.hu

Course lecturer: Prof. Dr. Károly Cseh

Course tutor: Dr. András Terebessy

First Semester

Lectures (1 contact hour, 45 min):

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

Seminars (2,5 contact hours, 113 min):

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 youth hygiene.

Field trip

Consultation

Second Semester

Lectures (1 contact hour, 45 min):

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 (2,5 contact hour, 113 min):

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

INTERNAL MEDICINE II.

2nd Dept. of Internal Medicine Tutor: **Dr. Krisztina Hagymási**

In 2018/19 Internal Medicine II. is taught by the 2nd Department!

First Semester

Type: compulsory

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 1, seminar 0, practical 3

Form of tuition: lecture, bedside practice

Mode of assessment: theoretical exam (semi final)

Aim: Diagnosis and treatment of the kidneys and the urinary tract, the medical aspect. Pathomechanism of the connective tissue diseases, The relevant steps in the differential diagnostic evaluation of the connective tissue diseases. Acquisition of knowledge of the diseases and functional disturbances of the immun system.

Syllabus: Morphological and functional examination of the kidney. The clinical presentation, morphological characteristics and classification of the glomerulopathies. Possibilities of the medical treatment in the different types of the glomerulopathies. The pathomechanism of the acute renal failure. Vascular disorders of the kidneys. Tubulopathies and interstitial nephritis. Chronic pyelonephritis. Urinary tract infections. Uraemia syndr. The clinical picture and treatment of the end-stage renal failure. The kidney in systemic diseases. Cystic and neoplastic diseases of the kidney and urinary tract.

The immunodeficiency states. Allergic diseases. SLE and rheumatoid arthritis (RA). Sjögren-syndr. Polymyositis, dermatomyositis, progressive systemic sclerosis (PSS), overlap syndr. Vasculitides and their differential diagnosis. Spodylarthropathies (M. Bechterew, Reiter syndr.). Osteoarthritis. Ricketts and osteomalacia. Osteoporosis. M.Paget. Crystal-induced arthropathies. Congenital disorders of the connective tissue.

INTERNAL MEDICINE III. – CARDIOLOGY

Heart Center Department of Cardiology

Tutor: **Dr. György Bárczi**

First Semester

Lectures (1 hour 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, 2 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.

I. Department of Surgery

Department of Transplantation and Surgery

Tutors: **Dr. Ákos Szűcs**
Dr. Gábor Telkes

First Semester

Lectures (1,5 hours per week)

History of Surgery. - Developments. Recent trends and perspectives.

General Anesthesia.

The resuscitation. (CPR). The Shock.

Fluid, electrolyte and metabolic disturbances. Artificial nutrition.

Surgical infections I. - Pyogenic infections, wound infections. Anaerobic infections.

Tetanus and gas gangrene. - Artificial nutrition of septic patient.

Surgical infections II. - Hepatitis. Aids, etc.

The role of antibiotics in surgery.

Asepsis, antisepsis. - Prevention of Surgical infections.

Surgical complications. Preparation of the patients and problems of the perioperative period.

Principles of operative surgery. Basic techniques, sutures etc.

Bleeding and blood clotting. Techniques of haemostasis.

Plastic surgery.

Surgical oncology.

Tissue and organ transplantation.

Consultation. Questions/Answers.

Practice (1 hour per week)

Introduction of the Department. The OP, the instruments of OP. The organization. The wards, etc. The central sterilization station. The admission system of the patients.

The preoperative wash-up. Asepsis, antisepsis, Get dressed for OP. The practical preparation of the skin.

The surgical instruments. What and when.

The treatment of wounds. The wound healing. The type of wounds. Bandaging procedures.

Injections. - Hypodermic, intracutan, intra muscular etc.,-

The suture techniques. Sutures, knots, clips, etc.-

Laparoscopic techniques.

Transfusion. The blood groups. Possible reactions and complications.

Anaesthesiology. - General anaesthesia. Narcosis systems. The intensive care unit.

The post operative treatments.

The resuscitation. - The CPR. - The latest pharmaceutical aspects of the CPR.

- Demonstration on AMBU unit.

Ward practices. (5x) - Investigate the surgical patients. The method of physical examinations. The evaluation of the findings.

Form of EXAM:

a) Semester Closing Written Test (demonstration): for all students

b) Oral exam (final result is calculated on the result of the test and the oral presentation)

SURGERY I.

II. Department of Surgery

The course leader is the director of the clinic: **Dr. Gábor István**

Study Responsible: **Dr. György Ledniczky** clinical chief physician

All educators in the clinic participate in the education.

ÁOK IV class **block study**

2018/2019 1st semester

In the semester, students will be introduced to the basics of general surgery.

The training builds on the curriculum and courses of the Department of Experimental Surgery.

Within the framework (35 contact lessons), we train the students in two-week turnovers.

The 35 lessons are divided by the timetable.

Eight lectures will be held in the field of general surgery.

1. The concept, types and indications of surgery. Legal issues, Surgery.
2. Types of wounds, principles of wound treatment
3. Surgical infections
4. Bleeding, haemostasis, thrombosis prophylaxis
5. Intraoperative and postoperative complications
6. Diagnosis and care of severe abdominal injuries
7. Basic principles of surgical oncology
8. Laparoscopic surgical technique, video presentation

In the course of the practicals we recommend and expect each student to hold a 20 minutes presentation on the following topics:

1. Surgical infections of the hand
2. Leg ulcer, diabetic foot, decubitus
3. Medical aids in surgical practice
4. Wrapping, modern dressings
5. Forms of soft tissue infection and their treatment
6. Intraoperative Diagnostics
7. Precancerosis, oncological screening
8. Risk factors, thrombosis prophylaxis

Recommended Practical Activities:

1. investigating an acute patient,
2. Investigating a surgical patient
3. wound treatment, dressings
4. participation in the work of the surgical ambulance
5. surgical assistance, visiting the OR
6. case reports
7. surgical administration
8. postoperative treatment, medication

In the framework of block education, because of its strict themes, we will be able to replace the absences in one of the next rounds.

On an individual basis, we offer students an opportunity to participate in acute care. This is possible every Sundays and Mondays.

Participation in fire and safety training is mandatory at the beginning of education.

After the term of study, during the exam period, only students who are taught by our clinic are eligible to sit for an oral exam (colloquium).

The exam items are published on our website and in the Neptun system at the beginning of the study period.

The items will be compiled from the themes of lectures and presentations.

With regard to the new form of education, there will also be items missing from lectures and presentations. Students can prepare themselves from textbooks and from other sources.

The course leader is the director of the clinic, Dr. Gábor István

Study Responsible: Dr. György Ledniczky clinical chief physician

All educators in the clinic participate in the education.

SURGERY II.

Second Semester

Lectures (2 hours per week)

Appendicitis

Acute abdomen

The oesophagus and diaphragm

The stomach, duodenum and small intestine

The large intestine and the ano-rectal region

The ileus

The liver

The cholelithiasis and biliary surgery

Pancreas I. - Acute pancreatitis

Pancreas II. (Chronic Pancreatitis. Tumours)

The artificial nutrition - Enteral, parenteral

The acute gastrointestinal bleeding

Catastrophic surgery. - Surgery of tropical diseases

Pediatric Surgery

Consultation - Questions-answers

Site of lectures: (előadások helye): lecture hall

PRACTICALS: all in wards (2 hours per week)

Form of EXAM:

a) Semester Closing Written Test (demonstration): for all students

b) Oral exam (final result is calculated on the result of the test and the oral presentation)

OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

Tutor: *Dr. Beáta Bencsik*

First Semester – half class

Second Semester – half class

Lecture (1 hour per week)

The role of otorhinolaryngology in medicine. Clinical anatomy of the ear. Diseases of the external ear.

Acute and chronic otitis media I. (etiology, diagnosis, pathology).

Acute and chronic otitis media II. (Complications and therapy)

Types of hearing losses, etiology. Audiological diagnostic methods.

Surgical management of hearing losses. Otosclerosis. Cochlear implant.

Physiology and lesions of the vestibular system.

Neurological and ophthalmological aspects of ear diseases. Prevention and rehabilitation.

Clinical anatomy and physiology of the nose and paranasal sinuses. Nasal obstruction. Epistaxis.

Infections and tumors of the nose and the paranasal sinuses. Therapeutical possibilities.

Clinical anatomy, physiology and diseases of the pharynx.

Diseases of the tonsils and their complications. Indications and complications of the tonsillectomy.

Anatomy and physiology of the larynx. Disorders. Infections of the larynx and their management.

Dyspnoea and suffocation with upper airway origin.

Conicotomy and tracheotomy.

Tumors of the larynx and their therapy. Rehabilitation of patients after total laryngectomy.

Diseases of the trachea and the oesophagus.

Foreign bodies. Medial and lateral neck masses.

Practice (2 hours per week)

Clinical examinations.

Diagnostical methods of the ear.

Evaluation of different types of perforations of the tympanic membrane. Cadaver bone practice.

Routine audiology. Uning fork practice.

Operating theatre. Video.

Examination of the vestibular system. ENG. CCPG.

Evaluation of different otological cases.

Anterior and posterior rhinoscopy. Clinical management of the epistaxis.

X-ray photos of the paranasal sinuses. Operating theatre. Video.

Advanced examination of the pharynx. Directoscopy, fiberoscopy.

Peritonsillar abscess. Dangers of the tonsillectomy. Tonsillectomy. Operating theatre.

Direct and Indirect of the voice. Laryngoscopy. Videostroboscopy.

Emergency management of suffocation.

Operating theatre. Video. Voice prostheses.

Oesophagoscopy, bronchoscopy.

Case reports. Palpation and investigation of patients with different neck masses.

ORAL SURGERY AND DENTISTRY

Tutor: **Dr. Zsolt Németh**

First Semester

Lectures (2 hours per week) **Practices** (0)

Introduction to Oral and Maxillofacial Surgery.

Benign tumors of the maxillofacial region

Haemangiomas of the maxillofacial region. Salivary glands

Malignant tumors of the maxillofacial region

Maxillofacial traumatology

Dental anesthesia. Extraction of the teeth General anesthesia in the maxillofacial surgery

Periodontal diseases. Oral medicine

Infections of dental origin

Minor oral surgery Dentoalveolar surgery

Dental reconstructions. Prosthodontics

Biomaterials in the maxillofacial surgery

Developmental anomalies of the maxillofacial region

Den to-maxillofacial radiology

Computer tomography (CT) in the maxillofacial surgery

Pediatric dentistry and orthodontics

Cariology and endodontics

Consultation

Note: The maximum number of absences from practices is 8 practice hours (45 minutes), from lectures is 4 hours (45 minutes) in a semester
More than these absences invalidate the semester. Final examination.

DERMATOLOGY

Department of Dermatology-Venerology and Dermatoooncology

Head of the Department: **Dr. Miklós Sárdy**

Tutor: **Dr. Béla Tóth**

Credits: 4

First Semester – half class

Second Semester – half class

Lectures: 1,5 hours/week; practices: 2,5 hours/week

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). Dermatoallergology. 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.

1,5 hours every week. Half of the fourth year students takes the subject in the first semester, the other half in the second semester. The curriculum contains the following topics: anatomy and functions of the skin, dermatoinfectology, oncodermatology, atopic dermatitis, ekzema, drug eruptions, bullous diseases, allergic skin diseases, autoimmune skin disorders, sexually transmitted diseases.

2,5 hours every week. Half of the fourth year students takes the subject in the first semester, the other half in the second semester. 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.

End semester 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

Tutor: **Dr. Márta Orosz**

First Semester – half class

Second Semester – half class

Lectures (1 hour per week)

Invasive and noninvasive diagnostic techniques of the lung diseases.

i.e. Fiberoptic bronchoscopy, lung biopsies, B.A.L., radiology, CT-scan, radioisotope scanning, ultrasound, lung function tests, immunological examinations.

The lung: anatomy and function (inclusive non-respiratory)

Chronic Obstructive Pulmonary Diseases

(Small Airway Diseases except: bronchial asthma)

Epidemiology, etiology, diagnosis, clinical picture, therapy.

Emphysema (clinical picture, diagnosis, laboratory findings,

Alpha-1 antitrypsin deficiency)

Bronchial asthma (epidemiology, etiology, pathogenesis, diagnosis, clinical picture)

Allergic rhinitis

Bronchial asthma, allergic rhinitis (treatment)

Pulmonary tuberculosis (epidemiology, etiology, primary and postprimary tb, clinical feature and risk groups. Common signs and symptoms. Diagnosis and treatment.

Follow-up dispensation.

Role of the I.C.U. (Intensive Care Unit) in pulmonology.

(Respiratory failures, mechanical ventilation, ARDS.)

Pneumonias (classification, etiology, causative agents, clinical features, diagnosis, therapy)

Opportunistic pathogens, AIDS and the lung, pulmonary mycotic infections

Tumors in the lung (statistics, etiology, classification, histology, clinical features, diagnosis, management, primary and metastatic forms)

Pulmonary embolism and pulmonary hypertension (clinical manifestations, origin, prevention, therapy, recurrent form)

Occupational lung diseases (Air pollution and the lung)

Immune diseases of the lung -Interstitial lung diseases

Sarcoidosis, Goodpasture-syndrome, hypersensitive pneumonitis, lung involvement in collagen vascular disease.

Diseases of the mediastinum and pleura.

Infrequent pulmonary diseases with uncertain etiology.

Consultation

Practises (2 hours per week)

In topics of lung function tests and blood gas analyses, allergology and clinical immunology, laboratory examinations, furthermore intensive therapy, rotary system has been planned. On further trainings patient interview, physical examination, X-ray picture visitation and discussion of the actual cases will be organized with active participation of all students. All of the main pulmonological diseases will be analyzed.

ORTHOPEDICS

Tutor: *Dr. Gergely Holnapy*

Second Semester

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.

RADIOLOGY

Dept. of Radiology

www.radi.sote.hu

Tutor: *Dr. László Dávid Tárnoki*

First Semester

Lectures (2 hours) **Practices** (2 hours)

Code: AOKRAD049_1A

Credits: 4

Course Director: *Dr. Viktor Bérczi*

Course topics (order of lectures could change)

Introduction. Clinical importance of imaging modalities. Gastrointestinal tract I-II. Urogenital radiology. Neuroradiology. Head and neck imaging. Chest imaging. Cardiovascular imaging. Intervention (vascular/ non-vascular). Pediatric radiology. Musculoskeletal imaging. Mammography- oncoradiology (screening methods). Nuclear medicine. Radiotherapy – Biology of radiation

Practices

Demonstration of imaging methods. Clinical radiology by interactive case reviews. Consultation. (Must-see-images: image collection on our website)

Semester requirements

3 or less absences (more than 3 invalidate the course).

Successful midterm test exam (on 8th or 9th week; supplementary test 2 weeks later)

Appreciated work on practices (assessment by teacher)

INFECTOLOGY

III. Department of Internal Medicine, Infectious Disease Group

Coursetype: compulsory/ optional / freely selectable (appropriate underlined)

code: AOKSIF538_1A

credit value: 2

Name of lecturer: Dr. med. habil. Gergely KRIVÁN, associate professor

Academic year: Semester 8

The role of the subject in realizing the purpose of the training:

Nearly 70% of patients in everyday medical practice are contacted by a physician due to infection, and in their 2/3 case of clinical complaints the role of a microorganism can be detected. This is why the infectological knowledge is essential for every clinician. Infectology as a compulsory subject primarily helps in the acquisition of an infectologist approach („thinking of pathogens“).

The course briefly reviews the changes in the incidence of infectious diseases, draws attention to new challenges, also to the risk of new and emerging infectious diseases.

It presents how the organism reacts to the attack of pathogens and deals with the consequences of the defective functioning immune system.

It is closely linked to the specific prophylaxis of infectious diseases, the description of vaccines.

The subject deals with the basics of antimicrobial therapy, first discussing the factors that most affect antibacterial efficacy and then discussing in detail the possibilities of managing the most important infections.

The most frequent infections in basic care are discussed, we deal with the possibilities of sepsis therapy and some special issues such as catheter sepsis or infections in patients with compromised immunity.

The lectures are particularly practical, bearing in mind that antimicrobial agents are used by all practicing professions and the knowledge of the basics is required by all professions.

The thematic of the subject:

1. The development of classical and modern infectology, the variable epidemiology of infectious diseases (variability in patient population, antibiotic resistance, new pathogens, its effect on therapy, etc.)
2. The principles of antibiotic use (empirical and targeted therapy, interpretation of microbiological results, dosage, duration, combinations, etc.)
3. Sepsis and its management (basis of the pathophysiology of sepsis, interpretation of lab results, markers) early diagnosis, treatment of patients with critical conditions.
4. Nosocomial infections, their major types, their diagnosis (hemocultures), changes in microbiome, CDI.
5. Foreign body associated infections (bloodstream infections and consequences, artificial valve, orthopedic prosthesis associated infections, treatment of some of the highlighted infections-MRSA, multi-resistant G- treatment)
6. Infections of patients with compromised immunity (baseline and associated bacterial, viral and fungal infections)
7. Zoonoses (leptospirosis, tularaemia, Hanta virus, Lyme disease, virus encephalitis, etc.) Bioterrorism
8. The most important tropical diseases, the possibility and significance of pandemics (malaria, leishmaniasis, respiratory viruses, etc.)
9. HIV-AIDS
10. The approach and practice of treating the most important infections in primary care (respiratory, urinary, skin, gastroenteritis)

11. Vaccinations (theoretical basics of vaccination, child and adult vaccines, medical and patient compliance, anti-vaccination)
12. Principles of antimicrobial prophylaxis (surgical and non-surgical prophylaxis).
13. Infection control and antimicrobial stewardship
14. Examination

Requirements for participation and the possibility of replacing non-attendance

The obligatory subject consists only of presentations, and the signature sheet must be completed. There is no special option for replacing the lecture.

The method of certification in case of absences from lectures or exam:

Absence from performances does not need to be specifically justified.

Number, topic and time, substitution and correction of mid-term audits (reports and exams):

The subject consists of one semester, there is no semiannual assessment.

Requirements for signature at the end of the semester (including the number and type of student tasks to be solved with individual work):

Presence on 85% of lectures.

Method of grading:

The exam consists of filling test questions, the number of test questions is between 30 and 35.

From the number of correct answers we deduct the number of absences, the rating will then be calculated based on this. If the correct answers minus absences result in less than 50% of all question counts, then it is inadequate, 51-60 % satisfactory, 61-70 % medium, 70-85 % good, 86-100 % is a great rating.

Exam Type:

Writing, multiple choice questions

Exam requirements:

To fulfill signature requirements.

Method of reporting:

At a predetermined time (after the last presentation)

The order of modification of the exam application:

Based on an individual discussion

Certification of absence from the examination:

Upon prior notification

List of notes, textbooks, tutorials and literature that can be used to learn the curriculum:

1. Feigin, Cherry eds. Textbook of Pediatric Infectious Disease 8th edition, Elsevier 2017.
2. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, Eighth Edition (2015) Eds: John E. Bennett, Raphael Dolin, Martin J. Blaser. ISBN: 13-978-1-4557-4801-3, Elsevier Saunders
3. Graphic material of lectures held during the course (in electronic form).

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)

Education: **Prof. Antal SZABÓ PhD., DSc.** (szabo.antal@med.semmelweis-univ.hu)

First Semester

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 Pathophysiology and Clinical Laboratory Diagnostic 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).

Classroom lectures “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.**

We 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: Simmelweis.hu/laboratorium

MEDICAL ETHICS (BIOETHICS)**Institute of Behavioral Sciences**

Tutor: **Prof. Dr. József Kovács**

Code: AOKMAG045_1A

Course Syllabus.

(28 hours)

Course objectives:

- a) To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- b) To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- c) 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
- d) 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 (Lecture) Principles of Medical Ethics
2. week (Lecture) Informed Consent I.
3. week (Lecture) Competence and Capacity to Make Health Care Decisions
4. week (Lecture) Informed Consent II. (Orsolya Peter)
5. week (Lecture) Information Disclosure to Terminally Ill Patients. Telling the Truth to Patients
6. week (Lecture) Confidentiality and Medical Records. Reportable Illnesses, HIV-Related Issues, Sexually Transmitted Diseases (STDs)
7. week (Lecture) Reproductive Issues
8. week (Lecture) End of Life Issues
9. week (Lecture) Organ and Tissue Transplantation
10. week (Lecture) The Rights of Patients
11. week (Lecture) Malpractice
12. week (Lecture) Doctor-Patient, Doctor-Doctor Relationship
13. week (Lecture) Doctor and Society
14. week (Lecture) Ethical Questions of Human Research

Course Faculty:

Prof. József Kovács, MD, PhD, (Head of the Department), 210-2930/56123;

Imre Szezik, MD, PhD: (Room 1914) (Tel: +36-20-824-3195)

Secretary: Jozefa Barreto

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. Deontological theories of ethics.
2. Utilitarian theories of ethics.
3. Kant and the categorical imperative
4. Virtue ethics
5. The principles of medical ethics
6. Justice and medical ethics: the allocation of scarce medical resources.
7. Paternalism in medical practice
8. Informed consent
9. Information disclosure for terminally ill patients
10. Advance Directives
11. Surrogate and Substitute Decisions
12. Medical confidentiality
13. Experimentation on human subjects
14. Objection to Transplantation of Organs and Counterarguments
15. Ethical problems of live organ donation
16. Organ donation from brain-dead donors: the system of donor cards.
17. Organ donation from brain-dead donors: presumed consent
18. Stages of Dying
19. No-Code Decisions
20. Withholding Fluids and Nutrition in terminally ill patients
21. Active and Passive Euthanasia
22. Withdrawing and withholding life sustaining treatment.

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.

PSYCHOTHERAPY IN MEDICAL PRACTICE

Institute of Behavioural Sciences (the Institute)

Department of Psychiatry and Psychotherapy (the Department)

Type of the course: compulsory

code: AOKPSI050_1A

credit: 2 credits 14 hours lecture + 14 hours practice

Presenter of the course: Dr. Zsolt Unoka, Dr. György Purebl

First semester: 2017/2018

Course objectives:

The objective of the course is that students acquire basic skills in psychotherapy which are necessary in general medical practice. Students are expected to gain knowledge about basic psychotherapeutic techniques necessary in the medical profession. Further objectives of the course are to further-develop the students' communication skills, to enable them to independently recognize and treat the problems approachable with psychotherapy on a basic level.

Course Syllabus:

1. The role of psychotherapy in the medical praxis
2. Stages of psychotherapy process
3. Core competencies, mechanism of changes and techniques of psychotherapies
4. Psychotherapy of anxiety disorders
5. Psychotherapy of affective disorders
6. Psychotherapy of sleep disorders
7. Psychotherapy of somatoform disorders
8. Psychotherapy in the treatment of chronic disorders
9. Crisis intervention. Detection and psychotherapy of suicidal intentions
10. Psychotherapy of eating and sexual disorders
11. Psychotherapy of alcohol and drug abuse/Dependence
12. Psychotherapeutic rehabilitation of psychotic patients
13. Treating difficult cases. Personality disorders

The e-learning material: Besides the written content, the material includes videos demonstrating psychotherapy techniques. Students have to read the e-learning material, watch videos and answer the controlling test questions on a weekly basis.

Topics of E-learning units and practices:

- I. The role of psychotherapy in medical practice and the treatment of illness related stress
 1. Basic competencies of medical doctors
 2. Psychological responses to illness and their psychotherapeutic treatment
- II. Indications of psychotherapy, the psychotherapeutic process
 1. First phase: Indications of psychotherapy
 2. Second phase: the phase of change
 3. The last phase of therapy
- III. Basic techniques of psychotherapeutic treatments of anxiety
- IV. Basic techniques of psychotherapeutic treatments of the depressive episode
- V. The psychotherapy of insomnia
- VI. The psychotherapy of somatization
- VII. Psychotherapeutic techniques in supporting patients living with chronic diseases
- VIII. Psychotherapeutic interventions of psychotic diseases
- IX. The psychotherapy of addictions: the short intervention, the motivational interview, and other techniques used in the psychotherapy of addictions

- X. The psychotherapy of sexual disorders
- XI. Dealing with difficult patients of various personality types in the medical practice.
- XII. Crisis intervention. Recognizing suicidal inclination and its psychotherapeutic treatment in practice
- XIII. Psychotherapeutic steps of imparting bad news
- XIV. Consultation about the semi-final exam

The seminars: Students practice psychotherapy techniques related to lectures and the e-learning material through role playing under the supervision of the seminar leader.

Participation on a seminar and making up for absences: Every student must read the e-learning unit and answer the control questions for every seminar as a condition of attending.

You can miss no more than three seminars during the term. It is possible to make up for an absence by attending another seminar group the same week.

For doing that students must ask the approval of both their teacher and the teacher of the group they aim to join for making up via e-mail.

Certifying the absence(s) from seminars and examinations:

Requirement for the participation on seminars is to read the e-learning material and complete the e-learning exercises. Attendance list and practice record will be made on every seminar. The seminar leader notes down the following data in the practice record: topic of the seminar, the demonstrated psychotherapeutic techniques, the practice group and the date. In case of absence the Department will not accept medical certificate, absences have to be made up.

Assessments during the semester (reports, written assignments) :

Continuous assessment: Requirement for the participation on seminars is pre-reading the e-learning material and doing the control questions each week.

Requirements for the signature at the end of the semester:

- (1) Regular active participation in seminars where psychotherapy techniques are practiced (participate in role plays) , (2) reading the e-learning material and doing the control questions each week before attending the seminar and (3) completing at least 10 e-learning tests with an error rate of 25%.

Method of the calculation of marks:

The condition for getting the semi-final grade is to pass an oral examination. The examination grade comprises the average of the grades for two oral examination questions (from a list of topics taken from the e-learning and textbook material).

Type of the exam: oral semi-final exam

Requirements for the exam: Regular active participation in seminars where psychotherapy techniques are practiced (participate in role plays) , (2) reading the e-learning material and doing the control questions each week before attending the seminar and (3) completing at least 10 e-learning tests with an error rate of 25%.

(4) Studying the exam material. Exam topic lists available on the websites of both the Institute of Behavioural Sciences and that of the Department of Psychiatry and Psychotherapy.

Application for the exam: Through the Neptun system. Students are required to register for the exam date of the institution the seminars of which they have attended during the semester.

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:

- 1 Glen O. Gabbard, Judith S. Beck, Jeremy Holmes – Oxford Textbook of Psychotherapy, Oxford University Press, 2007 - 534 pages
- 2 **Thomá H, Kächele H** (1987) Textbook of Psychoanalytic Therapy. 1 The basics. MIET Psychotherapeutic Team. Budapest, 1987.
- 3 **Rogers CR.** (2006) On Becoming a Person. The Birth of a Personality..
- 4 **Perczel** Forintos D, Mórotz K. Cognitive Behavioural Therapy. Medicina Publisher Ltd. Budapest, 2010.

LECTURES – TOPIC

Theme Lecturer

The role of psychotherapy in the medical practice: Indications of psychotherapy. The psychotherapeutic process Prof. Dr. Túry Ferenc

Stages of psychotherapy process Dr. Unoka Zsolt

Core competencies, mechanism of changes and techniques of psychotherapies Dr. Unoka Zsolt

Psychotherapy of anxiety disorders Prof. Dr. Bitter István

Psychotherapy of affective disorders Prof. Dr. Tringer László

Psychotherapy of sleep disorders Dr. Purebl György

Psychotherapy of somatoform disorders Prof. Dr. Tringer László

Psychotherapy in the treatment of chronic disorders Dr. Purebl György

Crisis intervention. Detection and psychotherapy of suicidal intentions Dr. Simon Lajos

Psychotherapy of eating and sexual disorders Dr. Túry Ferenc

Psychotherapy of alcohol and drug abuse/Dependence Dr. Szily Erika

Psychotherapeutic rehabilitation of psychotic patients Dr. Mersich Beatrix

Treating difficult cases. Personality disorders Dr. Unoka Zsolt

THE MEDICAL FUNDAMENTALS OF DISASTER RESOLUTION

Name of Educational Unit: **Department of Military-, Disaster- and Order Enforcement Medicine**

Subject title: The Medical Fundamentals of Disaster Resolution

Subject type: compulsory

Code: AOKHKRT026

credit value: 0

Subject coordinator: Dr. János Gál, university professor

Role of the subject in achieving the goal of the programme:

The primary aim of the subject is to provide basic level knowledge regarding civilian and disaster protection and resolution as they relate to medical students, healthcare, and citizens. Its objective is to empower students to creatively use their hereby gained knowledge and skills to recognize, and to participate in the resolution of emergency situations, disaster alerts and disaster resolving procedures in both their professional careers and their personal lives.

It also provides opportunities for various levels of specialization in the education and practice of potentially required medical duties in the prevention and resolution of disasters.

Subject Syllabus (weekly basis, in order):

7th semester: 2 lectures: (3M) Subject and objectives of Disaster Medicine. Medical trade-offs: Possible solutions to the disproportionalities between the capacity of the providing service and patients requiring treatment.

8th semester: 2 lectures: (4M) The importance of preventive medicine in disaster situations. Application of preventive medicine methods in disaster circumstances. Implementation of medical compromise principles during disasters. Surgical principals and their application during disaster situations. The principles of medical attendance during disasters.

Course attendance requirements and resolving absence:

Completing modules 1 and 2 are necessary for module 3 application. Participating in module 4 requires the completion of modules 1, 2 and 3. Application for the course must be done in accordance to corresponding regulations. Due to consisting of two 45-minute sessions per module, in the case of absence the completion of the course can only be credited to the student following attendance of a posterior lecture, or with the specific permission of the dean to take a test and successfully pass the exercise. Without either of these options being met, the course will be considered failed and no signature will be given. **For transferred students however, the following may be applied: In the first uneven semester it is permitted to apply for the uneven modules (I and III), and in the first even semester it is permitted to apply for even modules (II, IV).**

Certification of absence from lectures or the exam:

Accepted forms of certification: medical, formal – judicial, governmental, workplace, student governmental, etc.

Details of supervision during the course(hand-ins, written exams, dates, subjects, etc):

In the case of absence the completion of the course can only be credited to the student following attendance of a posterior lecture, or with the specific permission of the dean to write a test and successfully pass the exercise.

Requirements of signature (course completion) including the amount and types of assignments and tasks involving personal efforts of the candidate:

Students are required to attend the seminars to gain complete the course. Absence for acceptable reasons can be redeemed by participating on a posterior lecture or the successful completion of a test exercise following the permission of the dean. Only students who have initially applied for the course can participate on the posterior lecture. **Previously completed modules may be accepted in a separate procedure, subject to permission and approval.**

Method of grading: signature

Exam type: none

Examination requirements: none, only the participation requirement on the course is to be met.

Application for examination: none

Modification of examination application: none

Method of certifying absence from examination: none

List of literature for the course: In process of appearance

ELECTIVE SUBJECTS

Detailed programs see in the 5th year Study Program of Medicine!

COMPULSORY SUMMER PRACTICE

General Surgery - 1 month, 170 hours

Proof of completion (Certification of completed famulus practice) must be submitted prior to registration to the next academic year. Students who do not submit the certificate of completion on time will have their registration placed on hold until the proof of completion is received by the English Secretariat. Certificates can be downloaded at

http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101

Please read more about the rules concerning the criteria of selecting the foreign clinical practice positions and accepting the practice period spent abroad:

<http://www.semmelweis-english-program.org>

Practical syllabus of the famulation

Complete the tasks of a general physician of the department (in case of 6-10 patients at least), according to the assignment of the Head of the Surgery Department, under the supervision of a physician of the Department.

Recording patient's history, physical examination of the admission status of the patient, writing medical record according to this information.

Practicing the physical examination of breasts and the rectum is very important.

Developing the plan of the examination and the treatment of the patient, in conjunction with the monitoring physician. Ordering necessary examinations (laboratory, radiological, endoscopic, consultation), with approval of the monitoring physician. Monitoring and registering of the completion of these examinations.

Defining the necessary medication and other curing, with approval of the monitoring physician. Cognition and applying the Department's commonly used drugs (eg. heart drugs, intestinal motor drugs, antibiotics, etc.).

Continuously monitoring and registering of the state of the student's patients (temperature chart, decursus, etc.), referring to the Head of Department in the visits.

Writing final report at the patient's leave.

Practicing the technique of cupping.

Injecting (s.c., i.m., i.v.) under supervision.

Compilation of infusion and wiring of infusion under supervision.

Defining blood group, compilation of transfusion, cross-matching and biological matching, wiring transfusion, administration, under control and supervision!

Practice of the inserting of Duodenum-gavage, nasogastrical gavage.

Practice of bladder cathetering under supervision.

Practice of elastic bandageing.

Making and evaluating oversensitive tests under supervision.

Cognition and practice of applying test paper.

Applying and practicing oscillometry.

Picking stitches and chips.

Curing infected gashes, changing bandage under supervision.

Lend a helping hand in chest tapping and stomach tapping.

Participation in endoscopic and radiological examinations, if possible.

Participation in surgical consultations (in the Department and in other departments).

Participation in defining surgical indications.

Participation in operations of the Department. Assistance, especially in case of the student's own patients.

Cognition the principles of sterility, sterilization, washing, dressing, discipline of the operating room.

24 hour-on-call service once a week.

Experience the recognition of urgent, life-threatening surgical cases. Cognition of the principles and methods of patient care.

Participating in surgical preparation regarding anesthesiology.

Cognition and adaptation of surgical premedication, in case of chosen operation and urgent case.

Involvement in different types of general anesthesia (mask, combined, intracheal, intravenous narcosis).

Intubation (independent, if possible).

Cognition of the operation of the anesthetic machine. Monitoring of patient during surgery.

Ministration in vein preparation, and in insuring central vein (vena jugularis or subclavia punctio).

Practice and evaluation of measuring central vein pressure.

Sucking of excretion from pharynx and respiratory tracks.

Cognition of the specialities of the surgical intensive care.

Using patient monitoring machine.

Cognition of the problems of the post-operation-period. Participation in prevention and averting.

Cognition of the clinical methods of reanimation, participation in practical adaptation.

Participation in autopsy, and in clinical pathologic meeting.

Participation in every professional meeting of the institute, and the department.

Cognition and completion of the administration of the surgical out-patients consultations.

Applying and changing cover band, pressure bandage and vapour bandage.

Treatment of infected gash.

Examination of anthrax, abscess, phlegmone, pararitium. Participation in the treatment.

Application of tetanus prophylaxis.

Participation in ambulant operations.

Ministration in intravenous narcosis, doing it under supervision.

Ministration in local anesthetization, doing it.

Participation in consultation of the revision physician.

NOTE

CLINICAL MODULE



Faculty of Medicine
5th year

STUDY PROGRAMME

Fifth Year

Subject code	Compulsory Subjects	9 th semester				Credit Points	Examination	Prerequisite
		Lectures	Practicals					
AOKBL1471_4A ³	Internal Medicine IV.	1,5	2			3	semi-final	Internal Medicine I., Internal Medicine III. - Cardiology, Pharmacology and Pharmacotherapy II.
AOKONK539_1A	Oncology	1	1			2	semi-final	Pharmacology and Pharmacotherapy II. Radiology
AOKSB1343_3A	Surgery III.	1	1			2	semi-final	Surgery II.
AOKNO1480_1A	Obstetrics and Gynaecology I.	2	1 week/ sem			4	pract. mark	Pathology II., Pathophysiology and Clinical Lab. Diagnostics II., Surgery II.
AOKGY1054_1A ¹ AOKGY2055_1A ²	Pediatrics I.	2	3			5	pract. mark	Pathology II. Pharmacology and Pharmacotherapy II.
AOKPSI057_1A	Psychiatry I.	1,5	2			3	semi-final	Internal Medicine III. - Cardiology Pharmacology and Pharmacotherapy II. Neurology I. *
AOKNEU056_1A	Neurology I.	2	1,5			3	pract. mark	Anatomy, Histology and Embriology IV. Pathology II. Internal Medicine III. - Cardiology
AOKIGS399_1A	Forensic Medicine I.	1	1,5			2	semi-final	Anatomy H. E. IV., Genetics and Genomics, Pathology II.
AOKANE427_1A	Intensive Therapy and Anaesthesiology	1,5	1,3			2	semi-final	Surgery II., Pharmacology and Pharmacotherapy II., Internal Medicine III. (Cardiology)
AOKURO060_1A	Urology	1	2			3	semi-final	Surgery II. Radiology
Total Number of Credit Points						29		

1 1st Department of Pediatrics2 2nd Department of Pediatrics3 1st Department of Internal Medicine

Fifth Year**10th semester**

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKBL1471_5A ³	Internal Medicine V.	1,5	3	5	semi-final	Internal Medicine IV. Neurology II. * Forensic Medicine II. *
AOKNO1480_2A	Obstetrics and Gynaecology II.	2	–	2	semi-final	Obstetrics and Gynaecology I.
AOKGY1054_2A ¹ AOKGY2055_2A ²	Pediatrics II.	2	3	5	semi-final	Pediatrics I.
AOKPSI057_2A	Psychiatry II.	1,5	2	4	pract. mark	Psychiatry I.
AOKNEU056_2A	Neurology II.	2	1,5	4	semi-final	Neurology I.
AOKIGS399_2A	Forensic Medicine II.	1	2	3	semi-final#	Forensic Medicine I.
AOKANE426_1A	Oxyology – Emergency Medicine	1,5	1,1	1	semi-final	Internal Medicine III. – Cardiology Surgery II.
AOKTRA063_1A	Traumatology	1,5	2	3	semi-final	Anatomy, Cell, Histology and Embriology IV. Radiology Surgery I.
AOKCSA061_1A	Family Medicine	1	–	1	semi-final	Internal Medicine III. – Cardiology Public Health and Preventive Medicine II.
AOKSZE065_1A	Ophthalmology	2	2	4	semi-final#	Anatomy, Cell, Histology and Embriology IV., Internal Medicine III. – Cardiology, Surgery II.
Total Number of Credit Points				32		

* The prerequisite is that registration has been done for the marked subject – corequisite - as well

1st Department of Pediatrics2nd Department of Pediatrics3rd Department of Internal Medicine

The grade influences the qualification of the Diploma

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 Kaplan & Sadock's Synopsis of Psychiatry. Tenth ed. Eds: B.J. Sadock, V.A. Sadock, Lippincott Williams, 2007
- 5 N.C. Andreasen-D.W. Black: Introductory textbook of Psychiatry. American Psychiatric Press, Washington.
- 6 Lang, G.K.: Ophthalmology. A Pocket Textbook Atlas. Thieme Flexibook. Stuttgart, 2000. ISBN 3-13-126161-7
- 7 Hacker N.F-Moore J.G-Gambone J.C.: Essentials of Obstetrics and Gynecology. 4th ed. W.B. Saunders Co. ISBN 0-721601790 Paperback
- 8 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
- 9 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
- 10 P. Nyírády, I. Romics (ed.): Textbook of Urology, Semmelweis Publisher, Budapest, 2009.
- 11 Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients.
- 12 Adams: Principles of Neurology. McGraw-Hill
- 13 Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone
- 14 Marini J.J.-Wheeler A.P.: Critical Care Medicine – The Essentials. Williams and Wilkins. Baltimore, 2nd ed. 1997. ISBN 0-683-05555-0

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 Meeleod's: Clinical Examination. J.Munro. C.R.W 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 an 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
- 16 Rakel, R.E: Essentials of Family Practice. W.B.Saunders Co. 1998.
- 17 Taylor, R.B.: Fundamentals of Family Medicine. Springer, 1996.

IMPORTANT: Practical part of the clinical subjects is held in block system in the 5th year!
Information will be given by the departments in the beginning of the 2018/2019 academic year.

INTERNAL MEDICINE IV.

1st Dept. of Internal Medicine Tutor: **Dr. Péter Studinger**

In 2018/19 Internal Medicine IV. and V. are taught by the 1st Department!

First Semester

Course: Internal Medicine

Type: compulsory

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 1,5 + block system practical

Form of tuition: lecture, bedside practice

Mode of assessment: theoretical exam (semi-final)

Aim: Presentation and indications of the diagnostic examination of the gastrointestinal tract. An in-depth discussion of the gastrointestinal disorders and the therapeutic choices. Medical aspects of the hepatic diseases and the biliary tract disorders. Basic approach to the oncology patient. Therapeutic principles of the oncologic emergencies. Strategic principles of combined anti-tumor therapy.

Syllabus: The role of the diagnostic imaging in the gastro-enterology, its application in the inter-ventive therapy. Disorders of the oesophagus. Secretory diseases of the gastric juice. The peptic ulcer. Chronic inflammatory bowel diseases. Ischaemic colitis. Diverticulitis. A functional disorders of bowels. Tumours of the gastrointestinal tract. Diseases of the exocrin pancreas. The diagnostic approach to jaundice. Acute and chronic hepatitis. The clinical picture and therapy of the liver failure. Complications of the cirrhotic state. Hepatic tumours. Drug-induced liver disorders. Granu-lomatous and vascular diseases of the liver. Diseases of the biliary tract. The differential diagnosis of the abdominal pain. The acute abdomen. Gastrointestinal bleeding. Malabsorption and maldigestion. Differential diagnosis of the diarrhea.

Special solid organ tumors. Clinical importance of the paraneoplastic changes. Therapeutic principles of the oncologic emergencies. Strategic principles of combined anti-tumor therapy. Palliative therapy.

INTERNAL MEDICINE V.

Second Semester

Course: Internal Medicine

Type: compulsory

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 1,5 + block system practical

Form of tuition: lecture, bedside practice

Mode of assessment: theoretical exam (semi-final)

Aim: Integrated discussion of the haematological disorders and consideration of the therapeutic approaches. Differential diagnosis of infectious disorders.

Syllabus: Regulation of the haemopoiesis. Iron deficiency anaemia, anaemia of the chronic disorders, megaloblastic anaemias. Disorders of the iron utilisation. Aplastic anaemia. Haemolytic anaemias. Disorders of the haemoglobin synthesis. Cytopenic states. Myelodysplasia syndrome. Acute leukaemias. Chronic myeloproliferative diseases (CML, myelofibrosis, polycythaemia rubra vera (PV), essential thrombocytosis (ET). Lymphomas (M. Hodgkin, NHL). Plasmacell dyscrasias (multiple myeloma, Waldenström macroglobulinaemia, Heavy chain diseases, amyloidosis). Congenital and acquired disorders of the haemostasis. Fever of unknown origin (FUO). Nosocomial infections. Viral infections: human herpes virus infections. Acute upper airways viral infections. Pneumonia. Infective endocarditis. Septic shock. Influenza. Neurotop viral infections. Systemic viral infections. Systemic mycotic diseases (candidiasis, aspergillosis). Helminthiasis. Protozoon caused diseases: amoebiasis, giardiasis, malaria, leishmaniasis, pneumocystosis, toxoplasmosis, trypanosomiasis). The principles of antibiotic therapy.

SURGERY III.

Tutors: **Dr. Ákos Szűcs**
Dr. György Ledniczky
Dr. Gábor Telkes

First Semester

Lectures (1 hour/week) **Practices** (1 hour/week)

The surgery of hernia*

The surgery of endocrin organs*

No lecture

The surgery of breast*

No lecture

Vascular surgery. (To be announced later)**

No lecture

Cardic surgery (To be announced later)**

No lecture

Thorax and pulmonary surgery***

No lecture

The minimal invasive surgery (MIC) and the surgical perspectives*

No lecture

Consultation. - Questions/Answers*

Site of lectures:

Lecture room of 1st Department of Surgery (Előadó terem 1. Seb. Klinika)*

Lecture room of Dept. Of Cardio-Vascular Surgery (Szív és Érseb. Kl.)**

(XII., Városmajor u. 68.)

Lecture room of Dept. Of Thoraco-Pulmonology (National Korányi Inst.)***

Time:

Every second week on MONDAY

Site of practice: The venue is same as on the lecture will be held.

Form of the Exam

Written "Multiple Choice Test Exam" for all students

OBSTETRICS AND GYNECOLOGY I.

1st Dept. of Obstetrics and Gynecology

Tutor: **Dr. Gyula Richárd Nagy**

First Semester

Lectures (2 hours/week) held at the 1st Department

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.

OBSTETRICS AND GYNECOLOGY II.

Second Semester

Lectures (2 hours/week)

Gynecological endocrinology. Menstrual disorders. Inflammatory diseases in obstetrics and gynecology. Sterility, infertility. Assisted reproduction. Cervical cancer. 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. Practical education will be in groups of ten students. They spend a week in the Department rotating between major divisions and special outpatient clinics. They will take part in the night duties twice during the week.

PEDIATRICS I.

1st Dept. Tutor: **Dr. Dóra Krikovszky**

2nd Dept. Tutor: **Dr. Péter Hauser**

LECTURES IN PEDIATRICS FOR 5th GRADE MEDICAL STUDENTS

First Semester

Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 54. I. floor

TOPIC

The care of newborns and preterm babies.
Fever of infants and children. Congenital malformations
Introduction to paediatrics. Newborn physiology
Nutrition of infants. The care of the healthy baby
Presenting symptoms. Methods of paediatric diagnosis Inborn errors of metabolism
Diseases of the respiratory tract
Renal diseases in childhood
Psychomotor development of the child.
Mental retardation
Fluid and electrolyte disturbances.
Care of the child with diarrhea
Malnutrition. Chronic malabsorption disorders
Intrauterine infections. Anaemia. Infant mortality.
SIDS
Seizures during infancy and childhood.
Status epilepticus
Congenital heart diseases
Disturbances of the lipid metabolism

PEDIATRICS I.

First Semester

Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 53–54.

II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

Practice

The Pediatric Interview and History
The Pediatric Physical Examination
The Status of the Physical Findings
The Growth and Development of Infants
The Growth and Development of Children
Nutrition of Infants
Nutrition of Toddlers
Nutrition of Children
Genetic disorders and genetic counseling
Diagnostic Procedures (venipuncture, urine collection, gastric aspiration etc.)
Therapeutic procedures (administration of fluids, intravenous route, spinal tap, etc.)
Reanimation, monitoring of the critically ill child
EEG
ECG
X-ray

PEDIATRICS II.

LECTURES IN PAEDIATRICS FOR 5th GRADE MEDICAL STUDENTS

Second Semester

Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 54. I. floor

TOPIC

Collagen-vascular (autoimmune) diseases
Leukemia. Haemophilia. Malignant tumors
Diseases of the neuromuscular and skeletal systems
Surgical diseases of childhood. Acute and recurrent abdominal pain
Infectious diseases immunization
Meningitis, encephalitis. Differential diagnosis of the headache
Urinary malformations/infections. Urolithiasis.
Hypertension
Obstructive (wheezy) bronchitis. Bronchial asthma
Immunology
Endocrinology I.
Genetic counselling. Screening programs
Methods for clinical investigation of infants with perinatal brain damage
Laboratory investigations in paediatrics
Endocrinology II.

PEDIATRICS II.

Second Semester

Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 53–54.
II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

Practice

ECHO
Fever
Vomiting
Abdominal Pain diff. dg.
Diarrhea
Follow up of Patients With Chronic Diseases
Pediatric Emergency (surgery)
Prevention (screening, vaccination, vitamins)
Neurological Examination of Newborn Infant
The Patient With Glycosuria, Proteinuria etc.
Anaemia
Outpatients' Clinic Practice

Pediatric Otorhinolaryngology (examination)
 Endocrinology (puberty)
 Pediatric Oral Health

Each lesson starts with physical examination of children (at least 3 children) and discussion of one of the subjects above, depending on the examined patients.

Announcement of the 1st Department of Pediatrics – Regarding the exam for the 5th year English speaking students:

1. The first part is a practical exam at the patients bedside on the last day of your 2 week practice in the clinic. Paediatric patient examination.
2. The second part is a written exam at the end of the semester, based on our paediatric lectures. Your final mark is the mean of these two exams, with the written test exam having the bigger impact.

Note concerning the 6th year's rotations: Only legibly, completely and accurately filled out, institutionally sealed, original acceptance letters are recognized by the I. Department of Pediatrics!

PSYCHIATRY I – II.

Tutor: **Dr. Imola Seres**

First Semester

Lectures

Introductory lecture: curriculum, objectives, exams
 Gene-environment interactions in psychiatry.
 Stress and psychiatric disorders
 Classification of mental disorders
 Organic mental disorders: diagnosis and treatment
 EEG and event related potentials in Psychiatry
 Substance abuse: diagnosis and treatment
 Alcohol abuse and dependence: diagnosis and treatment
 Consultation and liaison psychiatry
 Somatoform disorders, Somatization and Conversion disorders, Hypochondriasis
 Psychosomatic and Eating Disorders: diagnosis and treatment
 Schizophrenia and other psychotic disorders
 Personality Disorders
 Posttraumatic stress Disorder
 Sleep disorders: diagnosis and treatment

First Semester

The semi-final exam in Psychiatry is a written test of 50 items which comprises multiple choice types, true and false and case recognition questions.

Week Practice

1	The psychiatric examination
2–5	Stress-related and somatoform disorders
6	Eating disorders
7–10	Mood (affective) disorders (incl. suicide)
11–14	Organic mental disorders (incl. mental retardation)

The semi-final exam of Psychiatry I. is a written test of 50 items comprising three types of questions: i.e. multiple choice, true and false, questions related to psychiatric cases.

Second Semester

Lectures

Child and adolescent psychiatry (ADHD, autism, tick disorders)
 Suicide
 Affective disorders: diagnosis
 Affective disorders: treatment
 Geriatric psychiatry
 Pharmacotherapy in psychiatry
 Adult ADHD (symptoms, comorbidity, disease course, therapy)
 Psychotherapy I: Cognitive and behavioural therapy
 Psychotherapy II: Family therapy, autogenic training, hypnosis
 Community psychiatry, rehabilitation of psychiatric patients
 Anxiety disorders: diagnosis and treatment
 Emergency Psychiatry
 Legal and ethical issues in psychiatry

Second Semester

Week Practice

1–4	Schizophrenia, schizotypal and delusional disorders
5–6	Personality disorders
7–8	Alcohol/substance abuse and dependency
9	Gerontopsychiatry
10	Clinical psychology in psychiatry
11–12	Emergency psychiatry/crisis intervention
13	Cognitive and behaviour therapy
14	Consultation /Questions and answers/; one/semester

FORENSIC MEDICINE I.

Tutor: *Dr. Zoltán Szőlősi*

First Semester

Lectures

The forensic medicine and its connection with law
The scene of death, suspicion of accident, suicide and homicide
Hurts and injuries I.
Hurts and injuries II.
Sudden death
The SIDS syndrome
Traffic medicine I.
Traffic medicine II.
Toxicology I.
Toxicology II.
Alcohol, alcoholism
Narcotics, narcomania
Asphyxia
Identification
Test writing

Second Semester

Lectures

Forensic Pediatrics
Forensic gynecology and obstetrics
Forensic traumatology
Forensic neurotraumatology
Forensic points of internal medicine I.
Forensic points of internal medicine II.
Forensic psychology and psychiatry
Environmental damages, occupational diseases
Medical risk, diagnostic problems
Genetics, serology
Transplantation, euthanasia

FORENSIC MEDICINE II.

Practice

50 per cent of the practical lessons will be interpreted in the autopsy room.
Once a semester each student has to make a written test in the framework of the consultation lessons.
50 per cent of the practical lessons will be "consultative lessons".

The topics:

First Semester

The role of the medical expert in the legal procedures.
Forensic autopsy and forensic autopsy report.
Expert patient connection, general rules of forensic examination.
Expert in front of the court (ethical, legal rules, the interpretation of the expert's opinion, the controversial reports, expert witness).
Legal points of medicine, patients' rights.
Examination of hurts and wounds, the first documentation.
Special points of examining different wounds.

Second Semester

Forensic examination of children and adolescents.
Forensic obstetrical and gynecological examinations.
Forensic psychological and psychiatric examinations.
Social and medical insurance, the medical risk, malpractice.
Paternity problems serological identification.
Rules and ethics of human clinical experiments.
Consultation (topic chosen by the students).

UROLOGY

Tutor: **Dr. András Horváth**

First Semester

UROLOGY

Head of Department: **Prof. Dr. Péter Nyirády**

Tutor: **Dr. András Horváth**

Second Semester

Education period: one semester

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

Tutor: **Dr. András Kállai**
Dr. Dóra Konczig

First Semester

Lectures:

1. Introduction
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
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. Basics of intensive therapy and anesthesiology. Diseases requiring intensive therapy. Patient safety. Psychological methods (hypnosis, suggestive communication) in anesthesiology and intensive therapy
10. Pulmonary embolism. Stroke. Disseminated intravascular coagulation (DIC)
11. Acute renal failure, acute kidney injury. Hepatic failure
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. Analgesics. 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 (Resplnt)
3. Shock practice (Shock)
4. Anesthesiology practice (ANE)
5. Anesthesiology and intensive care of trauma patients (TraumIA)

Simulation practices:

1. CPR-Basic
2. ALS-Sim1 (CPR Simulation 1)
3. ALS-Sim2 (CPR Simulation 2)
4. HiFi-Sim (High Fidelity Simulation)

Attendance criteria and absences:

In order to complete Intensive Therapy and Anesthesiology you need to be present **on 7 out of 9 practises (CPR Basic, CPR Simulation 1 or 2, High Fidelity Simulation are compulsory!)**. Also you need to pass a practical exam in In-Hospital Basic Life Support (CPR) that is built in the one-week rotation.

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). TraumaIA practices will be at the Trauma-ICU of OBSI ("Országos Baleseti Sebészeti Intézet", 1081. Budapest, Fiumei út 17., 7th floor). Simulation practices will take place at Simulation Center (Nagyvárad tér metro station, Bp. IX. Erő u. 7.) 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 TraumaIA practices our colleagues on the 7th floor of OBSI 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.

TRAUMATOLOGY

Department of Traumatology

Type of subject: Mandatory

Code: AOKTRA063_1A **credit points:** 3

Head of Department: Prof. Dr. Hangody László

Curriculum Year: 2018/2019

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. For this reason, the understanding of anatomy, physics, general surgery, neurology, radiology, and the clinical subjects (ENT, ophthalmology, urology), as well as physiology are prerequisites for the foundation of this subject. 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.

Syllabus (weekly schedule): 5th year students

General Traumatology

1. Patient history, physical examination
2. Non-invasive and invasive instrumental examinations
3. Soft tissue damage, bone-joint injuries
4. Injury mechanisms and classifications
5. Conservative fracture treatment methods
6. Identification and treatment of complications
7. Legal and medical insurance aspects of health care
8. Rehabilitation (physical therapy)

Specific Traumatology

1. Cranial injuries (facial and skull)
2. Spinal injuries
3. Shoulder and upper extremity injuries
4. Hand injuries
5. Pelvic and lower extremity injuries
6. Body cavity injuries (thoracic, abdominal, pelvic)
7. Polytrauma, ATLS, damage control
8. Sport trauma, arthroscopic surgery
9. Reconstructive surgery, arthroplasty

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. 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.

Attendance criteria and absences:

Lecture attendance:

75% attendance is required.

Practice attendance:

During the course of the one-week block, 7 absences are allowed, excluding the on duty shift, where attendance is mandatory. If the student is absent from 11 or more practices, he/she will not be allowed to take the exam, the subject will have to be repeated the following year. Absences between 7-10 must be repeated in the following manner: on-duty shift at the Traumatology Department. In this case, the student's must previously coordinate their attendance for this on-duty shift with the secretary.

Verification of absences from lectures, practices or from the exam:

We can only accept hospital discharge papers for verification of more than 25% absences from lectures, practices or the absence from the exam, proving the student was continuously hospitalized during that time period.

Mid-semester test and quiz topics, dates, absences and retaking of these tests:

There will be no tests or quizzes during the semester. During practices, the lecture material will be discussed, disputed questions can be settled.

Criteria for the signature at the end of the semester:

Attendance of lectures 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.

Grading:

1. Written (multiple choice test), only one date is ensured for this exam. In the case of absence from the exam, the student will only have the opportunity to take an oral exam.
2. Retaking of the written exam is not possible. Repeating of the examination can be taken in the form of oral exam only. Our department will ensure min. 1 time period per week for the repeated oral examination during the exam period.

Type of exam:

Written (multiple choice test) – one occasion - Make-up exam: oral
Oral exams

Exam requirements:

The knowledge of the given textbook, lecture and practice material.

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

Internet

The lecture material can be downloaded from the Semmelweis University Department of Traumatology website:

<http://semmelweis-egyetem.hu/traumatologia/education-program-of-traumatology-for-medical-students-fifth-year-2/>

OPHTHALMOLOGY

Dept. of Ophthalmology

Tutor: **Dr. Miklós Resch**

Second Semester

Lectures:

Introduction. History of ophthalmology.
Ophthalmology in medicine.
Functions of the eye. Optics.
The conjunctiva. Ocular surface diseases. The “red eye”.
Diseases of the eyelids.
The lacrimal system - function and diseases.
The cornea – keratitis, degenerations, dystrophies.
Keratoplasty. Refractive surgery.
Diseases of the sclera.
The crystalline lens. Aetiology of cataract.
Management of infantile and adult cataract.
The orbit. Signs and symptoms of orbital diseases. Thyroid ophthalmopathy Infections.
Lacrimal gland diseases.
The uvea and its diseases.
Glaucoma. Clinical diagnosis. Classification. Treatment.
Disturbances of ocular circulation.
“Medical”, retina (vascular diseases, macular disorders) and “surgical” retina (retinal detachment).
Ocular manifestations of systemic diseases. The vitreous and its disorders.
Pediatric ophthalmology. Strabismus, amblyopia.
Diseases of the optic nerve and optic pathways.
Neuro-ophthalmology. Normal and abnormal eye movements.
Pupillary reactions.
Tumours of the eye.
Modern diagnostic and imaging techniques in ophthalmology.
Trauma of the eye and adnexa.
The role of the general practitioner in the management of eye diseases.
Multiple choice questions. Diagnostics (slides).
Demonstration material: slides, handouts, videotapes, case studies.

Practice:

Anatomy of the eye and adnexa. Dissection of a pig's eye.
General notions on the examination of an eye patient.
The normal ophthalmological status.
Functions of the eye. Determination of visual acuity (distant, near). Refractive errors of the eye. Retinoscopy.
Correction of visual refractive errors. Prescription of glasses. Javal-Schiötz ophthalmometer.
Corneal topography. Contact lenses. Photorefractive keratectomy.
Visual field, colour vision, examination of dark adaptation, critical flicker fusion frequency. Tonometry.
External examination of the eye (diffuse light, focal illumination, slit lamp), exposing the palpebral fissure, eversion of the eyelids. Differential diagnosis of the red eye.
Ophthalmoscopy I.

Red reflex. Direct and indirect ophthalmoscopy. Examination of the pupil.

Ophthalmoscopy II.

Fluorescein angiography. Scanning laser ophthalmoscopy.

Surgical management of cataract. Ultrasound biometry. Planning of the refractive power of IOL.

One - day surgery.

The glaucoma patient, screening and follow-up. Antiglaucomatous interventions.

Surgery of the vitreous body.

Ophthalmoscopy III. Pediatric ophthalmology. The examination of concomitant squint and its treatment. Binocular vision. Differential diagnosis of paralytic strabismus.

Ultrasonographic examination. Diseases of the retina and vitreous body, intraocular tumors, retinopathy of prematurity. Demonstration of the ultrasound diagnostics of the aforementioned diseases.

Ophthalmoscopy IV. Ward round, examination of patients.

Electrophysiology of vision (ERG, EOG, VEP).

Emergency in ophthalmology. (Sudden and progressive loss of vision)

First aid in ophthalmology. Forms of patching, treatment of eye injuries.

Ophthalmological tasks of the family's physician. The most common eye complaints and disorders.

Ward round, examination of patients.

Consultation.

NEUROLOGY I – II.

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)

Exams: At the end of the first semester tutors conduct a practical examination.

At the end of the second semester the semi-final exam consists of a practical (testing the neurological examination skills at the bedside) and a written theoretical part. Passing the practical exam is the prerequisite of taking the written exam. The written exam includes simple and multiple choice questions. The questions are based on the matter of neurology lectures. On event of failing either part of the exam the earliest possible retake is after 10 days. The retake theoretical exam is an oral exam. At the exam students must present their index book and in case of retake the permission from the Office of Dean.

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 an Bannister's Clinical Neurology. Oxford University Press
6. Mumenthaler: Neurology. Georg Thieme Verlag.

First Semester

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 1, + block system practical

Form of tuition: lecture, bedside practice

Week	Lecture title
1.	Basic principles of neurological diagnosis. The anamnesis. The connection between symptoms, localization and causes of neurological diseases.
2.	Patient examination I. Cranial Nerves (part 1).
3.	Patient examination III. Motor system (part 1)
4.	Patient examination IV. Motor system (part 2)
5.	Patient examination II. Cranial Nerves (part 2)
6.	Patient examination V. The sensory system
7.	The spinal cord. The peripheral nervous system.
8.	The brainstem. The thalamus
9.	The cerebellum
10.	Altered states of consciousness
11.	Organization of speech, language
12.	The temporal and the parietal lobe
13.	Control of behaviour. Memory and related structures
14.	Neuroradiology (CT, MRI, angiography)

1 week block Practice

1st day	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.
2nd day	Assessment of the paresis. Examination of muscle tone and trophy. The mono- and polysynaptic reflexes. The pyramidal signs. The upper and lower motoneuron lesion.
3rd day	Examination of the sensory system. Examination of the spine and spinal cord. The vegetative functions.
4th day	The coordination. The cerebellar functions (neo-, paleo-, and archicerebellum).
5th day	The reticular activating system. Examination of speech and higher cerebral functions

Second Semester

Total weeks: lecture 14, seminar 0, practical 14

Hours per week: lecture 1, + block system practical

Form of tuition: lecture, bedside practice

Week	Lecture title
1.	Classification and treatment of cerebrovascular disorders
2.	Tumors of the central nervous system
3.	Dementias
4.	Movement disorders
5.	Diagnosis and treatment of epilepsy
6.	Neurological Emergencies
7.	Neurosurgical aspects of Neurology
8.	Neuromuscular disorders. Myopathies. Neuropathies
9.	Motoneuron diseases.
10.	Multiple sclerosis
11.	Neurological consequences of craniospinal traumas
12.	Alcohol related nervous system disorders
13.	Headaches and neuralgias
14.	Inflammatory neurological disorders. AIDS.

1 week block Practice

1st day	Examination of patients suffering from Cerebrovascular Disorders
2nd day	Movement Disorders, Hyperkinesias
3rd day	Hypnoid and non-hypnoid unconsciousness. Epilepsy
4th day	Multiple Sclerosis, Neuropathies
5th day	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, subarachnoidal 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

EMERGENCY MEDICINE – OXIOLOGY

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)

Second Semester

Compulsory subject: Emergency Medicine and Oxyology (EMO)– program and topics

1 credit

Lectures	Remarks
Pictures and sounds from the 20th century – birth of a new philosophy 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 emergency 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 frequent 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-anything 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):** Monitoring, basics of red flag treatment and team skills. Diagnostic and therapeutic approach of critical ill patient with basic technical and non technical skills. Basic monitoring techniques 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): Monitoring, basics of red flag treatment and team skills. Diagnostic and therapeutic approach of critical ill patient with basic technical and non technical skills. Basic monitoring techniques 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.

FAMILY MEDICINE

Tutor : Péter Torzsa MD Tel: 355-8530, e-mail: ptorzsa@gmail.com

Lectures

Exam: Test exam

Credit value: 1 credit point

Minimum/maximum group size: 55/210

Key elements of these seminars include:

- The structure and functioning of the Hungarian Primary Health Care System. Activity of the general practitioners.
- The ranges of normality as they will assist in recognizing and anticipating deviations from normal and the earliest manifestations of disease
- Quick diagnoses. Applying the best available evidence in investigations and and management of common family medicine conditions.
- The different roles of the physician and awareness of their own personal strengths and weaknesses and how it affects the Patient-Doctor relationship.
- The appropriate selection and use of screening methods for the early detection of disease. The principles of preventative care and methods to implement appropriate screening and patient education programs
- Assessing patients' illness experience within their family and social context
- Learn to manage in-hospital urgent and emergency situations in primary care.
- Management/treatment approaches of commonly presenting conditions
- Rural medicine
- Video communication to improve communication skills
- Arrangement for the 2 weeks practice (rotation)

ELECTIVE SUBJECTS

(basic/pre-clinical/clinical modules) – curricula

It is compulsory to choose one subject each semester.

ANTIBIOTIC THERAPY

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. Timár, E. Ludwig, Zs. Mécsner: 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, tonsillitis, pharyngitis). 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 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 Szebeni** 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 - MEDICAL LITERATURE RESEARCH

Lecturer: **Dr. Livia Vasas** PhD. – Central Library

Institute: Semmelweis University Central Library, 1088 Budapest, Mikszáth Kálmán tér 5, 1st floor

Duration: One semester, 30x45 minutes (10x3 lessons)

SUGGESTED SEMESTER 1-10.

Exam-form

Credit-value

Minimum/maximum group-size

The aim of the subject:

Thematic:

Assistant lecturer:

Student records officer:

Application deadline:

Precondition

Practical mark

3 credit-points

8/30

Teaching students how to search in medical literature sources

Medical e-catalogues, e-books, e-libraries, databases (PubMed/Web of Science/Scopus/Ovid Medline, EBM, PsycINFO, IPA, Primal Pictures -3D Anatomy Atlas/ProQuest Dissertations and Theses), Scientific Web Scientometry (IF, Citation)

Anna Berhidi, Edit Csajbók

Zsuzsa Margittai: Tel.: 459-1500/60503

September 4 -8, 2017

There isn't.

1. **Introduction, technical details introduction of Central Library's Homepage: www.lib.sote.hu and its facilities**
 Literary research
 Introduction: homepage of central library
 Training: researching, keywords
 – Basic computer knowledge for literature search
2. **PubMed database**
 The meaning of PubMed
 Introduction of PubMed
 National Library Medicine-Medline and thesaurus
 Entrez databases
 MESH and PubMed Searching
3. **Periodicals, Scientometry: Impact factor (JCR)**
 – Training: Browser and matching searching, archive and the newest editions
 – Characterization of periodicals/reviews/journals, ISSN, DOI
 Electronical edition (Science Direct, Springer, LWW, Biomed Central, InterScience, Nature Publishing Group)
Impact factor (JCR)
 Fundamentals of science
 ISI- JCR Science Edition and Social Science Edition, IF:
calculating Impact factor and its role by measuring scientific publications
 List of Journals with IF: **Journal Citation Report** and its editions.
Searching an exact data in JCR, handling data: sorting and filtering journals
4. **Searching International Library/Book/Periodical catalogues**
 Hungarian electronical catalogues
 Semmelweis Univ. Central Library (Budapest) <http://www.lib.sote.hu>
 National Library of Medicine (Bethesda, USA)
<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=nlmcatalog>
 Deutsche Zentralbibliothek für Medizin (Germany) <http://www.zbmed.de>
 Karolinska Institute (Sweden) <http://search.kib.ki.se/miks/bin2/>
 Worldcat <http://www.worldcat.org/>
 Amazon www.amazon.com
How do we get from the abstract to the full article? -
 practicing the proper search strategy
5. **Introduction of bibliographic and citation databases:**
Web of Science, SciVerse Scopus
 Bibliographical items, citations
 general searching in the database model searching –guided
 Exercises: bibliographic searching on keywords
 Citation analysis
 meaning of Citation analysis and its role by measuring scientific works
 Web of Science database cited reference search
 Value-added services of Web of Science, Scopus
6. **OVID databases, online books, online periodicals, 3D Anatomy Atlas**
 Natural language, advance search strategy
Evidence Based Medicine databases: the role of the EBM in research and practice
Full text journals in Ovid databases
MEDLINE, PsycINFO, IPA databases: subject heading systems, value-added services
 Primal Pictures – 3D Anatomy Atlas: interactive tools for studying anatomy
 Link Solver – access to the full text version

7. **Reference Manager: EndNote, EndNote Web**
the role of reference softwares in modern publishing
Literature searching: Importing and exporting records
 (from Web of Science, Scopus, OVID Medline, PubMed)
creating own records
search facilities within our records and from PubMed;
data handling: creating groups, filtering duplicates
8. – Paper and online periodicals
 – ProQuest, Dissertations and Theses- Full text
 – PubMed training
9. **Semmelweis Knowledgebase**
Scientific Discovery of the Internet:
 – Find Medical Information you can trust
 – Building search strategies
 – Google Scholar, Medworm
10. Summary of the course, consultation
exam: 2 electronic tests during the semester, renewal opportunity for each tests.
Proposed grade or exam test during the exam period.

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
 Alphafetoprotein (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 mucolipidoses
 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 (MartinBell 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

Physiology of the Fetus and Newborn. Transition to Extrauterin Life.
 Maternal and Fetal Problems in Neonatology. Prenatal Care.
 Delivery Room Management of Newborns. Resuscitation. Infant Transport.
 Respiratory Disorders of Newborns.
 Ventilation of the Neonate.
 Cardiac Diseases of Newborns.
 Surgical Diseases of Newborns.
 Metabolic Problems of Newborns.
 Neonatal Hyperbilirubinaemia. Anaemia. Polycythaemia. Blood Products Used in the Newborns.
 Parhophysiology of Body Fluids. Fluid and Electrolyte Management.
 Neonatal Neurology.
 Infections of the Newborns. Prevention and Treatment.
 Neonatal Pharmacology. Surfactant replacement.
 Neonatal Radiology.
 Follow up of High-risk Newborns.

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 antiseptics. 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, Otolaryngology, 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 medications. 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. Counseling.

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: **Prof. Dr. László Kalabay**

Location: Kútvölgyi Hospital, first floor, library

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

Faithel 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 thematics:

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

Second Semester

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 <http://www.dgci.sote.hu>

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 Köhidai**

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.sciencereoll.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 Director: *Prof. Dr. Ferenc Túry*

Lecturer: *Dr. János Kollár*

First and Second Semester

The program focuses on five fields of study:

- 1 **Keys of Originality** – Teaching simple methods for improving creativity. Such methods can be a part of the everyday practice. By improving creativity, people can regain their capability of open mind thinking and thus understand the world on a higher level.
- 2 **Learning methods** - Such methods that can help to make the process of learning as enjoyable and easy as possible. They can help to organize the structure of memory, improve recall and give an aid to find associations in between different learning materials.
- 3 **Lecturing** - Teaching basic rules of lectures and presentations (how to grab the attention of the audience, how to avoid the usual “pitfalls”, how to overcome “stage fright” etc.) and acquiring knowledge about the latest presentation softwares (including Prezi, Leonar3Do etc.).
- 4 **Analysis of the Social Media and Relaxation** – Using RSS (Really Simple Syndication) for collecting information regarding any topics for eg. for writing scientific papers, wise application of searching systems available on the internet and discovering sites important for teaching and learning. Learning the basics of relaxation.
- 5 **Exam** – The participants present their own presentations in front of the group while getting feed-backs from each-other and the leader of the course.
There is no prerequisite for the course. It consist of 5 meetings 4 university hours per each. At the end of the course the participants take an exam.

1st meeting: Keys of Originality – Teaching simple methods for improving creativity. Such methods can be a part of the everyday practice. By improving creativity, people can regain their capability of open mind thinking and thus understand the world on a higher level.

Some key elements:

- Creativity in the light of transactional psychology (possibilities for enhancing the “creative child” living inside of us)
- Creative problem solving (10 exercises for creativity improvement. Everybody has an opportunity for choosing the best ones for herself/himself.)
- Everyday methods for creativity improvement (20-25 games and exercises in small groups and large group)

2nd meeting: Learning methods - Such methods that can help to make the process of learning as enjoyable and easy as possible. They can help to organize the structure of memory, improve recall and give an aid to find associations in between different learning materials.

Some key elements:

- Neurologic base of learning, the role and function of Short Term Memory and Long Term Memory (short lecture)
- Connection in between emotions and learning (presentation and exercise)
- Acquiring individually shaped mnemotechnic methods (PQRST method, Mind Mapping, Locus Method, Storybuilding, ABC method, learning numbers, learning names etc. – introduction into the application of the methods, individual and small group exercises)
- Basic methods of neurolinguistic programming (NLP) (anchoring, reframing, VAKOG method)

- Creation of brainwave synergy and its role in learning (the application of Natura Sound Therapy software and its advantages in learning)
- Time management in learning (how to use time of learning more effectively making the period of learning much shorter)
- Biological background of learning (breathing, nutrition, yoga exercises)

3rd meeting: Lecturing – Teaching basic rules of lectures and presentations (how to grab the attention of the audience, how to avoid the usual “pitfalls”, how to overcome “stage fright” etc.) and acquiring knowledge about the latest presentation softwares (including Prezi, Leonar3Do etc.).

Some key elements:

- Basic differences in between a lecture and a presentation
- Making an 8 minute long presentation as perfect as possible on a conference (basic rules of creating and holding presentations)
- Overcoming nervousness while holding a lecture or presentation
- The latest softwares applied presenting your material.
- Making 3D presentations

Making your own presentation about a given topic – exercise (searching for material, collecting the presentation, keeping the rules of presentation, evaluation)

4th meeting: Analysis of the Social Media and Relaxation – Using RSS (Really Simple Syndication) for collecting information regarding any topics for eg. for writing scientific papers, wise application of searching systems available on the internet and discovering sites important for teaching and learning and learning the basics of relaxation.

Some key elements:

- How to find relevant material on the World Wide Web? (Search engines, searching methods)
- Searching for illustration materials (pictures, videos, other materials) for your presentation or lecture (introducing Slideshare, Scholar, Digg, Knol etc.)
- Web 2.0 and Web 3.0 and the exploitation of their possibilities (thematic and semantic search)
- Free internet sources of lectures and teaching/learning materials
- Organizing virtual conferences in cyberspace (Second Life, Conference Alert etc.)

5th meeting: Exam – The participants present their own presentations in front of the group while getting feed-backs from each-other and the leader of the course.

Application: A motivational letter should be written by the applicant describing the reasons of application. Based on the motivational letter the application can be accepted or denied. The decision will be made in 3 days. The motivational letter should be sent to the following e-mail address: kollarmethod@gmail.com.

ONLY ONE absence is allowed.

Textbooks:

- 1 Kermani, K. 1990. Autogenic Training. Souvenir Press Ltd. London.
- 2 Herkert, R. 1993. Die 90-Sekunden Pause. Integral Verlag, Wessobrunn.
- 3 Tracy, B. 2005. Focal Point. Amacom, American Management Association International, New York.
- 4 O'Connor, J., Seymour, J. 1993. Introducing NLP. Thorsons Publisher Ltd. London.
- 5 Metzger, W., Schuster, M. 1996. Lernen zu lernen. Springer-Verlag Berlin Heidelberg.
- 6 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://sciencerevolution.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

Lecturer: **Prof. Dr. Csaba Szalai**

Department of Genetics, Cell and Immunobiology

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 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 influence 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 shown.

Planned lectures:

- Introduction to genomics, the human genome
- 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

Faculty of Medicine, Department of Anatomy, Histology and Embryology

Type of course: optional course-unit

code: AOSANT494_1A

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. Gyorgy 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

Lévay 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 psychopharmaceuticals (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.)

1. Kirilly E., Gonda X., Bagdy G.: CB1 receptor antagonists: new discoveries leading to new perspectives. *ACTA PHYSIOLOGICA* 205:(1) pp. 41-60. (2012)
2. Lazary J., Juhász 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)
3. 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.
4. 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. Juhász G, Hullam G, Eszlári 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, Juhász 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, Truszká 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.

The course description was prepared by

Gyorgy Bagdy

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.**

OBLIGATORY ELECTIVE AND ELECTIVE SUBJECTS – SCHEDULE OF THE CLINICAL MODULE

OBLIGATORY ELECTIVE SUBJECTS						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVANE104_1A	Anesthesiology and Intensive Therapy	2	–	2	pract. mark	Surgery II.
AOVFRM252_1A	Medicinal, Epidemiological, and Social Aspects of Drug Abuse	2	–	2	pract. mark	Pre-clinical module
AOVPAT126_2A	Clinicopathology II.	2	–	3	pract. mark	Pathology final
AOVBL2112_1A	Clinical Endocrinology	2	–	2	pract. mark	Basic module
AOVCVT411_1A	Clinical Hematology	2	–	2	pract. mark	Pre-clinical module
AOVKLM157C1A	Clinical practice	–	1	1	pract. mark	Pre-clinical module
AOVBL2150_1A	Clinical Oncology	2	–	2	pract. mark	Internal Medicine II.
AOVINFI08_1A	Health Informatics	2	–	2	pract. mark	Pre-clinical module
AOVGY1120_1A	Neonatology	2	–	2	pract. mark	Pre-clinical module
AOVKIK102_1A	Clinical cardiovascular physiology	2	–	2	pract. mark	Pre-clinical module
AOVKIK099_1A	Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.
AOVEMK444_1A	Healthcare Management	2	–	2	pract. mark	Internal Medicine I.
AOVNO1554_1A	Ultrasonography in Obstetrics and Gynecology	2	–	2	pract. mark	

ELECTIVESUBJECTS

Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVSIF105_1A	Antibiotic therapy & infectology	2	–	2	pract. mark	Pre-clinical module Pharmacology and Pharmacotherapy II.
AOSKIK151_1A	Cardiorespiratorical and neurophysical measuring techniques	2	–	2	pract. mark	Medical Physiology II.
AOSWAG318_1A	Social media in medicine	2	–	2	pract. mark	Medical Communication
AOVSB2129_1A	Emergency Surgery	2	–	2	pract. mark	Surgery I.
AOVGY1283_1A	Neurobehavioral assessment of infants	2	–	2	pract. mark	Pre-clinical module
AOVIDS279_1A	Neurosurgery	2	–	2	pract. mark	Neurology
AOSWMS174_1A	Traditional Chinese Medicine	2	–	2	pract. mark	For 3rd year students and up
AOSGEN134_1A	Introduction to Epigenetics	2	–	2	semi-final	Immunology
AOSLEK340_1A	Clinical Hungarian	–	4	2	pract. mark	Hungarian Medical Terminology V.
AOSGEN135_1A	Inflammation Biology	2	–	2	pract. mark	Immunology, Molecular Cell Biology II.
AOSFRM394_1A	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 – Propeutics

NOTE



Faculty of Medicine
6th year

COMPULSORY INTERNSHIPS AND RESPONSIBLE DEPARTMENTS

Internal Medicine

1st Department of Internal Medicine

1083 Budapest VIII., Korányi Sándor u. 2/A Phone: 459-1500 / ext 51465

Head of the Department: **Dr. István Takács**

Tutor: **Dr. Péter Studinger**

2nd Department of Internal Medicine

Budapest, Szentkirály u. 46. Phone: 266-0926 ext. 55599, 55524

Head of the Department: **Prof. Dr. Péter Igaz**

Tutor: **Dr. Krisztina Hagymási**

3rd Department of Internal Medicine

1125 Budapest, XII. Kútvölgyi út 4. 12. Phone: 355-1122

Head of the Department: **Prof. Dr. Tamás Masszi**

Tutor: **Dr. Katalin Keltai**

Infectology

2nd Department of Medicine, Division of Infectology at Szent László Hospital

1097 Budapest, Albert Flórián u. 5-7.

Head of the Department: **Prof. Dr. Gergely Kriván**

Tutor: **Dr. János Sinkó**

Surgery

1st Department of Surgery

Budapest VIII., Üllői út. 78. Phone: 313-5216 / ext. 52167

Head of the Department: **Prof. Dr. László Harsányi**

Tutor: **Dr. Ákos Szűcs**

2nd Department of Surgery

1125 Budapest XII., Kútvölgyi út 4. Phone: 325-1100/ext. 57351, 57376, **57311**

Head of the Department: **Prof. Dr. Gábor István**

Tutor: **Dr. György Ledniczky**

Department of Transplantation and Surgery

1082 Budapest VIII., Baross u. 23. Phone: 267-6000, 459-1500/ ext. **60857**

Head of the Department: **Prof. Dr. Zoltán Máthé**

Tutor: **Dr. Gábor Telkes**

Traumatology

Department of Traumatology

Budapest VIII., Fiumei út 17. Phone: 461-4723

Budapest XIV., Uzsoki u. 29.

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: **Dr. Péter Sótónyi M.D., Ph.D.**

Tutor: **Dr. Péter Banga**

Pediatrics

1st Department of Pediatrics

Budapest VIII., Bókay J. u. 53. Phone: **3142-858**

Head of the Department: **Prof. Dr. Attila Szabó**

Tutor: **Dr. Erzsébet Horváth**

2nd Department of Pediatrics

Budapest IX., Túzoltó u. 7-9. Phone: 215-1380 / **ext. 52892**

Head of the Department: **Dr. Gábor Kovács**

Tutor: **Dr. Péter Hauser** (hauser.peter@med.semmelweis-univ.hu)

Obstetrics and Gynecology

1st Department of Obstetrics and Gynecology

Budapest VIII., Baross u. 27. Phone: 266-0473

Head of the Department: **Prof. Dr. János Rigó**

Tutor: **Dr. Gyula Richárd Nagy**

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)

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**

Family Medicine in Daily Practice

Department of Family Medicine

Budapest XII., Kútvölgyi út 4. Phone: 325-1100

Head of the Department: **Prof. Dr. László Kalabay**

Tutor: **Dr. Péter Torzsa**

Prehospital Emergency Medicine

National Ambulance Service

Budapest XIII., Róbert Károly krt. 77. Phone: **350-6720**

Director: **Dr. Gábor Göbl**

Tutor: **Ágnes Szabados**

Transfusion Course

Department of Pathophysiology

1089 Budapest VIII., Nagyvárad tér 4.

Phone: 210-2940

Head of the Department: **Prof. Dr. Attila Tordai**

STUDY PROGRAM

Subject code	Internship	Required number of weeks	Credits	Examination	Prerequisite
AOKBL1067_SA	Internal Medicine	9	9	final #	
AOKBL2068_SA					Internal medicine V.
AOKBL3069_SA					Medical Imaging
AOKSZL070_SA	1 week Infectology		–	signature	Bioethics – Medical ethics
AOKCSA154_SA	1 week Family medicine		–	signature	
AOKSB1071_SA	Surgery	9	9	final #	Surgery III.
AOKTRA075_SA	2 weeks Traumatology		–		Traumatology
AOKSBE066_SA	1 week Vascular surgery		–		
AOKGY1076_SA	Pediatrics	8	8	final #	
AOKGY2077_SA					Pediatrics II.
AOKSZL078_SA	1 week Infectology		–	signature	
AOKNO1081_SA	Obstetrics and Gynecology	5	5	final #	Obstetrics and Gynecology II., Urology, Pediatrics II.
AOKNEU080_SA	Neurology	4	4	final #	Neurology II.
AOKPSI079_SA	Psychiatry	4	4	final #	Psychiatry II.
AOKANG216_SA	Transfusion Course	1	–	signature	–
AOKOMS153_SA	Prehospital Emergency Medicine	1*	–	signature	Oxiology - Emergency Medicine
	Facultative course	1*		Facultative course	
Total:		42	39		
AOKSZD217_SA	Thesis work		20		

*The one week released by decreasing duration of Prehospital Emergency Medicine from two weeks to one week is offered to spend for extending duration of one of the following internships: Internal Medicine, Surgery, Pediatrics, Neurology, Psychiatry, Obstetrics and Gynecology or Prehospital Emergency Medicine. This offer is optional to use.

Please read more about the rules concerning the criteria of selecting the foreign clinical practice positions and accepting the practice period spent abroad:

<http://www.semmelweis-english-program.org>

http://www.sote.hu/intezetek/oktatas/?inst_id=145&page_id=480

Certificates can be downloaded at

http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101

Please note the followings:

- When **not at Semmelweis University** the two weeks Traumatology is to be completed at a surgical department providing **neurochirurgia** as well.
- 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**.
- The **final exams** can be done only on the exam **dates** published by the clinical departments of Semmelweis University.

INTERNAL MEDICINE

To be present for at least 6 hours per day (30 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: 2nd Department of Medicine, 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.

Being on duty for 24 hours once a week.

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

Code: AOKTRA075_SA

Credit points: 0

Time period: 2 weeks

The work hours of the practice are 30 hours/week

Head of Department: **Prof. Dr. Hangody László**

Curriculum Year: 2018/2019

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 – 2 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 two 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 two weeks, 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 two 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 two weeks 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 Jaryani 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 **8-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

Students who get preliminary permission from the Head of the Department to do the internship abroad are supposed to complete 2 weeks (out of the 8) at the Department of Pediatrics of Semmelweis University.

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 4 weeks long (when at Semmelweis University 3 weeks clinical practice+1 week preparation for the exam). 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 night duty (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 and 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 nystagmus 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 aphasia 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. Histopathological 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 (4 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 to 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/pszichiatra/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 4-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 8 hours on 20 (4x5) 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/pszichiatria/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-satisfactory-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/pszichiatria/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

Tutor: **Dr. Péter Torzsa**

During practice, treatment of patients is carried out with continuous consultation.

The student should:

- master the basics of treatment of acute cases;
- gain insight into the everyday practice of ongoing treatment of patients and the care of the chronically sick;
- form an opinion of the importance of the doctor-patient and nurse-patient relationship;
- besides treating patients, encounter social and family problems that have an influence on health;
- having gained the necessary knowledge and experience, prepare – under the GP tutor's supervision – an independent case study, and carry out treatment independently;
- take part in home visits;
- keep a continuous documentary record of observations and experience in a practice diary.

If the student wishes to complete the internship outside Hungary, the following instructions are to be followed:

Objectives of the course

1. To introduce the medical care outside the hospital, giving an opportunity to study the characteristics of work in general practice.
2. To help to manage patient members of a family who have problems (not only diseases) with their physical, psychological and social aspects.
3. To provide an opportunity to improve students' clinical skills.

Structure of the course

1 week = 5 workdays: working together with a GP tutor in his office and accompanying him/her on house calls:

4 consulting hours/day

1-3 house calls/1 week

Topics to observe and concentrate on during the course:

- patient-physician communication (structure, methods)
- problem-based care
- problem-oriented solution
- decision-making responsibility
- common acute problems
- complex care of patients with chronic illnesses

Make short notes in a 3–4 pages diary about:

8–10 instructive and interesting cases/day

(age, sex, problem, alteration in physical status, solution)

The following should be practiced independently:

history taking

physical examination

making medical record

Assessment and evaluation:

The performance of the students will be assessed on the diary and a written qualifying report by the GP tutor, so show these instructions to him/her, asking for an opinion about your
 medical knowledge
 pharmaceutical knowledge
 practical abilities (physical examination)
 attitude, interpersonal relations, communication skills

TRANSFUSION COURSE**Department of Pathophysiology**

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

PREHOSPITAL EMERGENCY MEDICINE (OXYOLOGY)

Ambulance practice

National Ambulance Service

Lecturer: **Dr. Gábor Göbl**

Syllabus

During the 1 week (30 hours) 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

Requirement of getting the semester signature: 30 practice hours

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.

GENERAL INFORMATION

Deadline of paying the tuition fee in the 6th year: the first part is to be paid between **September 3-7, 2018**, the second part between **January 28 – February 1, 2019**.

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.

Please note:

that you have to sign up for the General Board Examination held in June latest until April 30, 2019! For the November exam latest until October 15, 2019!

– that you have to leave your lecture book at the English Secretariat after each Final Examination (because the secretaries need it to do the administration, you will not lose or forget it abroad, etc.)

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		

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 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	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		

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	pract. mak	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 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	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

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 the 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		

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 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	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		

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	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
	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 subjects
	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	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 the 5-year studies.

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

CLINICAL MODULE

10th semester

subjects code	subjects	credit code	prerequisite-sites 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 elective	Dermatology	C1L1P0.5	final#	Internal Medicine I.
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	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 the 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		

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 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	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		

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, 4 weeks)	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.*	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 th 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 elective	Dermatology	C1L1P0.5	final#	Internal Medicine I.
obligatory elective	Obstetrics and Family Planning	C1L1P0	Semifinal	
obligatory elective	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 the 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		

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 Prosthodontics 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 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	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		

PRE-CLINICAL MODUE

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 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		

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, 4 weeks)	C0L0P30	signature	1-8 semesters compulsory subjects
	Total Credit	24		

#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.*	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

CLINICAL MODULE

10th semester

subjects code	subjects	credit code	prerequi- sites 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 the 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		

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 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 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		

PRE-CLINICAL MODUE

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	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		

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 subjects
	Total Credit	24		

#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.*	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

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 the 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 MODUE

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		

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	prerequi- sites 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 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		

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 i 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 MODUE

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	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. 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		

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 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.
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	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		

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 MODUE

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	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. 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		

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 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.
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	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)

FACULTY OF DENTISTRY

BASIC MODULE



Faculty of Dentistry
1st year

New Study Program for students starting studies in the 2018/19 academic year is to be introduced. Details available before starting the 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 (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	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
Total Credit		35		

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 **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
- 24 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
- 25 2nd-3rd semesters: Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)

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.

ANATOMY, HISTOLOGY AND EMBRYOLOGY

Department of Anatomy, Histology & Embryology

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

Aims and contents:

Aims of the lectures in Anatomy – Presentation of important and/or complicated topics such as: 1st semester – the structure of the body wall (e.g. thorax, pelvis), extremities and the cranium, 2nd semester – the morphology of internal organs including the cardiovascular, digestive and urogenital systems; 3rd semester – the composition of the central nervous system, together with the organs of special senses and topography of body regions, and the 4th semester is devoted entirely to maxillo-facial topographical anatomy.

Aims of the lectures in Histology – Presentation of the cell, basic principles in cellular morphology, detailed description of the epithelial, connective, muscle and nervous tissues. During the 3 semesters, the lectures contribute to the gross anatomical description of organs with a detailed presentation of their fine structures, including ultrastructural details. Important chapters: basic tissues, viscera, central nervous system.

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 (basic embryology) as well as the development of the locomotor system (1st semester). In the 2nd and 3rd semesters, the embryology topics will complement the gross anatomy and histology lectures of the organs and systems, also mentioning the most frequent malformations.

For the deeper understanding of relatively difficult questions small group discussions may be organized during the practical dissection room classes.

Aims of the practical dissection classes – In the first three semesters, based on their weekly programs, the students will study the morphology of the human body using anatomical specimens (bones, joints, muscles, viscera, brain) as well as learning the basic principles of dissection, including the proper usage of tools (scalpel, forceps, scissors) under the supervision of their lab instructors. The anatomy of the locomotor system and the peripheral nervous system will be principally taught in the dissecting room.

Aims of the histology practical classes – Under supervision by the lab instructor, the students will learn the use of the light microscope and the individual viewing of histology slides will facilitate the understanding of the basic tissues (epithelial, connective, muscle and nervous) and the fine structure of the organs.

The knowledge of students will be tested by regular **mid-term examinations**.

Lectures:

First semester: 3x 45 min; second semester: 3x45 min;

third semester: 3x 45 min; fourth semester: 3x45 min.

Topics:

First semester: Gross anatomy of the bones, joints and muscles, basic histology, general embryology, development of the skull, spine and limbs.

Second semester: Morphology, histology and embryology of the heart and vessels, lymphatic organs, viscera, body cavities and serous membranes. Sectional anatomy of the thorax, abdomen and pelvis. Description of the diaphragmas.

Third semester: Morphology, histology and embryology of the central and peripheral nervous systems, the organs of special senses, as well as of the endocrine organs; topographical anatomy of the extremities.

Fourth semester: Maxillofacial anatomy – organs, cavities, nervous and vascular supply of the head and neck regions, including topographical and cross sectional anatomy. Revision of the topics of the first three semesters.

Practical course:

First semester 5×45 min; second semester: 4×45 min;
third semester: 4×45 min; fourth semester: 2×45 min.

First semester: Gross anatomy of the bones, joints and muscles, basic histology, general embryology, development of the skull, spine and limbs.

Second semester: Morphology, histology and embryology of the heart and vessels, lymphatic organs, viscera, body cavities and serous membranes. Sectional anatomy of the thorax, abdomen and pelvis. Description of the diaphragmas

Third semester: Morphology, histology and embryology of the central and peripheral nervous systems, the organs of special senses, as well as of the endocrine organs; topographical anatomy of the extremities.

Fourth semester: Topographical anatomy of the head and neck. Individual revision of the subjects taught and studied during the four semesters.

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 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

Type of exams: oral and written

First, second and third semesters: semifinal examination, fourth semester: final exam

Semifinal examinations consist of written and oral (practical and theoretical) parts

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Histology (digitized slides)
3. Anatomy (prosected specimens)

Final examinations consist of written and oral (practical and theoretical) parts:

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Histology (2 slides) including relevant theoretical questions
3. Oral theoretical question in Maxillofacial Anatomy
4. Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions

Topics: Subject matter of all the 4 semesters in Anatomy, Histology and Embryology

ECTS credits: four semesters together: 27 (first semester: 8; second semester: 7; third semester: 7; fourth semester: 5)

LIST OF TEXTBOOKS (The list may change!)

1. **Sobotta Atlas of Human Anatomy** (Package), 15th English ed. Musculoskeletal system, internal organs,
2. **Gray's Anatomy for students** with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A.
3. **Gosling, Harris, Humpherson, Whitmore & Willan: Human Anatomy, Color Atlas and Textbook**, 6th
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:
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. **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

Recommended textbooks:

- 1 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.
- 2 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, ISBN13 978007178033, 2013.
- 3 Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- 4 Netter's Head and Neck Anatomy for Dentistry, 3rd Edition, Elsevier, 2016.
- 5 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.
- 6 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.
- 7 Illustrated Dental Embryology, Histology, and Anatomy, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.

ANATOMY, HISTOLOGY AND EMBRYOLOGY I.**First Semester**

Lectures: 3 hours per week

Laboratory: 5 hours per week, 3 hours Anatomy, 2 hours Histology

Week	Lecture	Dissecting room	Histology lab
1.	1. The role of anatomy, histology and embryology in the medical curriculum. Terminology 2. General osteology. Composition of the extremities. 3. Concept and types of tissues, epithelial tissue, simple epithelia	Dissection room activity, tools safety and rules. Osteology.	Introduction to histology. Rules, use of the microscope. Histological stains. Study of a compact and a hollow organs: surfaces, homogenous structure, layered structure.
2.	4. Skull. Sphenoid and ethmoid bones 5. Temporal bone 6. Stratified epithelia	Osteology.	Simple epithelia: simple squamous (mesothel, pleura); simple cuboidal (kidney); simple columnar (gall bladder); pseudostratified (trachea)
3.	7. Calvary, base and interior of the skull 8. Facial skeleton, orbit 9. Glandular epithelium	Osteology.	Stratified epithelia: squamous, non keratinizing (esophagus); squamous keratinizing (skin); columnar (male urethra); transitional (urinary bladder)
4.	10. Mandible 11. Maxilla, maxillary sinus 12. Nasal cavity, paranasal sinuses	Osteology.	Glandular epithelia: goblet cells (colon); merocrine gland (salivary gland); apocrine gland (prostate); holocrine gland (sebaceous gland).
5.	13. Oral cavity, pterygopalatine and infratemporal fossae 14. Connective tissue, cells. Blood, hematopoiesis. 15. Connective tissue, fibres, types of the connective tissue	1. Osteology 2. Test I.: Osteology	Connective tissue, fibres: collagen fibres (tendon); elastic fibres (vessel wall); reticular fibres (liver); differential staining of the fibres (skin); ground substance (umbilical cord)

Week	Lecture	Dissecting room	Histology lab
6.	16. Types and composition of joints (general arthrology) Features of the skeletal musculature (general myology) 17. Shoulder girdle, shoulder joint and the muscles acting upon it 18. Elbow joint and the muscles acting upon it	Dissection of the extremities (joints, muscles, vessels, nerves)	Connective tissue, cells: various cell types (scar tissue); mast cells (peritoneum); fat cells (tongue, skin).
7.	19. Bones, joints and muscles of the hand 20. Supporting tissue (cartilage, bone) 21. Bone formation, bone remodelling	Dissection of the extremities (joints, muscles, vessels, nerves)	Connective tissue types: mesenchyme (umbilical cord); dense connective tissue (tendon); reticular tissue (lymph node); adipose tissue; cell rich connective tissue (uterus)
8.	22. Pelvis: bones and ligaments 23. Hip joint and the muscles acting upon it 24. Knee joint and the muscles acting upon it	Dissection of the extremities (joints, muscles, vessels, nerves)	Blood, bone marrow. Blood smear, bone marrow smear. Supporting tissue: hyaline cartilage (rib); fibrocartilage (meniscus); elastic cartilage (epiglottis).
9.	25. Bones, joints and muscles of the foot 26. Vertebral column; actions and muscles. 27. Atlantooccipital and atlantoaxial joints. Muscles acting upon the joints	Dissection of the extremities (joints, muscles, vessels, nerves)	Bone, bone formation: bone, cross and longitudinal sections. Endochondral ossification (digit); intramembranous ossification (skull).
10.	28. Thoracic cage, diaphragm 29. Temporomandibular joint, muscles of mastication 30. Muscles of facial expression	Dissection of the extremities (joints, muscles, vessels, nerves)	Test II. Epithelial, connective and supporting tissues
11.	31. Muscles, fasciae and triangles of the neck 32. Muscle tissue; skeletal muscle, smooth and cardiac muscle 33. Nervous tissue: neurons and supporting cells	Dissection of the extremities (joints, muscles, vessels, nerves)	Muscle tissue: smooth muscles (gut); striated muscle (skeletal muscle); cardiac muscle (heart) tissues.
12.	34. Abdominal muscles, rectus sheath 35. Nervous tissue: fibres, synapses, receptors, effectors 36. <i>Introduction to human embryology. Gametogenesis, fertilization. Cleavage</i>	1. Dissection of the extremities (joints, muscles, vessels, nerves) 2. Test III. Joints, muscles, vessels and nerves of the extremities	Nervous tissue, cells: multipolar neurons (autonomic ganglion); pseudounipolar neurons (spinal ganglion), peripheral nerve, motor end plate.
13.	37. <i>Blastulation, implantation, decidua</i> 38. <i>The embryonic disc. Formation of the germinal layers (ecto-, endo- and mesoderm).</i> 39. <i>Differentiation of mesoderm. Derivatives of the embryonic layers.</i>	Muscles of the head, neck and trunk (demonstration)	Placenta. Umbilical cord.
14.	40. <i>Neurulation. Folding of the embryo. Umbilical cord. Fetal membranes</i> 41. <i>Early embryonic circulation. Structure of the placenta; placental circulation</i> 42. <i>Development of the vertebral column, the locomotor system and the skull. Fontanelles</i>	Consultation in embryology Revision.	Revision.

TOPICS OF THE SEMIFINAL EXAM

HISTOLOGY

Concept of basic tissues
 Definition and classification of epithelial tissue
 Simple epithelia
 Stratified epithelia
 Membrane specializations of epithelia
 Glandular epithelia
 Cells of connective tissue
 Ground substance and fibres of connective tissue
 Types of connective tissue
 Umbilical cord and placenta
 Blood and the formed 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 osteoid tissue
 Intramembranous ossification
 Endochondral ossification
 Growth and remodeling of bone
 Smooth muscle and myoepithelial cells
 Skeletal muscle tissue
 Cardiac muscle tissue
 Histology of the peripheral nervous system (sensory and autonomic ganglia)
 Supporting cells in the peripheral nervous system
 Nerve fibers, myelin sheath
 Motor end-plate

LOCOMOTOR SYSTEM

Fibrous and cartilaginous joints
 Components of the synovial joints
 Classification of synovial joints; movements and mechanisms
 Structure of the vertebral column, the gross anatomy of the muscles acting upon it
 Movements and muscles of the head (atlantooccipital and atlantoaxial joints)
 Joints of the shoulder girdle, the gross anatomy of the muscles acting upon them
 The shoulder joint, the gross anatomy of the muscles acting upon it
 The elbow joint, the gross anatomy of the muscles acting upon it
 Structure and movements of the wrist (radiocarpal) joint, the gross anatomy of the muscles acting upon it
 Metacarpophalangeal and interphalangeal joints, the gross anatomy of the muscles concerned with the movements
 Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb, the gross anatomy of the muscles concerned with the movements
 The hip joint and the gross anatomy of the muscles concerned with the movements
 The knee joint and the gross anatomy of the muscles concerned with the movements
 The ankle joint together with the gross anatomy of the muscles acting upon it
 The subtalar and talocalcaneonavicular joints, the muscles acting upon them
 The temporomandibular joint and the gross anatomy of the muscles acting on it
 Architecture and classification of bones
 Bones and spaces of the skull, including the description of the individual bones

Structure and actions of somatic muscles
Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)
Muscles and movements of the thorax
Muscles of the back and nape (occipital region)
The axilla, the quadrangular and triangular spaces
The cubital fossa
Muscles and cross section of the arm
Muscles and cross section of the forearm
Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths
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)
Osteofibrous compartments, muscles and cross section of the thigh
Popliteal fossa
Subinguinal hiatus, vascular and muscular compartments; adductor canal
Osteofibrous compartments, muscles and the cross section of the leg
Structure of the foot, arches of the foot
Osteofibrous compartments of the foot, tendinous sheaths
Muscles of mastication
Diaphragm
Lateral abdominal muscles and fasciae
Rectus abdominis muscle and the rectus sheath
Inguinal canal
Femoral canal
Superficial muscles of the neck and the muscle triangles
Deep muscles of the neck and the laminae of the cervical fascia
Muscles of facial expression

EMBRYOLOGY

Spermatogenesis
Oogenesis
Fertilization, cleavage of the zygote
Blastocyst formation; the bilaminar embryonic disc
Implantation
Formation of the intraembryonic mesoderm; the notochord
Neurulation (neural tube and neural crest)
Differentiation of the intraembryonic mesoderm; formation and derivatives of the somites
Derivatives of the intermediate mesoderm
Lateral plate mesoderm and its derivatives
Folding of the embryo
Development of the primitive cardiovascular system, the fetal circulation
The structure and function of the placenta
Development of the fetal membranes (chorion and amnion) and the umbilical cord
Periods embryonic and fetal life
Twin formation
Development of the limbs
Development of the vertebral column
Development of the skull
Development of the musculoskeletal system

ANATOMY, HISTOLOGY AND EMBRYOLOGY II.

Lectures: 3 hours per week

Laboratory: 4 hours per week, 2 hours Anatomy, 2 hours Histology

Second Semester

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
1.	1. Circulatory system, composition, significance. Histology of the vessels 2. Lymphatic organs 1- lymph node, tonsils 3. Lymphatic organs 2 - spleen, thymus	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: tonsils
2.	4. Chambers of the heart, external features 5. Structure of heart wall, myocardium, valves, anuli fibrosi 6. Vessels, innervation, conducting system, surface projection of the heart, pericardium	Dissection of heart, visceral complex, fresh heart	Lymphatic organs: spleen, thymus
3.	7. <i>Development of the heart (Film)</i> 8. <i>Development of the arteries and veins; malformations</i> 9. Gastrointestinal tract. Fine structure of the hollow and parenchymal viscera	Dissection of heart, visceral complex	Oral cavity: lip, filiform, fungiform vallate papillae, radix linguae
4.	10. Morphology and histology of the oral cavity 11. Morphology and histology of the soft palate and the faucial isthmus 12. Morphology and histology of the tongue and salivary glands	Test I.: Heart, great vessels, heart and vessels' development, fetal circulation	Ground teeth, tooth bud. Parotid, submandibular, sublingual glands
5.	13. Pharynx and parapharyngeal spaces 14. Morphology of the esophagus and the stomach 15. Histology of the stomach	Dissection: cervical viscera, vessels and nerves, branches of the aorta	Gastrointestinal tract: Oesophagus, cardia, fundus, pylorus of the stomach
6.	16. Morphology and histology of the duodenum and pancreas 17. Morphology and histology of the small intestine 18. Morphology and histology of the large intestine and rectum	Dissection: cervical viscera, vessels and nerves, branches of the aorta	Duodenum, jejunum ileum, colon, vermiform appendix
7.	19. Morphology and histology of the liver and biliary system. Portal vein 20. <i>Development of the fore-, mid- and hind-gut</i> 21. Peritoneum, cross sections	Demonstration of peritoneum, dissection of abdominal organs, vessels.	Liver, gall bladder, pancreas
8.	22. Morphology of the nasal cavity and paranasal sinuses 23. Larynx, cartilages, joints, muscles 24. Larynx, connective tissue skeleton, mucous membrane	Dissection: visceral complex (abdominal organs, vessels)	Test II.: Vessels, heart, lymphatic organs, gastrointestinal tract

Easter break

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
9.	25. Morphology of the trachea and lung, pleura. 26. Mediastinum, cross sections 27. Histology and development of the respiratory system	Demonstration of thoracic and abdominal situs on fresh and embalmed cadavers	Respiratory system: larynx, trachea, lung.
10.	28. Morphology and histology of the kidney 29. Morphology and histology of the urinary passages, pelvis, ureter, and bladder 30. Development of the uropoietic apparatus	Dissection: visceral complex (abdominal organs, vessels)	Urinary system kidney, ureter, urinary bladder
11.	31. Morphology of the testicle. Spermiogenesis. 32. Morphology and histology of the epididymis, spermatic cord and the seminal vesicle and prostate 33. Coats of the testicles. Hernia canals.	Test III.: Anatomy and dev. of gastrointestinal and respiratory systems, cross sections of the thorax and abdomen	Male genitals: testis, epididymis, spermatic cord, seminal vesicle, prostate
12. (Competition 1st round)	34. 35. Morphology and histology of penis and male urethra 36. Morphology and histology of the ovary and the uterine tube. Oogenesis.	Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels Dissection of the abdominal and pelvic visceral complexes	Penis, glans penis. Female genitals: ovary, corpus luteum,
13. (Competition 2nd round)	37. Morphology and histology of the uterus, divisions and content of the broad ligament 38. Morphology and histology of the vagina and the external genital organs 39. The pelvic and urogenital diaphragms (male, female)	Dissection of abdominal and pelvic visceral complexes. Demonstration of pelvic situs.	Uterine tube, uterus (proliferation, secretion), vagina
14.	40. Cross sections of the male and female pelvis, 41. Development and malformations of the genital system, hermaphroditism. 42. Development of serous membranes, separation of body cavities	Test: urogenital apparatus, pelvic floor, perineum, hernia canals	Review

TOPICS OF THE SEMIFINAL EXAM

CIRCULATORY SYSTEM

Shape, external features of heart
 Chambers of heart, endocardium, orifices, valves
 Skeleton of heart, anuli fibrosi
 Structure and histology of heart wall, myocardium, cardiac muscle
 Conducting system
 Pericardium
 Position and surface projections of heart
 Radiology of heart
 Development of heart tube
 Division of atria (septum primum and secundum, foramen ovale)
 Development of ventricles (interventricular septum)
 Ascending aorta, arch of aorta and its branches
 Branches of the common and external carotid arteries
 Subclavian artery (+ branches)
 Thoracic aorta (+branches)
 Coeliac trunk (+ branches)
 Superior mesenteric artery (+ branches)
 Inferior mesenteric artery (+ branches)
 Branches of the internal iliac artery
 Superior vena cava and its tributaries
 Inferior vena cava and its tributaries
 Azygos and hemiazygos veins
 Portal vein, portocaval anastomoses
 Histology of arteries, arterioles and capillaries
 Development of aorta and branchial (pharyngeal) arch arteries
 Development of great veins (caval, portal, azygos)
 Fetal circulation
 Histology of venules, veins and lymphatic vessels

LYMPHATIC ORGANS

Tonsils (anatomy, histology, embryology)
 Spleen (anatomy, histology, embryology)
 Thymus (anatomy, histology, embryology)
 Lymphatic vessels and nodes of head and neck
 Lymphatic vessels and nodes of mediastinum
 Lymphatic vessels and nodes of retroperitoneal space
 Lymphatic vessels and nodes of pelvis
 Thoracic duct and right lymphatic duct
 Microscopic structure of lymphatic system (reticular cells, lymphocytes, plasma cells, antibodies, lymphatic follicles)
 Histology of lymph nodes

DIGESTIVE SYSTEM

Oral cavity (divisions, boundaries)
 Floor of mouth, sulcus lateralis linguae
 Tongue (parts, vessels, innervation, histology)
 Salivary glands (anatomy, histology)
 Isthmus of fauces
 Hard and soft palates, palatine muscles

Pharynx, (shape, position, parts, muscles)
Topography of the pharynx, para and retropharyngeal spaces
Oesophagus (anatomy, histology, embryology)
Development of the face
Developmental derivatives of pharyngeal pouches
Stomach (shape, position, parts)
Peritoneal relations of stomach
Blood supply and innervation of stomach
Histology of stomach
Duodenum (shape, position, divisions, vessels)
Divisions and histology of small intestine
Fine structure of the intestinal villi
Large intestine (shape, position, divisions, vessels and histology)
Histology of vermiform appendix
Rectum, anal canal (shape, position, vessels)
Liver (shape, position, vessels, peritoneal relations, development and histology)
Gall bladder and biliary passages (anatomy, histology, embryology)
Circulation of liver, liver sinusoids
Histology of gall bladder and extrahepatic biliary tracts
Pancreas (shape, position, development, histology and vessels)
Peritoneum, greater omentum, lesser omentum, mesentery, omental bursa
Development of the foregut (esophagus, stomach, duodenum)
Derivatives of midgut, physiological umbilical hernia
Development of hindgut
Development and separation of body cavities
Development of the peritoneum
Development of diaphragm

RESPIRATORY SYSTEM

Nose, nasal cavity (boundaries, nasal meatus, vessels)
Paranasal sinuses (connections, vessels)
Larynx (shape, position, vessels, nerves)
Skeleton and joints of larynx
Laryngeal ligaments (fibroelastic membranes, mucous membrane)
Muscles of larynx, innervation
Histology and development of the larynx
Trachea and bronchial tree (anatomy, histology and development)
Lung (shape, parts, surfaces, hilum, position, vessels, nerves)
Pleura, pleural cavity
Surface projection of pleura and lung
Histology and development of the lung

UROGENITAL SYSTEM

Kidney (shape, position, hilum, sinus, capsules and vessels)
Histology of kidney (+JGA)
Development of kidney (pronephros, mesonephros, metanephros)
Calyces, renal pelvis and ureter (anatomy, histology and embryology)
Urinary bladder (shape, position, muscles, vessels)
Histology and development of the urinary passages
Differentiation of the urogenital sinus
Female urethra (anatomy, histology and embryology)

Testis (shape, position, vessels)
 Histology and development of testis, spermatogenesis
 Epididymis, vas deferens, spermatic cord (anatomy, histology and embryology)
 Scrotum, coats of testis
 Seminal vesicle (anatomy, histology and embryology)
 Prostate (anatomy, histology and embryology)
 Development of male genital ducts and glands
 Male urethra, bulbourethral gland (anatomy, histology and embryology)
 Penis (shape, position, mechanism of erection, vessels, nerves)
 Histology of penis and male urethra
 Pelvic floor, male perineum
 Hernia canals (inguinal, femoral)
 Development of the male external genital organs
 Ovary (shape, position, vessels and development)
 Histology of ovary, oogenesis and the corpus luteum
 Uterine tube (shape, position, vessels; histology, embryology)
 Uterus (shape, parts, wall, cavity, position, supporting structures, vessels)
 Broad ligament (divisions and content)
 Histology of uterus, menstrual cycle
 Vagina, female perineum
 External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vascular supply)
 Development of female genital tracts
 Histology of vagina
 Development of the female external genital organs

GENERAL DENTAL MATERIALS

Lecturer: **Dr. Judit Borbély D.M.D.**

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. Restorative materials
13. Luting materials
14. Tooth whitening materials

PHYSICAL BASES OF DENTAL MATERIALS

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/>

MEDICAL BIOLOGY (Cell Biology)

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. Orsolya Láng**

Subject code: FOKOGEN004_1A

Credit:3

Lectures (2 hours per week):

1. Cell membrane: structure and function
- 2.-3. Structure and function of nucleus I, II
4. Endoplasmic reticulum and the ribosomes
5. Golgi complex, secretion and protein transport
6. Lysosomes, endocytosis, vesicular transport
7. Structure and function of mitochondria and peroxisomes
8. Midterm (written)
9. Cytoskeleton and cellular movement
10. Cell adhesion, cell junctions
11. Extracellular regulation of cells, signal transduction
- 12.-13. Cell cycle and its regulation I, II
14. Cellular aging and programmed cell death (apoptosis)

Practices (1 hour per week):

1. The light microscope (LM)
2. Light microscopic (LM) microtechnique
3. The electron microscope (EM)
4. Cell nucleus. Cyto(histo)chemistry
5. Endoplasmic reticulum and Golgi complex
6. Golgi complex and secretion
7. Endocytosis and lysosomes
8. Pre-midterm consultation
9. Immunohistochemistry
10. Cell and tissue culture
11. Store and supply of energy. Mitochondria. Peroxisome.
12. Cell surface differentiation, enzyme-histochemistry
13. Consultation
14. Cell death (necrosis and apoptosis)

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.

Final exam consists of oral test (preparations, electron micrographs, methods applied in cell biology) and written test (multiple choice, essays, drawings, etc. covering theoretical part of the subject). Students have to pass both oral and written part of the exam. Exam grade is calculated as follows: mid-term grade (30%), oral test grade (20%) and written test grade (50%).

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)

MOLECULAR CELL BIOLOGY I.

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/molcellbiol1/>

BIOPHYSICS I.

Tutor: **Dr. István Voszka**

First Semester

Week	Lecture (1.5 hours per week)	Laboratory (2 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	Optical lenses; light microscope
6	Thermal radiation, thermography. Biological effects of light	Detection of nuclear radiations
7	Production and spectrum of X-radiation	Oscilloscope
8	Cyclotron; Linear accelerator; Attenuation of X-radiation, interactions	Special light microscopes
9	Atomic structure; Radioactive decay law	X-ray diagnostics
10	Gamma-radiation and its detection	Optics of the eye
11	Radiotherapy, radiosurgery; Isotope diagnostics	Polarimeter
12	SPECT, PET	Coulter counter
13	Beta-radiation, beta-decay	
14	Alpha-radiation, alpha-decay	Determination of skin-impedance
	Interaction with matter	
	Dosimetry	Concentration determination with refractometer
	Radiation protection; estimation of risk	Repetition

BIOPHYSICS II.

Second Semester

Week	Lecture (2 hours per week)	Laboratory (2 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 therapy, ultrasound)
7	heat	Audiometry
8	Basic concepts of Thermodynamics, First law	Isotope diagnostics
9	General description of transport phenomena, Onsager's equation, examples	
10	Diffusion; transport across membrane	Densitography (CT)
11	Resting potential and its local changes	Flow of fluids. Electric model of vascular circulation
12	Action potential, properties, interpretation	Electrocardiography
13	General characteristics of sensory function, hearing, vision	Diffusion
14	Biophysics of muscle function	Sensory function
	Motor proteins	Repetition

BIOETHICS-DENTAL ETHICS

Institute of Behavioural Sciences

Type of the course: compulsory elective

code: FOKVMAG113_1A

credit: 2 credits

Presenter of the course: Dr. József Kovács

Semester: 2018/19 I.

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

Course Syllabus:

1. week (Lecture) 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. (Practicals) 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. (Lecture) The basic principles of medical 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. (Practicals) 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. (Lecture) 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 (Practicals)

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 physicians's relationship with the relatives of the deceased patient.

7. week (Lecture) 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 (Practicals) Ethical questions of reproductive medicine.

- Abortion.
- Artificial insemination from donor.
- In vitro fertilization, surrogate motherhood.
- Ethical questions of genetic counselling.
- Ethical questions of embryo experimentation.

9. week. (Lecture) 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. (Practicals) 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. (Lecture) 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 (Practicals) 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 (Lecture) 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 (Practicals) 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.)

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.

Justification of the absence in the lectures and examinations: Medical certificate

Checks during the semester (reports, written checks) :

Number of checks during the semester: 1

Type: written exam on the 9th week.

Subjects: the material of practice weeks 1-8 and the relevant chapters of the textbook.

It is possible to make up for an absence or correct grade by oral exam.

Requirements for the signature at the end of the semester:

Participation of 75% of the lectures and seminars. Successful written or oral exam.

Method of the calculation of marks:

The result of the exam

Type of the exam: kollokvium

Requirements for the exam: Successful written exam or the successful oral exam

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: Announcing it at the secretariat of the Institute

Course and recommended text books:

- 1 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 13-ISBN: 978-1-4195-5314-1

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.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room-2005. tel: 2102930/ 56114.

Lecturers:

Dr. György Pureblpurgyor@net.sote.hu
 Dr. Róbert Bódizsbodrob@net.sote.hu
 Dr. Adrienne Stauderstaadr@net.sote.hu
 Dr. László Harmatlaszloharmat@yahoo.com
 Éva Pollák evipoll@yahoo.com
 Gabor Suhai 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: 15

Credit: 2

Code: **FOKVMAG010_1A**

Lecturer: Professor Dr. József Kovács

Course leader: Zsuzsa Szanto (szanto.zsuzsa@med.semmelweis-edu.hu)

Teachers : Bence Döbrössy e-mail: dobrossy.bence@chello.hu Katalin Kovács e-mail: kovacs@demografia.hu

Goals of the subject:

– To introduce to the students the social distribution of health and illness, the causes and consequences of health status inequalities, the role of psychosocial factors in health care, the social phenomena occurring in healing, the social situation of medicine, and the social embeddedness of the health care system.

Syllabus of the subject:

Week		
1	Introduction: basic concepts of sociology	Lecture
2	Socio-dental indicators of oral health; inequalities in dental health	Lecture
3	The psycho-social consequences of oral disease	Lecture
4	Illness behavior: oral health	Lecture
5	Dentistry as a profession, The dentist- patient relationship,	Lecture
6	Major current issues of dental care systems	Lecture
7	Midterm exam	Lecture
8	Introduction to practices, guide to reading and presentations	Practice
9	Social inequalities and dental health	Practice
10	Psycho-social factors in dentistry; from etiology to the experience of illness,	Practice
11	Intercultural dentistry	Practice
12	Dental fear and anxiety	Practice
13	The profession of dentistry, Dental health care delivery systems	Practice
14	Patient satisfaction with dental care, cosmetic dentistry	Practice

The course includes: lectures, seminars, laboratory exercises -
7 lectures, 7 seminars, 1 midterm exam.

Course requirements, methods of monitoring:

To obtain signature for absolving the course students have to participate at a minimum of 75% of the classes. Participation is documented through catalogues. One seminar per semester can be supplemented by attending the same class with another group.

Supplement possibilities: Absence may be justified by a medical a medical document at the next class.

A midterm exam is taken after the 6th lecture. It is also required to submit a home paper or a class presentation in course-related topics by the end of the semester.

To obtain signature for absolving the course students have to participate at a minimum of 75% of the classes and submission of the home paper.

The course ends with an exam; the grade may include the results of the midterm and the home assignment.

Exam requirements: Material of the lectures and the practices. The lectures can be obtained from the homepage of the Institute of the Behavioural Sciences.

Exam sign up: Through the Neptun System

Modifying: Through the Neptun System

Absence from the exam: With medical document submitted to the course director

Lectures' material (can be obtained from the homepage of the Institute of the Behavioural Sciences).

Textbook:

Armstrong, D (2008): Sociology as applied to medicine

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, Otolaryngology, 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 medications. 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: Péter L. Kanizsai, MD, PhD, DEAA

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. 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

Choking. Drowning. Electrocution.

Injuries. Extrication of the patient: Rautek maneuvers. 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. Substitution is possible according to a discussion with the teacher.

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.

The requirements of signature at the end of the term:

Suitable percentage of participation.

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.

Order of the modification of exam application:

According to Studies and Exams Code.

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 use of educational materials on the institute website is obligatory: www.semelweis.hu/dei

LANGUAGE COURSES – Medical Latin

Directorate for Language Communication

Lecturer: *Dr. Éva Kovács*

Subject name: Medical Latin I.; Medical Latin II.

Code: FOKVNYE173_1A; FOKVNYE173_2A

Credit value: 2

Thematics:

Students are introduced to the basic vocabulary of scientific terminologies in general, and to the terminology of medicine, dentistry and pharmacy in special.

- Texts: Anatomical names, clinical and pathoanatomical diagnoses and prescriptions
- Grammar: Substantives: the 5 declensions; adjectives with 3, 2 and 1 ending; construction of the most important attributive structures with the vocabulary of anatomy, clinical subjects and pharmacy; gradation of adjectives; prepositions; verbs: stem forms of the verb and participles; numerals: usage in prescriptions;
- Vocabulary: appr. 500 words used in anatomy (especially in the oro-maxillofacial region, the oral cavity, the anatomy of the head), pathology; parallel forms of Latin and Greek vocabulary

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. two times 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. two times 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

- 1 Belák Erzsébet: *Medical Latin*. Budapest, 2005, Semmelweis Kiadó.
- 2 Belák Erzsébet: *Terminology of Medicine*. Budapest, 2005, Semmelweis Kiadó.

Medical Latin I.

Week	Topics
1.	Introduction into medical Latin: alphabet, pronunciation, declensions, Greek and Latin elements. Anatomical planes and directions of the human body. The dictionary entry of nouns and adjectives, the 5 declensions
2.	Anatomical planes and directions of the human body. Possessive and attributive construction in anatomical terms (Genitive Singular; agreement of the adjective and noun)
3.	The anatomy of the bones. Declensions of adjectives; subjective and possessive construction with adjectives
4.	The anatomy of the bones. Exercises with possessive constructions.
5.	The cranium and the facial bones. Common endings of the 3 rd declension
6.	The cranium and the facial bones. Plural phrases in anatomy (Nominative Plural)
7.	1 st midterm
8.	Articulations and muscles of the head. Possessive phrases in plural (Genitive Plural)
9.	Articulations and muscles of the head. Exercises on possessive phrases in plural
10.	Exercises on vocabulary and grammar of the previous lessons
11.	Exercises on vocabulary and grammar of the previous lessons
12.	Review
13.	2 nd midterm
14.	Evaluation of student performance; retake of the midterms

Medical Latin II.

Week	Topics
1.	Grammatical exercises to maxillofacial anatomy and dental diagnoses. Introduction to medical prescription: <i>gramma, litra, gutta; numerals</i>
2.	Grammatical exercises to maxillofacial anatomy and dental diagnoses. Using Genitive and Accusative in the prescription
3.	Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural; prepositions with Accusative
4.	Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural with prepositions: prescriptions and diagnoses (<i>ICD</i>)
5.	Exercises on maxillofacial anatomy and dentistry. Verb forms in prescriptions (Imperative, passive and active voice)
6.	Exercises on maxillofacial anatomy and dentistry. Practising verbal forms in prescriptions; packaging materials used in pharmacology
7.	1 st midterm
8.	Exercises on maxillofacial anatomy and dentistry. The Ablative Singular and Plural; prepositions with Ablative
9.	Exercises on maxiofacial anatomy and dentistry. The Ablative Singular and Plural in diagnoses
10.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
11.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
12.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
13.	2 nd midterm
14.	Evaluation of student performance; retake of the midterms

Hungarian Language, Hungarian Medical and Dental Terminology

Information on the course

The course is obligatory for dental students and is offered in 4 hours a week per term. Student performance is evaluated with a practical course grade. A written and oral examination is taken in the examination period at the end of the 4th term. Students obtain 4 and 2 credit points in the fourth term and in all other terms, respectively.

Hungarian Dental Language is an obligatory course for dental students in the 3rd year of their studies. A final examination consisting of a written and an oral part has to be passed at the end of the 6th term.

The prerequisite for enrolling in the 2nd term is that criteria of the first term (signature, practical course grade and credit points) are fulfilled. The prerequisite for enrolling in every subsequent term is that criteria of the previous term (signature, practical course grade and credit points) are fulfilled. Attendance at classes is obligatory. The term is not recognized if the student has had more than six absences regardless of the reasons.

Curriculum and detailed course requirements

Term 1 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). Students receive 2 credit points for the course.

Topic

Vocabulary: greetings, introduction, numbers, addresses, telephone numbers, place of residence, apartment, restaurant, shopping, furniture, orientation in the city, transport, main activities and daily routine.

Grammar: accusative, verb conjugation in present tense, postpositions and endings, as well as adverbs.

Requirement

Active use of about 600 words and expressions

Written tests (2 during the term) focus mainly on vocabulary and communication.

Textbooks

L. Gyöngyösi – B. Hetesy: *Jó reggelt!*

L. Gyöngyösi – B. Hetesy: *Jó napot kívánok!*

A. Marthy – Á. Végh: *Egészségére!*

Term 2 Hungarian Medical Terminology

Hungarian Medical Terminology is a course for students who completed the course 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.

Topic

Students will be introduced to topics in medicine and learn related grammar issues in order to help communication with patients and assistants in Hungary.

Vocabulary: health, disease, body parts, medicines, examination, medical history, complaints, etc.

Grammar: plural, modal verbs, infinitive, definite verb conjugation, possessive (have and belong to), genitive construction.

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

M. Györfy: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

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

School year: 2018/2019

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**School year:** 2018/2019**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.

Nursing Course – 2 weeks (60' hours)

Week 1

An introduction to the structure of a hospital as an institution for attending patients.

1. In-patient department
2. Out-patient department
3. Auxiliary departments (X-ray, labs, physiotherapy, etc.)
4. Departments of Administration (warden's office, cashier's office, etc.)
5. Service departments (kitchen, storeroom, laundry, etc.)

Getting acquainted with the ward and its connected parts

Making beds with help and alone (for walking cases)

Making beds with turnable bedcase (for walking cases)

Use of comfort equipments (under supervision)

Disinfectants in the ward

Cleaning and sterilization of bedpans, urinals and spittoons

Helping with taking temperatures, sterilization of thermometers

Helping with serving food

Helping with feeding bed patients

Week 2 (practicing the things learnt the previous week)

Helping with the patients' placing in chairs, stretchers and wheelchairs

Helping with the washing of not seriously ill patients, mouth hygiene and nail care

Helping with the dressing and undressing of the patients

Taking temperatures

Practicing how to feel the pulse

Helping with changing clothes

Practicing to keep temperature and pulse charts

Working with syringe, practicing pumping

Helping to sterilize the syringe (the importance of sterilization)

Helping with preparing and sending samples to the labs, filling up guide slips

Staying in the lab for one day favourable in the department's lab helping with and practicing urine analysis with reagents

Students are not allowed to do the course in a children's ward.

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 assignment (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 an incisor and a premolar 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!

NOTE

BASIC MODULE



Faculty of Dentistry
2nd year

STUDY PROGRAMME

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 Cell Biology I., Medical Latin II.
compulsory	Dental Biochemistry II.	C4L3P1,5	semifinal	Dental Biochemistry I., Molecular Cell Biology I., Biophysics II.
compulsory	Molecular Cell Biology II.	C3L3P0	final#	Dental Biochemistry I.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cell Biology 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., Biochemistry, Molecular and Cell Biology II.
compulsory	Dental Biochemistry III.	C3L2P1,5	final#	Dental Biochemistry II.,
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Biochemistry, Molecular and Cell Biology 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)

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

ANATOMY, HISTOLOGY AND EMBRYOLOGY III.

Department of Anatomy, Histology & Embryology

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

First Semester

Lectures: 3 hours per week

Laboratory: 4 hours per week

Week	Lecture	Dissecting room	Histology lab
1.	1. Introduction to the study of the nervous system. Meninges 2. Blood supply to the brain, CSF circulation 3. Gross anatomy and development of the telencephalon, hemispheres. The lateral ventricles	Divisions of the brain, meninges, arteries and veins of the brain, surface structures of the hemispheres, basis cerebri. Specimen demonstration: dura mater, sinuses	–
2.	4. Gross anatomy and development of the diencephalon. The III. ventricle 5. Gross anatomy and development of the brain stem and the cerebellum. The IV. ventricle 6. <i>Differentiation of the neural tube, development of the spinal cord</i>	Lateral ventricles, third ventricle Brain stem, fourth ventricle, cerebellum	–
3.	7. Gross anatomy of the spinal cord, spinal segment. Dermatomes 8. Neuronal architecture of the spinal cord: proprioceptive and nociceptive (withdrawal) reflex arcs. 9. Neuronal architecture of the spinal cord: autonomic reflex arc. Spinal pathways	Cross sections of the brain. Specimen demonstration: spinal cord together with the membranes	–
4.	10. Microscopy of the brain stem: tracts and nuclei of the medulla oblongata 11. Microscopy of the brain stem: tracts and nuclei of the pons 12. Microscopy of the brain stem: tracts and nuclei of the midbrain. Reflex arc of mastication	Fine structure of spinal cord. Revision Test I: Anatomy and development of the brain and the spinal cord	–
5.	13. Cerebellar cortex, cerebellar pathways 14. Topographical anatomy of the limbs 15. Cerebral cortex, primary cortical centres	Dissection of the ventral regions of the limbs. Microscopy of the CNS	Nervous system I.
6.	16. Structure and connections of the basal ganglia (extrapyramidal system). 17. Motor pathways 18. Sensory pathways. Microscopy of the thalamus	Dissection of the ventral regions of the limbs. Microscopy of the CNS	Nervous system II.

Week	Lecture	Dissecting room	Histology lab
7.	19. Microscopy of the hypothalamus 20. The hypothalamo-hypophysial system 21. Introduction to cranial nerves. Sensory, motor and autonomic nuclei	Dissection of the ventral regions of the limbs. Microscopy of the CNS	–
8.	22. Trigeminal nerve, ophthalmic division 23. Trigeminal nerve, maxillary division 24. Trigeminal nerve, mandibular division	Dissection of the ventral regions of the limbs. Test II: Microscopic structure of the central nervous system, cranial nerves	–
9.	25. Endocrine organs: pituitary and pineal glands 26. Endocrine organs: thyroid, parathyroid, adrenal glands 27. Facial and glossopharyngeal nerves	Dissection of dorsal regions of the limbs. Demonstration of head and neck regions. Cranial nerves	–
10.	28. Vagus, accessory and hypoglossal nerves 29. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation 30. Inner coat of the eyeball, retina	Dissection of dorsal regions of the limbs. Demonstration of head and neck regions. Cranial nerves. Dissection of the eye	Endocrine organs
11.	31. Optic nerve, visual pathway, visual cortex 32. External muscles and movements of the eye 33. Protective and lacrimal apparatus of the eye. Development of the eye	Dissection of dorsal regions of the limbs. Demonstration of head and neck regions. Cranial nerves. Test III: Topographical anatomy of the limbs, spinal nerves, intracranial topography	–
12.	34. External ear, tympanic membrane, auditory tube Tympanic cavity, auditory ossicles 35. Bony and membranous labyrinth 36. Spiral organ of Corti. Development of the auditory and vestibular system	Demonstration of head and neck regions Organs of special senses	Organs of special senses I.
23.	37. Auditory pathway, auditory cortex 38. Vestibular system 39. Olfactory and gustatory systems	Demonstration of head and neck regions Organs of special senses	Organs of special senses II. Skin.
14.	40. Limbic system 41. Parasympathetic and sympathetic nervous systems 42. Skin and appendages. Mammary gland	Demonstration of head and neck regions Organs of special senses	–

TOPICS OF THE SEMIFINAL EXAM

Endocrine organs

Gross and microscopical anatomy of the pituitary gland; development of the posterior lobe
 Blood supply, histology and development of the anterior and intermediate lobes of the pituitary gland
 Gross and microscopical anatomy of the pineal gland
 Gross and microscopical anatomy and the development of the thyroid gland
 Gross and microscopical anatomy and the development of the parathyroid gland
 Gross and microscopical anatomy and the development of the suprarenal gland
 Histology of the Langerhans islets
 Endocrine cells and function of the male and female gonads
 Microscopical structure of the eyeball
 Histology of the lacrimal gland
 Microscopical structure of the cochlea
 Microscopical structure of the skin (scalp and palm)
 Histology of the mammary gland (lactating and non-lactating)

Macroscopical structure of the CNS

Gross anatomy of hemispheres
 Cranial dura mater and its sinuses
 Arachnoid and pia mater. Subarachnoid cisterns. Cerebrospinal fluid
 Arteries, circle of Willis and veins of the brain
 Gross anatomy of the lateral ventricles
 Gross anatomy of the third ventricle
 Gross anatomy of the fourth ventricle
 Gross anatomy of the large commissural pathways
 Gross anatomy of the internal capsule
 Gross and microscopic anatomy of basal nuclei
 Gross and microscopic anatomy of thalamus
 Anatomy, blood supply and development of the diencephalon
 Gross and microscopic anatomy of midbrain
 Gross and microscopic anatomy of pons
 Gross and microscopic anatomy of medulla oblongata
 Gross and microscopic anatomy of cerebellum
 Cranial nerve exits
 Gross anatomy of spinal cord. Spinal segment. Spinal nerve.
 Blood supply and meninges of the spinal cord

Microscopical structure and development of the central nervous system

Development and primary differentiation of the neural tube
 Development of the spinal cord; neurohistogenesis
 Differentiation of the prosencephalon vesicle; development of the hemispheres and the lateral ventricle
 Differentiation of the diencephalon vesicle, development of the third ventricle
 Differentiation of the mesencephalon and rhombencephalon vesicles, development of the fourth ventricle
 Roots, branches and components of the spinal nerves; spinal segment
 Fine structure (microscopy) of the spinal cord
 Neurons and function of the spinal proprioceptive (stretch) reflex
 Neurons and function of the spinal flexion (withdrawal) reflex

Neurons and functions of the visceral reflexes
Microscopical anatomy of the medulla
Microscopical anatomy of the pons
Microscopical anatomy of the midbrain
Nuclei of the cranial nerves
Microscopical anatomy of the cerebellum
Afferent and efferent cerebellar connections
Microscopical anatomy of thalamus, divisions, connections and transmitters
Hypothalamus, hypothalamo-hypophyseal systems
Microscopical anatomy of the basal ganglia, divisions, connections and transmitters
Histology of the cerebral cortex; cortical fields
Internal capsule, divisions
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)

Gross anatomy and development of the peripheral nervous system

Development, fate and differentiation of the cells in the neural crest
Development of the peripheral nervous system
Nuclei and branches of the IIIrd, IVth and VIth cranial nerves
Nuclei of the trigeminal nerve; course and fiber composition of the branches of the ophthalmic (V/1) nerve
Course and fiber composition of the branches of the maxillary nerve (V/2)
Course and fiber composition of the branches of the mandibular nerve (V/3)
Nuclei, course and fiber composition of the branches of the facial nerve (VII)
Nuclei, course and fiber composition of the branches of the glossopharyngeal nerve (IX)
Nuclei, course and fiber composition of the branches of the vagus nerve (X)
Nuclei, course and fiber composition of the branches of the accessory (XI) and hypoglossal nerves (XII)
Cervical plexus and its branches
Brachial plexus and its branches (including the short branches to the neck and shoulder girdle)
Lumbar plexus and its branches
Sacral plexus and its branches
General organization of the autonomic nervous system
The sympathetic trunk
Cranial part of the parasympathetic nervous system
Sacral part of the parasympathetic nervous system

Gross anatomy, histology and embryology of the organs of special senses

Gross anatomy and microscopic structure of the fibrous coat of the eye ball (cornea, sclera)
Gross anatomy and microscopic structure of the vascular coat of the eye ball (choroid, ciliary body, iris)
Gross anatomy, microscopic structure and development of the nervous coat of the eye ball (retina)
Neurons of the visual pathways; localization and microscopic structure of the visual cortex
Gross anatomy, microscopic structure and development of the lens, accommodation
Gross anatomy and content of the chambers of the eye, circulation of the aqueous humor; gross anatomy of the vitreous body
Gross anatomy and function of the external ocular muscles.
Visual reflexes

Gross anatomy, microscopic structure of the eye lids; conjunctiva, Tenon's capsule and periorbit
 Gross anatomy, microscopic structure and development of the lacrimal apparatus
 Gross anatomy and development of the external ear and the tympanic membrane
 Gross anatomy and development of the tympanic cavity and the auditory tube
 Gross anatomy and development of the auditory ossicles; joints, muscles, and the mucous membrane
 of the tympanic cavity
 Sensory innervation and blood supply of the tympanic cavity
 Internal acoustic meatus
 Gross anatomy of the bony labyrinth
 Gross anatomy and development of the labyrinth
 Morphology, development and divisions of the vestibular apparatus
 Receptors and neuronal connections of the vestibular system
 Gross anatomy, microscopic structure and development of the cochlear duct and
 the organ of Corti
 Neurons of the auditory pathways
 Organ and pathways of olfaction
 Organ and pathways of taste
 Gross anatomy and microscopic structure of the fibrous coat of the eye ball (cornea, sclera)
 Gross anatomy and microscopic structure of the vascular coat of the eye ball
 (choroid, ciliary body, iris)
 Gross anatomy, microscopic structure and development of the nervous coat of
 the eye ball (retina)
 Neurons of the visual pathways; localization and microscopic structure of the visual cortex
 Gross anatomy, microscopic structure and development of the lens, accommodation
 Gross anatomy and content of the chambers of the eye, circulation of the aqueous humor; gross
 anatomy of the vitreous body
 Gross anatomy and function of the external ocular muscles.
 Visual reflexes
 Gross anatomy, microscopic structure of the eye lids; conjunctiva, Tenon's capsule and periorbit
 Gross anatomy, microscopic structure and development of the lacrimal apparatus
 Gross anatomy and development of the external ear and the tympanic membrane
 Gross anatomy and development of the tympanic cavity and the auditory tube
 Gross anatomy and development of the auditory ossicles; joints, muscles, and the mucous membrane
 of the tympanic cavity
 Sensory innervation and blood supply of the tympanic cavity
 Internal acoustic meatus
 Gross anatomy of the bony labyrinth
 Gross anatomy and development of the labyrinth
 Morphology, development and divisions of the vestibular apparatus
 Receptors and neuronal connections of the vestibular system
 Gross anatomy, microscopic structure and development of the cochlear duct and
 the organ of Corti
 Neurons of the auditory pathways
 Organ and pathways of olfaction
 Organ and pathways of taste

ANATOMY, HISTOLOGY AND EMBRYOLOGY IV.

MAXILLOFACIAL ANATOMY

Second Semester

Lectures: 3 hour per week

Laboratory: 2 hours per week

Week	Lecture (Monday 10.00-11.40 Thursday 13.30-14.15)	Dissection room (Monday 8.00-9.30)
1.	1. Introduction, the composition and development of the skull 2. Maxilla, mandible. The temporomandibular joint, masticatory muscles, mechanism of mastication 3. Walls and parts of the oral cavity, the oral mucosa	Bones and spaces of the skull, content of the orbit
2.	4. Anatomy, histology and innervation of the tongue 5. Topography, histology, innervation of the salivary glands 6. The palate and the faucial isthmus	Prosected specimen: demonstration of the head@neck: oral cavity, tongue and the salivary glands
3.	7. Nasal cavity and paranasal sinuses 8. The pharynx and the parapharyngeal spaces 9. The cavity and muscles of the larynx	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section
4.	10. The mucosa of the larynx 11. Development of the face, malformations 12. Pharyngeal pouches, development of the tongue	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth
5.	13. Anatomy of the teeth I. 14. Anatomy of the teeth II. 15. Histology of the teeth I.	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth, morphology and histology (photos)
6.	16. Histology of the teeth II. 17. Parodontium 18. Tooth development I.	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth, morphology and histology (photos)
7.	19. Tooth development II., malformations 20. Bone formation, bone remodelling and supplementation 21. Anatomical relevances in gnathology	Maxilla, mandible. Prosected specimen: demonstration of the temporomandibular joint, muscles of mastication and facial expression.
8.	22. Blood vessels of the head and neck region 23. The lymphatic system and the cutaneous innervation of the head&neck region 24 1st Midterm: lectures 1-21.	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&neck regions. Regional anatomy of the head
Easter break		
9.	26. The concept of the spinal nerve, dorsal branches, cervical plexus and brachial plexus 27. Nerves of the head&neck region I.: CN 5 28. Innervation of the teeth and the gingiva, the anatomy of dental local anaesthesia	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&neck regions. Regional anatomy of the head

Week	Lecture (Monday 10.00-11.40 Thursday 13.30-14.15)	Dissection room (Monday 8.00-9.30)
10.	29. The reflex arc of mastication, the neuroanatomy of trigeminal neuralgia 30. Nerves of the head&neck region II. CN 7 and 9 31. Nerves of the head&neck region III CN 10, 11 and 12	Demonstration of the final's specimen: parapharyngeal space, cross section of the head and the neck
11.	32. Superficial regions and muscles of the head 33. Deep regions of the head. 34. Topography of the orbit	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&-neck regions.
12. (Competition 1st round)	37. Muscles and fasciae and the deep regions of the neck 38. Sectional anatomy of the head 39. Sectional anatomy of the neck	Demonstration of the final's specimen: parapharyngeal space, cross section of the head and the neck
13. (Competition 2nd round)	40. The cranial parasymphetic and sympathetic system 41. Topography of the neurocranium 42. The clinical significance of the SMAS	2nd Midterm: Topographical and sectional anatomy of the head and neck regions including the visceral organs
14.	43. Histology I. 44. Histology II. 45. Radiological anatomy of the jaws, teeth and the maxillary sinus	Summary and repetition

TOPICS OF THE FINAL EXAMINATION

Subject matter of the 4 semesters in Anatomy, Histology and Embryology (see previous topic lists)

AND

Maxillofacial anatomy (theoretical oral question following the Histology parts)

1. Composition of enamel
2. Amelogenesis
3. Composition of dentin
4. Dentinogenesis
5. Fine structure of the dental pulp
6. Composition and formation of the cementum
7. Parodontium
8. Parts and histology of the gingiva
9. Development of teeth, malformations
10. Eruption of teeth
11. Development of the maxilla and the mandible
12. Development of the face, malformations
13. Frontal section of the oral cavity
14. Gross morphology, histology and development of the primary and secondary palate
15. Gross morphology, histology and development of the tongue
16. Topographical anatomy of the oral diaphragm
17. Morphology of the incisors and the canine teeth
18. Morphology of the premolar teeth
19. Morphology of the molar teeth

20. Dentition and exfoliation
21. Blood supply and innervation of the upper teeth
22. Blood supply and innervation of the lower teeth
23. Temporomandibular joint
24. Muscles concerned with the opening and closure of the mouth
25. Muscles of facial expression and mastication
26. Mechanism of mastication
27. Reflex arc of mastication
28. Morphological background of taste perception (gustatory organ, pathways)
29. Gross morphology and histology of the parotid gland, nidus parotideus
30. Gross morphology and histology of the submandibular gland, submandibular region
31. Gross morphology and histology of the sublingual gland, sublingual region
32. Neuroanatomy of trigeminal pain
33. Autonomic innervation of the salivary glands

MOLECULAR CELL BIOLOGY II.

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Detailed information on the subject is available on our website under <http://semmelweis.hu/or-vosi-vegylan/en/students/molcellbiol/>

MEDICAL AND DENTAL PHYSIOLOGY

Department of Physiology

Subject code: FOKOELT187_1A, FOKOELT187_2A

Credit Points: 9 (I. semester) + 9 (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. Trans-epithelial 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. Autonomic neurotransmitters and physiology of smooth muscle. Neuromuscular junction and physiology of skeletal muscle. Physiology of the heart I.: origin and spread of cardiac excitation.
5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).
6. Physiology of blood circulation: introduction. Hemodynamics, systemic circulation. Microcirculation.
7. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.
8. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.
9. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.
10. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.
11. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.
12. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. Acid-base balance: role of lungs and kidneys.
13. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
14. Secretory functions of the gastrointestinal tract. Digestion and absorption of food. Energy balance, quality and quantity requirement of food.

Second semester

15. Haematopoiesis. Haemostasis, overview of immune system. Principles of the innate immunity.
16. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
17. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
18. Function of the adrenal cortex. Function of the thyroid gland.
19. Hormonal regulation of intermediary metabolism.
20. Calcium metabolism, bone tissue, growth. Function of the reproductive system: endocrinology of the sexual differentiation and development.
21. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
22. Introduction to neurophysiology. Physiology of nerve & glia cells.
23. Sensory functions.
24. Physiology of hearing and equilibrium.
25. Physiology of vision.
26. Motor functions.
27. Integration of autonomic responses.
28. 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
- Electromyography (EMG), nerve conduction velocity
- Recording and analyzing the human ECG
- Blood pressure measurement in humans
- Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Practices, II. semester:

- Circulatory and respiratory reflexes in rabbit
- Human pulmonary function tests
- Smooth muscle of rabbit small intestine
- Oral glucose tolerance test (OGTT)
- Electrooculography (EOG) and investigation of the vestibular system
- Computer simulation: Studies on circulatory reactions of a virtual rat
- Computer simulation: neuromuscular junction

Attendance at classes: The lecture hours per week are 6; the practice hours per week are 3.5. The attendance of a minimum of 75% of lectures and practices (including seminars) 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.

Grading Performance in Seminars and Practices:

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. The following rules will be enforced during the short tests: electronic devices must be kept in the baggage; any form of communication is disallowed; students not complying with these rules will be disqualified immediately. Evaluating the work of the student is based on his/her classroom tests and performance practice in the regular period of the semester. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of percentages of the nine best written tests and the practical grade (also is expressed as a percentage) result a five-point scale:

0-54 %	= 1
55-64 %	= 2
65-74 %	= 3
75-84 %	= 4
85-100 %	= 5

This grade is taken into account in the exams.

Obtaining signatures:

The attendance of a minimum of 75% of lectures and seminars (including seminars) is necessary for the end-term signature. Students must write a lab report for each practice using an A4 size exercise booklet. The booklet 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 seminars (6 lecture hours) and 1.5 absences (5 lecture hours) are allowed for any reason; otherwise the semester will not be credited.

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.

Type and grading of exams:

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 and the lab work grade.

The final exam consists of written and oral part. The written and oral part of the final exam is held on the same day. The oral part consists of two theoretical questions (I-II). The mathematical average of four grades (lab grade, written exam grade, and two oral exam grades) gives the grade of the final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. 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 lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

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.

Registration for the exam:

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

Modification of the registration for the exam:

Modification in the registration must be recorded through the NEPTUN system not later than 48 hours before the start of the exam.

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.

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-Incisor 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.

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.

Note: The maximum number of absences in a semester is 3.
During the semester 3 midterm examinations should be passed.
Practical course grade.

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

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 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 restoration, 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 – Hungarian

Language Communication Center

Term 3 Hungarian Dental Terminology I

Hungarian Dental Terminology I is a course for students who completed the course Hungarian Medical Language.

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.

Topic

- Students will be introduced to further topics of dentistry and grammar issues during the course.
- Vocabulary: undergraduate studies at the Faculty of Dentistry, structure of the tooth, at the dentist, appointments, medical history, dental examination, treatment, underlying diseases, etc.
- Grammar: possessive (have and belong to), genitive construction, indefinite and definite verb conjugations in the past.
- 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

M. Györfy: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

Term 4 Hungarian Dental Terminology II

Hungarian Dental Terminology II is a course for students who completed the course Hungarian Dental Terminology I.

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.

Topic

- Students will be introduced to further topics and grammar issues during the course to help professional communication with patients who students will see in the third year.
- Vocabulary: properties, comparisons, paediatrics, doctor's surgery, medical history, pain, disease, tooth extraction, etc.
- Grammar: comparative, prepositions, spatial relationships, date indication, imperative and genitive
- The course consists of 56 hours (4 hours per week). Students receive 4 credit points for the course.
- Evaluation is based on two written tests and active participation in classes.
- A written and oral examination is taken at the end of the 4th term.

Textbooks

M. Györfy: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

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.*

LIBRARY INFORMATICS – MEDICAL LITERATURE RESEARCH

Lecturer: **Dr. Livia Vasas PhD.** – Central Library

Institute: Semmelweis University Central Library, 1088 Budapest, Mikszáth Kálmán tér 5, 1st floor

Duration: One semester, 30x45 minutes (10x3 lessons)

SUGGESTED SEMESTER 1-10.

Exam-form **Practical mark**

Credit-value **3 credit-points**

Minimum/maximum group-size 8/30

The aim of the subject: Teaching students how to search in medical literature sources

Thematic: Medical e-catalogues, e-books, e-libraries, databases
(PubMed/Web of Science/Scopus/Ovid Medline, EBM, PsycINFO,
IPA, Primal Pictures -3D Anatomy Atlas/ProQuest Dissertations
and Theses), Scientific Web Scientometry (IF, Citation)

Assistant lecturer: Anna Berhidi, Edit Csajbók

Student records officer: Zsuzsa Margittai: Tel.: 459-1500/60503

Application deadline: September 4 - 8, 2017

Precondition There isn't.

1. **Introduction, technical details introduction of Central Library's**

Homepage: www.lib.sote.hu and its facilities

Literary research

Introduction: homepage of central library

Training: researching, keywords

– Basic computer knowledge for literature search

2. **PubMed database**

The meaning of PubMed

Introduction of PubMed

National Library Medicine-Medline and thesaurus

Entrez databases

MESH and PubMed Searching

3. **Periodicals, Scientometry: Impact factor (JCR)**

– Training: Browser and matching searching, archive and the newest editions

– Characterization of periodicals/reviews/journals, ISSN, DOI

Electronical edition (Science Direct, Springer, LWW, Biomed Central, InterScience,

Nature Publishing Group)

Impact factor (JCR)

Fundamentals of science

ISI- JCR Science Edition and Social Science Edition, IF:

calculating Impact factor and its role by measuring scientific publications

List of Journals with IF: **Journal Citation Report** and its editions.

Searching an exact data in JCR, handling data: sorting and filtering journals

4. Searching International Library/Book/Periodical catalogues

Hungarian electronical catalogues

Semmelweis Univ. Central Library (Budapest) <http://www.lib.sote.hu>

National Library of Medicine (Bethesda, USA)

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=nlmcatalog>

Deutsche Zentralbibliothek für Medizin (Germany) <http://www.zbmed.de>

Karolinska Institute (Sweden) <http://search.kib.ki.se/miks/bin2/>

Worldcat <http://www.worldcat.org/>

Amazon www.amazon.com

How do we get from the abstract to the full article? -

practicing the proper search strategy

5. Introduction of bibliographic and citation databases:

Web of Science, SciVerse Scopus

Bibliographical items, citations

general searching in the database model searching –guided

Exercises: bibliographic searching on keywords

Citation analysis

meaning of Citation analysis and its role by measuring scientific works

Web of Science database cited reference search

Value-added services of Web of Science, Scopus

6. OVID databases, online books, online periodicals, 3D Anatomy Atlas

Natural language, advance search strategy

Evidence Based Medicine databases: the role of the EBM in research and practice

Full text journals in Ovid databases

MEDLINE, PsycINFO, IPA databases: subject heading systems, value-added services

Primal Pictures – 3D Anatomy Atlas: interactive tools for studying anatomy

Link Solver – access to the full text version

7. Reference Manager: EndNote, EndNote Web

the role of reference softwares in modern publishing

Literature searching: Importing and exporting records

(from Web of Science, Scopus, OVID Medline, PubMed)

creating own records

search facilities within our records and from PubMed;

data handling: creating groups, filtering duplicates

8. – Paper and online periodicals
- ProQuest, Dissertations and Theses- Full text
- PubMed training

9. **Semmelweis Knowledgebase**
Scientific Discovery of the Internet:
 - Find Medical Information you can trust
 - Building search strategies
 - Google Scholar, Medworm
10. Summary of the course, consultation
exam: 2 electronic tests during the semester, renewal opportunity for each tests.
Proposed grade or exam test during the exam period.

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

School year: 2018/2019

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!

Additional list of literatures:**Additional Resources:****Subject: Physical Education IV.**

Type of Subject: Compulsory

Code of Subject: FOKOTSI007_4A

Credit: 0

Name of the Lecturer: Várszegi Kornélia

School year: 2018/2019

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 againsts 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!

IMPORTANT NOTE: You can only register to any third year subject after completing the Basic Module!

PRE-CLINICAL MODULE



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	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 MODUE

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)

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 Schillenburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 3rd 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 Samaranyake 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)

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.-Nyárasdy 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.

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)	Practices (2 hours per week)
Pathophysiology of gastric disorders. GERD. Peptic - and duodenal ulcer. Intestinal digestion and absorption. Diseases and regulation of exocrine pancreas. Acute and chronic pancreatitis	Gastric function
Pathophysiology of liver. Processes leading to the lysis of liver cells. Viral hepatitis Development of jaundice. Fatty liver. Pathophysiology of cirrhosis Cardiac insufficiency. Forward and backward heart failure. Cardiomyopathies. Hypo- and hyperventilation. Obstructive and restrictive respiratory disorders. Emphysema. Respiratory insufficiency	Liver
Shock. Circulatory failure in shock. Various mediators in shock. Depressed functions in various tissue in shock.	ECG-1 (Rhythm, frequency, axis, development of various waves on the normal ECG)
Regulation of blood pressure in hypertension. Risk factors and definitions in hypertension. Processes leading to elevation in blood volume and total peripheral resistancy. Consequences of hypertension	ECG-2 (Defects of excitation. ES)
Defects in water intake. Hypovolemia, exsiccosis. Hyperhydrosis. Changes in sodium intake: hypo- and hyper natremia	ECG-3 (Defects in conductance, blocks.)
Pathophysiology of kidney functions. Acute renal failure. Chronic renal failure. Uremia syndrome. Nephrosis.	ECG-4 (Defects of repolarisation. Myocardial infarction)
Protein metabolism. Development of hypoproteinemia. Low protein and amino acid intake and absorption. Complete and incomplete proteins Kwashiorkor and marasmus. Energy balance. Low and high energy intake. Regulation of metabolic rate. Anorexia nervosa. Various types of obesities. Control of appetite and energy balance.	ECG-5 (Hypertrophy, hypokalemia) Midterm exam
Lipid metabolism. Absorption and metabolism of lipids. Regulatory and endocrine effect of WAT.	Urine analysis, renal function tests
Atherosclerosis. Risk factors and epidemiological aspects. Various theories for the development of atherosclerosis (lipid theory, connective tissue theory, immune theory, thrombogenic theory, response to injury etc)	Proteins, malnutrition astric function
Endocrin disorders. Regulation of hormone activities: hypothalamus hormones. Hormone receptors in the brain. Pituitary- hormones. Panhypopituitarism. Changes in the release and activity of thyroid hormones and glucocorticoids. Short and long feed backs	Salt and water metabolism
Impaired carbohydrate metabolism. Hypo- and Hyperglycemic states. Etiology and pathogenesis of primary and secondary diabetes.	Lipid metabolism. Atherosclerosis
Acute and chronic complications and oral side of diabetes. (Oral manifestations in diabetes.)	Diabetes
Pain sensation: central and oral mechanisms.	Clinico-chemical assays for endocrine disorders
Pathophysiology of malignancies.	Molecular laboratory diagnostic
Acid-base regulation. Respiratory acidosis and alkalosis. Metabolic acidosis, alkalosis. Mechanisms in compensation.	Acid base analysis

Note: The maximum number of absences in a semester is 3
More than 3 absences invalidate the semester

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 mediated 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.

Practices

(2 hours per week)

Laboratory

AUTOPSY
 Chemical mediators.
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 AUTOPSY
 HISTOLOGY
 Consultation.
 AUTOPSY
 AUTOPSY

Pathology of the breast.	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 anaerobic, 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 reovirus 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.

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, organs and cell of 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	Case studies I.
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.	Midterm exam (written)	Biological therapies I.
10.	Immune response in infections, immunodeficiencies	
11.	Hypersensitivity	Hypersensitivity I
12.	Tolerance and autoimmunity	Hypersensitivity II-IV.
12.	Immunology of transplantation; Antitumor immunity	Screening methods for autoantibodies
13.	Antitumor immunity	Screening methods for autoantibodies
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.

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

Lectures (1 hour per week):

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)

1.	Primary, secondary and tertiary prevention. Health-protection, health-education: collective, group and individual prophylaxis. Dental-prophylaxis
2.	Caries. Caries-indexes and epidemiological relations. Characteristics of Hungarian epidemiology
3.	Caries-aetiology. Plaque. Risk-factors
4.	Caries incipient and remineralisation
5.	Oral hygiene
6.	Gingivitis and periodontal disease. Epidemiological characteristics. Pathogenesis and diagnosis.
7.	Strategy for prevention of periodontal diseases.
8.	Possibilities in prevention of orthodontic anomalies.
9.	Midterm exam
10.	Fluorides
11.	Systemic and local fluoride-prevention
12.	Fissure-sealing
13.	Infection control
14.	Other possibilities in caries prevention

Practices (2 hours/week)

Seminar or clinical practice

PREVENTIVE DENTISTRY II.

Second Semester

Lectures 1 (hour/week)

1.	Prevention in pregnancy and in the intrauterine life to the age of three
2.	Dental plaque - Biofilm
3.	Oral hygiene – toothpastes
4.	Organization and realization of collective prevention
5.	Cervical sensitivity, dentinal hypersensitivity and erosion
6.	Integrated preventive dentistry – prosthodontics
7.	Integrated preventive dentistry – preventive fillings
8.	Integrated preventive dentistry – Finishing, polishing of fillings
9.	Midterm exam
10.	Integrated preventive dentistry – orthodontics
11.	Dental public health programs. Primary and secondary prevention in screening program for oral cancer
12.	Care of handicapped and hospitalized patients
13.	The role of dental hygienists in dental practice
14.	Iatrogenic damaging factors

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 moulages. 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

ODONTOTEHCNOLOGY 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

INTERNAL MEDICINE I.

1st Department of Internal Medicine

Second Semester

Lectures (2 hours per week)

Introduction to internal medicine.
History taking.
Physical examination

Respiratory diseases. Physical examination
and respiratory diagnostic procedures. Bronchitis.
Pneumonias. Syndromes of the respiratory system.

Bronchiectasis. Lung abscess. Pulmonary embolism.
Chronic aspecific respiratory disorders.
Tumors of the lung.

Practices (2 hours per week)

The bases of the diagnostic procedures
in the internal medicine
(The exact preparation of the patient's
case history, the methods of physical
examination of the patients)

The medical examination of the heart
and lung (percussion, auscultation)

The investigation of the peripheral
arterial pulse rate and blood pressure

Disorders of the cardiovascular system.
Physical examination.
Examination of the peripheral blood vessels.
Coronary heart disease.
Acute myocardial infarction.
Acute heart failure. Shock.
Chronic heart failure.

Practicing injection technique

Rheumatic fever. Valvular heart disorders.
Infective endocarditis. Disorders of the pericardium.
Cor pulmonale.

The physical examination of the abdominal organs

The medical considerations of dentistry and dental considerations of internal medicine

Cardiac arrhythmias. Conduction disturbances.
Hypertension.
Atherosclerosis. Thromboangiitis obliterans.
Raynaud's phenomenon.
Headache. Dental relation of the heart diseases

Consultation

Consultation

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester
Practical course grade

ORAL AND MAXILLOFACIAL SURGERY, PRE-CLINICAL COURSE

Tutor: **Dr. Attila Szűcs**

First Semester

Practices (2 hours per week)

Oral surgery as a part of general surgery
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)
 Summerising 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)

The oral mineralized tissues –
Amelogenesis-dentinogenesis – cementogenesis

dentin and cementum. Microanatomy and
and structures of enamel, physiology and innervation
of the pulp.– Chemistry of formation and solubilization
of the various calcium phosphate salts. Crystallography
of bio-apatite and other calcium phosphate
Mechanism of biological calcification

– Principles of demineralization-remineralization-
phenomena – The inorganic and organic composition
of teeth – Role of fluoride and carbonate in calcium
and dental tissue phosphate solubility demineralization
-remineralization-phenomena

Abnormal development and mineralization of enamel,
dentin and cementum – Pulpal mineralization and
dentin-pulp phenomena; dentin permeability –
Nutrition and hormonal influences on the oral
mineralized tissues

The salivary glands and saliva – Ultrastructure
and innervation

– The physiology of salivary gland secretion

acute leukemias Plasma cell dyscrasias
Neurological and pharmacological control of
salivary gland secretion – Chemical composition
and physical properties of saliva – Influences
of saliva on oral tissues.

Nutritional and hormonal influences on salivary
gland function and saliva composition. – Immune
and non-immune defense mechanisms – Salivary
secretion of drugs – S. gland regeneration
sideoblastic, hemolytic anemia.

Oral motor and sensory system – Ultrastructure of
temperature, touch, pressure and taste receptors
of the oral cavity.– Physiology of pain in the oro-facial
region and its control. – Physiology of temperature
and touch perception in the oro-facial region
– Dentin sensitivity and its control. Biochemistry and
physiology of taste perception

Biomechanics and structure of the temporomandibular
joint – Neuro-physiology of mastication – Kinesiology

Practices (2 hours per week)

Hematology I.
Cellular components of
the whole blood
The function of the individual cells.
Normal blood cell values
Cellular elements of the bone marrow
Methods for examining the peripheral
blood smear and the bone marrow.
Hematology II.
Immature cellular forms
The red and white blood cell series

Hematology III.
White blood cell disorders
Disorders related to segmented cells.
Disorders related to mononuclear cells

Hematology IV. Malignant white cell
disorders
Part I. Classification of leukemias. Acute
leukemias Cytochemical differentiation of

Hematology V.
Malignant white cell disorders. Part II.
Chronic leukemias. The importance of
oral symptoms in the early diagnosis of
leukemias
Hematology VI.
Abnormalities of red blood cell
production.
Classification of anemias.
Aplastic, iron deficiency, Abnormalities of
red blood cell production. Platelet disorders
Folate- and Vit. B12-deficiency anemia
Polycythemia, erythrocytosis.

Midterm exam of hematology

and electromyography of oral musculature –
Phenomenon of deglutition – Microcirculation and innervation of the tongue – Role of the tongue in speech and other oral phenomena. Physiology of olfaction – Food consistency and its effects on oral phenomena

The oral mucosa and periodontium – Ultrastructure of oral mucosa – epithelial cell and oral mucosa metabolism – Epithelial cell adhesion and aggregation Bacterial tooth and epithelial interaction. Transmucosal absorption. – The physiology and composition of sulcular fluid. – Microcirculation of the gingiva and periodontium – The biochemistry of the structure proteins of the periodontium – Ultrastructure of alveolar and associated bone – Physiology of bone remodeling, mechanical effects on bone – Physiology of bone remodeling, mechanical effects on bone Eruption and resorption – Oral immunological mechanism – Nutritional and hormonal influences on the oral mucosa and periodontium
Plaque associated diseases – Structures adhering

– Formation, composition and metabolism of dental plaque.
– Plaque and the demineralization-remineralization phenomena
– Dynamism and control of the oral microbial ecosystems
– Pathogenesis of caries – Pocket formation Plaque and dental calculus formation – Gingivitis and periodontitis and alveolar bone resorption.

Aging – Nutrition

Immunologic techniques

Aging Nutrition Part Two

Hemostasis and fibrinolysis – Physiology and biochemistry

– Activators and inhibitors of blood clotting and fibrinolysis

– Thrombosis and bleeding disorders: etiology, pathomechanism, oral symptoms, differential diagnosis

Inflammation – cardinal signs – fever – changes in RES

– vascular permeability – cellular reactions – chemical mediators – inflammation and repair

The biological effects of ionizing radiation – The sources of ionizing radiation in the environment – General and specific effects: cell and genedamages – Radiation diseases and its consequences – Oral symptoms of therapeutic irradiations and the management of head and neck irradiated patients

Determination of salivary flow rate and collection of samples for analysis

Measurement of fluoride concentration to dental pellicle

Oral clearance measurements
Oral cytology

Analyses of oral hard tissues

Measurement of plaque and salivary pH

Note: A final exam will be organized at the end of the semester. During the semester one midterm examination (hematology) should be passed. The mark of that will also be considered when establishing the mark of the final. During the final examination there are the following requirements:

- to reach the minimum level of a written theoretical evaluation,
- to present orally two of the main theoretical questions, and also,
- to present one question of the subject-specific practices.

In the case of an invalid midterm the examination will start with assessing the knowledge of hematology. Under the minimum level of passing hematology (mark 2) there is no possibility of continuing of the final. A failed exam can be retaken at least one week after the first one.
The maximum number of absences from practice in a semester is 3!
More than 3 absences invalidate the semester.

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

Tel.: 459-1500/59161, 317-1044

Tutor: **Prof. Dr. Csaba Dobó Nagy**

email: 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.

SEMMELEWEIS 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: Differential Diagnosis of Diseases of the Oral Mucosa Quintessence Publishing 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

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. Pharmac- 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: to be issued later

LANGUAGE COURSE – Hungarian

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!

CLINICAL MODULE



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 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.	C2L1,5P0,5	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. 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		

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)

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.
- T.G.Wilson-K.S.Kornman: Fundamentals of Periodontics Quintessence. 1996. ISBN 0-86715-303-2
- 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 Andreoli, T.E.-Bennett, J.C.-Carpenter, C.C.J.-Plum, F.: Cecil Essentials of Medicine. 4th ed. W.B. Saunders Co. 2000.
- 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 Schillenburg 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.

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/Gerd Knolle: Diseases of the Oral Mucosa A Color Atlas 2nd ed. Quintessence Publ. Co.Inc. Carol Stream Illinois 1994.
- 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.-Áranyi 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

PHARMACOLOGY, TOXICOLOGY I.

Lecturer: **Dr. László Köles**

Tutor: **Dr. Erzsébet Kató**

First Semester

Lectures (1 hour per week)

1. Introduction to pharmacology
2. Pharmacokinetics
3. Basics of the neurotransmission of autonomic nervous system
4. Parasympathomimetics
5. Sympathomimetics
6. Alpha and beta receptor antagonists
7. Skeletal muscle relaxants
8. Anxiolytics, sedative-hypnotics
9. Antipsychotics
10. Antidepressants and antimanic drugs
11. Penicillins, β -Lactamase inhibitors. carbapenems. monobactams.
12. Macrolides, ketolides, lincosamides, streptogramins.
13. DNA gyrase inhibitors, antifolates, metronidazol
14. Antiviral drugs

Practices (1 hour per week)

1. Pharmacodynamics I.
2. Pharmacodynamics II. Basic principles of prescription writing. Drug formulations
3. General anesthetics
4. Parasympatholytics
5. Pharmacology of the respiratory tract
6. Sympatholytic and antisympathotonic drugs
7. 1st midterm exam, prescription writing
8. Antiepileptics
9. Drugs for neurodegenerative diseases, nootropic drugs, anorectic agents
10. Desinfectants and antiseptics
11. 2nd midterm exam. Cephalosporins, glycopeptide antibiotics
12. Aminoglycosides, chloramphenicol, tetracyclines, glycyclines, linezolid
13. Antituberculous, special antibiotics (polymyxins, bacitracin, nitrofurantoin, phosphomycin)
14. Antifungal, antiprotozoal and antihelminthic drugs

PHARMACOLOGY, TOXICOLOGY II.

Second Semester

Lectures (1 hour per week)

1. Inhibitors of platelet aggregation
2. Inhibitors of the renin-angiotensin-aldosterone system. Calcium channel blockers.
3. Diuretics
4. Antianginal drugs
5. Antihypertensive agents
6. Drugs acting on bone homeostasis.
7. Gluco- and mineralocorticoids
8. Local anesthetics
9. Pharmacology of the cyclooxygenase- inhibitors. Acetylsalicylic acid.
10. Natural opioids
11. Pharmacology of the smooth muscles.
12. Drugs used in the treatment of peptic ulcer and reflux disease
13. Anticancer drugs
14. Toxicology in the dental practice

Practices (2 hours per week)

1. Anticoagulants, fibrinolytics, treatment of bleeding
2. Antiarrhythmic drugs, prescriptoin writing
3. Drugs used in the treatment of congestive heart failure.
4. Antihyperlipidemic drugs. Drugs used in the treatment of peripheral vascular diseases. Local circulation improving drugs. Drugs acting on erythropoiesis
5. Drugs acting on glucose homeostasis
6. 1st midterm exam. Drugs influencing the thyroid function. Prescriptoin writing
7. Hypothalamic and pituitary hormones. Sexual hormones and contraceptives. Drugs influencing uterus function.
8. Clinical use of local anesthetics
9. Non-steroidal antiinflammatory drugs and further non-opioid analgesics. Drugs used in the treatment of gout and migraine.
10. Synthetic opioids. Drugs of abuse.
11. 2nd midterm exam. Prescriptoin writing
12. Pharmacology of the gastrointestinal tract
13. Immunopharmacology. Treatment of rheumathoid arthritis
14. Prescription exam

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

INTERNAL MEDICINE III.

3rd Department of Internal Medicine

Tutor: *Dr. László Jakab*

Second Semester

Lectures (1 hour per week)

Diseases of the kidney. Physical examination.
Urine analysis.
Primary glomerular disorders. Nephritic syndrome.
Interstitial nephritis. Tubular disorders.
Acute and chronic pyelonephritis. Nephrolithiasis.
Acute and chronic renal failure.
Disorders of the digestive system. History taking and physical examination. Special techniques for diagnosing disorders of the digestive system.
Disorders of the esophagus. Peptic ulcer disease.
Tumors of the stomach.
Crohn's disease. Chronic ulcerative colitis.
The malabsorption syndrome.
Colonic and rectal neoplasms.
Acute abdomen. Mechanical obstruction and ileus.
Disorders of the liver. Physical examination.
Diagnostic procedures.
Jaundice. Cirrhosis of the liver.
Acute and chronic hepatitis.
Disorders of the gall bladder and the biliary tract.
Disorders of the pancreas.

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester
Final examination

CONSERVATIVE DENTISTRY AND ENDODONTICS II.

Department of Conservative Dentistry

Head of Department: *Dr. Zsuzsanna Tóth D.M.D., Ph.D.*

First semester

Lectures (1 hour per week):

1. Preventive endodontics: significance of pulp protection
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 Endodontic Outcomes

8. Endodontic emergencies.
9. Endodontic management of traumatic dental injuries
10. Demonstration (Midterm)
11. Definitive restorations of root canal treated teeth, post and core build-up, single crowns
12. Surgical treatments related to Endodontics. Methods and indications.
13. Radiology in Conservative Dentistry
14. Planning of complex treatments

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

Lectures (1 hour per week):

1. Evidence based dentistry
2. Microscope in endodontic treatments
3. Special cavity preparations
4. Core build-up
5. Esthetic inlays
6. Dental CAD/CAM
7. Bleaching of teeth
8. Thesis defence
9. Esthetic veneers
10. Demonstration (midterm)
11. Surgical treatment of multiplex cervical lesions
12. Difficulties during root canal treatments and their solutions
13. Endodontic and Periodontal interrelationships
14. Surgical procedures in restorative dentistry

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 control 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 laboratorial 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
2. Classification of the partially edentulous dental arches
3. Tooth saddle determination
4. Treatment planning for the class 0. dental arch
5. Treatment planning for the class IA. and 1B. dental arches
6. Treatment planning for the class 2A. dental arches
7. Treatment planning for the class 2B. dental arches
8. Treatment planning for the class 2A/I. and 3. dental arches
9. Maxillo – facial prosthetics
10. Implants in prosthodontics
11. Parodontologic aspects of Prosthodontic Treatments
12. Construction of Complex Dentures
13. Consultation

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
 Oesophageal 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 operating theater

 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.

Tutor: **Dr. Attila Szûcs**

First Semester

Lectures (1 hour per week)

- Pyogenic dental inflammations I.
- (General aspects)
- Pyogenic dental inflammations II.
- (periodontitis, periostitis) Dental focus
- Pyogenic dental inflammations I. Cellulitis
- Osteomyelitis, specific inflammations of the maxillofacial region.
- Cystic lesions of the maxillofacial soft tissues.
- Dental and surgical aspects of the maxillary sinus
- Diseases of the salivatory glands.
- Odontogenic cysts I.
- Odontogenic cysts II.
- Odontogenic cysts III
- Surgical endodontics. I.
- Surgical endodontics. II.
- Dental implantology
- Preprothetic surgery
- Consultation

Note: The maximum number of absences in a semester 3.
More than 3 absences invalidate the semester.
During the semester three midterm examinations should be passed.
Practical course grade

Practices (3 hours per week)

[illegible]

ORAL AND MAXILLOFACIAL SURGERY III.

Second Semester

Lectures (1 hour per week)

- Developmental anomalies of the face Part I.
(Cleft lip and palate)
- Developmental anomalies of the face Part II.
(Craniofacial malformations, cleft face)
- Developmental anomalies of the face Part III.
(Dysgnathias)
- The diseases of the salivary glands Part. I.
(Pathology)
- Vascular anomalies in the head and neck region
(Diagnosis and management)
- The diseases of the salivary glands Part. II.
(Differential diagnosis and treatment)

Practices (3 hours per week)[illegible]

Maxillofacial traumatology Part I. (General rules, soft tissue injuries)	Practicing minor oral surgery
Maxillofacial traumatology Part II. (Polytraumatised patients)	Practicing minor oral surgery
Maxillofacial traumatology Part III. (Fractures of the mandible)	Practicing minor oral surgery
Maxillofacial traumatology Part I V. (Fractures of the midfacial bones)	Practicing minor oral surgery
Maxillofacial traumatology Part V. (Posttraumatic deformation and its correction)	Practicing minor oral surgery
Differential diagnosis and treatment of facial pain	Midterm Demonstration
Case Demonstration	Practicing minor oral surgery
Guest speaker	Practicing minor oral surgery
Consultation	Consultation
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 Semifinal examination	

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

email: noemirozsa65@gmail.com

Tutor: *Dr. László Miklós Kaán D.M.D., PhD.*

tel: (1)-4591500 / 59270

email: 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 autumn 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)	Practices (2 hours per week)
Radiation physics	Normal radiographic anatomy: Tooth anatomy (lecture)
Dental caries	Normal radiographic anatomy: Anatomic landmarks of the maxilla (lectures)
Pulp cavity	Normal radiographic anatomy: Anatomic landmarks of the mandible (lecture)
Extraction of the teeth	Development of the teeth, Deciduous teeth (lect.)
Root canal therapy	Recognition of the teeth, anatomic landmarks and caries
Periapical lesions	Development of the teeth, deciduous teeth, extraction of the teeth
Periodontal disease	Periapical lesions
Cysts of the jaws	1st midterm
Hypercementosis	Periodontal disease
Excessive bone formation	2nd midterm
Injuries to teeth	Cysts of the jaws
Osteomyelitis	3rd midterm
Tumors	Hypercementosis
Apicoectomy	Excessive bone formation
	Injuries to teeth
	Osteomyelitis
	Tumors, apicoectomy
Anomalies	Anomalies
Salivary gland diseases	
Resorption of the teeth	
Radiation biology	Review
Health physics	
Long-cone paralleling technique	
Traditional extraoral radiographic examinations	Review

Panoramic technique I.	Viewing of the examination radiographs I.
Panoramic technique II.	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

Beside 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

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

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

PUBLIC HEALTH

Tutor: **Dr. András Terebessy**

English Dental

Lectures (1,5 hours per week)	Practicals (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
Lectures (1,5 hours per week)	Practicals (2 hours per week)
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 prandomization.

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

Lecturer: **Dr. Árpád Joób-Fancsaly**

Course Syllabus:

History of oral implantology. Different types of implants. Indications, contraindications of implant rehabilitations. Preoperative diagnosis. Surgical placement of implants. The biology and morphology of osseointegration and mucosal seal. Implant biomechanics. Treatment plans, bone grafting methods. Parodontological and esthetic aspects of implant rehabilitation. Implant prosthodontics. Different dental implant systems. Case presentations, planning and completing implant treatments in different edentulous situations. Failures and complications.

Semi-final examination

COMMUNITY DENTISTRY

Department of Community Dentistry

Head of department and supervisor of the subject: **Dr. Péter Kivovics**

Tutor: **Dr. Orsolya Németh**

1st semester: only practice

2nd semester: lecture and practice

Time: 14 × 1,5 hours

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 Periododontics 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 of 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!

CLINICAL MODULE



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	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		

*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. Conservative Dentistry and Endodontics IV. Prosthodontics IV.
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
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		

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 Répásky,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.-Hidas Gy.-Tárján 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 Schillenburg 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)

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. 2nd Rev. 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.

CLINICAL DENTISTRY I.-II.

The aim of the practice is to teach the sequence of the dental treatment like operative dentistry and endodontics, prosthodontics in the same patient. To teach the theoretical background and practical knowledge of operative dentistry and endodontics, prosthodontics. To teach how to integrate these two disciplines in treating one patient.

No lectures

OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY

Lecturer: **Prof. Dr. László Tamás**

Tutor: **Dr. Beáta Bencsik**

First Semester

Lectures (1 hour per week)

The role of otorhinolaryngology in dentistry and medicine. Clinical anatomy of the ear. Diseases of the external ear.

Acute and chronic otitis media. Etiology, diagnosis, complications and therapy.

Types of hearing losses. Fundamental audiological diagnostic methods. Surgical management of hearing losses. Otosclerosis and cochlear implant.

Clinical anatomy and physiology of the nose and paranasal sinuses. Nasal obstruction. 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.

Clinical aspects of diseases of the mouth and pharynx. Diseases of the labial, oral and laryngeal mucosa.

Anatomy and physiology of the larynx. Disorders of the voice. Infections and tumors of the larynx and their management.

Diseases of the salivary glands. Emergency management of suffocation. Conicotomy and tracheotomy. Foreign bodies in the trachea and oesophagus

Practices (0,5 hour week)

Routine clinical examinations in practice.

Evaluation of different types of perforations of the tympanic membrane. Cadaveric practice. Paratonsillitis on moulage.

Routine audiology. Operating theater. Video demonstration.

Anterior and posterior rhinoscopy. X-ray photos of the paranasal sinuses. Clinical management of epistaxis.

Operating theatre. Luc. Caldwell operation. Functional endonasal surgery. Endoscopic examination of the paranasal sinuses.

Peritonsillar abscess. Indications and dangers of the tonsillectomy. Adenotomy. Basis of conservative of the mouth and pharynx treatment of disease.

Direct and indirect laryngoscopy. Videostroboscopy and fiberoscopy.

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

No lectures, Clinical practice (3 hours per week), **Clinical dentistry** (6 hours per week):

Practice of thorough patient examination, taking medical and dental history, stomatologic screening. Preparing a treatment plan for complete rehabilitation of the oral cavity. Rehabilitation of oral hygiene and scaling.

Restoring carious teeth with fillings and if needed root canal treatment. Simple and complex cavity preparation for fillings and inlays/onlays. Using different isolation techniques.

Root canal treatment of single or multi rooted teeth, their definitive restoration with onlay or solo crown. Revision of root canal fillings.

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

No lectures, Clinical practice (3 hours per week), **Clinical dentistry** (6 hours per week):

Practice of thorough patient examination, taking medical and dental history, stomatologic screening. Preparing a treatment plan for complete rehabilitation of the oral cavity. Rehabilitation of oral hygiene and scaling.

Restoring carious teeth with fillings and if needed root canal treatment. Simple and complex cavity preparation for fillings and inlays/onlays. Using different isolation techniques.

Root canal treatment of single or multi rooted teeth, their definitive restoration with onlay or solo crown. Revision of root canal fillings.

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 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 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.

tel: (1)-4591500 / 59268

email: noemirozsa65@gmail.com

Tutor: Dr. László Miklós Kaán D.M.D., PhD.

tel: (1)-4591500 / 59270

email: kaanm@dent.semmelweis-univ.hu

First Semester

Lectures (1 hour/week)

- 1 The subject, the connection and significance of pedodontics.
- 2 Induction of caries, caries theories, and indices.
- 3 General aspects of caries prevention.
- 4 Possibilities of caries prevention and fluorideprophylaxe.
- 5 Development of the teeth, anatomy and dentition of primary teeth.
- 6 Structure and physiology of the hard dental tissues, and its practical significance.

- 7 Disturbances of development of the permanent and primary teeth.
- 8 Caries of primary teeth. Treatment of caries of primary teeth.
- 9 Consecutive illnesses of caries of primary teeth.
- 10 Mechanism of second dentition.
- 11 Physiological and pathological phenomena in second dentition.
- 12 Caries and treatment of permanent teeth.
- 13 Secondary disease of caries of permanent teeth, endodontic treatment.
- 14 Endodontic treatment of immature teeth.
- 15 Consultation.

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 Radiology in pedodontics.
- 2 Minor oral surgery in pedodontics, local anaesthesia.
- 3 General anesthesia.
- 4 Prothesis in pedodontics.
- 5 Traumatic injuries of primary and permanent teeth.
- 6 Complex therapy of traumatic injuries of permanent teeth.
- 7 Parodontology and oral diseases in childhood.
- 9 Administration of medicine in pedodontics.
- 10 Diagnostic competition.
- 11 Organizing of pedodontic treatment and nursing.
- 12 Administration and documentation.
- 12 Significance of agegroup in pedodontics.
- 13 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).

ORTHODONTICS I.

Department of Orthodontics and Pediatric Dentistry

Head of Department: *Dr. Noémi Katinka Rózsa* D.M.D., Ph.D.

tel: (1)-4591500/ 59268

email: noemirozsa65@gmail.com

Tutor: *Dr. László Miklós Kaán* D.M.D., PhD.

tel: (1)-4591500 / 59270

email: kaanm@dent.semmelweis-univ.hu

First Semester

Lectures (1 hour/week)

The subject, the significance of orthodontics, and its relation to caries and parodontology.

Etiology, acquired and hereditary anomalies.

Orthodontic elements, terminology.

Relationship between function and anomalies. Angle diagnostic system.

X-ray diagnosis, evaluation of telerradiogram.

The date of the beginning of treatment and the length of treatment time.

Basic principle of orthodontic treatment. Biological and mechanical fundamentals.

Classification of orthodontic appliances. The appliances' historical survey.

Removable appliances. Active and passive plates.

Removable appliances. Functional jaw orthopedic appliances.

Elements of fixed appliances.

Types and characters of orthodontic arches.

Multiband systems I. (edgewise, light-wire, twin-wire)

Multiband systems II. (bioprogressive, straightwire)

Appliances used rarely in Hungary (head-gear, face-bow, quad helix, hyrax)

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	Direct bonding.
2	Treatment of Angle class I. anomalies. Local anomalies.
3	Treatment of Angle class I. general anomalies.
4	Treatment of Angle class II. anomalies.
5	Treatment of Angle class III. anomalies.
6	Orthodontic treatment by missing teeth.
7	Complex therapy of cleft lip and palate.
8	Extraction in orthodontics.
9	Ambulant surgical interventions in orthodontics.
10	Surgical and orthodontic treatment of mandibular and maxillar prognathism.
11	Adult treatment in orthodontics.
12	Early treatment in orthodontics.

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)	Practices (2 hours/week)
Introduction: What is the clinical periodontology is?	Clinical practice
The rational of periodontal cause related therapy	Clinical practice
Clinical and radiological periodontal diagnostics	Clinical practice
Oral hygienic, Gingival and Periodontal indices	Clinical practice
The treatment of periodontal emergency cases	Clinical practice
The stages of the comprehensive periodontal treatment I.	Midterm Demonstration
The stages of the comprehensive periodontal treatment II.	Clinical practice
Professional oral hygiene I. Supragingival scaling	Clinical practice
Professional oral hygiene II. Supragingival scaling	Clinical practice
Professional oral hygiene III. Correcting plaque retention factors	Clinical practice
Oral hygienic education, tooth brushing	Clinical practice
The instruments of the individual oral hygiene	Clinical practice
Reevaluation of the patients. Antibiotics.	Midterm Demonstration
Rational of periodontal surgery	
Cause related periodontal surgery I. Gingivectomy	Clinical practice
Cause related periodontal surgery II. Modified Widman	Clinical practice
532 Flap operations	

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)	Seminar (2 hours/week)
1	Reevaluation II. Correcting phase in periodontal surgery	Literature review
2	Correcting periodontal Surgery -Mucogingival surgery I.	Clinical case conference
3	Mucogingival Surgery Gingival esthetics II.	Literature review
4	Periodontal regeneration	Clinical case conference
5	Periodontal regenerative processes – biological barrier membranes	Literature review
6	Periodontal regenerative processes – growths factors and other biochemical means	Midterm Demonstration
7	Prosthodontic rehabilitation I.	Clinical case conference
8	Prosthodontic rehabilitation II. The white esthetics	Clinical case conference
9	Periodontal follow-up – periodontal maintenance	Literature review
10	Perio – endodontic relationship	Literature review
11	The evaluation of the success of the comprehensive periodontal treatment	Differential diagnosis
12	The occlusion and the periodontium	Consultation
13	Consultation	
14	Written final exam – periodontal diagnostics	

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

Tel.: 459-1500/59161, 317-1044

Tutor: *Prof. Dr. Csaba Dobó Nagy*

email: 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) **Practices** (1 hour/week)

Course Syllabus:

History of oral implantology. Different types of implants. Indications, contraindications of implant rehabilitations. Preoperative diagnosis. Surgical placement of implants. The biology and morphology of osseointegration and mucosal seal. Implant biomechanics. Treatment plans, bone grafting methods. Parodontological and esthetic aspects of implant rehabilitation. Implant prosthodontics. Different dental implant systems. Case presentations, planning and completing implant treatments in different edentulous situations. Failures and complications.

ORAL DIAGNOSTICS II.

Department of Oral Diagnostics

Address: Bp. VIII., Szentkirályi u. 47. 1088

Tel.: 459-1500/59161, 317-1044

Tutor: **Prof. Dr. Csaba Dobó Nagy**

email: 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 Quintessence-Publishing 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: **Prof. Dr. Márta Marschalkó**

Tutor: **Dr. Bernadett Hidvégi**

Department of Dermatology, Venerology and Dermatooncology

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

2nd 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.

FORENSIC DENTISTRY

Department of Forensic Medicine

Tutor: **Dr. Zoltán Szölősi**

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

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

Tel.: 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 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. Velscope)

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, morbidity and mortality data
2. Etiological factor and pathomechanism 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. light devices)
11. Contemporary diagnostic possibilities and a multidisciplinary cooperation
12. Social and dental rehabilitation after the treatment of oral cancer
13. Consultation / Examination

PEDODONTIC AND ORTHODONTIC 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**

E-mail: gerle@fok.usn.hu

Phone: 459-1500/ ext 59391; 59392

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, **email:** 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, **email:** 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. Conservative and Proshetic Dentistry.

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 PHARMACY



Faculty of Pharmacy
1st year

STUDY PROGRAMME

First Year

1 st semester						
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination	
General and Inorganic Chemistry I. Practice GYASKASKG1A	–	5	5	–	practical course grade	
General and Inorganic Chemistry I. GYASKASKE1A	4+1	–	5	–	semi-final	
Introduction to Health Informatics I. Practice GYINFBEIG1A	–	1	–	–	signature	
Introduction to Health Informatics I. GYINFBEIE1A	1	–	2	–	semi-final	
Biophysics I. Practice GYFZBIFG1A	–	3	2	–	practical course grade	
Biophysics I. GYFZBIFE1A	2	–	3	–	semi-final	
Biology I. Practice GYGENBILG1A	–	2	2	–	practical course grade	
Biology I. GYGENBILE1A	2	–	2	–	semi-final	
Medical Terminology** GYLEKOTRG1A	–	2	2	–	practical course grade	
Mathematics I. Practice GYEGYMATG1A	–	2	2	–	practical course grade	
Mathematics I. GYEGYMATTE1A	2	–	2	–	semi-final	
Physical Education I. GYTSTSITNSG1A	–	1	0	–	signature	
History of Sciences, Propedeutics GYEGYTTPE1A	2	–	2	–	semi-final	
Hungarian Medical Terminology I. * GYLEKMSZG1A	–	4	4	–	practical course grade	
Total Credit			33			

2nd semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
General and Inorganic Chemistry II. GYASKASKE2A	3	–	3	GYASKASKE1A General and Inorganic Chemistry I.	final #
Analytical Chemistry I. (qualitative) GYASKANKG1A	2	5	5	GYASKASKE1A General and Inorganic Chemistry I.	practical course grade
Anatomy GYANTANAE1A	2	–	4	GYGENBILE1A Biology I.	semi-final
Anatomy Practice GYANTANAG1A	–	2	–	GYGENBILE1A Biology I.	signature
Introduction to Health Informatics II. Practice GYINFBEIG2A	–	1	–	GYINFBEIE1A Introduction to Health Informatics I.	signature
Introduction to Health Informatics II. GYINFBEIE2A	1	–	2	GYINFBEIE1A Introduction to Health Informatics I.	semi-final
Biophysics II. Practice GYFIZBIFG2A	–	3	2	GYFIZBIFE1A Biophysics I.	practical course grade
Biophysics II. GYFIZBIFE2A	2	–	3	GYFIZBIFE1A Biophysics I.	final #
Biology II. Practice GYGENBILG2A	–	2	1	GYGENBILE1A Biology I.	practical course grade
Biology II. GYGENBILE2A	2	–	2	GYGENBILE1A Biology I.	final #
Pharmaceutical Botany I. GYNOVGYNG1A	1	2	3	GYGENBILE1A Biology I.	practical course grade
Mathematics II. Practice GYEGYMATG2A	–	1	1	GYEGYMATIE1A GYINFBEIE1A Mathematics I. Introduction to Health Informatics I.	practical course grade
Mathematics II. GYEGYMATE2A	2	–	2	GYEGYMATIE1A GYINFBEIE1A Mathematics I. Introduction to Health Informatics I.	semi-final
Physical Education II. GYTSITSNAG2A	–	1	0		signature
First Aid GYTRAELE1A	1	--	0		signature
Hungarian Medical Terminology II. * GYLEKMSZG2A	–	4	2	GYLEKMSZG1A Hungarian Language I.	practical course grade
Total Credit			30		

The grade influences the qualification of the diploma

* Obligatory courses

** Obligatory elective courses: (2 credit points).

LIST OF TEXTBOOKS (The list may change!)

- 1 Alberts Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546
- 2 Genetics and Genomics (e-book)
- 3 Faller, Schuenke: The Human Body: An Introduction to Structure and Function (Flexibook) Paperback – 2004. Thieme
- 4 Damjanovich – Fidy – Szöllösi (eds) Medical Biophysics, Medicine, Budapest, 2009. ISBN 978 963 226 127 0
- 5 Miklós Kellermayer: Medical Biophysics Practices (Semmelweis Publishers, Budapest, 2015) ISBN 978-963-331-349-7
- 6 Rost et al.: Botany, a brief introduction to plant biology. Wiley.
- 7 Mihalik: Botany for Students of Pharmacy. (Szeged)
- 8 Lásztity-Noszál: Practical Inorganic and General Chemistry. Bp. (SOTE)
- 9 Lásztity-Gyimesi: Qualitative Inorganic Analysis. Bp. (SOTE)
- 10 Körös: General Chemistry. Bp. (SOTE)
- 11 Körös: Inorganic Chemistry. (Szeged)
- 12 Masterton-Hurley: Chemistry. Principles and Reactions. Saunders College Publishing, 1998.
- 13 1st semester: Gyöngyösi L. & Hetesy B., 2012. Jó reggelt! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 14 2nd-3rd semesters: Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)

Recommended textbooks:

- 1 Bland M.: An Introduction to Medical Statistics. (Oxford medical publication)
- 2 Batschelet, E.: Introduction to Mathematics for Life Scientists
- 3 Maróti-Berkes-Tölgyesi: Biophysics Problems. A Textbook with Answers. Bp. Akadémiai K. 1998. ISBN 963 05 7526 4
- 4 Alberts et al.: Molecular Biology of the Cell. Garland Science/Taylor & Francis Group Publ. (4th or 5th edition)
- 5 Belák E. Medical Terminology for Beginners (earlier title: Medical Latin), Bp. Semmelweis Kiadó
- 6 Berg-Tymoczko-Stryer: Biochemistry 7th edition

MATHEMATICS

University Pharmacy, Department of Pharmacy Administration

Tutor: **Dr. Andrea Meskó**

In the first year of the curriculum two hours of lectures are given to pharmacist students under the title above. The lectures are accompanied by practicals to help a better understanding and to get experienced in solving problems and exercises.

The title covers two, more or less independent, subjects. The majority of the lectures (over 60 per cent) is devoted to (classical) mathematics, the smaller part, however, in which biostatistics are given, is not of less importance.

The aim of learning classical mathematics is to understand biological, chemical, and physical processes dealt with in the subjects mentioned. The most appropriate mathematical model for the processes in nature are functions of one or more variables. To obtain the proper function for a particular process a differential equation is to be solved. The notion and the way of solution of differential equations is the central point of the course. The others namely limits, differential and integral calculus, discussion of functions, series etc. are, however, necessary preparatory steps for getting acquainted with differential equations.

Biostatistics, the other subject under this title, is a more recent branch of sciences. Its importance is permanently increasing in each field where data are present, i.e. quite everywhere in scientific work. Pharmacological investigations, clinical trials, epidemiological studies (etc, etc.) cannot be carried on without the statistical analysis of the data obtained. The results of the above mentioned studies are always derived by statistical inference. Statistics is an indispensable part of any research from planning the experiment to interpretation of the results. Statistical methods are essential even for students in their laboratory work.

MATHEMATICS I.

University Pharmacy, Department of Pharmacy Administration

Tutor: **Dr. Andrea Meskó**

First Semester

Lectures: 2 hours per week

Practicals: 2 hours per week

Differential and differential coefficient. Rules for derivations of functions.

The derivative of the power function.

Derivation of composite and inverse functions. Differentiability of the elementary functions. Higher order derivatives.

Application of differentiation for calculation of limits of fractions.

An iterative method to solve equations (Newton-method).

Expansion of differentiable functions to power series. The Taylor series of $\exp x$, $\sin x$, $\cos x$, $\ln x$ and other functions.

Qualitative examination of functions. Roots, extremes and inflexion points.

The multiplicity of a root.

The complete discussion of elementary functions.

Integration as the inverse operation of derivation. The indefinite integral.

Integration of power functions. Integration of simple elementary functions.

Integration of products (the rule of "partial integration"). Integration of composite functions. Integration of rational fractions.

Area under a curve: the definite integral. Improper integrals.

The concept of a differential equation. Differential equations arising in physics, chemistry, biology, botanics and other fields. The homogeneous linear differential equation with constant coefficients: solution and proof of unicity.

Separation of variables as the method of solution. General and particular solutions. Introduction of new variables.

Nonlinear differential equations of the first order.

Differential equations of the chemical reactions of 0th, 1st and 2nd order.

Functions of several variables. Partial derivatives of first and second order.

Differentiability and exact differential. Application of exact differential in error calculations. Maxima and minima of two-variable functions.

Different kinds of integration of functions of several variables. Integration along a line. Point functions and independence of the integral of the path.

Calculation of the integral along different curves.

MATHEMATICS II.

University Pharmacy, Department of Pharmacy Administration

Tutor: **Dr. Andrea Meskó**

Second Semester

Lectures: 2 hours per week

Practicals: 1 hour per week

Introduction and information. The most common calculations in laboratory. Some hints for numerical calculations.

Biometrics and/or biostatistics. Statistical inference. Frequency distributions. Theoretical distribution and probability. The normal distribution.

Measures of central tendency (mode, median, mean etc.) Applications of the weighted mean. Measures of dispersion.

Standard deviation and variance. The coefficient of variation. Error bounds. The standard error of the mean.

The concept of "regression line". The linear regression: coefficients, interpretation, application.

The correlation coefficient: formula and interpretation. Uses and misuses of correlation coefficient.

Lack of correlation vs. independence. Spurious correlations. Coefficient of determination.

Sampling distributions. Important distributions derived from the normal one: t F, and chis-quared distributions. The use of statistical tables.

Theoretical background of statistical inference. Qualitative and quantitative conclusions. Estimation; confidence interval for the expected value.

Testing hypotheses. The concept of "significance". Errors of the first and of the second kind. The t-tests.

Analysis of variance. The Ftest. Discrete and dichotomous distributions; variables on a nominal scale.

The Poisson distribution.

Analysis of qualitative data. Counting tables. Measures of association and statistical tests in fourfold tables.

Sets (finite and infinite). Natural, integral, rational, real and complex numbers.

Definition of a function.

General attributes of the functions. Classification of elementary functions.

Rational and irrational functions.

Transcendent functions: exponential, logarithmic, trigonometric and cyclometric functions.

Limits of functions. Continuous functions.

Sequences and series. Series of functions. Power series.

Radius of convergency.

BIOLOGY I.

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. Orsolya Láng**

Subject code: GYGENBILG 1A (practice)

GYGENBILE1A (lecture)

Credit:4

1st Semester

Lectures: 2 hours per week

Practice: 2 hours per week

Week	Lecture	Practice
1.	The cell membrane: structure and function	The light microscope in use
2.	Structure and function of the nucleus I	General view of the cell. Light and electron microscopic microtechnique.
3.	Structure and function of the nucleus II	Cell nucleus. Cyto(histo)chemistry
4.	Endoplasmic reticulum and the ribosomes	Endoplasmic reticulum
5.	Golgi complex, secretion and protein transport	Golgi complex
6.	Lysosomes, endocytosis, vesicular transport	Midterm (written)
7.	Structure and function of mitochondria and peroxisomes	Secretion. Immunohistochemistry
8.	The cytoskeleton,	Endocytosis. Cellular digestion. Enzyme-histochemistry
9.	Cellular movement	Cell and tissue culture
10.	Cell adhesion, cell junctions	Store and supply of energy. Mitochondria. Peroxisome.
11.	Extracellular regulation of cells, signal transduction I	Cytoskeleton and cellular movement
12.	The cell cycle and its regulation I	Cell surface differentiation, ultrastructure of cellular junctions
13.	The cell cycle and its regulation II	Midterm (written)
14.	Cellular aging and programmed cell death (apoptosis)	Cell death (necrosis and apoptosis)

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 are two midterms during the semester. To get practice grade and signature the average of the midterms have to be 2.0. Missed or failed midterms might be repeated two times. No improvement of midterm grade.

Requirement of lecture signature is: practice grade and not more than three absences from the lectures.

Students having lecture and practice signature may give the exam. Exam is a written test (multiple choice, essay, drawing etc. similar to midterms) covering practice and lecture parts.

BIOLOGY II.

Department of Genetics, Cell- and Immunobiology

Course director: **Prof. Dr. Edit Buzás**

Course coordinator: **Dr. Orsolya Láng**

Subject code: GYGENBILG_2A (practice)

GYGENBILE_2A (lecture)

Prerequisite: Biology I.

Credit: 3

Lectures: 2 hours per week

Practices: 2 hours per week

Second Semester

Week	Lectures	Practices
1.	Meiosis	Typical and atypical mitosis
2.	Introduction to human genetics; human genom	Meiosis and gametogenesis
3.	Mutations and polymorphisms I.	Cytogenetics I.
4.	Mutations and polymorphisms II.	Cytogenetics II.
5.	Epigenetics	Introduction to humangenetics; special methods of human-genetics
6.	Cytogenetics I.	Molecular genetics I.
7.	Cytogenetics II.	Midterm I (written)
8.	Autosomal inheritance I.	Molecular genetics II.
9.	Autosomal inheritance II.	Molecular genetics III.
10.	Role of sex in inheritance	Application of genetic methods in the study monogenic inheritance I.
11.	Genetics of sex	Application of genetic methods in the study monogenic inheritance II.
12.	Relationship of genom and environment. Complex inheritance	Complex inheritance
13.	Pharmacogenetics, -genomics	Midterm II.
14.	Gene and genom manipulation	Consultation

Important notes: see at Biology I.

Students having lecture and practice signature may give the final exam. Final exam is a written test (multiple choice, essay, drawing etc. similar to midterms) covering practice and lecture parts of Biology I and II.

BIOPHYSICS I.

Tutor: **Dr. Károly Módos**

First Semester

Lectures (2 hours per week)

Introduction; structure of matter; interactions
Gases, crystals, liquids, Boltzmann distribution
Properties of condensed matter
Liquid crystals, membranes
Structural organization of macromolecular systems
Radiations, light, optics
Wave and corpuscular nature of light
Light absorption and emission, light scattering, vision
Electromagnetic radiations, thermal radiation
Luminescence
Lasers

X-radiation

Ionizing radiations, radioactive decay

Dosimetry

Sound, ultrasound, hearing

Laboratory (3 hours per week)

Laboratory safety rules
Data processing
Emission spectroscopy. Light sources
Spectrophotometry
Optical lenses; light microscope

Detection of nuclear radiations
Oscilloscope
Radioactive power of an X-ray tube

Special light microscopes
Gamma energy determination
Electronic blood particle counting
Picoscale
Determination of skin-impedance
Concentration determination with refractometer
Isotope diagnostics
Repetition, consultation

BIOPHYSICS II.

Second Semester

Lecture (2 hours per week)

Transport phenomena, flow of fluids and gases
Diffusion, osmosis
Thermodynamic aspects of transport processes
Laws of thermodynamics
Membrane potential
Signals as information carriers, signal processing
Detectors, transducers, displays
Basic electronic units and circuits
Physical methods for structural analysis I
Physical methods for structural analysis II
Regulatory system in technics and b
Some diagnostic methods, endoscopy, thermography, ultrasound echo, Doppler, X-ray
Isotope diagnostics
Magnetic resonance imaging
Some therapeutic methods, laser surgery, radiation therapy
Research fields in the Department of Biophysics and Radiation Biology

Laboratory (3 hours per week)

U V-dosimetry
Dosimetry
Amplifier
The attenuation of gamma-radiation
Pulse generators
Sine wave oscillators
Audiometry
Densitography (CT)
Calculations
Flow of fluids. Electric model of vascular system
Electrocardiography

Diffusion
Sensory function
Repetition

Repetition

GENERAL AND INORGANIC CHEMISTRY I.

Lecturers: **Dr. Béla Noszál, Dr. István Szalai**

Tutor: **Dr. Krisztina Kurin-Csörgei**

First Semester

Elementary particles: quarks, leptons, gauge 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 moleculepolarity. 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.

Multicentered 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, pseudofirst order and zero order reactions. Reaction mechanisms.

The temperature dependence of the reaction rate, collision theory.

Catalysis. catalysts. Autocatalytic reactions. Enzyme catalysed, 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.

PRACTICAL GENERAL AND INORGANIC CHEMISTRY

First Semester

Lectures (4+1 hours per week)

Methods of purification of chemical substances. Recrystallization.
 Sublimation.
 Ion exchange. Distillation.
 Chemical purification.
 Preparation of inorganic compounds.
 Stoichiometry of chemical reactions.
 Theoretical yield, actual yield and percent yield. Types of chemical reactions.
 Acid-base reactions. Preparation of inorganic compounds by acid-base reactions.
 Acid-base properties of salt solutions, hydrolysis.
 Thermal decomposition of inorganic compounds (acids, bases, salts).
 magnesium metal sample.
 Oxidation-reduction reactions. Balancing redox equations.
 Preparation of inorganic compounds by oxidation-reduction reactions.

Complex formation reactions. Naming of complex ions and coordination compounds.
 Methods of preparation of double salts and coordination compounds.

Calculation of pH in solutions of acids and bases.
 Buffer solutions and their functions, calculation of pH of buffer solutions.

Precipitation reactions. Equilibria in precipitation reaction.

Problem-solving in general chemistry. (Calculation of molar masses of nonelectrolytes from colligative properties).

Problem solving in general chemistry (Electrochemistry)

Practicals (5 hours per week)

Safety instructions. General instructions on the requirements. Recrystallization of $\text{KAl}(\text{SO}_4)_2 \cdot 12 \text{H}_2\text{O}$. Sublimation of iodine.
 Chemical purification of sodium chloride.
 Water purification using ion exchange resins.
 Distillation of hydrochloric acid.
 Preparation of $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$

Preparation of $(\text{NH}_4)_2\text{SO}_4$, H_3BO_3 from borax ($\text{Na}_2\text{B}_4\text{O}_7$)
 Preparation of CaHPO_4 . Observation of hydrolysis of some salts.
 Observation of thermal decompositions.
 Determination of the mass of a

Observation of some oxidation-reduction Reactions.
 Preparation of metallic copper and metallic manganese.
 Reactions of metals.
 Preparation of Cu_2O and FeSO_4

Preparation of precipitated sulfur.
 Experimental observation of direction of redox reactions (standard potentials).
 Preparation of a double salt (Mohr salt, $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6 \text{H}_2\text{O}$)
 Preparation of a buffer solutions.
 Preparation of $\text{Cu}(\text{NH}_3)_4\text{SO}_4$ and $\text{Co}(\text{NH}_3)_4\text{SCN}$ coordination compounds.
 Qualitative comparison of solubility products.
 Observation of osmosis.
 Dependence of the reaction rate on concentration and temperature.
 Observation of catalysis.
 Decomposition of hydrogen peroxide.
 Closing inventory. Problem-solving.

GENERAL AND INORGANIC CHEMISTRY II.

Lecturer: *Dr. Zsuzsanna Nagy-Ungvárai*

Second Semester

3 hours per week (lecture)

Weeks Introduction

- 1 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.
- 2 **Chemistry of hydrogen, oxygen, nitrogen and carbon.**
Hydrogen: occurrence, preparation, chemical properties, uses. Binary hydrogen compounds (hydrides). Oxygen: occurrence, preparation, chemical properties, uses. Ozone. Peroxides, superoxides.
- 3 Nitrogen: occurrence, chemical properties. Hydrogen compounds of nitrogen. Oxides and oxyacids of nitrogen. The nitrogen cycle in nature. 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. (Hostguest 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.

ANALYTICAL CHEMISTRY I.

Qualitative Chemical Analysis

Lecturer: **Dr. István Szalai, Dr. Norbert Szoboszlai**

Practical: **Dr. István Szalai, Dr. Norbert Szoboszlai**

Tutor: **Dr. Krisztina Kurin-Csörgei**

Second Semester

Lectures (2 hours per week)

Subject and aims of analytical chemistry.
Analytical chemistry and other sciences.
Qualitative and quantitative chemical analysis.
Chemical and physical methods of analysis.
The characterization of analytical reactions.
Specificity, selectivity and sensitivity of analytical reactions. Requirements for qualitative chemical reactions. Separation and identification of ions.
Analytical classification of cations. Group reactions of cations. Analytical groups and periodic table of the element. Summary of properties of elements and reactions of Group I cations.

Ion reactions in aqueous solution. Acidbase reactions. Thioamphoterism. Summary of properties of elements and reactions of Group II cations.

Complex formation reactions. Complex equilibria. Pearson classification of acids and bases.

Precipitation reactions. Equilibria in cations. precipitation reactions. Solubility and pH. Precipitation and solubilities of metalsulfides. group of cations.

Summary of properties of elements and reactions of Group III cations.

Solubility and complex ion equilibria and application in qualitative analysis of ions.

Summary of properties of elements and reactions of Groups IV–V cations. Flame tests. Atomic spectroscopic methods of qualitative analysis.

Classification of anions into analytical groups. Group reagents for qualitative analysis of anions.

Oxidation-reduction.

Oxidation-reduction reactions in qualitative chemical analysis.

Summary of reactions of common anions.

Practicals (5 hours per week)

General rules of work in the laboratory of analytical chemistry. Study of reactions of Group I cations.

Part I: Bi^{3+} , Pb^{2+} , Cd^{2+} .

Study of reactions of Group I cations.

Part II: Hg_2^{2+} , Hg^{2+} , Ag^+ , Cu^{2+} .

Identification of cations in mixture of Group I cations.

Study of ion reactions of Group II cations:

As/III/ , /V/ , Sb/III/ , /V/ , Sn/II/ , /V/ .

Analysis of Group I cation in unknown samples. Identification of the second group of cations in mixtures.

Study of ion reactions of Group III cations.

Part I: Co^{2+} , Ni^{2+} , Fe^{2+} , Fe^{3+} , Cr^{3+} .

Study of ion reactions of Group III

Part II: Al^{3+} , Mn^{2+} , Zn^{2+} . Analysis of unknown mixture of the third analytical

Study of ion reactions of Groups IV–V cations.

Analysis of Group III cations in unknown samples. Detection of cations in the mixture of the fourth and fifth analytical groups of cations.

Analysis of unknown samples containing cations of the Groups I–V.

Study of reactions of the first analytical group anions.

Study of reactions of the second and third analytical groups of anions.

Study of reactions of the fourth group of anions.

Identification of anions in the mixture of Groups I–IV anions.

Special tests for mixture of anions.

Lectures (2 hours per week)

Analysis of cation-anion solution sample. Preliminary and specific tests.
Analysis of cation-anion unknown solid sample. General procedure for chemical analysis.
Physical methods of qualitative analysis.

Practicals (5 hours per week)

Analysis of cation anion unknown solution sample (3–5 ions).
Analysis of cation anion unknown solid samples (3–5 ions).
Analysis of unknown simple substances.

PHARMACEUTICAL BOTANY I.

Department of Plant Anatomy

Tutor: **Dr. Gábor Kovács**

Second Semester

Week Lectures

- 1 Introduction. The Plant Kingdom. The botanical sciences. Pharmaceutical Botany, the program of the lectures.
- 2 Compartmentalization and metabolic pathways in plant cells.
- 3 Chloroplast and photosynthesis. Starch formation and degradation.
- 4 Synthesis of cell wall polysaccharides. Cell wall formation and architecture. Plasmodesmata. Mucilage synthesis and the dynamics of hydrophilic secretion.
- 5 Mitochondrion and respiration.
- 6 Lipid metabolism. Fatty acid polymers: cutin, suberin. Wax. Terpenoids. The lipophilic secretion.
- 7 Amino acid and protein metabolism. The N cycle. Protein bodies, protein mobilization. Protein secretion.
- 8 Formation of alkaloids and phenolics. Lignification. Vacuole, cell sap, osmoregulation, crystal formation, autophagy, autolysis.
- 9 Nucleic acid metabolism. The nucleus. Plant specificities of mitosis and meiosis.
- 10 Organizational types of plants. The cormophyte plant body. Tissues, tissue system. Meristems.
- 11 Dermal tissue system.
- 12 Conductive tissue system.
- 13 Ground tissue system.
- 14 Secretory structures.

Practicals

Fundamentals in Botany. The use of the light microscope. Knowledge of the medicinal plants
Plant cells (plasmolysis, cycloses).

Plastids, reserve polysaccharides, protein bodies.
Cell wall, structural polysaccharides and other wall substances.

Vacuole, crystals, lipid bodies.
1st Test Work. Stem morphology (buds).
Monocots: analysis of a living plant.

Analysis of dicots representing ancestral type (Ranunculaceae).

Simple tissues, meristems.

Dermal tissue system, trichomes.

2nd Test Examination
Analysis of living plants (Rosaceae, Apocynaceae), medicinal plants.
Conductive tissue system.
Ground tissue system.
Analysis of living plants (Papaveraceae, Primulaceae).
3 Test Work
Knowledge of the medicinal plants.
Pteridophyta.

A visit to Research Institute for Medicinal Plant (Budakalász) by coach, to study the chemotaxonomic plant collection. Field practice in the mountains near to Budapest to study the springtime blossoming medicinal plants.

ANATOMY

Tutor: *Dr. Ágnes Csáki*

Second Semester

The aim of the subject is to introduce to the fundamentals of the structure of the human body and by this teach the essential terms used in the communication between pharmacists and physicians. The topic anatomy also serves as a preliminary study for later clinical subjects and deals with the basic methods of morphological research. The programme refers to anatomical books and periodicals helping the pharmacists to complete their knowledge in necessary.

Lecture Practice

1	Introduction, general Embryology	Microscopy: stratified epithelium,
2	Basic tissue	connective tissue, cartilage, bone
3	Bone, joint and muscle types	Macroscopy: bones and joints of the
4	Ossification, development of the vertebral column	shoulder girdle and upper limb
5	Heart and its development	Microscopy: artery and vein, blood,
6	Blood vessels	lymph node spleen, palatine, tonsil
7	Blood, development of the blood cells	Macroscopy: bones and joints of the
8	Lymphatic organs	pelvis girdle and lower limb
9	Respiratory system	Microscopy: lung, submandibular gland,
10	Development of lung and intestines	liver, pancreas
11	Intestinal tract.	Macroscopy: vertebral column and skull
12	Digestive glands	
13	Kidney	Microscopy: stomach ileum, kidney,
14	Ureter, urinary bladder, urethra	ureter
15	Inner and outer genitals	Macroscopy: muscles, vessels and
16	Development of the urogenital organs	nerves of the upper limb.
17	Endocrine gland	Microscopy: ovary, uterus, placenta,
18	Development of the nervous system	testis, penis
19	Spinal cord.	Macroscopy: muscles, vessels and
20	Oblongate medulla, pons, mesecephalon	nerves of the lower limb.
21	Diencephalon, neurosecretion	Microscopy: hypophysis, thyroid, adrenal
22	Cerebral cortex	gland, cerebellum, spinal cord.
23	Cerebellum, extrapyramidal system	Macroscopy: intestinal complex
24	Olfactory and limbic systems	
25	Eye, optic tracts and centers	Microscopy: eye, organ of Corti
26	Auditory and static system	
27	Gustatory buds, skin and accessory organs	Macroscopy: brain and spinal cord.
28	Development of the sensory organs	
29–30	Repetition, complementary day for holidays	

HISTORY OF SCIENCES, PROPEDEUTICS

University Pharmacy, Department of Pharmacy Administration

Lecturer: **Prof. Dr. Ágnes Kéry**

Tutor: **Dr. Anna Sólyomváry**

First Semester

Week Lectures (2 hours per week)

- 1 The place and importance of the subject in the curriculum.
Profession's history as bridge, methods, main fields.
Symbols of medicine and pharmacy.
- 2 Knowledge of medicine and pharmacy in Babylonia-Assyria.
Knowledge of medicine and pharmacy in Egypt.
- 3 Knowledge of medicine and pharmacy in Greece. Hippocratic medical writing.
Knowledge of medicine and pharmacy in Rome. Galen.
- 4 The Arabs and the European Middle Ages. Transit ways of knowledge.
Monastic medicine and pharmacy. The School of Salerno.
Universities emerge, the birth of European professional pharmacy.
- 5 The idea of renaissance. Paracelsus and chemical drugs.
Homeopathy as an example of medical sectarianism.
- 6 Development of pharmacy in Italy and France.
Development of pharmacy in Germany and Britain.
- 7 Development of Pharmacy in Hungary.
- 8 Pharmaceutical education in Europe. Development of education.
- 9 Definition of drugs. Aspects of classification.
Classification of drugs according to their origin and on the basis of strength.
- 10 Classification of drugs by their pharmaceutical action, use and by the place of application.
Drug and doses. Specially named doses.
- 11 Drug utilization. How could be influenced the increased drug consumption?
Drug abuse. Prevention of drug abuse.
Narcotic controls.
- 12 International professional trends. F.I.P., I.P.S.F.. Unification of drug standards.
Pharmaceutical literature: treatises, pharmacopeias, formularies, journals, periodicals.
- 13 Ordering of drug preparation. Pharmacy, galenic laboratories, pharmaceutical factories.
- 14 Pharmacists, connections with physicians, etc.
Health for all – all for health.

FIRST AID

Department of Traumatology

Head of Department: **Prof. Dr. László Hangody**

Tutor: **Dr. Tamás Gál**

Type of subject: Mandatory

Second Semester

Purpose of subject:

First aid is the provision of initial care for an illness or injury. It is usually performed by a lay person, until definitive medical treatment can be accessed. 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.

The duty of care is the legal duty owed by one person to another to act in a certain way. As a first aider, you have a duty of care towards your casualties to exercise reasonable care and skill in providing first aid treatment. The duty arises because you have knowledge and skills relevant to a medical emergency situation.

The goal of first aid is to preserve life, prevent further harm, and to promote recovery.

Syllabus (weekly schedule):

1. Cardio-pulmonary resuscitation (CPR)
2. Bandaging methods
3. Mechanical injuries (fractures)
4. Bleeding and its control
5. Sport injuries
6. Thermal injuries
7. Shock
8. First aid in internal medicine
9. Respiratory diseases
10. Multiple casualty accident: organization and transport
11. Unconscious patient
12. Internal bleeding

Following the Cardio-pulmonary resuscitation (CPR) lecture, simultaneously during the lectures, a group of students will perform CPR practices on CPR manikins. Students will have the opportunity to learn the following: physical examination of injured patients, bandaging, providing first aid in cases of sport, mechanical, thermal injuries, how to treat a bleeding wound, respiratory diseases, shock, unconscious patient and internal bleeding. The student will have an understanding of the Hungarian Paramedic Services, organization and transportation. Students have the opportunity for the consultation of the typical and the more frequent first aid cases during the interactive lectures and practices.

Attendance: During the course of the semester, three absences are allowed.

Verification of absences:

We can only accept hospital discharge papers for verification of more than three absences from lectures, proving the student was continuously hospitalized during that time period.

Mid-semester test and quiz topics, dates, absences and retaking of these tests:

There will be no tests or quizzes during the semester, nor at the end of the semester.

Criteria for the signature at the end of the semester: Attendance of lectures is required.

INTRODUCTION TO HEALTH INFORMATICS I.

Name of the educational organizational unit: SE EKK Institute of Digital Health Sciences

Name of the subject: Introduction to health informatics I.

Type of the subject: 1 theory, 1 practice / week

code: GYINFBEIE1A (theory), GYINFBEIG1A (practice)

credit value: 2 (theory), 0 (practice)

Name of the lecturer of the subject: *Dr. Miklós Szócska*

Teachers: Dr. Ádám Zoltán Tamus (PhD, assistant lecturer)
 Dr. Gergely Zajzon (assistant lecturer (a PhD student))
 Tamás Tóth (assistant lecturer (a PhD student))
 Péter Dombai (assistant lecturer (a PhD student))
 Zoltán Sándor (assistant lecturer (a PhD student))

Term: autumn

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): 2×7 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. The IT tasks of health care experts

Topic of the practical practices (broken down into weekly figures): 2×7 practices = 14 practices

Application of MS Excel in the pharmacist practice

(functions, diagrams, advanced level) 4×2 lessons

Application of MS Word in the pharmacist practice 2×2 lessons

Execution of individual complex exercise 1×2 lessons

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

According to rules of the Studies and Exam Code. The absence can be excused by the presentation of a medical certificate. Substitution is possible according to a discussion with the teacher.

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.

The number, the topic, the time, the possibility of the substitution and improvement of checking during the term:

Acceptable solution of individual exercises.

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):

Suitable percentage of participation.

The mode of acquisition of the mark:**Exam:** solution of a computer test (five-grade valuation).**Practice:** three-grade valuation.**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.

Order of the modification of exam application:

According to Studies and Exams Code.

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 use of educational materials on the institute website is obligatory: www.semelweis.hu/dei**Recommended literature:**

- 1 Kékes-Surján-Balkányi-Kozmann: Egészségügyi informatika, Medicina Könyvkiadó, 2000 ISBN 9632423410
- 2 Dinya Elek (szerk.): Humán gyógyszerfejlesztés, Medicina Könyvkiadó Zrt, 2006 ISBN 9632429982
- 3 Meskó Bertalan: The Guide to the Future of Medicine, Webicina 2014 ISBN 9789631200072

INTRODUCTION TO HEALTH INFORMATICS II.

Name of the educational organizational unit: SE EKK Institute of Digital Health Sciences**Name of the subject:** Introduction to health informatics II.**Type of the subject:** 1 theory, 1 practice / week**code:** GYINFBEIE2A (theory), GYINFBEIG2A (practice)**credit value:** 2 (theory), 0 (practice)**Name of the lecturer of the subject:** *Dr. Miklós Szócska*

Teachers: Dr. Ádám Zoltán Tamus (PhD, assistant lecturer)
 Dr. Gergely Zajzon (assistant lecturer (a PhD student))
 Tamás Tóth (assistant lecturer (a PhD student))
 Péter Dombai (assistant lecturer (a PhD student))
 Zoltán Sándor (assistant lecturer (a PhD student))

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): 2×7 lectures = 14 lectures

1. IT tools related to the lifecycle of medicines
2. Informatics of medicine planning – molecular modelling
3. Clinical evidences – Scientific proofs and their data sources
4. Informatics of medicine-licencing
5. Medicine-data and -databases on the Internet
6. Functions of pharmacy software
7. Telemedicine and pharmaceutics – mobile phone applications connected with medicine

Topic of the practical practices (broken down into weekly figures): 2×7 practices = 14 practices

Database management (PuPha (MS Access)) 3×2 lessons

Practice with data representation and data visualisation

(MS Powerpoint, Prezi) 3×2 lessons

Execution of individual complex exercise 1×2 lessons

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

According to rules of the Studies and Exam Code. The absence can be excused by the presentation of a medical certificate. Substitution is possible according to a discussion with the teacher.

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.

The number, the topic, the time, the possibility of the substitution and improvement of checking during the term:

Acceptable solution of individual exercises.

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):

Suitable percentage of participation.

The mode of acquisition of the mark:

Exam: solution of a computer test (five-grade valuation).

Practice: three-grade valuation.

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.

Order of the modification of exam application:

According to Studies and Exams Code.

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 use of educational materials on the institute website is obligatory: www.semleweis.hu/dei

Recommended literature:

- 1 Kékes-Surján-Balkányi-Kozmann: Egészségügyi informatika, Medicina Könyvkiadó, 2000 ISBN 9632423410
- 2 Dinya Elek (szerk.): Humán gyógyszerfejlesztés, Medicina Könyvkiadó Zrt, 2006 ISBN 9632429982
- 3 Meskó Bertalan: The Guide to the Future of Medicine, Webicina 2014 ISBN 9789631200072

TERMINOLOGY (1st semester)**Responsible organisational unit:****Faculty of Health Sciences, Division of Foreign Languages and Communication****Programme director: Zöldi Kovács Katalin PhD**, Head of the Division

2 lessons per week, 2 credits

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.

Basics of Foreign Language (module 1.)

Magyar orvosi szaknyelv 1.

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, 4 credits

Assessment: end-term written and oral exam

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 first module students acquire basic structures and the vocabulary for everyday topics / e.g. shopping, food, housing etc./, language for „survival“. The course places special emphasis on phrases essential for everyday communications, e.g. introductions, greetings, getting/giving information etc. Grammar is of less importance in this phase of language studies.

Course content of practical lessons:

- Lesson 1-2: The alphabet
- Lesson 3-4: Greetings
- Lesson 5-6: Where are you from?
- Lesson 7-8: Introducing people
- Lesson 9-10: Numbers-phone numbers
- Lesson 11-12: What time is it?
- Lesson 13-14: Practising telling the time
- Lesson 15-16: Days
- Lesson 17-18: When do you study?
- Lesson 19-20: What is it? - food
- Lesson 21-22: Consolidation
- Lesson 23-24: Test 1 + situations
- Lesson 25-26: What is the food like? - adjectives
- Lesson 27-28: What do you think of English tea?- giving opinions
- Lesson 29-30: I would like a tea
- Lesson 31-32: Shopping for food
- Lesson 33-34: Ordering food- in a café
- Lesson 35-36: Rooms in the flat
- Lesson 37-38: Furniture in the rooms
- Lesson 39-40: Where are the furniture?
- Lesson 41-42: As a guest
- Lesson 11-12: At a party
- Lesson 43-44: Where can I find the library?
- Lesson 45-46: When shall we meet?
- Lesson 47-48: Asking for information, setting programs
- Lesson 49-50: Places in the city

Lesson 51-52: Consolidation

Lesson 53-54: Test 2 + situations and communication practice

Lesson 55-56: Assessment

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

Gyöngyösi Livia - Hetesy Bálint. *Hungarian language: Jó reggelt!* Semmelweis Egyetem Egészségtudományi Kar, 2010.

Basics of Foreign Language (module 2.)

Magyar orvosi szaknyelv 2.

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 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 second module students acquire basic structures and the vocabulary for everyday topics (e.g. family, relatives, at the doctor's etc.) language for survival.". The course places special emphasis on phrases essential for everyday communications, e.g. likes, dislikes, offering help, etc. Grammar is of less importance in this phase of language studies.

Course content of practical lessons:

Lesson 1-4: Forming questions

Lesson 5-6: Plural forms

Lesson 7-8: What do you like doing in your free time?

Lesson 9-10: I would like to.....

Lesson 11-12: Communication skills

Lesson 13-14: A date – what do you like?

Lesson 15-16: I like dancing, swimming etc.

Lesson 17-18: I can ride a bike, drive etc.

Lesson 19-20: Communication practice

Lesson 21-22: Can I help you? In a clothes shop

Lesson 23-24: Can I give you something else?

Lesson 25-26: Communication practice

Lesson 27-28: Consolidation

Lesson 29-30: Test 1 + situations

Lesson 31-32: I have a headache- at the doctor

Lesson 33-34: At the chemist's

Lesson 35-36: Communication practice- at the doctor, at the chemist's

- Lesson 37-38: My family, family members
- Lesson 39-40: Family relations
- Lesson 41-44: Communication practice- introducing your family
- Lesson 45-48: My boss' wife – social relations
- Lesson 49-50: Consolidation
- Lesson 51-54: Test 2 – situations, communication practice
- Lesson 55-56: Assessment

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

Gyöngyösi Livia – Hetesy Bálint. *Hungarian language: Jó napot kívánok!* Semmelweis Egyetem Egészségtudományi Kar, 2011.



Faculty of Pharmacy
2nd year

STUDY PROGRAMME

Second Year

3 rd semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
Analytical Chemistry (quantitative) I. GYASKAKG1A	2	5	7	GYASKANKG1A GYEGYMATE2A GYASKASKE2A	practical course grade
Physical Chemistry I. GYFKTFIK1A	4	–	4	GYASKASKE2A GYEGYMATE2A GYFIZBIFE2A	semi-final
Pharmaceutical Botany II. Practice GYNOVGNG2A	–	3	2	GYGENBILE2A GYNOVGNG1A	practical course grade
Pharmaceutical Botany II. GYNOVGNG2A	1	–	2	GYGENBILE2A GYNOVGNG1A	final #
Organic Chemistry I. Practice GYSZKSZKG1A	–	5,5	5	GYASKASKE2A GYASKANKG1A GYINFBEIE2A	practical course grade
Organic Chemistry I. GYSZKSZKE1A	4	–	5	GYASKASKE2A GYASKANKG1A GYINFBEIE2A	semi-final
Physical Education III. GYTSITNG3A	–	1	0		signature
Hungarian Medical Terminology III. *	–	4	2	GYLEKMSZG1A	practical course grade
Total Credit			27		

4 th semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
Analytical Chemistry (quantitative) II. Practice GYASKAKKG2A	–	5	3	GYSZKSZKEIA GYASKAKKG1A	Organic Chemistry I. Analytical Chemistry (quantitative) I. practical course grade
Analytical Chemistry (quantitative) II. GYASKAKKE2A	2	–	6	GYSZKSZKEIA GYASKAKKG1A	Organic Chemistry I. Analytical Chemistry (quantitative) I. final #
Biochemistry I. GYOBIBIKEIA	3	–	3	GYGENBILE2A GYSZKSZKEIA GYFIZBIFE2A	Biology II. Organic Chemistry I. Biophysics II. semi-final
Physical Chemistry II. GYFKTFIKG2A	1	4	5	GYFKTFIKEIA	Physical Chemistry I practical course grade
Colloid Chemistry I. GYKOLKOLEIA	2	–	2	GYFKTFIKEIA	Physical Chemistry I. semi-final
Organic Chemistry II. Practice GYSZKSZKG2A	–	5,5	4	GYSZKSZKEIA	Organic Chemistry I. practical course grade
Organic Chemistry II. GYSZKSZKE2A	4	–	5	GYSZKSZKEIA	Organic Chemistry I. final #
Hungarian Medical Terminology IV. * GYLEKMSZG4A	–	4	2	GYLEKMSZG1A	Hungarian Language III. practical course grade
Physical Education IV. GYTSITNG4A	–	1	0		 signature
Summer Practice I. ** GYSZGNSZG1A	–	35	4	GYASKAKKE2A GYSZKSZKE2A	Analytical Chemistry II. Organic Chemistry II.
Total Credit			30+4		

The grade influences the qualification of the diploma

* Obligatory courses

** 4 weeks (140 hours) summer practice in elective place (accredited public / community pharmacy, Galenical laboratory, research institute, university department) after the second and third year.

LIST OF TEXTBOOKS (The list may change!)

- 1 Everett, D.H.: Basic Principles of Colloid Science. Royal Society of Chemistry, London, 1988. ISBN 0-85186-443-0
- 2 Atkins, P.W.: Physical Chemistry. 6th ed. Oxford Univ. Press ISBN 0-190850101-3 Paperback. **Or:** Atkins, P.W., de Paula J: Atkins' Physical Chemistry. 7th ed. Oxford Univ. Press. ISBN 0-19-897285-9
- 3 Buvári-Barcza: Quantitative Analytical Chemistry. Bp. (SOTE)
- 4 Murray (et al.): Harper's Biochemistry. Stanford. Appleton-Lange 2000. ISBN 0-8385-3684-0.

Recommended textbooks:

- 1 Shaw, D.J.: Introduction to Colloid and Surface Chemistry. Butterworth-Heinemann Ltd. Oxford, 1992. ISBN 0-7506-1182-0
- 2 Csémpesz, F.: Experimental Colloid Chemistry. Bp. SOTE. 2012.
- 3 Skoog, West, Holler: Fundamentals of Analytical Chemistry. Saunders College Publishing Co.
- 4 Harwood L.M., Claridge T.D.W.: Introduction to Organic Spectroscopy. Oxford Univ. Press
- 5 Laidler, K.J.-Meiser, J.H.: Physical Chemistry. 1999. 3rd ed. Houghton Mifflin Co. Boston, ISBN 0-395-91848-0
- 6 Steiner E.: The Chemistry Maths Book. Oxford Univ. Press. ISBN 0-19-855913-5
- 7 Nelson, Fox, Lehninger, A.L.: Principles of Biochemistry. 3rd ed. 2000. Worth Publ. New York, ISBN 1-57259-153-6
- 8 Berg-Tymoczko-Stryer: Biochemistry 7th edition
- 9 F.A. Carey, R.M. Giuliano: Organic Chemistry, 10th Ed., McGraw Hill: New York, 2016, ISBN 0073511218
- 10 T.W.Gr. Solomons, C.B. Fryhle, S.A. Snyder: Organic Chemistry, 12th Ed., John Wiley & Sons, Inc., 2016, ISBN 1118875761
- 11 M. Jones, Jr., S.A. Fleming: Organic chemistry, 5th Ed., Norton Science Co., 2014, 978-0-393-91303-3
- 12 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
- 13 Gábor Krajsovsky: Collection of Organic chemical problems, Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry, 2017, Editor: Gábor Krajsovsky, ISBN 978-963-06-5345-9 <http://mek.oszk.hu/17200/17281/>
- 14 László Szabó, Gábor Krajsovsky: Isomerism in Organic Compounds, Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry, 2017, Editor: Gábor Krajsovsky, ISBN 978-963-12-9206-0 <http://mek.oszk.hu/17200/17283/>
- 15 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)
- 16 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
- 16 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
- 17 J. Clayden, N. Greeves, S. Warren: Organic chemistry (paperback), Oxford University Press, 2012, ISBN 978-0-19-927029-3
- 18 J. Clayden, S. Warren: Solutions manual to accompany organic chemistry (paperback), Oxford University Press, 2013, ISBN 9780199663347
- 19 A. Corbella, E. Marcantoni, G. Renzi: Seminars in Organic Synthesis, Royal Society of Chemistry, 2011, ISBN 978-88-86208-64-2
- 20 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
- 21 K.L. Williamson, K.M. Masters: Techniques Labs for MacroScale and Microscale Organic Experiments, Brooks Cole 2016, 7th Ed, ISBN 1305577191
- 22 E. Pretsch, P. Bühlmann, M. Badertscher: Structure Determination of Organic Compounds, Springer-Verlag, Berlin • Heidelberg, 2009, ISBN 3540938095

QUANTITATIVE ANALYTICAL CHEMISTRY I.

Tutor: *Dr. Krisztina Kurin-Csörgei*

First Semester

Lectures (2 hours per week)	Practicals (5 hours per week)	
	Topic	Task
Introduction. Review of some elementary concepts. Titrimetric methods of analysis.	Introduction.	Laboratory introduction; Safety and order in the laboratory; The schedule of the semester; Practical and theoretical requirements in the semester
Acid-base reactions, repetition of different calculations. Titration curves in acid-base titration.	Calibration	Calibration of burette (3-6-9-12 ml); Calibration of pipettes (10, 20 ml)
End point detection Acid-base indicators.	Acidi-Alkalimetry	Practicing the use of the laboratory tools; Determination of sulfuric acid
Standard solutions in acid-base acid titrations and the survey of the most important methods.	Acidi-Alkalimetry	Standardization of 0.1 N hydrochloric
Acid-base titrations in non-aqueous solutions. Determination of organic bases in glacial acetic acid.	Acidi-Alkalimetry	Test I. Determinations of hydroxide and carbonate ions in the presence of each other
Effects of common ion, pH, complex formation and redox processes on precipitation.	Acidi-Alkalimetry (Instrumental)	Potentiometric titration of acetic acid; Conductometric determination of Beta-ine hydrochloride
Formation and morphology of precipitates. Development and treatment of precipitates.	Acidi-Alkalimetry	Indirect determination of sodium thio-sulfate Determination of "Lidocain" in nonaqueous solution
Important methods in precipitation gravimetry.	Acidi-alkalim.; Chelatometry	Determination of lactic acid; Chelatometric determination of lead
Precipitation titrimetry.	Chelatometry	Test II. Determination of calcium and magnesium ions in mineral water
Complex formation, chelate effect. Stability constant. Complexometric and chelatometric titrations.	Chelatometry	Determination of copper and zinc in the presence of each other; Determination of aluminium in "Aluminium tartaricum solum"
Effect of pH and foreign ligands on ions the apparent stability constant. Chelatometric titrations. Titration curves. Methods of end point detection.	Gravimetry	Gravimetric determination of sulfate in the form of BaSO_4 ; (precipitation, preparation of filter)
	Gravimetry; Argentometry	filtration, washing, weighing of BaSO_4 precipitate; Determination of chloride ions by Mohr's method
Types and applicability of EDTA titrations.	Argentometry Determination of bromide ions by	Test III. Volhard's and Fajans' methods
Redox reactions and their mechanism. The redox potential and its calculation.	Komplexometry Supplements	Determination of cyanides by Liebig-Denigee's Method; Supplements
The effect of pH, the complex and precipitate formations on redox potential. Redox equilibria.	Supplements Closing	Supplements; Closing

QUANTITATIVE ANALYTICAL CHEMISTRY II.

Second Semester

Lectures (2 hours per week)	Practicals (5 hours per week)	
	Topic	Task
Titration curves in oxidimetry. Titrations with permanganate solution.	Introduction	Safety and order in the laboratory Practical and theoretical requirements in the semester The schedule during the semester Redox titrations (permanganometry) Standardization of » 0.1N potassium permanganate solution
	Permanganometry	
Titrations with chromate and cerium (IV). Bromatometry I.	Permanganometry	Determination of the total iron content by Zimmermann-Reinhardt method Permanganometric determination of bromide ions (Winkler's method)
Bromatometry II. Reactions with periodate and their analytical use.	Chromatometry	Determination of Mohr salt with chromatometric titration Bromatometric determination of arsenic (III) (from As ₂ O ₃) or antimony (III) compounds (in form of "tartar emetic": antimonyl tartarate) Determination of azophene
	Bromatometry	
Iodometric titrations and other redox titrimetric methods.	Bromatometry Cerimetry	TEST I. Bromatometric determination of ascorbic acid (Vitamin C) in tablets (e.g. Vit C, Rutascorbin, Béres C) Cerimetric determination of amidazophene
Sampling and preparatory processes in analytical chemistry.	Iodometry	Standardization of » 0.01N sodium thiosulfate solution. Determination of phenol in water / acetyl salicylic acid content in tablets (e.g. Aspirin, Kalmopyrin, Istopyrin,...) by Koppeschaar's method
Interactions between electromagnetic radiations and materials. Emission spectroscopy.	Iodometry	Iodometric determination of copper (II)-ions Determination of mannitol by Malaprade's reaction with periodate
Flame emission photometry, atomic absorption spectrophotometry. ICP-ES and ICP-MS possibilities.	Iodometry	Determination of iodide by Winkler's method
Molecular absorption spectroscopy in UV-VIS region as well as in IR.	Optional measurements	TEST II. One selection from "Other determinations"
Possibilities of spectrophotometric method(s) in complex systems.	Instrumental Analysis	Computer aided learning of modern instrumental analytical methods (HPLC; GC; UV-Vis Spectrophotometry)
Separation methods in analytical chemistry.	Optional measurements	From "Potentiometric determinations" From "Other determinations"

Lectures (2 hours per week)	Practicals (5 hours per week)	
	Topic	Task
Distillation, extraction and their possibilities.	Spectrophotometry Semi-quantitative analysis	Spectrophotometric determination of iron content in multivitamin tablets Spectrophotometric determination of phosphate content in egg shell Semi-quantitative analysis using "Merko-quant" testpapers
Different planar chromatographic methods and their use in pharmaceutical analyses. Gas chromatographic methods.		
High performance liquid chromatography. Supercritical fluid extraction and chromatography.	Optional measurements	From "Potentiometric determinations" From "Other determinations"
HPCE and its future application. Survey on analytical chemistry.	Final test Determination	TEST III. (Qualitative and quantitative analysis of complex samples) Quantitative determination of the sample
Summary.	Supplements Closing	Supplements Closing

Potentiometric determinations:

1. Direct potentiometric determination of fluoride content in tooth paste
2. Potentiometric titration of bromide content of "Elixirium thymi composita"
3. Potentiometric titrations of iodide and chloride ions in presence of each other
4. Potentiometric titration using computer controlled burette:
Determination of phosphoric acid content in "Coca Cola"

Other determinations:

1. Complexometric determination of metals in coins: (e.g., 1,- Ft; 2,- Ft; 5,- Ft; US cent; Groschen) (Cu^{2+} – Ni^{2+} ; Cu^{2+} – Ni^{2+} – Zn^{2+} ; Cu^{2+} ; Al^{3+})
2. Determination of calcium and magnesium ions in mineral water (e.g., Römerquelle, Teodora Quelle, Margitszigeti), in bitter water (Míra) and in tap water
3. Chelatometric determination of aluminium ions in "Aluminium aceticum tartaricum solutum"
4. Iodometric determination of Cr^{3+} ions
5. Permanganometric determination of hydrogen peroxide content in tablet "Hyperol"
6. Complex analysis of "Solutio iodi alcoholica"
7. Determination of "Papaverinium chloride" in nonaqueous solution (glacial acetic acid)
8. Conductometric determination of acid contents in red wine

ORGANIC CHEMISTRY I-II.

Complete name of the course: Szerves kémia I., II.

Name of the Programme: Pharmacy

Abbreviated name of the course: Org Chem

English name of the course: Organic Chemistry I, II.

Neptun Codes: GYSZKSZKE1A; GYSZKSZKE2A; GYSZKSZKG1A; GYSZKSZKG2A

Institute: Semmelweis University, Department of Organic Chemistry

Name of the tutor/lecturer: Dr. István Mándity Ph. D.

Contacts

Phone: +36-1-476-3600/53055

E-Mail mandity.istvan@pharma.semmelweis-univ.hu

Further tutors: Dr. Péter Tétényi Ph. D.

Dr. Gábor Krajsovsky Ph. D.

Credit points: 5; 5; 5; 4

Course principles: 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.

Brief course summary:

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.

Course data

Recommended semester of completing the course 3.

Lecture (contact hrs/ week) 4 hours weekly

Practice (contact hrs/ week) 8 hours biweekly

Seminar (contact hrs/week) 2 hours biweekly

Individual lecture (introductory lecture) 1 hour weekly

Total number of contact hours/semester 70 (lectures+ introductory lectures) + 140 (seminars+ practices in 2 groups)

Semester

Spring semester*

Winter semester*

Both semesters*

Consultation as many times as students ask for

Semester 1 program

1. Lecture topics/week

- 1. week:** Introduction to Organic Chemistry 1. Introductory lecture: Safety requirements for organic chemical laboratory work; requirements for presentation of a laboratory note-book. Short summary of the Guidelines. Recrystallization and vacuum filtration. Extraction. Drying methods. Distillation of solvents. Thin layer chromatography, column chromatography, HPLC. Melting point determination.
- 2. week:** MO theory 1. Atomic orbitals, LCAO-MO method, sigma and pi orbitals, molecular orbitals, delocalisation. Introductory lecture: Distillation. 4-Bromoacetanilide. Diethyl (3,5-dimethylpyrrol-2,4-dicarboxylate).
- 3. week:** MO theory 2. Hybridisation, Lewis-Langmuir theory of bonds, valence bond method, resonance. Classification of organic compounds. Isomers: constitutional and conformational isomers, stereoisomers. Eclipsed, staggered conformers, gauche effect. Cycloalkanes: stereostructure, the most stable conformers, axial and equatorial substituents for disubstituted cycloalkanes.
- 4. week:** Chirality, absolute configuration according to Cahn-Ingold-Prelog, enantiomers and diastereomers. Axial chirality, determination of absolute configuration. Prochiral compounds: alkenes, imines or carbonyl compounds.
- 5. week:** Nomenclature of organic compounds. Classification of reactions: ionic or radical reactions. Electronegativity, reactivity of reagents: inductive, mesomeric and steric effects.
- 6. week:** Alkanes and cycloalkanes: physical properties, preparations, reactions.
- 7. week:** Alkenes: structure, preparations, reactions. Asymmetric synthesis, and reactions. Diolefines: structure, cycloaddition reactions, Woodward-Hoffmann rules. Spectroscopy.
- 8. week:** Alkynes. Benzene and aromaticity. Extension of the aromatic system. Antiaromatic and non-aromatic structures. S_EAr reactions of aromatic compounds. Activating and deactivating groups, direction rules.
- 9. week:** Isolated polycyclic compounds. Fused polycyclic compounds: direction rules in S_EAr reactions. S_NAr reactions of aromatic halogen compounds.
- 10. week:** Structure of halogenated hydrocarbons, physical, biological properties, preparations. Radical reactions: thermochemistry. Main substitution reactions of halogenated hydrocarbons. Nucleophilic substitution reactions: S_N1 , S_N2 , S_Ni . Molecularity and order of reactions. Reaction kinetics. Allylic rearrangement. E1, E2 and E1cB reactions, factors influencing ration of S_N vs. E reactions: substrate, solvent, temperature effects, role of the base, of the leaving group and of heavy metal salts. Aromatic halogen compounds. Reactivity differences of aromatic halogen compounds.
- 11. week:** Alcohols: preparation. Redox reactions. Alcohols: oxidation and reduction methods. Phenols: preparation, chemical reactions. Acid-base theories. Ethers, crown ethers, phase transfer catalysis. Organic sulfur compounds and ylides; nitro compounds: preparation and properties.
- 12. week:** Amines: structure. N-oxides. Amines: preparation, physical properties. Amines: chemical properties, regioselectivity and protecting groups.
- 13. week:** Aromatic diazonium compounds, Sandmeyer reaction and azo coupling. More important amines. Organophosphorus compounds. Organometallic compounds of zinc, magnesium and palladium.
- 14. week:** Oxo compounds.

II. Practice and seminar topics/week

- 1. week:** –
- 2. week:** –
- 3. week:** **Practice:** Purification of 4-bromoacetanilide by recrystallisation, checking by TLC, laboratory glassware, how to carry out basic procedures, proper mounting, cleaning glassware
- 4. week:** **Seminar:** Molecular orbital (MO) theory, hybridization
- 5. week:** **Practice:** Purification of ethyl acetate by extraction and distillation. Demonstration of melting point measurement
- 6. week:** **Seminar:** Types of isomers
- 7. week:** **Practice:** Preparation of 4-bromoacetanilide
- 8. week:** **Seminar:** Stereochemistry: Cahn-Ingold-Prelog's and Fischer's convention, central (R, S, D, L) and axial chirality. Enantiomers and diastereomers
- 9. week:** **Practice:** Preparation of diethyl (3,5-dimethylpyrrol-2,4-dicarboxylate)
- 10. week:** **Seminar:** Stereochemistry of cycloalkanes. Prochiral molecules, enantiotopic and diastereotopic atoms, groups and surfaces with examples
- 11. week:** **Practice:** Evaluation of spectra I. (theoretical basis, analysis of spectra)
- 12. week:** **Seminar:** Molecularity and kinetic order of reactions. Classification of organic chemical reactions (according to reagents, or from a kinetic aspect, according to polarity or by the reaction coordinate). Addition and elimination reactions (regio- and stereoselectivity). Kinetic and thermodynamic control.
- 13. week:** **Practice:** Evaluation of spectra II. (complex analysis of spectra, problem solving)
- 14. week:** Extra practice, checking students' cupboards. **Double seminar:** Aromaticity and direction rules for aromatic electrophilic and nucleophilic substitution. Substituent effects, acid-base theory, and structure-pK_a relationship.

Course data

Recommended semester of completing the course 4.

Lecture (contact hrs/ week) 4 hours weekly

Practice (contact hrs/ week) 8 hours biweekly

Seminar (contact hrs/week) 2 hours biweekly

Individual lecture (introductory lecture) 1 hour weekly

Total number of contact hours/semester 70 (lectures+ introductory lectures) + 140 (seminars+ practices in 2 groups)

Semester

Spring semester*

Winter semester*

Both semesters*

Consultation as many times as students ask for

Semester 2 program

I. Lecture topics/week

- 1. week:** Carboxylic acids 1.
- 2. week:** Introductory lecture: Preparation of the (organic chemical) electronic literature searching (e.g., DiscoveryGate, SciFinder Scholar, PubMed, PubChem, INTERNET and nomenclature) and molecular pharmaceutical informatics.
Carboxylic acids 2.
- 3. week:** Introductory lecture: Acetylsalicylic acid. 4-nitrobenzoic acid. (*E,E*)-1,5-Diphenyl-1,4-pentadien-3-one.
Nomenclature of oxo compounds and of carboxylic acid derivatives.
- 4. week:** Introductory lecture: Cyclohexanone oxime. Methyl 4-nitrobenzoate. Phthalimide.
Carboxylic acid derivatives 1.
- 5. week:** Carboxylic acid derivatives 2. Carbonic acid derivatives
- 6. week:** Carbohydrates.
- 7. week:** Amino acids, peptide and proteins.
- 8. week:** Heterocyclic nomenclature.
- 9. week:** Heterocycles 1.
- 10. week:** Heterocycles 2.
- 11. week:** Heterocycles 3.
- 12. week:** Heterocycles 4.
- 13. week:** Nucleotides. Natural compounds (terpenes, steroids and alkaloids) 1.
- 14. week:** Natural compounds (terpenes, steroids and alkaloids) 2.

II. Practice and seminar topics/week

- 1. week:** –
- 2. week:** –
- 3. week:** **Practice:** Practice of electronic literature searching
- 4. week:** **Seminar:** Aldehydes and Ketones
- 5. week:** **Practice:** Preparation of acetylsalicylic acid and 4-nitrobenzoic acid
- 6. week:** **Seminar:** Ambident nucleophiles, electrophilic substitution (reactions of aldehydes and ketones)
- 7. week:** **Practice:** Molecular pharmaceutical informatics practice
- 8. week:** **Seminar:** Substitution reactions of carboxylic acid derivatives
- 9. week:** **Practice:** Preparation of (*E,E*)-1,5-Diphenyl-1,4-pentadien-3-one and cyclohexanone oxime
- 10. week:** **Seminar:** Carbonic acid derivatives, chemistry of sugars
- 11. week:** **Practice:** Special Chapters of Organic chemistry. Literature searching report
- 12. week:** **Seminar:** Amino acids, and proteins
- 13. week:** **Practice:** Preparation of methyl 4-nitrobenzoate and phthalimide
- 14. week:** Extra practice **Double seminar:** Heterocyclic compounds (monocycles and fused compounds). Isoprenoids, alkaloids, and nucleotides

Course requirements

Order of consultations: as many times as students ask for consultation, at least 1 week before the date of consultation.

Prerequisites:	GYASKANKG1A	Analitical chemistry I. (qualitative)
	GYASKASKE2A	General and inorganic chemistry II.
	GYINFBEIE2A	Introduction to medical informatics II.
	GYSZKSZKE1A	Organic chemistry I.

Semester acceptance conditions: (*successful course attendance, mid-term tests, absence, etc.*) *Oral examination at the end of the first semester*

Students have to answer in oral form questions on the subject-matter of the main lectures, the introductory lectures to the practicals and the practicals themselves, and on the spectroscopy discussed in the practicals and seminars.

Final (oral) examination at the end of the second semester

The student is expected to answer questions on the theoretical and practical subject-matter from both semesters. In addition there will be a question on nomenclature. The subject-matter involves all topics involved in the main lectures and the introductory lectures to the practicals, and related topics not necessarily directly indicated in the list of questions.

Practical course grade

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. Students are allowed to participate in the practicals only if they have participated in the corresponding introductory lecture. 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. The presence of the student at the main lecture is a necessary requirement for a consultation.

The **grade for the practical course** is awarded on the basis of the average of preparation mark.

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.

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.

Knowledge testing during the semester: Midterm tests would be held at each semester once in written form, 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, the student must attend at the following correction test. If the value of the any correction tests reach the passmark, then the midterm test is accepted. If the value of the any correction test is failed, then the student does not get signature for the semester, he/she is **not allowed to sit in the (semi)-final examination**.

Requirements of the signature at the end of the semester:*Evaluation of the student's performance at the seminars:*

at least one successful oral report at the seminars per semester is also required for the signature for the semester. Seminars are obligatory; if anyone has 2 or more absences, then he/she must have report from the missing seminars, and this report must be accepted.

Evaluation of the student's presence during the lectures:

if anyone has more than 3 absences for lectures (6 hours), then he/she gets an aggravated exam (with considerably more questions). Attendance on at least 75% of the lectures is necessary for the signature by the end of each Semester. If the number of absences exceeds 25% of the lectures, then the given student must have report **from the whole material of the Semester** at the tutor of the subject, and this report must be accepted. Otherwise proof of completion the Semester cannot be provided by the signature for the Semester.

How to get a practical course grade:

The performance of the practical tasks is validated by countersign of the leading instructor. It must be at least passmark.

Individual activity of the student during the semester (*protocol, etc.*) each student work separately in the laboratory, must prepare himself/herself before entering to the laboratory, must strictly follow the prescriptions provided by us and must precisely demonstrate the experiments carried out by a complete laboratory note-book.

Performance control in the examination period (*final, semi-final*) students, who have got signature for the Semester, can sit in the examination. The examinations are evaluated by a mark 1-5 (5 is the best), and unsuccessful exams may be repeated not more than 3 times.

Performance control in the examination period (*written, oral, written and oral*) only oral exams are held.

Prescribed external practice: no.

List of teaching materials: (List of textbooks, hand-outs, scripts, etc.)

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: Collection of Organic chemical problems Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry, 2017 Editor: Gábor Krajsovsky ISBN 978-963-06-5345-9
6. <http://mek.oszk.hu/17200/17281/>
7. László Szabó, Gábor Krajsovsky: Isomerism in Organic Compounds Semmelweis University, Pharmaceutical Faculty, Department of Organic Chemistry, 2017 ISBN 978-963-12-9206-0
8. <http://mek.oszk.hu/17200/17283/>
9. 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)
10. Pázmány Péter Katolikus Egyetem, Semmelweis Egyetem és a Dialóg Campus Kiadó-Nordex Kft. által alkotott konzorcium
11. http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_A_molekulak_vilaga_II/adatok.html
12. 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
13. http://www.tankonyvtar.hu/hu/tartalom/tamop425/0006_Szerves_es_biokemia/adatok.html
 14. J. Clayden, N. Greeves, S. Warren: Organic chemistry (paperback) Oxford University Press, 2012 ISBN 978-0-19-927029-3
 15. J. Clayden, S. Warren: Solutions manual to accompany organic chemistry (paperback) Oxford University Press, 2013 ISBN 9780199663347
 16. A. Corbella, E. Marcantoni, G. Renzi: Seminars in Organic Synthesis. Royal Society of Chemistry, 2011
 17. ISBN 978-88-86208-64-2
 18. 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
 19. K.L. Williamson, K.M. Masters: Techniques Labs for Macroscale and Microscale Organic Experiments. Brooks Cole 2016, 7th Ed ISBN 1305577191
 20. E. Pretsch, P. Bühlmann, M. Badertscher: Structure Determination of Organic Compounds. Springer-Verlag, Berlin • Heidelberg, 2009 ISBN 3540938095

The course description was prepared by dr. Péter Tétényi

PHYSICAL CHEMISTRY I.

First Semester

Week Lectures (4 hours per week)

- 1 Selection rules and intensity. Anharmonicity. The vibrations of polyatomic molecules. Normal modes. Vibrational Raman spectra.
- 2 Chromophores. The fate of electronically excited states: Fluorescence, Phosphorescence, laser action.
Photoelectron spectroscopy: UPS, XPS, ESCA
- 3 Nuclear magnetic resonance: The technique, the chemical shift.
Electron spin resonance. Mass spectroscopy.
- 4 The permanent electric dipole moment. Polarizability. Polarizabilities at high frequencies. The refractive index. Additive properties.
Heat, work and the conservation of energy.
Heat capacity enthalpy. State functions.
- 5 Changes in internal energy. The temperature dependence of the internal energy and enthalpy. The relation between C_v and C_p .
The reaction enthalpy. Hess's law and reaction enthalpies.
The temperature dependence of reaction enthalpies. (Kirchoff's law).
- 6 The definition of entropy. The entropy change in the system.
Carnot efficiency. The Helmholtz and Gibbs functions. Maximum work.
The third law of thermodynamics.
Standard molar Gibbs function.
- 7 The temperature and pressure dependence of the Gibbs function.
The chemical potential of a perfect gas. The solid-liquid boundary.
The liquid – vapour boundary. The solid-vapour boundary.
The solid – liquid – vapour equilibrium.
- 8 Partial molar volume. Partial molar Gibbs function.
The thermodynamics of mixing. The elevation of boiling point.
The depression of freezing point. Solubility. Osmosis.
- 9 Vapour pressure diagrams. The representation of distillation. Azeotropes.
The solvent and solute activities. The phase rule.
- 10 The Gibbs function minimum. Exergonic and endergonic reactions.
Perfect gas equilibria. A recipe for equilibrium constants.
The response of equilibrium to the conditions (temperature and pressure).
Reaction rate. Rate laws and rate constants. The determination of the rate law.
First-, second- and higher order reactions, half lives.
- 11 The temperature dependence of reaction rates. Reactions approaching equilibrium.
Consecutive reactions and parallel processes. The steady-state approximation.
Chain reactions. Photochemical reactions, radiolysis.
- 12 Catalysis. Fast reactions. Collision theory. Activated complex theory.
Thermodynamic aspects. Adsorption at surfaces. Catalytic activity at surfaces.
- 13 Mean activity coefficients. Debye–Hückel theory. The ionic strength.
The mobilities of ions. The measurement of transport numbers.
Conductivities and ion-ion interactions. Diffusion and transport.
The metal ion/metal electrode. The ion (insoluble salt) metal electrode.
Oxidation-reduction electrodes. Liquid junctions and membrane potentials.
- 14 Kinds of cell. E.m.f. and electrode potentials, the sign convention.
The concentration dependence of the e.m.f. Standard electrode potentials.
Thermodynamic data from cell e.m.f.-s and applications of e.m.f. measurement.
The rate of charge transfer. The current density. Overpotential. Polarography.

PHYSICAL CHEMISTRY II.

Second Semester

Week	Lectures (1 hour per week) Practicals (4 hours per week)
1	Determination of freezing point depression.
2	Calibration of a thermometer. Determination of the temperature of a phase transition.
3	Studying IR Spectra.
4	Spectrophotometric investigations in the ultraviolet region.
5	Determination of ionization constant of indicators by spectrophotometric method.
6	Solubility product determination by potentiometric method.
7	Measurement of pH by hydrogen-electrode, measurement of redox potential.
8	Deadstop titration, determination of ionization constant of a weak acid.
9	Computer assisted conductimetric titration.
10	Polarography.
11	Studying the kinetics of the hydrolysis.
12	Investigation of stressed decomposition of a medicine.
13	Studying of the surface tension.
14	Supplementary lab.

COLLOID CHEMISTRY I.

Lecturer: **Dr. Ferenc Csémpesz**

Second Semester

Week	Lectures (2 hours per week)
1	What are colloids? Definitions, nomenclature, historical perspective.
2	Basic principles of colloid stability Intermolecular forces, interparticle forces, effect of the intervening medium. Electrostatic forces and the electrical double layer.
3	Steric repulsion, the effect of adsorbed or anchored layers. The total interaction potential curve.
4	Preparation of colloidal dispersions Dispersion methods, condensation methods: nucleation and particle growth. Emulsion and dispersion polymerization. Preparation of monodisperse colloids.
5	Interfaces Surface tension, surface energy, wetting phenomena.
6	Adsorption: the Gibbs adsorption equation, the influence of adsorption on interparticle forces The effect of the curvature of surfaces on equilibrium.
7	Some important properties of colloids. Kinetic properties: Brownian motion, diffusion, osmosis, Donnan equilibrium, dialysis, electrokinetic phenomena, sedimentation and creaming. Scattering of radiation: light scattering, neutron scattering.
8	Rheology: viscosity, Newtonian and non-Newtonian systems, rheology of suspensions of colloidal particles.

Week Lectures (2 hours per week)

- 9 Aggregation processes in colloidal dispersions
Flocculation and coagulation of electrostatically stabilized dispersions, the Deryagin–Landau–Verwey–Overbeek (DLVO) theory. Reversible flocculation, bridging flocculation, depletion flocculation, sterically stabilized systems. Kinetics of coagulation, heterocoagulation.
- 10 Structure of flocs and sediments.
Coalescence and particle growth.
- 11 Association colloids and self-assembly systems
Micellisation, solubilization.
- 12 Thin films, foams and emulsions
Film stability, film tension.
Foams, foaming and antifoaming agents, froth flotation.
Emulsions and microemulsions.
- 13 Macromolecular colloids and gels
The formation and structure of macromolecules.
General properties of polymer solutions.
Determination of the molecular mass of macromolecules.
Forces leading to gel formation.
Swelling properties of gels.
- 14 The industrial importance of colloids.

PHARMACEUTICAL BOTANY II.**Department of Plant Anatomy**Tutor: **Dr. Gábor Kovács****First Semester****Weeks Lectures** (1 hour per week)

- 1 Embryo development. The root apex, primary structure of roots. Root modifications
Brassicaceae
- 2 The shoot apex. The primary structure of stems. Stemroot connection.
- 3 Secondary growth of roots and stems.
- 4 Development and anatomy of leaves.
Adaptations to the environment. Shoot modifications.
- 5 The movement of water in plants. Mineral nutrition. Transport of assimilates.
- 6 Initiation and anatomy of flowers. Sporo-Angiosperms.)
and gametogenesis in angiosperms. Fruits and seed.
- 7 Control of growth and development.
- 8 Mycophyta, Bryophyta, Pteridophyta, Gymnospermatophyta

Practicals (3 hours per week)

Germination, seedlings. Plants representing fam.: Fabaceae,

Roots. Plants representing fam.: Apiaceae, Euphorbiaceae.

Stems I. Plants representing fam.: Solanaceae, Lamiaceae

Stems II. Plants representing fam.: Asteraceae

1. Test Work:

Plants representing fam.: Cannabaceae
Woody stems (Gymnosperms,

The fungi (introduction). I. Test
Work on the knowledge of medicinal plants
The Fungi I.
The Fungi II.

Weeks	Lectures (1 hour per week)	Practicals (3 hours per week)
9	Angiospermatophyta: Magnoliidae Preparing a cleared specimen	2. Test Work: Fungi
10	Angiospermatophyta: Hamamelididae, Caryophyllidae	Leaf and flower anatomy
11	Angiospermatophyta: Rosidae 2. Test Work on the knowledge of medicinal plants.	Morphology and anatomy of the seed
12	Angiospermatophyta: Dilleniidae	Morphology and anatomy of the fruit.
13	Angiospermatophyta: Asteridae flower, seed, fruit.	3. Test Work: woody stems, leaf,
14	Angiospermatophyta: Monocotyledoneae the practicals.	Consultation, questioning, finishing

Visit in the Botanical Garden of Eötvös Loránd University to learn taxonomy of higher plants. Field trip (1 day) to learn medicinal plants and fungi in the wild. Handing in of your own herbarium (collection of 30 medicinal plants, pressed and dried, mounted for permanent display with references).

BIOCHEMISTRY I.

Department of Medical Biochemistry

Lecturer: **Dr. Attila Ambrus**

Tutor: **Dr. Erzsébet Maróthy-Tóth**

Second Semester

Lectures (3 hours per week)

- Proteins. The amino acids building blocks of proteins.
Determination of amino acid composition and primary structure of proteins.
- Ordered conformations of polypeptide chains. Four levels of protein structure.
Determination of secondary and tertiary structure. Oxygen transporting proteins.
Myoglobin and hemoglobin. Structure of myoglobin and hemoglobin.
- Fetal hemoglobin. Molecular pathology of hemoglobin.
Purification and characterization of proteins.
Separation procedures based on molecular size, solubility differences, electric charge and selective adsorption.
- Enzymes. Identification of functional groups essential for catalysis. Kinetics of enzyme-catalyzed reactions:
The Michaelis-Menten equation. Transformation of the Michaelis-Menten equation.
- Enzyme inhibition. Regulatory enzymes: allosteric enzymes, covalently modulated regulatory enzymes.
- Fine mechanism of enzyme action. Three-dimensional structure of chymotrypsin, a serine protease.
Mechanism of acetylcholinesterase catalysis.
- Bioenergetics. Introductory remarks. High energy compounds. Glycolysis.
- Oxidative decarboxylation of pyruvate Citric acid cycle.
- Metabolic transport through the mitochondrial membranes.
Respiratory chain.
- Oxidative phosphorylation. Mitochondrial import and export of reductive equivalents.

- Energetics of glucose oxidation. Pasteur effect. Heat production by the brown adipose tissue.
- Carbohydrate metabolism. Cellular uptake and production of glucose. Gluconeogenesis. Regulation of glycolysis and gluconeogenesis.
- Glycogen metabolism. Blood glucose and regulation of glycogenolysis and glycogenesis. Hexose interconversions.
Galactosemia and galactosuria. Fructosuria and fructose intolerance.
- The phosphogluconate oxidative pathway. Significance and regulation of the pentose phosphate pathway.
Biosynthesis of hexosamines. Biological role and synthesis of glycoproteins and glycolipids
- Betaoxidation of fatty acids. Metabolism of ketone bodies.
- Digestion of lipids. Synthesis of triglycerides and phospholipids.
- Synthesis of fatty acids.
- Biosynthesis of cholesterol and bile acids.

Basics of Foreign Language (module 3.)

Magyar orvosi szaknyelv 3.

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 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.

Course content of practical lessons:

- Lesson 1-2: What was your weekend like?
- Lesson 3-4: What did you yesterday?
- Lesson 5-6: Did you like the city?
- Lesson 7-8: Have you ever been to England?
- Lesson 9-10: What did you do on Monday?
- Lesson 11-12: Communication practice: What did you do?
- Lesson 13-14: What did your neighbour say?
- Lesson 15-16: Practising past tense
- Lesson 17-18: He didn't know that we were there. –Past tense
- Lesson 19-20: Communication practice – Practising past tense

- Lesson 21-22: Consolidation
- Lesson 23-24: Test 1 + situation
- Lesson 25-26: I'd like a ticket to London.
- Lesson 27-28: Travelling by train
- Lesson 29-30: Travelling abroad
- Lesson 31-32: Communication practice: travelling
- Lesson 33-34: Accommodation
- Lesson 35-36: Booking accommodation
- Lesson 37-38: Booking accommodation- conversations
- Lesson 39-40: At a hotel
- Lesson 41-42: Communication practise: travelling and booking accommodation
- Lesson 43-46: Customs and festivities – modal auxiliaries
- Lesson 47-48: At the dentist
- Lesson 49-50: Healthy lifestyle
- Lesson 51-52: Consolidation
- Lesson 53-54: Test – situation, communication practice
- Lesson 55-56: Assessment

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

Gyöngyösi Livia - Hetesy Bálint. *Hungarian language: Jó napot kívánok!* Semmelweis Egyetem Egészségtudományi Kar, 2011.

Basics of Foreign Language (module 4.)

Magyar orvosi szaknyelv 4.

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.

Course content of practical lessons:

- Lesson 1-4: Revision
- Lesson 5-6: Family history – asking for family members, names
- Lesson 7-8: Family history – describing state
- Lesson 9-10: Family history – communication practice

- Lesson 11-12: Social history – habits
- Lesson 13-16: Social history – expressing frequency
- Lesson 17-18: Body parts, internal organs
- Lesson 19-20: Symptoms
- Lesson 21-22: Consolidation
- Lesson 23-24: Test 1 + situation
- Lesson 25-28: Asking the patient about the pain
- Lesson 29-30: Describing pain and symptoms
- Lesson 31-32: Names of diseases
- Lesson 33-36: Taking medical history
- Lesson 37-40: Medication
- Lesson 41-48: Giving advice, doctor's recommendations
- Lesson 49-52: Consolidation
- Lesson 53-54: Test – situation, communication practice
- Lesson 55-56: 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.

SUMMER PRACTICAL TRAINING PROGRAM I.

Four weeks: 35 hours/week, min. 6/max. 8 hours/day. The aim of the summer practical training: getting acquainted with the pharmacy as a sanitary unit.

Duties and respects:

- 1 Survey of duties in a public pharmacy of drug dispensing.
- 2 Introduction to the structure of a public pharmacy: rooms, office, laboratories, stores etc., accessories.
- 3 Knowledge related to the storage of drugs in a pharmacy.
Storage of drugs according to their activity, strength etc.
- 4 Accessories in a public pharmacy. Practising their use, working with pharmacy balances etc.
- 5 Examination of chemical and crude drugs already learnt in the 1st–4th semesters. (Knowledge of materials, organoleptic, physicochemical methods etc.)
- 6 Practising of some pharmaceutical technological manipulations: measuring, compounding, sieving, milling filtration, homogenization of powders, ointments etc.
Getting acquainted with the equipments of these manipulations.
Right selection of the accessories: scale, scale-relations, place etc.
- 7 Drug dispensing according to regulations. Corking of flasks for solutions, signal-signature, packing, presentation. Esthetic demunt.
- 8 Labour safety in a pharmacy. (Inflammable, explosive goods, acids, corrosive chemicals etc.)

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!

NOTE

STUDY PROGRAMME



Faculty of Pharmacy
3rd year

Third Year

5 th semester						
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination	
Biochemistry II. Practice GYOBIBKIG2A	–	1,5	0	GYZKSZKE2A GYOBIBKE1A	Organic Chemistry II. Biochemistry I.	signature
Biochemistry II. GYOBIBKE2A	2,5	–	3	GYOBIBKE1A GYNYELATG1A	Biochemistry I. Medical Terminology	final #
Physiology I. Practice GYKIKELG1A	–	1	2	GYOBIBKME1A GYNYELATG1A	Biochemistry I. Medical Terminology	practical course grade
Physiology I. GYKIKGELE1A	5	–	4	GYOBIBKME1A GYNYELATG1A	Biochemistry I. Medical Terminology	semi-final
Pharmaceutical Chemistry I. GYGYKGYKG1A	4	5	8	GYASKAKE2A GYZKSZKE2A GYFKTFIKG2A GYNYELATG1A	Analytical Chemistry (quantitative) II. Organic Chemistry II. Physical Chemistry II. Medical Terminology	practical course grade
Pharmaceutical Technology I. GYGYGYTG1A	2	3	5	GYZKSZKE2A GYKOLKOLE1A GYFKTFIKG2A GYNYELATG1A	Organic Chemistry II. Colloid Chemistry I. Analytical Chemistry (quantitative) II. Medical Terminology	practical course grade
Basic Immunology GYGENIMUE1A	2	–	2	GYGENBILE2A GYNYELATG1A GYHUMANAE1A	Biology II. Medical Terminology Anatomy	semi-final
Colloid Chemistry II. GYKOLKOLG2A	–	2	2	GYKOLKOLE1A GYFKTFIKG2A GYZKSZKE2A	Colloid Chemistry I. Analytical Chemistry (quantitative) II. Organic Chemistry II.	practical course grade
Hungarian Medical Terminology V. GYLEKMSZG5A	–	4	2	GYLEKMSZG1A	Hungarian Medical Terminology IV.	final
Total Credit			28			

6th semester

Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
Physiology II. Practice GYKIKGELG2A	–	1	2	GYOBIBKIE2A GYKIKELE1A	practical course grade
Physiology II. GYKIKGELE2A	5	–	4		final #
Pharmacognosy I. Practice GYFMGGNDG1A	–	4	3	GYNOVGYNE2A GYOBIBKIE2A GYGYKGKG1A	practical course grade
Pharmacognosy I. GYFMGGNDE1A	2	–	3		semi-final
Pharmaceutical Chemistry II. Practice GYGYKYGK2A	–	5	4	GYKOLKOLG2A GYOBIBKIE2A GYGYKGKG1A	practical course grade
Pharmaceutical Chemistry II. GYGYGYKE2A	4	–	4		semi-final
Pharmaceutical Microbiology GYMIKGMIE1A	3	–	5	GYOBIBKIE2A GYKIKELE1A GYGENIMME1A	final #
Pharmaceutical Microbiology Practice GYMIKGMIG1A	–	2	–		signature
Pharmaceutical Technology II. Practice GYGYIGYT2A	–	5	4	GYOBIBKIE2A GYKOLKOLG2A GYGYIGYT1A	practical course grade
Pharmaceutical Technology II. GYGYGYTE2A	2	–	3		semi-final
Summer Practice II. ** GYSZGNSZG2A	–	35	4	GYGYGYKE2A GYGYKYGK2A GYGYGYTE2A	signature
Total Credit			32+4		

The grade influences the qualification of the diploma

** 4 weeks (140 hours) summer practice in elective place (accredited public / community pharmacy, Galenical laboratory, research institute, university department) after the second and third year.

LIST OF TEXTBOOKS (The list may change!)

- 1 Falus A.: Immunology. Bp. Semmelweis K. 2001.
- 2 Csemesz: Experimental Colloid Chemistry. Bp. (SOTE)
- 3 Hansen, Pedersen-Bjergard, Rasmussen: Introduction to Pharmaceutical Chemical Analysis (Wiley, 2012)
- 4 Mazák: Pharmaceutical Chemistry, The Quality Control of Medicinal Compounds and Pharmaceutical Preparations. BP. Semmelweis Publishers (2010)
- 5 Lemke, Williams, Roche, Zito: Foye's Principles of Medicinal Chemistry 7th ed. (Wolter Kluwer, 2013)
- 6 Rác: Drug Formulation (Bp.)
- 7 Rác: Pharmaceutical Technology – Part One (Bp.)
- 8 Rác: Pharmaceutical Technology – Part Two (Bp.)
- 9 Rác: Pharmaceutical Technology – Part Three (Bp.)
- 10 Murray P, Rosenthal K, Pfaller M: Medical Microbiology, 8th edition. Elsevier 2015. ISBN 9780323299565
- 11 Bruneton J.: Pharmacognosy Phytochemistry Medicinal Plants. Lavoisier Publ. 2nd ed. Paris, 1999. ISBN 1-898298 637
- 12 Dee Unglaub Silverthorn: Human Physiology – An Integrated Approach, 5th edition (Pearson Education, 2010)
- 13 Bray, J.J.-Cragg, P.A.-Anthony D.C: Macknight, Roland G. Mills: Lecture notes on human physiology. 4th ed. 1999. Blackwell Science. ISBN 086542-775-5
- 14 Abbas, Lichtmann, Pillai, Basic Immunology 5th Edition, Elsevier, 2015, eBook ISBN: 9780323400145, eBook ISBN: 9780323400114, eBook ISBN: 9780323400152, Paperback ISBN: 9780323390828

Recommended textbooks:

- 1 Guyton and Hall: Textbook of Medical Physiology 13th edition (Elsevier, 2016)
- 2 Ganong's Review of Medical Physiology 24th Edition (McGraw-Hill & Lange, 2012)
- 3 A. Fonyó: Principles of Medical Physiology (Medicina Publishing House, 2002)

PHARMACEUTICAL CHEMISTRY I.

Director: **Dr. Péter Horváth**

Tutor: **Prof. Dr. Krisztina Takács–Novák**

First Semester

Week	Lectures (4 hours per week)	Practicals (5 hours per week)
1	Introduction. (Pharmaceutical Chemistry, Pharmacopoeias) Methods for identification of inorganic compounds. Solubility, acidity-basicity.	Equipping, repetitional analytical tasks.
2	Preliminary testing of organic compounds, classification Identification of organic functional groups	Preliminary testing and systematization of inorganic and organic compounds official in Ph. Eur.
3	General purity tests in Pharmacopoeias	Preliminary testing and systematization of inorganic and organic compounds official in Ph. Eur.
4	Structural and physical chemistry of drug action I.-II.	General reaction of organic functional groups Analysis of IR spectra
5	Structural and physical chemistry of drug action III-IV.	General purity tests of inorganic ions I.
6	Narcotics Sedato-hypnotics and anxiolytics	General purity tests of inorganic ions II.
7	Major analgetics	General purity tests of inorganic ions III.
8	Minor analgetics	Complete pharmacopoeial qualification of an inorganic compound official in Ph. Eur.
9	Psychopharmacons	Narcotics, sedato-hypnotics
10	UV-VIS spectroscopy in the analysis of drug mixtures ORD and CD spectroscopy in the analysis of drug mixtures	Major analgetics I.
11	Separation techniques I.-V. Application of chromatographic methods for the drug analysis. TLC	Major analgetics II.
12	GC, HPLC, CE	Minor analgetics I.
13	Cholinergic and adrenergic agents	Minor analgetics II.
14	Cholinergic and adrenergic agents	Psychopharmacons

PHARMACEUTICAL CHEMISTRY II.

Second Semester

Week	Lectures (4 hours per week)	Practicals (5 hours per week)
1	Protonspeciation of drugs	Equipping, identification
2	Determination of protonation constants Optimization of pH-dependent processes	Drugs acting on the vegetative nervous system I.
3	Cardiac glycosides, sugars Analysis of cardiac glycosides, sugars	Drugs acting on the vegetative nervous system II.
4	Local anaesthetics	Local anaesthetics
5	Cardiovascular drugs: antiarrhythmic agents Cardiovascular drugs: antianginal agents	Digitalis glycosides, sugars
6	Cardiovascular drugs: antilipaeic agents Cardiovascular drugs: antihypertensive agents	Determination of protonation macroconstants
7	Diuretics	Determination of protonation microconstants
8	Vitamines	Determination of logP
9	Quality assurance, GLP, validation Non-steroid antiinflammatory agents	Diuretics
10	Corticosteroids Sexual hormones	Steroidal hormones
11	NMR: phenomena NMR: d, J, T1, T2	Complete pharmacopoeial qualification of an organic compound official in Ph. Eur.
12	NMR: multiplicity, 1D NMR NMR: spin echo, 2D NMR, MRI, MRS	Non-steroidal antiinflammatory agents
13	Desinfectants Chemotherapeutic agents: sulfonamides	Quality assurance, GLP, validation I.
14	Chemotherapeutic agents: antimalarial drugs, fluoroquinolones Antidiabetics	Quality assurance, GLP, validation II.

PHARMACEUTICAL TECHNOLOGY I.

Department of Pharmaceutics

Director: **Dr. István Antal**

Tutor: **Dr. Mária Hajdú**

First Semester

Lectures

History of pharmaceutical compounding and technology
 Dosage forms as drug carrier systems. Classification of dosage forms and routes of administration.
 Technological aspects of quality, safety, and efficacy.
 The tasks, construction, and equipments of a pharmacy. Storage of pharmaceuticals.
 Technological considerations of the pharmacopoeia (Eur. Ph.)
 Physical chemical principles in the pharmaceutical technology.
 Basic operations for pharmaceutical compounding.
 Liquid dosage forms. Theory and classification.
 Excipients for liquid dosage forms.
 Preparation of solution, aromatic water, syrup, mucilago, mixture, gargle, enema.
 Drops for internal and external use.
 Principle and practice of aseptic preparation. Eye drops.
 Preparations made by extraction.
 Disperse systems and their physical chemical characteristics.
 Emulsions.
 Suspensions.

Practice

Introduction, general information, labour safety.
 The prescription. Nomenclature.
 Weighing and balances. Control and measuring.
 Dose calculations. Reading prescriptions.
 Computer in the pharmacy practice.
 Preparation of simple solutions.
 Preparation of composite solutions.
 Preparation of drops.
 Preparation of ophthalmic solutions
 Preparation of decoctions and infusions.
 Preparation of suspensions without excipients.
 Preparation of suspensions with excipients.
 Preparation of emulsions
 Dispensing a test preparation independently.

PHARMACEUTICAL TECHNOLOGY II.

Second Semester

Lectures

Dosage forms with coherent structure
Semi-solid preparations. Classification and preparation.
Ointments, gels, pastes. Eye ointments.
Tests of semisolid preparations. Rheology and other characteristics.
Cosmetics.
Rectal and vaginal preparations.
Tests of suppositories.
Dosage forms prepared by aggregation. Pills, boluses, sticks, foams, medicated chewing gums.
Compounding powder preparations.
Compounding veterinary preparations.
Incompatibility problems I. Solutions.
Incompatibility problems II. Solid dosage forms
Incompatibility problems II. Other dosage forms and role of excipients.
Good Pharmacy Practice.
Laws governing the pharmacy practice.

Practice

Formulae Normales: the guide for pharmaceutical compounding in Hungary.
Preparation of ointments of solution and emulsion type.
Preparation of ointments of emulsion and suspension.
Preparation of ointments of composite type.
Directions of eye ointments and gels. Preparations of eye ointments.
Preparation of pastes.
Preparation of cosmetics.
Preparation of suppositories by cold compression and by moulding.
Preparation of vaginal preparations.
Preparation of pills.
Preparation of multidose powders. Topical powders.
Preparation of single-dose powders. Division of powders. Manual capsule filling machine.
Preparations of veterinarian preparations.
Guidelines for the preparation of incompatible drugs.
Incompatibility problems of solutions
Incompatibility problems of powder mixtures.
Incompatibility problems of emulsions.
Incompatibility problems ointments.
Health accessories in pharmacy.
Dispensing a test preparation independently.

PHARMACOGNOSY I.

Director: **Dr. Szabolcs Béni**

Lecturer: **Prof. Ágnes Kéry, Dr. László Kursinszki, Dr. Szabolcs Béni, Dr. Anna Blázovics**

Tutor: **Dr. Anna Bucsy-Sólyomváry**

Second Semester

Lectures (2 hours per week)

Pharmacognosy, History of pharmacognosy.

Medicinal plant - herbal drug. Nomenclature. Classification of herbal drugs.

From plant to phytopharmaceutical (phytotherapy).

Sources of drugs, factors involved in the production of drugs. Quality control.

Compounds of primary metabolism.

Carbohydrates. Mono- and oligosaccharides and their drugs. Homogenous polysaccharides and their drugs.

Heterogenous polysaccharides: gums, neutral and acidic mucilages, pectins; polysaccharides from microorganisms and fungi. Algae polysaccharides.

Lipids. Generalities, vegetable oils, alkyne derivatives.

Amino acids (which are not constituents of proteins).

Cyanogenic glycosides, glycosinolates. Betalains.

Protein sweeteners. Lectins. Enzymes.

Compounds of special (secondary) metabolism.

Plant phenolics in general. Phenols, phenolic acids, derivatives and crude drugs.

Coumarins and coumarin containing drugs.

Medicinal application and toxicity.

Lignans, lignan containing drugs. Biological interest of lignans. Silybum marianum and its significance.

Flavonoids, chemical structure and classification, biological properties, use of flavonoid-containing drugs, therapeutical significans.

Chief flavonoid containing herbal drugs.

(Crataegus species, Ginkgo biloba, etc.)

Isoflavonoids, rotenoids, biological significance.

Anthocyanins, chief anthocyanin-containing drugs.

Phenoloids in Zingiberaceae family (diarylheptanoids and arylalkanonones)

Tannins. Classification of tannins. Structures and properties of hydrolyzable and condensed tannins, biological significance. Chief tannin-containing drugs.

Polyketides-quinones. Naphthoquinone-containing drugs. Laxative hydroxyanthraquinone glycosides.

Pharmacological properties.

Main hydroxyanthraquinone glycoside-containing drugs.

Naphthodianthrone and diterpene quinone containing drugs.

Hypericum perforatum.

Orcinol and phloroglucinols. Cannabis.

Humulus lupulus.

Practicals (4 hours per week)

Introduction, safety rules. Macroscopic and microscopic knowledge.

European Pharmacopoeia.

General methods in pharmacognosy.

Vegetable drugs containing carbohydrates. (Starches, mucilages, etc.)

Plant acids and their drugs.

Plant lipids and their drugs.

Phenolglycosides, flavonoids, anthocyanins and chief drugs I.

Phenolglycosides, flavonoids, anthocyanins and chief drugs II.

Lignans, Coumarins and diarylheptanes.

Tannins and chief tannin drugs.

I. Methods used in tannin chemistry.

Tannins and chief tannin drugs II. Mass spectrometry of tannins, determination of procyanidins.

Anthraglycoside containing crude drugs I.

Chemical tests.

Anthraglycoside containing crude drugs II.

Quantitative determinations.

Terpenophenoloid and phloroglucine derivatives.

Personal task.

BIOCHEMISTRY II.

Department of Medical Biochemistry

Lecturer: **Dr. Attila Ambrus**

Tutor: **Dr. Erzsébet Maróthy-Tóth**

First Semester

Lectures (2,5 hours per week)

Lipid metabolism: Intestinal absorption of lipids. Plasma lipoproteins and lipid transport. Outline of triacyl glycerol metabolism. Regulation of lipid metabolism: lipogenesis and lipolysis. Metabolism of steroid hormones.

Metabolism of steroid hormones. Metabolism of arachidonic acid, eicosanoids. Nutritionally essential amino acids. Interconversion. of amino acids: transamination. Overall aspects of amino acid metabolism. Amino acid catabolism. Fate of nitrogen: Deamination. Elimination of ammonia: The urea cycle. Biosynthesis of nonessential amino acids. Metabolic fates of individual amino acids: glycogenic and ketogenic amino acids. Amino acid decarboxylation: biogen amines. Nucleotide metabolism: biosynthesis and catabolism of purine and pyrimidine nucleotides. Physical properties of DNA. Structure of DNA (A, B, Z-DNA). Topoisomerases. Supercoiling of DNA. The structure of nucleosome. Replication in procaryotes. DNA polymerases. Okazaki fragments. DNA ligase. The mechanism of replication. Origin of replication. Replication of eukaryotic cells. The cell cycle. DNA polymerase alpha, beta, gamma and delta. Mutations, Ames test. The repair processes. Excision repair of UV-induced thymine-thymine dimmers. The different types of RNAs. Prokaryotic transcription. The role of sigma factor. The operon model. The lac and trp operons. Eukaryotic replication. Transcription factors. Enhancers. The maturation of the different RNAs. Splicing. Translation. The genetic code. Initiation, elongation and termination. Signals for protein sorting. Biochemical preparations in therapy. Biotechnological methods for drug preparation. Recombinant DNA technology. Therapy of the diseases (inherited enzymopathies) by biochemical preparations.

Practicals

(1,5 hours every **second** week)

Seminar: Lipoprotein lipase and carnitine deficiency

Seminar: Pyruvate dehydrogenase and pyruvate carboxylase deficiency

Seminar: Liver failure

Midterm: lipids and amino acids

Seminar: Vitami B12 and folate deficiency

Midterm: nucleotides and macromolecules

Microsomal drug metabolism. Microsomal mono-oxygenase system: induction of cytochrome P-450.

Seminar: gene therapy

Conjugation reactions in detoxification.

Mechanism of the regulation of biomechanical pathways by hormones. Biochemistry of the hormonal action.

Receptors, classification of receptors. The ion channels.

Calcium homeostasis.

The signal transduction: the G-proteins, role of the adenylate cyclase and phosphoinositol system in signal transduction. The protein kinases and phosphorylation of specific proteins.

Interaction of receptors and hormones. Mechanism of Consultation.

neurotransmission. The cholinergic and adrenergic transmission. The insulin and steroid receptors.

COLLOID CHEMISTRY II.

Tutor: **Dr. Ferenc Csémpesz**

First Semester

Practice (2 hours per week)

- Surface and interfacial tensions
- Measurement of the surface, the tension of aqueous surfactant solutions.
- Determination of oil/water and oil/ solution interfacial tensions.
- Adsorption at interfaces
- Determination of vapour adsorption isotherm by gravimetric method.
- Adsorption from solution; determination of adsorption isotherm for methylene blue on cellulose.
- Wetting of solid surfaces
- Determination of contact angles. Flotation of kaolin suspensions by cationic surfactants, characterization of the wetting properties of kaolin particles.
- Stability of colloidal dispersions
- Determination of critical coagulation concentration of electrostatically stabilized sols.
- Flocculation and stabilization of sols by uncharged polymers and polyelectrolytes.
- Electrokinetic phenomena
- Measurement of electrophoretic mobility by moving boundary method, determination of zeta potential.
- Separation to components of a dye mixture by zone electrophoresis.
- Suspensions and emulsions
- Determination of particle size distribution by Andreasen pipette.
- Determination of apparent viscosity of concentrated suspensions, investigation of thixotropy. Preparation of emulsion by dispersion method, determination of the type of emulsion. Measurement of the viscosity of concentrated emulsions by rotational viscometric method.
- Association colloids
- Determination of critical micelle formation concentration by conductometric titration. Solubilization of organic acids, determination of solubilization saturation.
- Macromolecular colloids
- Determination of the relative molecular mass of polymers by viscosity measurements. Dependence of the viscosity of polyelectrolyte solutions on pH.
- Phase states and structures of polymers
- Determination of the thermomechanical curve of a polymer by Höppler consistometer. Determination of the relative deformation of a polymer at various loading times.

PHYSIOLOGY I.

First Semester

Week	Lecture (5 hours per week)
1	Historic overview, concepts of physiological control, homeostasis. Basics in cell physiology. Cell-to-cell interactions. Cellular membranes and transmembrane transport. Membrane receptors. Ionic equilibria and resting membrane potentials, ion channels and gates. Action potentials, synaptic transmission.
2	Muscle. Contractile mechanism. Skeletal, cardiac, and smooth muscles. Biomechanics, electrical properties, metabolism.
3	Physiology of blood circulation. Introduction. Functional organization of the cardiovascular system, basic principles and conditions of its healthy functioning. Dynamics of blood and lymph flow: Physiological functions of the blood vessels, their significance in the healthy functioning of the organism. Principles of hemodynamics. Rheology of blood.
4	Biomechanical properties of the vessel wall. Significance of vessel geometry. Signal transduction in the blood vessels. Pressure & flow in large vessels. Circulatory resistance. Measurement of pressure, flow and cardiac output. Factors influencing blood pressure. Venous circulation.
5	Cardiac functions: Biomechanical basis of cardiac functions. Cardiac pump. Signal transduction in the cardiomyocytes.
6	Cardiac cycle. Electrical activity of the heart. Transmembrane potentials. Conduction in cardiac fibers, cardiac excitability, cardiac rhythmicity, electrocardiography.
7	Microcirculation. Tissue oxygenization. Fluid movement across the capillary wall. Control of lymphatic flow and interstitial fluid volume.
8	Cardiovascular control mechanisms: Systemic control mechanisms. Local control mechanisms. Control of cardiac output.
9	Circulation through organs and special regions: Coronary circulation. Circulation of blood and cerebrospinal fluid in the brain. The blood-brain barrier. Regulation of cerebral circulation. Brain metabolism & oxygen requirements.
10	Splanchnic circulation. Circulation through skeletal muscles. Circulation of the skin. Thermoregulation. Placental & fetal circulation. Physiological aspects of circulatory shock.
11	Pulmonary circulation. Structure and function of the respiratory system, pulmonary mechanics. Gas transport between the lungs and the tissues. Regulation of RBC count - erythropoietin, acclimatization.
12	Regulation of respiration: Neural and chemical control of respiration. Adaptation of cardiorespiratory system and skeletal muscle to physical exercise.
13	Whole body metabolism. 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.
14	Liver & biliary system. Digestion & Absorption. Carbohydrates, lipids and proteins. Absorption of water and electrolytes. Absorption of vitamins and minerals.

Practice and consultation (2 hours biweekly)

Recording of compound action potential of the frog sciatic nerve, Sim Nerve
 Experiments on the rat nerve-muscle preparation, Sim Muscle
 Experiments on isolated rat heart, Sim Heart
 Smooth muscle activity of isolated, superfused muscle strips, Sim Vessel

PHYSIOLOGY II.

Second Semester

Week	Lecture (5 hours per week)
1	Formation and excretion of urine. Physiological functions, their significance in the maintenance of the internal milieu and in healthy functioning of the organism. Renal circulation. Glomerular filtration.
2	Tubular functions. Mechanisms adjusting the composition of urine. Fluid compartments. Regulation of extracellular fluid composition and volume. Role of the kidneys in the control of blood pressure. Micturition.
3	Regulation of acid-base balance.
4	General principles of endocrine physiology. The pituitary gland. Posterior lobe hormones. Anterior lobe hormones. Growth hormone and physiology of growth.
5	The adrenal cortex. 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.
6	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. Hormonal control of intermediary metabolism.
7	The reproductive glands. Development and function of the reproductive system. The female reproductive system. The menstrual cycle. Ovarian hormones. Control of ovarian function. Pregnancy. Lactation. The male reproductive system. Endocrine function of the testes. Control of testicular function.
8	Principles of sensory systems. Sensory receptors. Electrical and ionic events in receptors. "Coding" of sensory information. Somatosensory functions. Cutaneous, deep and visceral sensation; pathways. Pain. 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.
9	Spinal organization of motor function. Monosynaptic reflexes. Polysynaptic reflexes. Spinal reflexes. Ascending and descending pathways. Spinal and supraspinal control of muscular tone. Effects of lesions. Spinal shock.
10	Control of posture and movement. The vestibular system. Basal ganglia. Cerebellum. Lateral and medial descending pathways involved in motor control (spinal integration, medullary, midbrain and cortical components).
11	The visual system. The image-forming mechanism. The photoreceptor mechanism: Genesis of action potentials. Responses in the visual pathways and cortex. Color vision. Eye movements
12	The auditory system. Chemical senses. Olfactory receptors and pathways. Physiology of olfaction. Taste receptor organs and pathways. Physiology of taste.
13	The autonomic nervous system and its central control. Anatomic organization and chemical transmission. Adrenal medulla. Control of autonomic functions.
14	Neural basis of instinctual behavior. The integrative role of the hypothalamus. Limbic functions. Sexual, maternal and feeding behavior. Fear and rage. Motivation. Emotion. "Higher functions of the nervous system". Conditioned reflexes, learning and related phenomena. Learning and memory. Functions of the neocortex.

Practice and consultation (2 hours biweekly)

Indirect measurement of arterial pressure and recording heart sounds

Kidney function

Determination of parameters of acid/base equilibrium

Endocrinology lab

Electroencephalogram (EEG) experiment

PHARMACEUTICAL MICROBIOLOGY

Program director: **Prof. Dr. Éva Ádám**

Tutor: **Dr. Orsolya Dabai**

Second Semester

Lectures (3 hours per week)

Introduction. Short history, subject and aim of Microbiology. Occurrence and importance of microorganisms in the nature. General microbiology. Microbial genetic. Principles and practice of sterilization. Sterile pharmaceutical products. Sterility control. Contamination of non-sterile pharmaceuticals in hospital and in community environment. Chemical disinfectants, antiseptics and preservatives. Types of antibiotics and synthetic antimicrobial agents. Mechanisms of action of the antibiotics. Bacterial resistance to antibiotics. Interactions Principles of microbial pathogenicity and epidemiology. Immunity to microbes. Active and passive immunization. Bacteria causing purulent diseases. Bacteria causing enteric diseases. Causative agents of respiratory tract. Aerobic and anaerobic endospore forming bacteria. Other anaerobic microbes. Spirochetes. Rickettsiae. Chlamydia. Mycoplasmas Parasitology (parasites and helminths). Causative agents of human mycosis and their therapy. General virology. Interactions between viruses and the human host. Characterization of virus Families causing human diseases. Respiratory pathogen viruses and the most important diseases. Enteric viruses and diseases caused by them. Hepatitis viruses. Arthropod-borne viruses and diseases caused by them. Other important virus caused diseases. Slow virus infections. Conventional and non-conventional agents. Prions. AIDS. The role of viruses in carcinogenesis. Antiviral chemotherapy. Interferon. Immunity to viral infections. Application of microorganisms in the pharmaceutical sciences. Production of therapeutically useful substances by recombinant DNA technology. New ways in vaccine production. The manufacture and quality control of immunological products. Importance of nosocomial infections. Factory and hospital hygiene and good manufacturing practice.

Practices (2 hours per week)

Introduction to basic microbiology. Laboratory rules. Morphology of bacteria (Microscopic examinations I.) Morphology of bacteria. Staining procedures (Microscopic examinations II.) Methods for cultivation of bacteria. Examination of biochemical activity of microorganisms I. Colony morphology of bacteria. Examination of biochemical activity of microorganisms II. Laboratory procedures of sterilization and disinfection. Antibiotic susceptibility of bacteria. In vitro antigen-antibody reactions (serological reactions). Bacteria causing purulent diseases Bacteria of the respiratory tract I. Bacteria of the respiratory tract II. Normal flora and pathogens of the gastrointestinal tract. Aerobic and anaerobic endospore forming Bacteria. Spirochetes. Chlamydiae. Morphology and cultivation of human pathogen Fungi. Medically important protozoans. Medically important helminths. Cultivation of viruses. Virus-cell interactions. Bacteriophages. Medical virology. The most important viral diseases: prevention and therapy.

In the course of laboratory practices, the students of Faculty of Pharmacy become acquainted with the most important methods used for microbiological diagnosis of human pathogen bacteria, viruses and parasites.

Note: The maximum number of the absences in the semester is 3. More than 3 absences invalidate the semester.
During the semester two midterms should be passed.
Practical course grade. Final examination.

BASIC IMMUNOLOGY

Department of Genetics, Cell and Immunobiology

Course director: Prof. Dr. Edit Buzás

Tutor: Dr. Marianna Csilla Holub

Subject code: GYGENIMM1EA

Prerequisite subject: Biology II., Anatomy, Medical Terminology

Credits: 2

Lectures (2 hr / week)

1. The role, processes, organs and cells of the immune system
2. Principles of natural immunity
3. The complement system
4. Inflammation, acute phase reaction, neuro- and psychoimmunology
5. Antigen, antigen presentation and MHCs
6. Antigen receptors and their formation
7. T lymphocytes and cell-mediated immune response
8. B lymphocytes and humoral immune response
9. Hypersensitivity
10. Midterm exam (written)
11. Immune response in infections, immunodeficiencies
12. Natural and pathological autoimmunity
13. Immunology of transplantation, pregnancy and antitumor immunity
14. Immunopharmacology and review
(The sequence of lessons may change.)

75% minimum attendance of the lectures is necessary for the end-term signature.

Exam: written test in the exam period. For passing you have to reach more than 50 % of the exam scores. If the student earns more than 50 % exam scores and has reached level 5 or 4 on the mid-term, exam scores will be supplemented with some bonus points.

Literature:

The course textbook is: Abbas, Lichtmann, Pillai, Basic Immunology 5th Edition, Elsevier, 2015, eBook ISBN: 9780323400145, eBook ISBN: 9780323400114, eBook ISBN: 9780323400152, Paperback ISBN: 9780323390828

Other information: gsi.semmelweis.hu (The user name and password is on the course datasheet of the Neptun.)

CLINICAL PHYSIOLOGY LABORATORY MEASUREMENTS

GYKIKKFVE1A

Elective course for pharmacy students in the 3rd, 4th and 5th years.

The purpose of the subject is to familiarize pharmacy students with the background, uses and implementation of clinical diagnostic measurement techniques which are closely related to the knowledge acquired on the physiology course. The course provides theoretical and practical knowledge which helps to integrate basic physiology in the broader scope of clinical and pharmaceutical sciences. Moreover, the subject helps to develop fundamental skills which are relevant for proficient medical professionals (measurement skills, presentation of precise documentation, cooperativity etc.).

Program:

Theoretical course:

1st week	Introduction to the bases of measurement techniques.
2nd week	Scientific and diagnostic measurement techniques for studying the electrophysiology of motor nerves, neuromuscular transmission and skeletal muscle.
5th week	Electrophysiology of the heart, cardiac arrhythmias. Regulation of arterial blood pressure under physiological and pathophysiological conditions. The characteristics of the pulse wave propagation.
7th week	Mechanical properties of the respiratory system under physiological conditions and in respiratory diseases. Adaptation of the cardiorespiratory system to physical exercise.
9th week	Regulation of carbohydrate metabolism and its disorders.
11th week	Reflexes of the somatic nervous system. Function of the vestibular system. Regulation of body position under physiological conditions and in neural disorders.
13th week	Consultation

Practical course:

2nd week	Introduction to the uses of instruments and data acquisition software applied during the course
4th week	Electromyography, electroneurography. Study of the electrical properties of the skeletal muscle, measurement of the impulse conduction velocity of a motor nerve by Biopac student lab system.
6th week	Measurement of pulse wave velocity. Recording and analysis of a 12-lead ECG. Demonstration of pathological ECG recordings.
8th week	Spirometry. Studying the circulatory and respiratory adaptation responses during physical exercise
10th week	Oral glucose tolerance test, determination of HbA _{1c} level, analysis of normal and pathologic glucose tolerance curves.
12th week	Neurological examination techniques: examination of motor reflexes and vestibular function, EOG.
13th week	Optional lab retake.
14th week	Repetition and practice for the practical exam

Acknowledgement of the course: Attendance of at least 6 lab practices and 5 theoretical classes; presentation of the completed lab manual to the tutor. Semifinal exam. Two (2) credit points will be provided after a successful completion of the course.

Hungarian Medical Terminology V. (5th semester)

Magyar orvosi szaknyelv 5.

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 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.

COMPULSORY SUMMER PRACTICE II.

Program

Four weeks: 35 hours/week; min. 6 max. 8 hours/day.

The aim of summer practical training: to deepen theoretical and practical knowledge of Pharmaceutical Technology learnt in the 3rd year; adaptation of basic knowledge (chemistry, physics, colloids, physiology etc.) to the practical work in pharmacies.

Duties and respects:

1. Appreciation of prescriptions, reading of prescriptions (Formula Magistralis, Formula Normales, Formula Originalis). The forms of dispensing, dose calculating etc. Preparation of medicaments (Formula Magistralis) under supervision of the instructing pharmacist.
2. Prescriptions and regulations of narcotics
3. Various dosage forms (solutions, suspensions, emulsions, ointments, solid dosage forms etc.), their preparation.
4. Practising of the pharmaceutical technological manipulations, procedures etc.
5. Aseptic production of medicaments. Main technological steps.
6. Guidelines for the preparation of incompatible drugs. Preparation of these medicaments.
7. Health accessories.
8. Control of medicines and raw materials in the pharmacy. Administration in the pharmacy.
9. Organization of drug supply.

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!



Faculty of Pharmacy
4th year

STUDY PROGRAMME

Fourth Year

The prerequisite to start 4th year is to take a Basic Hungarian Language Exam (oral).

7 th semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
Pharmacognosy II. Practice GYFMGNGDG2A	–	4	3	Pharmacognosy I. Pharmaceutical Chemistry II.	practical course grade
Pharmacognosy II. GYFMGNGDE2A	2	–	3	GYFMGNGDE1A GYGYGYKE2A	final #
Pharmaceutical Chemistry III. Practice GYGYGYKG3A	–	4	3	Pharmacognosy I. Pharmaceutical Chemistry II. Pharmacognosy I. Pharmaceutical Chemistry II.	practical course grade
Pharmaceutical Chemistry III. GYGYGYKE3A	2	–	3	Pharmacognosy I. Physiology II. Pharmacognosy I. Physiology II.	final #
Pharmacology and Toxicology I. Practice GYGYHHATG1A	–	2	2	Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology	practical course grade
Pharmacology and Toxicology I. GYGYHHATE1A	4	–	4	Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology	semi-final
Pharmaceutical Technology III. Practice GYGYGYTG3A	–	9	5	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	practical course grade
Pharmaceutical Technology III. GYGYGYTE3A	3	–	4	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	semi-final
Basic Medical Pathophysiology I. GYGYHKKAE1A	2	–	2	Physiology II. Pharmaceutical Microbiology	semi-final
Industrial Pharmaceutical Technology I.* GYGYIIGTE2A	2	–	2	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	semi-final
Total Credit			31		

8 th semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
Pharmacology and Toxicology II. Practice GYGYYHATG2A	–	2	2	GYGYHHATE1A GYGYGYKE3A GYGYGYTE3A GYGYHKKAE1A	practical course grade
Pharmacology and Toxicology II. GYGYHHATE2A	4	–	4	GYGYHHATE1A GYGYGYKE3A GYGYGYTE3A GYGYHKKAE1A	final #
Pharmaceutical Technology IV. Practice GYGYGYTG4A	–	9	6	GYGYGYKE3A GYGYGYTE3A GYFMMGND2A	practical course grade
Pharmaceutical Technology IV. GYGYGYTE4A	3	–	4	GYGYGYKE3A GYGYGYTE3A GYFMMGND2A	final #
Pharmacy Administration I. GYGYGSZE1A	2	–	2	GYINFBEE2A GYGYTTPE1A GYGYGYTE3A	semi-final
Basic Medical Pathophysiology II. GYGYHKKAE2A	2	–	2	GYGYHKKAE1A GYGYHHATE1A	final #
Public Health GYNEINETE1A	2	–	2	GYKIKGELE2A GYMIKGMIE1A	final #
Public Health Practice GYNEINETG1A	–	2	2	GYKIKGELE2A GYMIKGMIE1A	practical course grade
Written scientific thesis (diploma work) I. GYSZSDZG1A	–	4	0	All of the 7 th semester subjects	signature
Industrial Pharmaceutical Technology II. * GYGYNINPE2A	2	–	2	GYGYNINPE1A GYGYGYTE3A	semi-final
Total Credit			26		

The grade influences the qualification of the diploma

*Obligatory elective subject

LIST OF TEXTBOOKS (The list may change!)

- 1 Rang H.P.-Dale M.M.-Ritter J.M.-Moore P.K.: Pharmacology. 5th ed. Churchill Livingstone, 2003. ISBN 0 443 071454
- 2 Hadházy P.: The Basis of Functional and Medical Pathology. Bp.
- 3 The New Public Health: An Introduction for the 21st Century. By: T.Tulchinsky, E.A.Varavikova. 2000. ISBN 0-12-703350-5
- 4 Dandy, D.J.: Essential Orthopaedics and Trauma. 2nd ed. 1989. Churchill Livingstone.
- 5 Z.Vincze: Pharmacy Administration. Lecture notes.

Recommended textbooks:

- 1 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. Bp. SOTE 1992.
- 2 C. Edwards-P. Stillman: Minor Illness or Major Disease? (Ph. P. Pharmaceutical Press, 2000.) ISBN 0 85369 447 8

PHARMACEUTICAL CHEMISTRY III.

Director: **Dr. Péter Horváth**

First Semester

Week	Lectures (2 hours per week)	Practicals (4 hours per week)
1	Antibiotics I.	Equipping, identification
2	Antibiotics II.	Desinfectants, chemotherapeutics
3	Antibiotics III.	Antibiotics
4	Analysis of drug mixtures I.	Identification of drug mixtures
5	Analysis of drug mixtures II.	Identification of drug mixtures
6	Analysis of drug mixtures III.	Quantitative determination of drug mixtures
7	Anticancer agents	Quantitative determination of drug mixtures
8	Antiviral agents	Quantitative determination of drug mixtures
9	Lipophilicity in drug research	Quantitative determination of drug mixtures
10	Rational methods of drug design I.	Quantitative determination of drug mixtures
11	Rational methods of drug design II.	Quantitative determination of drug mixtures
12	Lead compound discovery strategies I.	
13	Lead compound discovery strategies II.	
14	Antihistamines	

PHARMACEUTICAL TECHNOLOGY III-IV.

Department of Pharmaceutics

Director: **Dr. István Antal**

First Semester

Lectures

Scope of industrial pharmaceutical technology. History and development.

Aspects of the pharmaceutical development. Preformulation studies.

Applying principles of chemical engineering for the manufacturing of pharmaceutical preparations.

Critical manufacturing parameters and principles of scaling up.

Requirements and conditions for manufacturing (Good Manufacturing Practice)

Quality assurance and manufacturing. Safety regulations.

Validation. Concepts of the statistical process control.

Basic procedures: comminution, powdering, sieving.

Basic procedures: separation, filtering, settling, extraction.

Basic procedures: homogenization, dispersing, distillation, evaporation.

Basic procedures: fluidization.

Basic procedures: drying.

Basic procedures: freeze-drying.
Basic procedures: crystallization.
Sterilization.
Formulation of parenteral preparations.
Manufacturing of large and small volume parenterals.
Pyrogenicity. Endotoxins.
Stability of pharmaceutical preparations. Stability tests. Stabilization methods.
Preparations for inhalation. Aerosols.

Practice

Pilot plant laboratory

Controlling the drying process.
Study of the filtration process.
Mixing of solids.
In-process control of the homogenization process.
Study on parameters of fluidization.
Investigations of factors affecting the size reduction in ball-mill.
Control of raw materials.
Preparation and stability test of emulsions.
In-process control of manufacturing solid dosage forms.
Manufacturing suppositories. Determination of the replacing factor.

Laboratory for parenteral preparations

Aseptic processing.
Autoclaving.
Determination of inside pressure of bottles at different filling volumes.
Preparation of dextrose infusion.
Preparation of mannitol infusion.
Filtration by frame filter.
Control of infusions and injections containing dextrose (pH, refractive index, degradation product).
Preparation and control of infusions containing electrolytes and sugars.
Preparation of infusions used in acidosis.
Determination of endotoxin concentration in parenteral solutions by the quantitative LAL test.
Adjustment of isotonicity.

Chemical laboratory

Control of the formation of calcium acetilsalicylate with oscillometry.
Acid neutralizing tests of antacids (USP tests and "pH-stat" method).
Determination of the lipase activity.
Investigation on the catalytic oxydation of ascorbic acid.
Stability test of hydrocortisone-hemisuccinate solutions.
Stability test on the decrease of acetic acid content of Spiritus antirheumaticus.
Stability test of solutions containing penicillin.
Real-time stability test of tablets containing aspirin.
Accelerated stability test of solutions containing phenobarbital sodium.
Computer Aided Practice (accelerated stability testing).

Physical laboratory

Test of ion-exchange resins.
 Determination of the dissociation constant of drugs.
 Increasing of solubility of salicylic acid by changing permittivity.
 Concentration determination of sugar syrups by viscometry.
 Viscometric evaluation of macromolecular colloids used as stabilizers
 Investigation of phase-inversion of emulsions by viscometry.
 Determination of the average molecular mass of polyethylene glycols by viscometry.
 Determination of the critical micelle concentration by stalagmometry.
 Investigation of surfactants using the Donnan's pipette.
 Investigation of solubilization of volatile oils by aqueous titration method.
 Particle size analysis of suspensions by the Andreasen's cylinder.
 Particle size analysis of suspensions by the the Wiegner's tube.

Second Semester**Lectures**

Physical chemistry for solid dosage forms.
 Characterization of particle systems. Powder rheology.
 Granules and granulation.
 Pellets and pelletization.
 Capsules and microcapsules.
 The tablet compression process.
 Tablets and their characteristics. Testing tablets.
 Manufacturing methods and excipients for tablets.
 Coated dosage forms and the coating procedure. Coating materials.
 Traditional sugar coating and film-coating. Solvent-free coating.
 Dosage form design: modified drug release and prolonged action.
 Dosage form design: improving bioavailability and enhancement of absorption.
 Modern dosage forms: concepts of the therapeutic systems.
 Oral preparations with modified release.
 Locally applied therapeutic systems.
 Transdermal drug delivery systems.
 Alternative routes of drug administration.
 Colloidal drug delivery systems.
 Micro- and nanofabrication.
 Molecular pharmaceutics.
 Technological aspects of genomics and biopharmaceuticals.
 Technological aspects of veteriner drug delivery.
 Innovation and the pharmaceutical technology. Generics and supergenerics.

Practice*Pilot plant laboratory*

Preformulation studies and product development.
 Ointment preparation.
 Preparation of liquid dosage forms (solutions, elixirs, syrups, mixtures).
 In-process control tests for solutions.
 Tablet compression and in-process control of tablet manufacturing.
 Pellet preparation in a high-shear mixer

Preparation of coating dispersions.
Coating of pellets in fluid bed.
Coating of tablets.

Laboratory for parenteral preparations

Preparation of injections liable to hydrolysis.
Determination of the chloride ion concentration by ion selective electrode.
Filling and closing of ampoules.
Preparation and control of aerosols.
Preparation of heat sensitive injections.
Sterilization by membrane filtration. Integrity testing of membranes.
Nonaqueous injections.
Freeze-drying.
Preparation of injections liable to oxidation
Control of drug content of ascorbic acid injection
Preparation of suspension injections
Color determination of ascorbic acid injections
Isotonicity setting based on freezing point depression
Isotonicity setting based on sodium chloride equivalents

Chemical laboratory

Testing of containers (hydrolytic resistance; physical resistance; blister closing testing; light transmission test, adsorption test)
Investigation of the interaction between acetylsalicylic acid and caffeine.
Investigation of the interaction between papaverine hydrochloride and phenobarbital sodium with potentiometric method.
Investigation of the interaction between methyl-p-oxy-benzoate and macromolecules by dynamic dialysis.
Formulation of KCl prolonged release capsules and their dissolution test.
Dissolution test of aspirin containing tablets with rotating basket method.
Study on impurities by HPLC, GC/MS and LC/MS analytical methods.
Preparation of oxytetracycline containing microcapsules.
Testing dissolution profile of coated pellets.

Physical laboratory

Slipping-and drop point determination of ointment and suppository bases.
Study on drug release of suppositories.
Investigation of compression strength of suppositories.
Study of disintegration of suppositories.
Congealing-and softening point determination of ointment and suppository bases
Penetrometric test of ointments.
Study on the rheological behaviour of ointments with rotational viscometer.
Examination of drug distribution in suspension type suppositories.
Determination of the adsorptive surface of medicinal charcoal.
Study of polymorphism.
Determination of particle size and particle size distribution by sieve analysis.
Investigation of flow properties and real density of granules.
Investigation of disintegration of tablets and capsules.

PHARMACOGNOSY II.

Director: **Dr. Szabolcs Béni**

Lecturer: **Prof. Ágnes Kéry, Dr. László Kursinszki, Dr. Szabolcs Béni**

Tutor: **Dr. Anna Sólyomváry**

First Semester

Lectures (2 hours per week)

Terpenoids: biogenetic generalities.
 Classification. Regular and irregular monoterpenes, sesquiterpenes. Essential oils.
 Lamiaceae containing essential oils.
 Anise-flavored essential oils.
 Asteraceae containing essential oils.
 Iridoids. Chief iridoid containing drugs.
 Sesquiterpene lactones. Chief drugs containing sesquiterpene lactones.
 Diterpenes. Diterpene-containing drugs of potential interest. Triterpenes and steroids.
 Biosynthesis, classification.
 Saponins. Biological and pharmacological interest. Chief saponin containing drugs.
 Adaptogenes. Ginseng, Siberian Ginseng.
 Cardiac glycosides. Structures, chief vegetable drugs.
 Starting materials for steroid hormone semisynthesis.
 Other significant steroids and triterpenes.
 Carotenoids. Chief carotenoid-containing drugs.
 Alkaloids in general. Protoalkaloids and their chief drugs.

Alkaloids derived from ornithine and lysine.
 Tropane-, pyrrolizidine-, quinolizidine-, indolizidine-, piperidine alkaloids and their drugs.
 Alkaloids derived from nicotinic acid.
 Alkaloids derived from phenylalanine and tyrosine: phenethylamines-, isoquinolines-, benzyltetraisoquinoline-, phenethylisoquinoline alkaloids and their drugs.
 Alkaloids derived from phenylalanine and tyrosine: Morphinan alkaloids.
 Alkaloids derived from tryptophan: ergotene alkaloids, monoterpenoid indole alkaloids and chief drugs.
 Alkaloids derived from anthranilic acid: quinoline, quinazoline alkaloids. Alkaloids derived from histidine: imidazole alkaloids. Terpenoid alkaloids.
 Purine bases.
 Alkaloids with miscellaneous structure.
 Vitamins and vitamin containing drugs.
 Plants in complementary and traditional systems of medicine.
 Plants in prevention, Functional foods

Practicals (4 hours per week)

Essential oil containing drugs (Lamiaceae, Asteraceae, Apiaceae)

Methods in essential oil analyses (GC, TLC). Steam distillation of essential oils.

Bitter substances of plants.
 Classification, reactions, bitter value.

Saponins and chief saponin drugs.

Methods used in the identification and quality control of saponins.

Cardioactive glycosides and chief drugs.
 Methods used in the analyses of cardioactive glycosides.

Tropane, piridine and piperidine alkaloid containing drugs.
 Quantitative assays in alkaloid chemistry (titration)

Quinoline, isoquinoline and morphine group alkaloids, their chief drugs.

Methods in alkaloid chemistry: TLC, TLC-densitometry, spectrophotometry.
 Indol, purine alkaloids. Alkaloids with miscellaneous structure. Chief drugs.
 Methods in alkaloid chemistry: Column chromatography.

Practical examination.

Practical examination.

PHARMACOLOGY AND TOXICOLOGY I-II.

Department of Pharmacodynamics

Course Director: **Prof. Dr. György Bagdy**

Tutor: **Dr. Tamás Tábi**

First Semester

General principles of drug action: receptor theory
General principles of drug action
The fate of drugs in the body
Drug metabolism
Pharmacokinetics
Factors influencing the drug effect
Basics of clinical pharmacology
Chemical neurotransmission
Pharmacology of ANS
Chemical neurotransmission in the CNS
General anaesthetic agents
Narcotic analgesics: opioids
Drug abuse and drug dependence
Anxiolytic and hypnotic drugs
Drugs used in affective disorders
Antipsychotic drugs
CNS stimulants and appetite control
Antiepileptics and excitatory amino acid neurotransmitters
Neurodegenerative disorders
Local anaesthetics
Drugs acting on striated and smooth muscle
Drug interactions. Adverse effects
Toxicology

Second Semester

Histamine and antihistamines. Glucocorticoids
Immunopharmacology
Non-steroidal anti-inflammatory drugs
Antirheumatoid drugs
Basic principles of antibiotic chemotherapy
Sulphonamides. Fluoroquinolones. Beta-lactam antibiotics
Tetracyclines. Chloramphenicol. Macrolides
Aminoglycosides. Minor antibiotics
Antiprotozoal and antihelminthic drugs
Antifungal drugs
Antimycobacterial and antiviral drugs
Cancer chemotherapy I.
Cancer chemotherapy II.
Pharmacotherapy of heart failure
Diuretic drugs

Antidysrhythmic drugs
 Antihypertensive drugs
 Calcium-channel blockers
 Antianginal drugs
 Lipid-lowering drugs
 Haemostasis and thrombosis
 The haemopoietic system
 The respiratory system
 Pharmacology of the gastrointestinal system
 Pharmacology of the reproductive system
 Diabetes and antidiabetic drugs
 Pharmacology of bone metabolism
 Vitamins
 Pharmacology of the thyroid, retinoides

PHARMACY ADMINISTRATION I.

Faculty of Pharmacy

University Pharmacy Department of Pharmacy Administration

Director: *Prof. Dr. Romána Zelkó*

Tutor: *Dr. Ágnes Mészáros*

4th year term 2

Lecture

Objectives and research methods of pharmacy administration
 European Pharmacopoeia, Ph.Hg. VIII, FoNo VII.
 Managing health care
 Financial pressures and human resource management
 Resource allocation in health care
 Managing quality in health care
 Quality systems and total quality management
 Good Clinical Practice (GCP)
 European marketing authorisation procedures
 The registration dossier
 Legal regulations in health care
 Health promotion
 Good Pharmacy Practice (GPP)
 International pharmaceutical organisations
 Pharmaceutical ethics

BASIC MEDICAL PATHOPHYSIOLOGY I-II.

Institute of Pharmacodynamics

Course Director and Tutor: **Prof. Dr. Kornélia Tekes**

First Semester

Fundamental pathological processes
Psychiatry: diagnostic systems
Delirium, dementia, amnesic disturbances
Inflammation. Tissue repair. Pain. Edema
Injuries produced by high and low temperatures and electricity
Schizophrenia.
Depressive disorders
Anxiety disorders. Drug induced disorders
Sleep disorders.
Eating disorders. Impulse control disorders
Epilepsy.
Neurodegenerative disorders
Inflammatory diseases of the central nervous system
Headache.
Backache
Disorders of erythropoiesis and haemostasis
Varicose veins.
Thrombo-embolic disorders
Congestive heart failure.
Atherosclerosis
Ischaemic heart disease.
Cardiac arrhythmia
Inflammatory diseases of the heart
Hypertension.
Circulatory shock

Second Semester

Gastrointestinal disorders I
Gastrointestinal disorders II
Gastrointestinal disorders III
Respiratory diseases I.
Respiratory diseases II.
Genitourinary disorders
Infectious disorders I.
Infectious disorders II.
Ophtalmologic disorders I.
Ophtalmologic disorders II., Ear disorders
Endocrine and metabolic disorders I.
Endocrine and metabolic disorders II.
Musculoskeletal disorders
Immunologic disorders, Oncologic disorders
Dermatologic disorders, Consultation

PUBLIC HEALTH

Tutor: **Dr. András Terebessy**

Second Semester

Lectures (2 hours per week)	Practices (2 hours per week)
The development and role of public health in medicine. Basic principles of epidemiology and demography.	Introduction to Public Health. Principles of epidemiology of communicable diseases.
Global situation of communicable diseases in the world and in Hungary. Life expectancy, morbidity, mortality in Hungary.	Classification of communicable diseases. Disinfection and sterilisation. Laboratory investigations
The occurrences of communicable diseases. Surveillance. New immunizations, chemoprophylaxis.	Activity of doctors in case of communicable diseases. Immunisations: vaccines and sera. Nosocomial infections.
Infections of Gastrointestinal and Respiratory Tract.	Epidemiology I. (Most important rates and indices).
Haematogen infections and infections of the skin.	Epidemiology II. (Methods of epidemiology, calculations: standardisation, risk).
STD. AIDS/HIV. Viral hepatitis.	The role of the pharmacist in primary prevention of smoking, alcohol and drugs.
New, emerging diseases. Health care in case of disasters.	The role of the pharmacist in healthy nutrition and required physical activity.
Malnutritions. Nutrition related non infectious diseases. Vegetarianism.	Nutrition I. (Healthy nutrition. Assessment of nutritional status. Diet planning.)
Acute food-borne diseases.	Nutrition II. (Prevention of food – borne diseases)
Water hygiene.	Practical aspects of water hygiene.
Air-and soil hygiene.	Practical aspects of air hygiene.
Occupational risk factors, prevention of occupational diseases. Ionising and non-ionising radiation	Occupational diseases, accidents. Vibration, noise.
The health care system, quality assurance.	Toxicology. Radiation hygiene.
Maternal, infant child and youth health care.	Practical aspects of maternal, infant, child and young people hygiene.
Health promotion and health education.	Practical aspects of health education.

Practices are compulsory for each student.

The obligatory material for the final exam:

The material of the lectures and practices compulsory textbooks, see List of Textbooks

INDUSTRIAL PHARMACEUTICAL TECHNOLOGY I:

Dosage form and product development

Department of Pharmaceutics

Director: *Dr. István Antal*

First Semester

The subject is recommended for the students interested in several fields of industrial pharmaceutical technology such as research and development of new dosage forms and medicinal preparations.

Topics:

History of industrial pharmacy. Profiles of the pharmaceutical industry, career for pharmacists. Pharmaceutical technological aspects of product authorization. Evolution of dosage forms. Innovation and intellectual property. Preformulation and formulation studies. Optimization of dosage form composition. Control of active substance and excipients, physic-chemical and solid state characterization. Novel drug delivery systems. Design of the manufacturing process. Critical formulation attributes and process parameters. Comparison of scaling-up methods.

INDUSTRIAL PHARMACEUTICAL TECHNOLOGY II:

Operations and procedures

Department of Pharmaceutics

Director: *Dr. István Antal*

Second Semester

The subject is recommended for the students interested in several fields of industrial pharmaceutical technology such as operations and procedures in the manufacture of medicinal preparations.

Topics:

Evolution of pharmaceutical manufacturing operations and procedures. Novel technologies for the production of dosage forms. Quality by design, manufacturing related to quality assurance and quality control. Critical parameters in the production. In-process control methods. Process Analytical Technology. Novel analytical methods for testing production and product quality. Validation of the manufacturing method. Methods for statistical process control. Current Good Manufacturing Practice.

CLINICAL PHYSIOLOGY LABORATORY MEASUREMENTS

GYKIKKFVE1A

Elective course for pharmacy students in the 3rd, 4th and 5th years.

The purpose of the subject is to familiarize pharmacy students with the background, uses and implementation of clinical diagnostic measurement techniques which are closely related to the knowledge acquired on the physiology course. The course provides theoretical and practical knowledge which helps to integrate basic physiology in the broader scope of clinical and pharmaceutical sciences. Moreover, the subject helps to develop fundamental skills which are relevant for proficient medical professionals (measurement skills, presentation of precise documentation, cooperativity etc.).

Program:

Theoretical course:

1st week	Introduction to the bases of measurement techniques.
2nd week	Scientific and diagnostic measurement techniques for studying the electrophysiology of motor nerves, neuromuscular transmission and skeletal muscle.
5th week	Electrophysiology of the heart, cardiac arrhythmias. Regulation of arterial blood pressure under physiological and pathophysiological conditions. The characteristics of the pulse wave propagation.
7th week	Mechanical properties of the respiratory system under physiological conditions and in respiratory diseases. Adaptation of the cardiorespiratory system to physical exercise.
9th week	Regulation of carbohydrate metabolism and its disorders.
11th week	Reflexes of the somatic nervous system. Function of the vestibular system. Regulation of body position under physiological conditions and in neural disorders.
13th week	Consultation

Practical course:

2nd week	Introduction to the uses of instruments and data acquisition software applied during the course
4th week	Electromyography, electroneurography. Study of the electrical properties of the skeletal muscle, measurement of the impulse conduction velocity of a motor nerve by Biopac student lab system.
6th week	Measurement of pulse wave velocity. Recording and analysis of a 12-lead ECG. Demonstration of pathological ECG recordings. 8th week - Spirometry. Studying the circulatory and respiratory adaptation responses during physical exercise
10th week	Oral glucose tolerance test, determination of HbA1c level, analysis of normal and pathologic glucose tolerance curves.
12th week	Neurological examination techniques: examination of motor reflexes and vestibular function, EOG.
13th week	Optional lab retake.
14th week	Repetition and practice for the practical exam

Acknowledgement of the course: Attendance of at least 6 lab practices and 5 theoretical classes; presentation of the completed lab manual to the tutor. Semifinal exam. Two (2) credit points will be provided after a successful completion of the course.

NOTE



Faculty of Pharmacy
5th year

STUDY PROGRAMME

Fifth Year

9th semester (12 weeks)

Subjects	Lectures	Practices	Credit Points	Examination
Compulsory Practical Training I. (2 months) * GYSZGSZVG1A	–	40	8	practical course grade
Biopharmacy-Pharmacokinetics Practice GYGYIBFKG1A	–	3	2	practical course grade
Biopharmacy-Pharmacokinetics GYGYIBFKE1A	2	–	2	semi-final
Pharmaceutical Sociology, Ethics GYMAGGYEE1A	2,5	–	2	semi-final
Drug Therapy Practice GYGYHGTG1A	–	2	0	signature
Drug Therapy GYGYHGTRE1A	2	–	4	semi-final
Pharmacy Administration II. Practice GYEGYGSZG2A	–	2	2	practical course grade
Pharmacy Administration II. GYEGYGSZE2A	2	–	2	final #
Clinical Pharmaceutical Care GYEGYGYGE1A	2	–	4	semi-final
Clinical Pharmaceutical Care Practice GYEGYGYGG1A	–	3	–	signature
Written Scientific Thesis (diploma work) II. GYSZDSZDG2A	–	6	0	signature
Facultative subject 1.	3	–	2	semi-final
Facultative subject 2.	3	–	2	semi-final
Facultative subject 3.	3	–	2	semi-final
Total Credit			32	

10th semester (16 weeks)

Subjects	Lectures	Practices	Credit Points	Examination
Compulsory Practical Training I. (4 months) * GYSZGSZVG2A	–	40	16	Practical course grade
Diploma Defence GYSZDDIVE1A			10	final
Total Credit			26	

LIST OF TEXTBOOKS (The list may change!)

- 1 Walker Roger, Whittlesea Cate: Clinical Pharmacy and Therapeutics. 5th Edition, Churchill Livingstone Elsevier, 2012 eBook ISBN: 9780702048487
- 2 Z. Vincze: Pharmacy Administration. Lecture Administration.
- 3 Wells BG. et. al.: Pharmacotherapy Handbook. 10th ed. McGraw-Hill, New York, 2017
- 4 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

Recommended textbooks:

- 1 Herfindal-Gourley-Hart, L: Clinical Pharmacy and Therapeutics. Williams and Wilkins USA. ISBN 0 683 03966 0
- 2 Fincham, J.E.-Wertheimer, A.I: Pharmacy U.S. Health Care System. ISBN L-56024-097-0
- 3 Smith, M.C: Studies in Pharmaceutical Economics. ISBN 0-7890-0062-8
- 4 Ritschel, W.A.: Handbook of Basic Pharmacokinetics. Drug Intelligence Publ. Inc. Hamilton Press, 1999. ISBN 0-914768-40-9

CLINICAL PHARMACEUTICAL CARE

Faculty of Pharmacy

University Pharmacy Department of Pharmacy Administration

Director: **Prof. Dr. Romána Zelkó**

Tutor: **Dr. Ágnes Mészáros**

5th year term 1

Lectures

1. About clinical pharmacy
2. Pharmaceutical care
3. Individual therapy with magistral preparation
4. Clinical guidelines in the treatment of type 2 diabetes mellitus
5. Clinical guidelines in the treatment of hypertension
6. Special conditions influencing drug therapy
7. Clinical bio-analytical analyses
8. Therapeutic drug monitoring, Pharmacogenetics
9. Pediatrics
10. Total Parenteral Nutrition
11. Pharmaceutical care in asthma
12. Patient education in OTC products I.

Practical lessons

1. Pharmaceutical care in diabetes
2. Pharmaceutical care in hypertension
3. Surgery
4. Dermatology
5. Preparations for surgery, intensive therapy
6. Headache, depression, distress, insomnia
7. Patient education in OTC products I.
8. Patient education in prescription drugs
9. Patient education in OTC products II.
10. Drug information systems
11. Laboratory diagnostic
12. Adverse Drug reactions

BIOPHARMACY – PHARMACOKINETICS

Department of Pharmaceutics

Director: **Dr. István Antal**

Tutor: **Prof. Dr. Sylvia Marton**

First Semester

Lectures

Introduction into biopharmacy and pharmacokinetics. Terms and definitions.
 Modeling the fate of drugs in the body (LADME and other models).
 Transport processes and absorption mechanisms. Factors influencing the absorption.
 Basic concepts and importance of the Biopharmaceutical Classification System.
 Biopharmaceutical considerations of drug distribution and metabolism.
 Bioanalytical methods.
 Excretion and clearance of drug. The biological half-life.
 Bioavailability and influencing factors.
 Studies and regulations on bioequivalence.
 Importance of food-drug interactions.
 Compartmental and non-compartmental modeling.
 Physiologically based pharmacokinetic models.
 Pharmacokinetics of multiple dosing.
 In vitro – in vivo correlation and relationship.
 Pharmacokinetic and metabolism investigations during preclinical and clinical development.

Practices

Study on the distribution of salicylic acid in a three-phase system.
 In vitro test for drug liberation from a patch system.
 In vitro drug release from ointments with local effect.
 In vitro dissolution profile of conventional and modified release nitrofurantoin containing preparations.
 Determination of diclofenac sodium in synovial fluid samples.
 Urinary excretion kinetics of aspirin.
 Determination of theophylline plasma levels in beagle dogs after iv. administration.
 Determination of theophylline plasma levels in beagle dogs after po. administration.
 Calculation of bioavailability.
 Computer modeling and analysis in pharmacokinetics.
 Analyzing data to establish in vitro-in vivo correlation.

PHARMACEUTICAL SOCIOLOGY, ETHICS

Credit: 2

Lecturer: **Prof. Dr. József Kovács**

Syllabus (14 hours)

Course objectives:

- a. To enable students to recognize ethical issues when encountered in everyday practice and research
- b. To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- c. 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
- d. 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

1. week (Lecture)

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 (Lecture)

Normative theories of ethics. The basic principles of medical 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)

The principle of respect for autonomy.

The principle of non-maleficence.

The principle of beneficence.

The principle of justice.

Arguments against „principalism“.

3. week (Lecture)

Justice in Health Care. Ethical questions of macro- and microallocation

Higher and lower level macroallocational problems.

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 problem of right to health care. (The libertarian, the liberal and the socialist views about the right to health care.)

628 The role of the market and that of the state in the health care system.

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.)

4. week (Lecture)

Informed consent and truth telling

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.

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 physicians's relationship with the relatives of the deceased patient.

5. week (Lecture)

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.)

6. week (Lecture)

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.

7. week (Lecture)

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.

Course Faculty:

Professor József Kovács, MD, PhD, (Head of the Institute), 210-2930/6350;
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Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@yahoo.com
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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 medical ethics
4. Justice and medical ethics: the allocation of scarce medical resources.
5. Paternalism in medical practice
6. Informed consent
7. Information disclosure for terminally ill patients
8. Advance Directives
9. Medical confidentiality
10. Experimentation on human subjects
11. Objection to Transplantation of Organs and Counterarguments
12. Ethical problems of live organ donation
13. Organ donation from brain-dead donors: the system of donor cards.
14. Organ donation from brain-dead donors: presumed consent
15. Stages of Dying
16. Active and Passive Euthanasia
22. Withdrawing and withholding life sustaining treatment.

Important notes:

To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (Two absences from the lectures is the maximum number permitted.) The student can make up for the absences in practicals held at other times elsewhere.

Justification of an absence: Doctor's certificate

Semester requirement: To participate on at least 75% of the total number of lessons.

Grade: The result of the semi-final.

Sign up for the exam: Through the NEPTUN system.

Modifying of the exam date: Through the NEPTUN system.

Justification of absence from the exam: A telephone message to the secretary of the Institute.

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

SOCIOLOGY

(14 hours)

Course objectives:

To introduce to the students the concepts of the social distribution of health and illness, the causes and consequences of health status inequalities, the role of psychosocial factors in health care, the social phenomena occurring in healing, the social situation of medicine, and the social embeddedness of the health care system.

Course syllabus

- 1 Social Science and Pharmacy (lecture)
- 2 Sociological Understanding of Health and Illness (lecture)
- 3 Lay Health Beliefs and "Help-seeking" Behavior (lecture)
- 4 Social Factors and Health (lecture)
- 5 Social Inequalities and Health (lecture)
- 6 Is Pharmacy a Profession? (lecture)
- 7 Pharmacist and Health Promotion (lecture)

Course Faculty:

Zsuzsa Szántó, PhD, (Head of the Department of Sociology), 210-2930/56338; e-mail: szanzsu@net.sote.hu

Katalin Kovács, PhD e-mail: kovacs.katalin@gmail.com

Department:

Institute of Behavioral Sciences

Department of Sociology

NET Building, 19th, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room-2005

Important notes: To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (Two absences from the lectures is the maximum number permitted.) The student can make up for the absences in practicals held at other times elsewhere. Participation submitting home paper.

Justifying absence: with doctor's certificate

Semester grade: The result of the semi-final and home paper.

Justifying absence from the exam: A telephone message to the secretary of the Institute.

Textbook:

- 1 Kevin Taylor, Sarah Nettleton, Geoffrey Harding: Sociology for pharmacists. Taylor and Francis, London, 2003
- 2 Handouts for the lectures will be accessible on the homepage of the Institute of Behavioral Sciences: www.magtud.sote.hu.

PHARMACY ADMINISTRATION II.

Faculty of Pharmacy

University Pharmacy Department of Pharmacy Administration

Director: **Prof. Dr. Romána Zelkó**

Tutor: **Dr. Ágnes Mészáros**

5th year term 1

Lectures

1. Dispensing in Pharmacy
2. Reimbursement systems
3. RCT and clinical trials
4. Evidence Based Pharmacy
5. Pharmacoeconomics 1.
6. Pharmacoeconomics 2.
7. Quality of life analysis
8. Pharmaceutical research and development, Pharmaceutical industry
9. Good Manufacturing Practice (GMP), Good Laboratory Practice (GLP)
10. Good Documentation Systems, QC
11. Trends in the international drug markets
12. Marketing of pharmaceuticals

Practical lessons

1. Hospital Pharmacy Management
2. Micromedex, drug information
3. Publication strategies
4. Medline 1
5. Medline 2, IPA
6. Drug information, Micromedex
7. Presentation concerning health promotion
8. Internet in Pharmacy, computer skills
9. Quality criteria of economic evaluations
10. Critical decision making
11. Supply of OTC medicines
12. Consultation, assessment

DRUG THERAPY

Course Director: **Prof. Dr. Éva Szökő**

Tutor: **Dr. Tamás Tábi**

Department of Pharmacodynamics

Lecture:	2
Practice:	2
Credit:	4
Exam:	semi-final (oral)

First semester

Program:

Lectures:

- 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
- 11. week: Addiction – therapeutic possibilities
- 12. week: Drug usage in the elderly and during pregnancy

Seminars:

- 1. week: Drugs affecting the circulation
- 2. week: Drugs affecting the heart. Diuretics
- 3. week: Lipid lowering drugs. Drugs affecting blood coagulation and thrombocytes
- 4. week: Drugs affecting carbohydrate metabolism
- 5. week: Drugs affecting the GIT
- 6. week: Drugs affecting the reproductive system
- 7. week: Drugs affecting calcium and bone metabolism
- 8. week: Principles of antimicrobial chemotherapy
- 9. week: Antibacterial drugs
- 10. week: Antimycobacterial, antifungal, antiparasite and antiviral drugs
- 11. week: Anticancer drugs
- 12. week: Drugs affecting the haemopoetic system, the pituitary and thyroid
- 13. week: Toxicology
- 14. week: Toxicology

FACULTATIVE SUBJECTS

PHYTOCHEMISTRY Institute of Pharmacognosy

The aim of this subject is to introduce the pharmacy students interested in crude drug researches and knowledges deeper into phytochemistry. It is a laboratory practice completed with some theoretical lectures. Learning this theses, the students obtain an expertness in the qualification and standardization of crude drugs and herbal remedies, as well as in discovery of biologically active substances from them, using different isolation methods and chromatographic (TLC, GC, HPLC) techniques, photometry or other equipment. They acquire the identification and characterization of the most important substances and attain the mode of the scientific research work in this field.

- 1 Investigation methods used in phytochemistry
UV and IR spectroscopy in phytochemical analysis
- 2 Chromatography (TLC, PLC, HPLC, GC) in phytochemical analysis.
- 3 Type of active substances and their quantitative determination in plant material
Different methods and their comparing valuation for the determination of flavonoid content.
- 4 Determination of tannin and procyanidin content, determination of anthraglycoside content, determination of total essential oil content.
- 5 Determination of alkaloid content, determination of bitter substance content.
- 6 Qualitative investigation and detection of active components
TLC investigations of different glycosides and their aglycons.
- 7 GC investigation of essential oil components
- 8 Possibility of standardization of complex plant products
Preparing (extraction, purification, etc.) of investigated samples dependent on different medicament forms.
- 9 Chemical analysis of tea mixtures, tea decocts, aqueous solutions
- 10 Chemical analysis of tinctures, aqueous alcoholic solution
- 11 Chemical analysis of oleaginous solutions, ointments
- 12 Consultation

PHYTOTHERAPY

Institute of Pharmacognosy

3 hours/week

1. The complexity of herbal medicines. Synergism in phytotherapy. Herbal products regulations.
Activity, safety and quality of herbal medicines. Side effects, interactions.
2. Plants and the nervous system.
3. Plants and the cardiovascular system.
4. Plants and metabolic diseases.
5. Plants and the renal system.
6. Anti-inflammatory plants.
7. Plants and the respiratory system.
8. Plants and the reproductive system.
9. Plants and the digestive system.
10. Plants and the liver and biliary system.
11. Plants and the cutaneous system.
12. Adaptogen plants. Medicinal plants in the prevention and complementary treatment of cancer.

HEALTH INFORMATICS

Name of the educational organizational unit: SE EKK Institute of Digital Health Sciences

Name of the subject: Health Informatics

Type of the subject: 3 theory / week

Code: GYINFEUIE1A

Credit value: 2

Name of the lecturer of the subject: Dr. Miklós Szócska

Teachers: Prof. Dr. Elek Dinya

Term: autumn

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

Biostatistics is an innovative field that involves the design, analysis, and interpretation of data for studies in public health and medicine. Biostatistics experts arrive at conclusions about disease and health risks by evaluating and applying mathematical and statistical formulas to the factors that impact health. By looking at empirical data, such as the outcome of a clinical trial, you can predict whether a medical treatment will help a sick patient. Choose this subject if you have a mathematics background and a strong interest in biology and public health. This program emphasizes statistical theory and methods and will prepare you to design, execute, and collaborate on all types of studies as well as contribute to the methodological development of biostatistics.

Topics of the subject:

1. Probability theorem, Discrete and Continuous Probability Distributions. Data scales, data reductions, data distributions and representations. Genetic applications.
2. Decision theorem: significance level, hypothesis, type I-II errors and its handlings. Power analysis, sample size calculations. Confidence limits.
3. Parametric tests I.: one sample, paired and two sample t-tests. Effect size calculations.
4. Parametric tests II.: the principle of the analysis of variance (ANOVA). ANOVA tables. Different ANOVA models, post-hoc test.
5. Parametric tests III.: Mixed models.
6. Nonparametric tests: (sign, Wilcoxon rank-test, Mann-Whitney U-test, Friedman ANOVA, Kruskal-Wallis test). Permutation tests.
7. Contingency tables: chi-square test, Fisher-test, trend analysis.
8. Classification functions: sensitivity, specificity, OR, RR calculations. ROC analysis.
9. Linear and nonlinear regressions (GLM/GLS models): simple, multiple, Ridge regression.
10. Logistic regression.
11. Survival analysis I.: life-table and Kaplan-Meier methods.
12. Survival analysis II.: Cox-model.
13. Multivariate exploratory techniques I: PCA, cluster, discriminant.
14. Test

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.

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):

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.

The mode of acquisition of the mark:

Exam: Course will conclude with a written semi-final examination in the examination period. Statistical problems should be solved in written.

Type of the exam:

Colloquium.

Exam requirements:

Content of the lectures.

Mode of the application for the exam:

Via Neptun system.

Order of the modification of exam application:

According to Studies and Exams Code.

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 use of educational materials on the institute website is obligatory: www.semmelweis.hu/dei

Recommended literature:

1. Beth Dawson, Saunders R. G. Trapp: Biostatistics, Prentice-Hall international Inc.
2. <http://semmelweis.hu/dei/files/2013/11/Biostatistic1.pdf>

BIOINORGANIC CHEMISTRY

Institute of Chemistry, Department of Analytical Chemistry (ELTE)

During the last two decades our knowledge on the behavior of metals and some nonmetals (e.g. boron, silicon, selenium) has widened considerably. As a result of this the cooperation between inorganic chemists, biochemists and biologists became most involved and a new multidisciplinary branch of natural sciences developed that is termed bioinorganic chemistry or inorganic biochemistry.

It is rather difficult to mark the boundaries of this discipline since it includes biological metabolic processes and syntheses where metal ions and/or metal complexes are involved as well as ion transport, biomineralization, metal toxicity, chelate therapy, and the application of metal complexes in the treatment of different conditions.

In order to understand all aspects of the material discussed in the course a brief summary is given on metal coordination compounds: on their stereochemistry, equilibria and kinetics.

A rather fascinating problem is how certain metal ions have been selected during a long evolutionary process for biological purposes, and how the various metal containing systems developed due to the change of the geoenvironment.

The biosystems take up metals and non-metals from the geosphere. The entry of an element into the living system and its incorporation into a specific site of a biomolecule is a multistep process controlled both by thermodynamic and kinetic factors. This will be demonstrated on many examples including metal ions, anions, and neutral molecules.

In the following topics the roles of bioessential metals are dealt with. Many physiological phenomena are connected to the biochemistry of sodium, potassium, magnesium, and calcium, e.g. the conduction of nerve impulses, muscle contraction, and blood clotting.

Zinc metalloenzymes are most abundant in the living organism and catalyze a large number of hydrolytic and group transfer reactions. Iron, copper and molybdenum take part in many bioredox processes, and the former two metals also in the transport of molecular oxygen. Also, cobalt, manganese, chromium, nickel and vanadium have their roles in important biochemical processes.

Transition metals are needed to activate small molecules as CO_2 , N_2 and O_2 . The biochemistry of the latter is an intriguing topic of bioinorganic chemistry. The deposition of certain solid inorganic compounds (CaCO_3 , Ca-phosphates, etc.) in the organism is under biological control and worth dealing with briefly.

Among the biomedical problems some metaldependent diseases (e.g. Wilson's disease, Menkes' disease) are touched upon. Much time will be devoted to metal complexes of antitumor activity and to those that are used in the treatment of rheumatoid arthritis.

Metal ion toxicity, an increasing hazard due to the contaminated environment, and chelate therapy are the topics that also deserve attention.

A look into the future closes the course.

BIOTECHNOLOGY

Department of Plant Anatomy (ELTE)

Topics

1. Introduction to biotechnology Historical evolution of biotechnology. Biotechnology as an interdisciplinary pursuit. Application of biotechnology. Substrates of biotechnology.
2. Applied genetics Selection and screening. Culture maintenance. Mutagenesis. Protoplast and cell fusion technologies.
3. Introduction to genetic engineering The emergence of recombinant DNA technology. Regulation and control of recombinant DNA experimentation. Basic recombinant DNA techniques. Restriction endonucleases and other DNA and RNA modification enzymes.
4. Gene cloning Transformation. Cloning vectors. Construction of libraries. Identification of transformants and recombinants. Gene isolation and analysis. Nucleic acid labelling and detection. Hybridization analysis. DNA sequencing. DNA amplification by the polymerase chain reaction.
5. Expression of foreign DNA in bacteria Control of gene expression in bacteria and in eukaryotes. Expression of eukaryotic genes in bacteria. Alternative host organisms.
6. Cloning in higher organisms Gene cloning in mammalian cells. Vector systems. Gene transfer methods. Plant tissue culture techniques. Rotoplast fusion. Plant genetic engineering. Transformation using *Agrobacterium* as a gene vector. Direct gene transfer. Crop improvement using molecular techniques: resistance to herbicides and diseases. RFLP-analysis.
7. Application of molecular biology in medicine Diagnosis of genetic disorders. DNA fingerprinting. Case applications.
8. Genetic engineering and the pharmaceutical industry Fermentation products. Antibiotics production. Protein production. Recombinant virus vaccines. Monoclonal antibodies.
9. Fermentation technology Microbial cultivation. Bioreactor design. Media design. Instrumentation and process control. Scale-up. Animal and plant cell cultivation. Solid substrate fermentation.
10. Enzyme technology Enzyme engineering. Site-directed mutagenesis. Enzyme stabilization. Product of enzymes. Immobilized enzymes. Immobilization of cells.
11. Biosensors Principle and structure of biosensors. Application in clinical chemistry and medicine. Application in fermentation industries.

ENVIRONMENT PROTECTION – ECOLOGY

Institute of Public Health

“... One of the fundamental human rights is to live in a healthy environment appropriate to the dignity of man ... But the man is responsible for this environment not only to the contemporary society but to the rising generations too...”

(Proclamation of the UNO conference on Environmental Protection, Stockholm, 16. June, 1972.)

Aim of the training:

Teaching of general and profession-orientated subjects of environment protection based on the studies of human ecology and environmental hygiene/epidemiology, which are obligatory for all students in the course of Hygiene and Epidemiology in the first semester of the fourth study-year.

PROGRAMME

- A) **General relations**
 - I Environmental conditions of living. Biosphere. Adaptation to the environment.
Self regulating systems in (global and local) ecosystems. “Nourishment chains” (systems) – ability for maintaining.
The “environment” as a unified system.
 - II Regenerating and non-regenerating resources for the humans (thesis of the “Roman Club”).
Influences of human activities on biogeochemical circulation.
Anthropogenic pollution of the environment – indirect and direct dangers.
Possibilities of protection: environment – spare technological procedures; biodegradability; technical development; waste materials: reduction of its quantity, reutilization, neutralization of toxic and radioactive materials.
 - III Primary prevention of actual environmental damages, hygienic standardization.
- B) **Professional knowledge**
 - I Environmental pollution due to sanitary activities – prophylaxis, protection.
 - II Environmental pollution due to pharmaceutical activities-prophylaxis, protection:
 - a) production and preparation of drugs
biotechnology,
medical plants\drugs,
basic and subsidiary materials of drugs,
packaging materials,
chemical medicaments,
biological, immunological and microbiological products,
plant protecting materials, insecticides, pesticides;
 - b) distribution and utilization of drugs;
 - c) scientific and laboratory activities.

PHARMACEUTICAL COMPOUNDING (obligatory elective course)

Department of Pharmaceutics

Head: *Dr. István Antal*

Credit: 2

Second semester

1 hour/week

The subject is recommended for the students interested in fields of traditional pharmaceutical compounding such as preparation of several dosage forms (solutions, eyedrops, ointments, suppositories, powders).

Topics:

Past and future of pharmaceutical compounding
Combined preparations for individual therapy
Pharmacopoeial aspects of compounded dosage forms.
Practical guidelines for traditional compounding (Formulae Normales)
Pharmaceutical substances, synonyms.
Dose calculations.
Functional excipients in the formulation.
Practical problems of incompatibilities in combined preparations.

PHARMACONFORMATICS

3 hours/ week

1. Aims :

- to present state of art computing and telecommunication techniques including the INTERNET and to illustrate how these techniques are applied in drug industry, pharmacies and clinical patent management.
- to discuss various data base and knowledge base management systems, health care information systems, decision support tools for pharmacotherapeutic problem solving, educational programs and telemedicine techniques as they are applied in drug research and development, and in evidence based pharmacotherapy
- to teach pharmacy students how to rely on informatics tools when making cost effective decisions and trying to improve patient compliance.

2. Organization of the course :

The course consists of lectures and practices. Lectures provide theoretical foundations as well as examples of the use of various technologies and methods in research and pharmacy practice. Practices allow students to work with different medical databases, information systems, and decision support tools that address various drug related problems

Lectures	References	Hour
1. MEDICAL INFORMATICS AS A DISCIPLINE	HEALTH INFORMATICS IN THE 21st CENTURY by John Mantas, Document 506 GLOBAL INFORMATION SOCIETY AND HEALTHCARE by Jean ROBERTS Document 508	2
2. DATA TYPES, CLINICAL DATA-BASES, DATA BASE MODELS, AND MEDICAL IMAGES	TERMING, CODING AND GROUPING SYSTEMS IN HEALTH by Rudiger KLAR, Document 416 DATA-BASES, SPREADSHEETS AND WORD PROCESSING IN HEALTH by Francesco PINCIROLI, Luisa PORTONI Document 401	2
3. THE THERAPEUTIC PROCESS AND THE MEDICAL RECORD	HEALTHCARE RECORD by Jos AARTS Document 407	2
4. HEALTH CARE INFORMATION SYSTEMS	OPERATIONAL USES OF HOSPITAL INFORMATION SYSTEMS by Marie-Christine JAULENT, Document 405 ARCHITECTURES IN HEALTH by Sergio TORRES, Jose TORRES Document 422	2
5. COMPUTER-BASED SUPPORT FOR PHARMACISTS (AN OVERVIEW)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
6. REPRESENTING DRUG-RELATED KNOWLEDGE (classification of drugs, describing drug properties, drug informationsystems, examples)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
7. HOSPITAL PHARMACY AND DRUG-USE MONITORING SYSTEMS (informatics of public and hospital pharmacies, patient education)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
8. INFORMATION RESOURCES AND THE INTERNET, KNOWLEDGE COUPLERS EVIDENCE-BASED DRUG THERAPY (pharmacoeconomics and outcome research planning therapeutic protocols)	REFERENCE SOURCES IN HEALTH by Jean ROBERTS, UK Document 412 ELECTRONIC COMMUNICATIONS IN HEALTH by Enrique GOMEZ AGUILERA, Francisco DEL POZO GUERRERO, Teresa ARREDONDO WALDMEYER, Andres MARTINEZ FERNANDEZ, Document 403	2
9. INFORMATICS OF DRUG PRESCRIPTION	EXPERT SYSTEMS AND ARTIFICIAL INTELLIGENCE IN HEALTH by Jana ZVAROVA, Jan TALMON Document 424 COMPUTER-AIDED DIAGNOSTIC SUPPORT by Ann OOSTENDORP, Document 408	2
10. COMPUTER SUPPORT FOR PLANNING DRUG THERAPY (Watchdog, focusing, critiquing and advisory systems, patient-centred pharmacotherapy), PLANNING DRUG DOSAGE	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990 Van Bommel and M.Musen: Handbook of Medical Informatics, Springer, 197 (www.mihandbook.stanford.edu)	2
	Total:	20

PRACTICES:	10 hours
1. Informatics of high throughput screening (METABOL EXPERT)	2
2. Drug information systems (Micromedex and Internet resources) Resources of evidence based medicine (Cochrane library)	2
3. Analysis of dose response data in pharmacology (PROBIT analysis) Evaluation of clinical trial data (analysis of variance)	2
4. An antibiotic advisor UTI	2
5. A drug-dosage planning assistant USC PACK	2
Total:	10

CLINICAL PHYSIOLOGY LABORATORY MEASUREMENTS

GYKIKFVE1A

Elective course for pharmacy students in the 3rd, 4th and 5th years.

The purpose of the subject is to familiarize pharmacy students with the background, uses and implementation of clinical diagnostic measurement techniques which are closely related to the knowledge acquired on the physiology course. The course provides theoretical and practical knowledge which helps to integrate basic physiology in the broader scope of clinical and pharmaceutical sciences. Moreover, the subject helps to develop fundamental skills which are relevant for proficient medical professionals (measurement skills, presentation of precise documentation, cooperativity etc.).

Program:

Theoretical course:

1st week	Introduction to the bases of measurement techniques.
2nd week	Scientific and diagnostic measurement techniques for studying the electrophysiology of motor nerves, neuromuscular transmission and skeletal muscle.
5th week	Electrophysiology of the heart, cardiac arrhythmias. Regulation of arterial blood pressure under physiological and pathophysiological conditions. The characteristics of the pulse wave propagation.
7th week	Mechanical properties of the respiratory system under physiological conditions and in respiratory diseases. Adaptation of the cardiorespiratory system to physical exercise.
9th week	Regulation of carbohydrate metabolism and its disorders.
11th week	Reflexes of the somatic nervous system. Function of the vestibular system. Regulation of body position under physiological conditions and in neural disorders.
13th week	Consultation

Practical course:

2nd week	Introduction to the uses of instruments and data acquisition software applied during the course
4th week	Electromyography, electroneurography. Study of the electrical properties of the skeletal muscle, measurement of the impulse conduction velocity of a motor nerve by Biopac student lab system.
6th week	Measurement of pulse wave velocity. Recording and analysis of a 12-lead ECG. Demonstration of pathological ECG recordings. 8 th week - Spirometry. Studying the circulatory and respiratory adaptation responses during physical exercise
10th week	Oral glucose tolerance test, determination of HbA _{1c} level, analysis of normal and pathologic glucose tolerance curves.
12th week	Neurological examination techniques: examination of motor reflexes and vestibular function, EOG.
13th week	Optional lab retake.
14th week	Repetition and practice for the practical exam

Acknowledgement of the course: Attendance of at least 6 lab practices and 5 theoretical classes; presentation of the completed lab manual to the tutor. Semifinal exam. Two (2) credit points will be provided after a successful completion of the course.

EVALUATION OF PROGRESS

Grading system

- a) Five-scale
excellent (5)
good (4)
satisfactory (3)
pass (2)
fail (1)
- b) Three-scale
excellent (5)
satisfactory (3)
unsatisfactory/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
Fair	(közepes)	if the average is 2.51–3.50
Passing	(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!**
For transfer students admitted at the Faculty of Dentistry: July 15

No reduction of tuition fee is granted in case of exemptions.

DIPLOMA WORK (Degree Thesis) AT THE FACULTY OF MEDICINE AND PHARMACY

The dissertation and degree thesis

1. In Bachelor's programmes, Master's programmes and undivided programmes, students must prepare a dissertation or a degree thesis in order to obtain a degree. The purpose of the dissertation is to contribute to students' improving their ability of discernment and mastering the methods of using libraries and researching specialist literature, and their ability to formulate their opinions succinctly and accurately, by means of independently performing a scientific study of any problem in the given area of science.
2. The preparation of a dissertation (degree thesis) is guided by a thesis supervisor and occasionally also by a consultant. The thesis supervisor can be a professor or researcher of the faculty, or, if authorised by the dean, an external expert. The consultant is a university lecturer, a researcher or an external expert who supports the student's work. An external thesis supervisor may only be used if an internal consultant is used. Both the fundamental and newest Hungarian studies relating to the subject must be used in processing the subject.
3. The rules for announcing and approving topics for dissertations (degree theses): The educational organisational unit prepares a list of topics, which must also contain the names of consultants. The list of topics must be published both on the department's notice board and electronically by the last day of the examination period of the first term of every year, in the case of Bachelor programmes, Master programmes and undivided programmes at least four terms before the year of graduation.
4. Rules for applying for the topics:
Students may choose any of the announced topics. Students may also choose topics other than those announced subject to the approval of the head of the competent educational organisational unit. The student must choose and submit the topic of their dissertation to the head of the given educational organisational unit at least one year before graduation at the latest. If the topic is approved, the head of the unit will arrange its registration and provide a consultant. The chosen topic must discuss a current issue of the discipline concerned.
5. Formal requirements of the dissertation:
The minimum length of the degree thesis is 50,000 characters and it cannot be longer than 100,000 characters (without spaces). Font: Times New Roman, 12. Tables and the cited literature will be included in the length of the thesis but diagrams, other relevant literature and footnotes will not. The degree thesis must be submitted in 2 copies, stapled in a folder or bound as a book. The cover must show the title of the thesis, the student's name, year and study group, the date of submission and the consultant's name and workplace. If authorised by the head of department, the student may submit their degree thesis in a foreign language.
6. The submission deadline:
The student must meet the consultant at least three times:
 - for the first time no later than 1 October of the year of graduation: the consultant outlines the requirements relating to the preparation of the degree thesis and the possibilities inherent in the topic;
 - for the second time no later than 15 November of the year of graduation: the student gives an account of the work until that time;
 - for the third time no later than 1 January of the year of graduation: the consultant evaluates the results achieved by the student and advises the student on finalising the findings.

The finished dissertation must be submitted to the department *in duplicate*, by January 15 of the year of graduation at the latest.

At the Faculty of Pharmacy this deadline is 1 March in the year of graduation.

7. The dissertation (degree thesis) must be assessed by a reviewer. The reviewer must be an external expert holding a university degree (college degree) or a university lecturer or researcher invited by the head of the educational organisational unit. The reviewer will also prepare a separate evaluation. The assessments must be sent to the candidate at least 5 days before the dissertation (degree thesis) defence. The reviewer and the thesis supervisor make a proposal on grading the dissertation (degree thesis).
8. The subject of dissertations (degree theses) must fall within mandatory subjects and they are evaluated on a scale of five grades (1-5). The extent of independent research demonstrated in the paper must be taken into account when assessing the dissertation (degree thesis). Dissertations are defended before a panel made up of three members from the educational organisational unit, the chairperson of which is the head of the educational organisational unit or a deputy, and its other members are the consultant and a lecturer of the department. The department may also invite an external lecturer as the third member of the panel, for example from among the private lecturers of the university. In the event that the thesis is graded as "fail", the head of the educational organisational unit informs the student of this and the conditions of a repeat thesis. A dissertation (degree thesis) marked as "unsatisfactory" can only be corrected once.
9. After the defence, the head of the educational organisational unit will hand over a copy of the dissertation to the student and the other copy, as well as a copy of the minutes certifying the defence, will remain with the educational organisational unit. Dissertations must be stored in the library of the educational organisational unit for five years. A copy of the thesis defence minutes must be sent to the competent dean's office by 1 April at the latest.
10. Based on the proposal of the head of the educational organisational unit responsible for the subject of the dissertation, the dean of the competent Faculty may exempt the following students from the obligation of writing a dissertation:
 - students who prepared an individual competition essay or a joint competition essay (with two authors) for a competition announced by the rector, and achieved first place.
 - students publishing a paper as the primary author in a peer-reviewed scientific journal.Students must submit their applications for exemption by the end of the academic year preceding the year of graduation. The exemption from writing the dissertation does not involve an exemption from the obligation to defend it.
11. The educational organisational unit will return a copy of the successfully defended dissertation (degree thesis) to the student after the defence, and the other copy must be stored in the organisational unit in accordance with the effective archiving rules. A copy of the form specified in Annex 1, completed in duplicate, must be sent to the competent Dean's Office 60 days before the final examination period, while the other copy of the form will remain at the organisational unit.

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, infringe-
ments act and criminal law.

Budapest,, 20.....

.....
student's signature

RULES OF REGISTERING FOR DIPLOMA WORK TOPICS AT THE FACULTY OF DENTISTRY

The schedule of announcing diploma work topics:

The head of the organizational unit prepares a list of topics and indicates the names of the consultants. The same topic can be announced at least 3 years after its defense. If a topic is being processed, it cannot be announced for three years after its announcement. The organizational units forward their topic lists – for the Hungarian and foreign language students separately arranged – to the Dean's Office (as well as to the competent Foreign Language Secretariats) until the end of June, where the topics will be summarized and mailed through the year responsible for the students who are starting the 4th year in September. The foreign language students must also appoint a student as year responsible.

Rules of registering for topics:

Each year is bound to appoint a year responsible. The foreign language students must also appoint a representative as year responsible. This person has to be an active member of the current Student Council. If it is not possible, the Student Council asks a student from the given year as an external helper based on board decision. In case of the foreign language students the year responsible must be a member of the actual foreign language students organization, if it is not possible he/she must be a person from the year appointed by the members of the organization.

The year responsible summarizes the list of topics given by the Student Council in an electronic table, which will be shared with all members of the year at a previously announced time for editing.

The students of the year can choose 3 topics numbered in order of favorability, so all students choose a primary, a secondary and a tertiary topic.

The students who are preparing a TDK-work with a supervisor take precedence if they choose a topic signed for their supervisor. The organizational units can announce topics attached to names of students. These topics can be processed only by the attached students. Following the TDK-students, the students who have the lowest ranking number next to the given topics will be signed to.

If a topic is chosen by more students with the same ranking number, the student who is in a better position for their other topics is to choose the other.; except the students involved reach agreement by completing a waiver statement.

If the students fail to agree, the year responsible decides on the cumulative average of the students and the student who has the highest average gets the topic.

In any other disputed question, which is not answered by this guide, the year responsible decides following personal discussion with the students involved and with a written explanation. The year responsible must communicate the decision to the year.

Explanation:

Fictitious department

1. Vital exhaustion and cardiovascular diseases	Szentágothai János1.*	Vízi E. Szilveszter 1.	
C: Dr. Santiago Ramon Y Cajal			
2. Cognitive therapy for depression	Knoll József 3.	Vízi E. Szilveszter 2.*	Pléh Csaba 3.

Dr. Magyar Kálmán

3. The addiction model of eating disorders	Kodály Zoltán 3.	C: Koessler János	
4. Insomnia – health consequences, diagnosis and treatment	Eötvös József 1.*	Szemere Bertalan	Teleki László 2.
C: Pruzsinszky József			
5. Family therapy in eating disorders	Pálinkás József (TDK)	Toró Tibor 1.	
C: Wigner Jenő			
6. Relationship between personality disorders and mental diseases	Vizi E. Szilveszter 3.	Szentágothai János 2.	
C: Réthelyi Miklós			

- The red color indicates the student having an accepted topic
- Pálinkás József as a TDK-student of Wigner Jenő has an advantage over the other student even if they signed the topic as a first choice
- The * after the ranking number indicates:
 - Szentágothai and Vizi E. competed for the 1. topic and even if they both were about to win another topic; they reached an agreement by mutual consent
 - the agreement between Eötvös and Szemere

Order of approval:

The year responsible finalizes the table for a predefined date and informs the year about the results. All students manually fill out the consultation pages in two copies based on the table. The consultation pages can be downloaded from the website of the faculty. On the pages, the chosen topic and the name of the supervisor must be represented.

All four-year students must have the completed papers confirmed in the organizational unit by 30th October (signed and sealed by the supervisor). One copy of the consulting page has to be presented to the representative of the organizational unit, who certifies that the chosen topic is not processed by other students. The countersigned, certified page has to be transmitted to the Dean's Office until the end of the 7th semester. The other copy of the consulting page is kept by the student, which has to be signed by the supervisor at each of the obligatory consultations.

The student is allowed to write the master's thesis from a topic out of the announced ones should any institute agree.

This guide was prepared by the Student Council of Semmelweis University Faculty of Dentistry supported by the Faculty Council.

Budapest, 13th December, 2013

Dr. Hermann Péter
Dean
Semmelweis University
Faculty of Dentistry

Somogyi Andrea
President
Faculty of Dentistry
Student Council

GENERAL REQUIREMENTS OF THE DIPLOMA WORK

The student is required to prepare a diploma work for the diploma. The aim of the diploma work is to enable the student by the individual research of the scientific field to improve his or her skills in seeing the significant items, the method of researching literature and to express opinions thoroughly and accurately.

The diploma work is a creative project dealing with a subject closely linked to the theoretical and practical background of dental science. It uses a firm theoretical framework and a practical approach, both meeting highest scientific standards. The diploma work is based on the studies of the student and guided by a supervisor. It is to be processed with using national and international literature. A supervisor may be an instructor or researcher of the faculty or, if the dean allows, an external expert (TVSz. 24.§.2.) While processing the topic the student has to use the essential and latest national and international studies or articles linked to the topic.

The schedule of announcing and approving diploma work topics:

The head of the organizational unit prepares a list of topics and indicates the names of the supervisors. The topic which is being processed or has been defended in the last three years cannot be announced. The organizational units forward their topic lists – for the Hungarian and foreign language students separately arranged – to the Dean's Office (as well as to the competent Foreign Language Secretariats) until the end of June. The topics are going to be summarized and mailed through the year responsible – by the foreign language students appointed student (year responsible) – to the students starting the IV. year in September. The year responsible prepares an electronical table, which has to be sent with the explanatory notes made by the HÖK (Student Council) and approved by the Dean's Office to the fourth-year students. The students can only choose from that list of topics, which is written in their language of education. After the completed negotiations and agreements all students manually fill out the consultation pages in two copies. The consultation pages can be downloaded from the website of the faculty. On the pages, the chosen topic and the name of the supervisor must be represented. All fourth-year students are to have filled out pages confirmed (signed and sealed by the supervisor) in the education department (responsible to the topic) until 30th October. One copy of the consulting page has to be presented to the representative of the organizational unit, who certifies that the chosen topic is not processed by other students. The countersigned, certified page has to be transmitted to the Dean's Office until the end of the 7. semester. The other copy of the consulting page is kept by the student, which has to be signed by the supervisor at each of the obligatory consultations.

The student is allowed to write the diploma work from a topic apart from the announced ones should one of the institutes agree and provide a supervisor.

The obligation of preparing a diploma work may be waived by the dean for the following students:

- Who prepare a rector paper as one of a maximum of two authors and receive a first prize
- Who write a course work and it is rewarded at the competition of a professional scientific society

Exceptions to the thesis writing exemption does not exempt from the obligation of defense. (TVSz. 24.§. 10.)

To change the topic of the diploma work underway is possible until the end of the 8th semester. Conditions for change are to forward the receiving notice of the new topic to the Dean's Office.

The content requirements of the diploma work

The diploma work is based on individual professional work. It is a didacted study which proves the student's material knowledge and ability to synthesize. It is important to keep the Hungarian language's (or the specific language's in case of foreign language education) rules and spelling in mind. The structure and correlations of the individual chapters should be logical. Its message follows each other, in terms of wording it is a continuous free-text description.

Structure of diploma work:

- Title
It should be short, compact and express the content well.
- Content
It should contain the titles of the below listed numbered chapters and the occurrent another subchapters as well as the page numbers.
- Introduction
- The introduction should convince the reader about the theoretical or/and practical importance of the thesis and account for the topic selection.
- The intention of the thesis
It has to be formulated what kind of professional goals the author is trying to achieve with the presentation of the topic and the development and/or solution of the chosen problem.
- Literary background of the theme
The most important national and international publications of the chosen topic should be presented. It can be the presentation of the importance and problems of the topic, the applied methods, the results, observations, conclusions, references or processing of similar topics.
- Method section
The applied qualitative and quantitative methods, statistical analysis, applied softwares should be listed according to the different methods and relevance. At this point the toolbar of the project work can be described, if it is in the thesis incorporated.
- Results
The professional achievements with interpretation should be factually listed. The charts and tables can help systematize and interpret the results.
- Conclusions, findings, suggestions
Confirmation, confrontation and rejection of statements, conclusions based on the results; forward-looking recommendations and opinions in the literature.
- Summary
The summary should repeat the most important issues raised in your thesis. The summary should not contain new information or findings which do not occur in the thesis.
- References (see the formal requirements below)
- In case of presence of not own intellectual properties (publication, chart, table) the professional journal source has to be given and represented in the bibliography. **For lack of aforesaid it constitutes plagiarism, which can imply initiation of investigation or immediate suspension of student status.**
- Acknowledgements
- List of all collaborators who were helping to write the thesis through supplying of data, making analysis or giving professional advice.
- Figures, tables (in the thesis they can also be among the text)
- All figures and tables – separately – need to be added a title and a line number. The title, the letterheads of the tables, the measures of the charts has to be given so that the charts and the tables can be independently interpreted of the context. There must be a reference for all charts and tables, otherwise they cannot be included in the thesis. Charts and tables containing the same information should not be included in the paper at the same time. In so far as

any chart or table derives from literary sources, that has to be represented below them with the precise designation of the reference.

- List of concepts and abbreviations
- Appendices
- Not closely related to the theme or longer topics eg.: chart, table, questionnaire, other document have to be indicated in the annex. The annex has to be supplied with a title and a serial number and referred in the text.

The formal requirements of the diploma work

The general **formal requirements** of the thesis are as follows:

- length: it must be no less than 50,000 characters and no longer than 100,000 (excluding spaces). Tables and references are included in the length, but figures, footnotes and the literature list are not.
- margins: at the top, bottom, left, and right edges of the page: 2,5 cm
- gutter margin: on the left side, 1,5 cm
- page numbering: these numerals must be centered under the text beginning with the front page
- paragraph alignment: justified
- font size: 12
- font type: Times New Roman
- font colour: black
- line spacing: 1,5
- table of contents: at the beginning of the thesis with page number
- figures, tables: tables and figures are referenced with a line number in the text, should be numbered for identification; all have a title and are understood independently of the context
- printing: single-sided printing
- number of copies to be delivered: 3 paper - based and 1 electronic - based

The three paper-based copies must be submitted in black leather cover (with golden subtitles). The outside cover must indicate the student's name and the year of submitting the diploma work under the „DIPLOMA WORK“ subtitle. The inside cover must indicate the title of the thesis, the name of the student, the name, title and workplace of the supervisor. On the spine of the thesis the name of the student and the year have to be placed.

The electronic version has to be made in „word“ and „pdf“ format.

- bibliography: The bibliography must be listed and represented at the end of the thesis after the following criteria.

The literary items must be referred in the citation with the representation of the author and the year. The line numbers in the bibliography can also be represented in square brackets.

In the bibliography alphabetic order by author has to be applied. In case of books, monographs the name(s) of the author(s), the year of publication, the title of the publication, the name and the place of the publisher have to be given.

In case of a journal article the name in italics, the volume number and the page number (from... to) of the journal have to be presented behind the author(s), year and title. It is also possible to mark a web resource at which the exact web address and the exact date of the query should be marked after the author and the title of the publication.

It is important that all listed literary items should be referred in the thesis. All statements, facts, data which are not intellectual products of the thesis writer should contain the data source. If

one source is referred by the thesis writer at more places, the source has to be marked at all places. It is an important requirement that a verbatim citation can only be cited between quotation marks with exact source mark and exact designation of the place of the source (in case of a book or a journal: page number). The failure of this counts as plagiarism, which may apply the immediate suspension of student status at worst!

Examples of use of numbered items:

...
...: „*certain plaque bacteria are able to communicate with sulcus epithelial cells too by bacterial surface molecules.*” [23]
...

References:

- ...
23. Gera I: *The bacterial biofilm and the possibilities of chemical plaque control. Literature review. Fogorv. Szle.* 2008; 101: 91-99.
24. Gera I: *Parodontology.* Semmelweis Kiadó, Budapest, 2009; 94.
...

The outside and inside covers of the diploma work should follow the next patterns:

Outside cover:

<p>DIPLOMA WORK</p> <p>(THE NAME OF THE STUDENT)</p> <p>Budapest year</p>

Inside cover:

Semmelweis University
Faculty of Dentistry

...(THE NAME OF THE STUDENT)...

...(THE TITLE OF THE DIPLOMA WORK)...

Supervisor:

(name of the supervisor)

(title of the supervisor)

(workplace of the supervisor)

TIME MANAGEMENT, DEADLINES

The student must consult with the supervisor at least three times during writing the thesis. The supervisor informs the student on the requirements and tangible opportunities of the thesis writing. The supervisor also checks the work completed up until that point. The first visit must be at the end of the 8. semester, the second visit until the end of the second week of the 9. semester when the student reports on the work done so far. The third time must happen until the end of the 9. semester when the supervisor evaluates the results of the student and gives advice on forming, writing and submitting the thesis.

The diploma work prepared has to be submitted at the department by the **15 February** in the final year in three paper-based copies (after aforementioned format requirements) and in an electronical format as well (both Word and PDF format)

THESIS JUDGING PROCESS

For the permission to take the General Board Examination students are to obtain the Leaving Certificate (Absolutorium) [Nftv.108.§.(43.)] as well as having defended the diploma work – which was previously reviewed and accepted by an appointed external examiner by the head of the institute – in front of a jury. The supervisor and the reviewer separately make a written opinion about all theses. The thesis qualification suggested by the supervisor and the reviewer is not part of the judgment.

The judgment about the thesis has to be handed out for the students no later than five days prior to the defense of the thesis.

The defense of the thesis includes a maximum 8 minutes long powerpoint presentation which summarizes the most important items, statements; and the answers to questions of the jury.

JUDGMENT CRITERIA OF THE THESIS

The thesis which contains plagiarism cannot be defended! The verbatim quotations without quotation marks and marking the source; charts, statistical data, takeover of illustration without marking the source; rewording text or passage without marking the source counts as plagiarism.

1. The structure of the thesis

- Is it easy to overview?
- Does the title of the thesis fit to its content?
- Are there forward recommendations, conclusions?
- Does the layout of the thesis help to recognize the structure of the thesis?
- Is the layout, structure of the thesis professionally correct, logical?
- Are the individual chapters and subchapters properly separated from each other?

2. The professional relevance of the thesis

- Does the thesis satisfy the objective? Are the statements supported?
- Do the relevant subjects of the core curriculum appear in the thesis?
- Promoting of the independent investigation.
- Are the methods and equipments displayed in the analysis and examination of the focus of the thesis topic correctly applied by the writer?
- Does it show all analytical methods?
- Are the results, consequences logical and correct? Are they evaluated in the light of the results found in the literature?

3. Use of references

- Does the student appropriately use the references?
- Are the references critically and correctly summarized during the presentation of problems, analysis, interpretation of the interpretation of results?
- Does the citation mode fulfill the expectations?
- Are the references in the text present on the reference list and vice versa?
- Is the bibliography relevant (significant literary items, timeliness, theme fit)?
- Is the thesis formally correct?
- Does it contain a reference from foreign literature?

4. Use of charts and tables, other formal requirements

- Is there a reference for every chart and table in the text?
- Can they be easily found based on the references?
- Are the charts and the tables numbered? Do they have a title? Are there references to their sources?
- Is there a perspicuous table of content?
- Are the pages numbered?
- Is there relevant information in the letterhead and in the footer? Do they help to orientate in the document?
- Are the spelling and the wording appropriate?

5. Correct and consistent use of terms

- Is the terminology used by the author uniform and correct?
- Does the student uniformly treat the foreign words (coherent application of Latin medical terminology, names of institutions)?
- Does the student use abbreviations list or glossary?

6. Does the thesis provide a unified view?

EVALUATION OF FINAL THESIS

The diploma work (as part of the compulsory subjects) is evaluated on a five-scale grade. Grades: fail (1), pass (2), satisfactory (3), good (4), excellent (5). The extent of individual research will be taken into consideration.

The defense of the diploma work takes place before a committee of three members of the given unit. The committee chairman is the head of the unit or a by him/her appointed certified instructor of the unit. The two other members are the supervisor and an other instructor of the unit.

That theses which are formally inadequate (eg.: less than 50000 characters) or have not been submitted until the deadline can be corrected, completed or resubmitted after an appropriate time (eg.: a month) but at the latest until the 1st May of the 10. semester. Theses assessed as insufficient based on content during the process of defense can be re-submitted, rewritten until the 20th August. Writers of such theses' can only be admitted to the period of retaken examinations at the end of August. A failed diploma work may only be corrected once. (TVSz. 24.§. 8.)

TREATMENT OF THE THESIS

The head of the organizational unit will return a copy of the successfully defended diploma work to the student after the defense. The other two copies and a copy of the minutes (which bears record to the assessment of the thesis) will be kept by the unit. The diploma work (the paper - based and the electronic version) will be kept at the library of the unit for a period of 5 years.

One copy of the minutes will be sent to the Dean's Office 1st April at the latest. In case of a foreign language student it has to be forwarded to the competent Foreign Language Secretariat.

SAMPLE

Disclaimer Statement

Undersigned..... (1.) time of birth..... Neptun code.....
fourth year student of group no.at Semmelweis University, Faculty of Dentistry hereby voluntarily resign of the elaboration of the thesis-topic in favour oftime
of birth..... Neptun code..... fourth year student of group no. at Semmelweis
University, Faculty of Dentistry.

The theme of the thesis:.....

Date.....

.....
signature

LEAVING CERTIFICATE

After completion of the obligatory practices (internships at the Faculty of Medicine), all the final and semi-final examinations and the successful defense of the diploma work, the students receive a "Leaving Certificate" (Absolutorium) in their lecture book validated by the Dean's signature.

The Leaving Certificate is essential for the permission to take the General Board Examination.

GENERAL BOARD EXAMINATION – GBE (Complex Final Examination)

The final examination consists of the following:

1. The final examination prescribed in the qualification requirements consists of the following examinations (the parts of the final examination):
 - a) written examination
 - b) oral examination and
 - c) practical examination.The dissertation (degree thesis) defence is part of the final examination but it is assessed and defended separately from the final examination.
At the Faculty of Pharmacy, defending the degree thesis is the condition for taking the (written, practical and oral) final examination.
2. The dean will determine at least two final examination periods per academic year. Final examinations may only be taken in such final examination periods.
3. The final examination board must have at least two members in addition to the chairperson. The chairperson and the members must be recognised external experts or university (college) professors or associate professors in the special field. At least one member of the board must be an external expert. The chairperson of the final examination board is appointed by the dean – in agreement with the Faculty Council – just like its members, for a period of one to three years.
4. Students must register for the final examination in the dean's office, on the 60th day before the first day of the final examination period at the latest.
5. The dean of the Faculty is responsible for organising the final examinations. The number of examination boards must be determined on the basis of the number of students who registered for the final examination, assigning no more than 6 students to every examination board for every examination day.
At the Faculty of Pharmacy and the Faculty of Dentistry a maximum of 12 students can be assigned to a final examination board on an examination day.
6. Students will be assigned to their examination boards by way of an electronic lottery. The composition of the boards and students' distribution among them can only be disclosed on the day of the examination, through the usual method applied by the Faculty.
7. The final examination board establishes the marks of the examination subjects in camera. When the examination is finished, the chairperson of the board announces the results.
8. The result of the final examination is the simple arithmetic mean of the results of its different parts.
9. The result of the final examination is established by the final examination board and the chairperson of the board enters it into the student's markbook.
10. The final examination will be successful if the parts of the final examination are at least "pass" marks.
11. If a subject or a section of the final examination is marked as "unsatisfactory", the candidate will only be required to repeat the final examination in the subject or section the candidate has failed.
Faculty of Pharmacy and Faculty of Dentistry: if the student fails any of the successive parts of the final examination (written, practical and oral parts), the final examination will be regarded as unsuccessful and it cannot be continued. However, it will only have to be repeated from the unsuccessful part.
12. The final examination can be repeated twice. Retake or repeated retake final examinations can only be taken in the following final examination period(s).

13. No credits can be assigned to the final examination.
14. If the final examination is taken after seven years from the issue of the pre-degree certificate, the condition of taking the final examination will be the successful completion of the last academic year.

THE DIPLOMA (dr. med.; dr. med. dent.; dr. pharm.)

The degree (diploma)

The degree, the certificate

1. A condition of obtaining the degree or certificate issued by the university is that the credit value of subjects completed at another higher education institution and recognised by the university in a credit transfer procedure may not be more than 50% of the credits required by the qualification criteria for obtaining the degree.
2. The conditions of issuing the degree: a type "C" intermediate language certificate in English, German, French, Spanish, Italian or Russian, issued or recognised by the state, and passing at least one basic-level university final examination. (One of these must be English.)
The passing of that examination must be proved by presenting the original language certificate or a certified copy of it.
3. The rector of the University may delegate the right to sign degrees to the dean of the Faculty concerned.
4. If, because of the provisions of paragraph 1, the degree is issued after the final examination period, the degree will be signed by the head of the educational organisational unit instead of the chairman of the final examination board if the chairman of the final examination board is no longer employed by the University when the degree is issued.
5. The degree issued by the University must also contain the classification of the degree.
6. The certificates mentioned in Annex 2 and Annex 2/a are issued by the Dean's Office concerned and this Office keeps records of all certificates issued.
7. The relevant Dean's Office is responsible for issuing the diploma supplement.
8. The classification of the degree (diploma) is based on the cumulative, weighted grade point average, rounded to two decimal places.

Classification on a scale of five grades:

- 4.51 – 5.00 distinction
- 3.51 – 4.50 good
- 2.51 – 3.50 satisfactory
- 2.00 – 2.50 pass

Qualification on a scale of three grades:

- 4.51 – 5.00 summa cum laude
- 3.51 – 4.50 cum laude
- 2.00 – 3.50 rite

The subjects that do not end with comprehensive examinations but must be counted in the grade of the degree are specified by the curriculum of the Faculty concerned.

9. Method of calculation of the classification of degrees:

$$XD = \frac{Xn + D + I + Sz + Gy}{n + 4}$$

where:

XD = the figure serving as the basis for grading the degree

Xn = the sum of the grades of the required comprehensive examinations

n = the number of required comprehensive examinations

D = the grade of the degree thesis (on a scale of 5) (part of the complex FE)

I = the grade of the written examination (part of the complex FE)

Sz = the grade of the oral examination (part of the complex FE)

Gy = the grade of the practical examination (part of the complex FE)

- 10. At the student's request – against the payment of a fee – the university will issue an honorary degree, signed by the rector of the university, the dean of the faculty concerned and the chairman of the final examination board.**

The relevant Dean's Office is responsible for calculating the grade of the degree.

COST OF THE PROGRAM FOR TWO SEMESTERS

Tuition fee for the 2018/2019 academic year

Medicine	USD 9,100 / semester
Dentistry	USD 9,100 / semester
Pharmacy	USD 6,000 / semester

The first year tuition fee (+ the registration fee – USD 220 payable in the 1st semester) should be paid in two installments (unless the Hungarian Visa regulations have different conditions):

Within two weeks after receipt of the Letter of Acceptance

Medicine	USD 9,320 (USD 9,100 tuition fee + USD 220 registration fee registration fee is payable once during the studies)
Dentistry	USD 9,320 (USD 9,100 tuition fee + USD 220 registration fee registration fee is payable once during the studies)
Pharmacy	USD 6,220 (USD 6,000 tuition fee + USD 220 registration fee registration fee is payable once during the studies)

Before February 1	Medicine	USD 9,100
	Dentistry	USD 9,100
	Pharmacy	USD 6,000

In consecutive years the annual tuition fee should be paid:

See details under title: „Fees – Important“

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

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)

Registration 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.*

REFUND POLICY

1. Prior to registration at the university

Refundable: 100% of payment except the 1st year students' **USD 2000 deposit**, which is **non-refundable**

2. After registration at the university

Withdrawal of studies:

Students, compelled to withdraw for academic/disciplinary reasons or have been accepted/transferred by another institute of higher education are not entitled to a refund of the tuition fee. Students are entitled to a refund on a pro rata basis if studies are interrupted due to a sound reason (eg. the death of parents/guardians or due to a requirement to fulfill a military service obligation). The refund is applicable from the first day of the month following report of the above mentioned conditions with accompanying official certificates.

Suspension of studies:

a. **Student's legal relationship is suspended after registration within a month following the beginning of the semester**
Tuition fee is non-refundable. It can be transferred to the next active semester.

b. **Student's legal relationship is suspended after registration after more than a month following the beginning of the semester**

Tuition fee is non-refundable. It cannot be transferred to the next active semester and the semester must be considered as active.

No other claims are acceptable.

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 Lehocski-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

Livia Csinei (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

Residence Visa, Residence Permit, Entry for a Long Stay

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
- * 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.

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.)*
- 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.
- 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 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.

** 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 USD 7/800 and enclose a photocopy of the bank card.

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.

Immigration Office:

Office Hours of the Immigration Office at Szegedi út 35-37 Ground Floor, (Twin Office Center Office Building) (13th district) Clients' Service II. ("II. sz. Kirendeltség"):

Monday	8:30 am to 1:00 pm
Tuesday	1:00 pm to 5:00 pm
Wednesday	8:30 am to 12:00 pm
Thursday	8:30 am to 1:00 pm
Friday	8:30 am to 12:00 pm
E-mail:	bp2@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32 from KELETI – you have to get off at the bus stop named 'Szegedi út'.

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)

Immigration Office

Office Hours of the Immigration Office at Szegedi út 35-37 Ground Floor, (Twin Office Center Office Building) (13th district) Clients' Service II. ("II. sz. Kirendeltség"):

Monday	8:30 am to 1:00 pm
Tuesday	1:00 pm to 5:00 pm
Wednesday	8:30 am to 12:00 pm
Thursday	8:30 am to 1:00 pm
Friday	8:30 am to 12:00 pm
E-mail:	bp2@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32 from KELETI – you have to get off at the bus stop named 'Szegedi út'.

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

Immigration Office

Office Hours of the Immigration Office at Szegedi út 35-37 Ground Floor, (Twin Office Center Office Building) (13th district) Clients' Service II. ("II. sz. Kirendeltség"):

Monday	8:30 am to 1:00 pm
Tuesday	1:00 pm to 5:00 pm
Wednesday	8:30 am to 12:00 pm
Thursday	8:30 am to 1:00 pm
Friday	8:30 am to 12:00 pm
E-mail:	bp2@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32 from KELETI – you have to get off at the bus stop named 'Szegedi út'.

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

Immigration Office

Office Hours of the Immigration Office at Szegedi út 35-37 Ground Floor, (Twin Office Center Office Building) (13th district) Clients' Service II. ("II. sz. Kirendeltség"):

Monday	8:30 am to 1:00 pm
Tuesday	1:00 pm to 5:00 pm
Wednesday	8:30 am to 12:00 pm
Thursday	8:30 am to 1:00 pm
Friday	8:30 am to 12:00 pm
E-mail:	bp2@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32 from KELETI – you have to get off at the bus stop named 'Szegedi út'.

REDUCTION OF TUITION FEE

Defined by the current Regulations on Compensation and Benefits of Semmelweis University. It is to be tracked on the website.

THE WORDS OF THE SOLEMN 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

Faculty 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 működésemmel kapcsolatos etikai követelményeket tiszteletben tartom. Arra törekszem, hogy az orvostudomány, valamint a SEMMELWEIS Egyetem jó hírnevét öregbítsem és megbecsülését előmozdítsam."

Faculty of Pharmacy

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.

HOW TO GET A CERTIFICATE WHICH PROVES THAT THE DIPLOMA ISSUED BY SEMMELWEIS UNIVERSITY IS IN CONFORMITY WITH THE EU REQUIREMENTS, AND A CERTIFICATE OF GOOD STANDING

<http://www.enkk.hu/index.php/en/department-of-migration-and-human-resources-methodology/certificates-for-recognition-in-a-foreign-country/certificate-of-conformity>

In order to get the abovementioned certificates a request should be provided to the ENKK's Department of Migration and Monitoring.

CERTIFICATE OF CONFORMITY

(It states that the diploma satisfies the training requirements laid down in European Parliament and Council Directive 2005/36/EC on the recognition of professional qualifications.)

The following documents are required:

- application form
- copy of the passport or ID card,
- copy of any official paper that proves the applicant's address (optional)
- copy of the diploma
- receipt about the fee of the procedure

CERTIFICATE OF GOOD STANDING

(It provides information about the applicant's ethical/ criminal background and his or her right to practice in Hungary)

The following documents are required:

- application form
- copy of the passport or ID card,
- copy of any official paper that proves the applicant's address (optional)
- copy of the diploma
- receipt about the fee of the procedure

- + **Original Hungarian Police Record not older than 3 months** (The police record has to attest that the applicant has a clean criminal record and that he/she is not under the effect of a non-appealable sentence imposed for a criminal offence suspending the health care activity.)

Police Record can be requested:

- at any post offices or
- personally at the criminal authority (Central Office for Administrative and Electronic Public Services; H-1133 Budapest, Visegrádi utca 110-112. (Mo-Fri: 8.00-20.00, Sat, Sun: 8.00-14.00) or
- by ENKK(In this case the applicant should attach a handwritten authorisation concerning the police record can be required directly by the ENKK and the receipt of the bank transfer about the fee of police record (3.100,- HUF) (In this case the procedure can take more than 30 days.)

Contact information:

Postal address:

Egészségügyi Nyilvántartási és Képzési Központ /Health Registration and Training Center
Migrációs és Monitoring Főosztály /Department of Migration and Monitoring
Bélteki Zsolt
1380 Budapest Pf.:1188

General information about the procedures:

Tel: +36-1-235-7965

E-mail: recognition@enkk.hu

Information about ongoing cases:

You can contact the consultants directly on Monday between 9.00-11.30 am. and on Tuesday and Thursday between 9.00-11.00 am. and 13.00-15.00 pm.

Nándor Rikker

Tel: +36-1-235-79-22

E-mail: rikker.nandor@enkk.hu

Nóra Nacsá

Tel: +36-1-235-79-27

E-mail: nacsanora@enkk.hu

Nóra Kovács

Tel: +36-1-235-79-29

E-mail: kovacs.nora@eekh.hu

Judit Bunyitai

Tel: +36-1-235-79-41

E-mail: bunyitai.judit@enkk.hu

In person:

Egészségügyi Nyilvántartási és Képzési Központ (ENKK)

Budapest (V.), Akadémia u. 7.

Office hours: Tuesday, Thursday 8.30-11.15 a.m. and 12.00-15.30 p.m.

Web: www.enkk.hu /English version (logo) / Department of Migration and Monitoring/ Certificates for recognition in a foreign country

For price update, please, visit the Department's home-page!

Account details:

Egészségügyi Nyilvántartási és Képzési Központ
10032000-00285788

From abroad:

Egészségügyi Nyilvántartási és Képzési Központ

Swift code: MANEHUHB

IBAN number: HU28 1003 2000 0028 5788 0000 0000

Bank: Magyar Nemzeti Bank

Important note: Applicants who have graduated at the Faculties of Medicine, Dentistry since 1 September 1986, and at the Faculty of Pharmacy since 1 September 2007 may apply for the certificate of conformity!

Additional information concerning the certificate of good standing:

The Certificate of Good Standing attests that the applicant

- 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 depends on the membership in the professional chamber (Hungarian Medical Chamber (MOK), Hungarian Pharmaceutical Chamber(MGYK), Hungarian Chamber of Health Professionals (MESZK)) and on the Operational Registration:

- If the Applicant does not have a membership in the chamber, the Applicant is not entitled to pursue healthcare activities in Hungary at all,
- If the Applicant has a membership in the chamber, but does not have a valid Operational Registration, the Applicant is entitled to pursue healthcare activities only with supervision in Hungary,
- If the Applicant has a membership in the chamber, and also has a valid Operational Registration, the Applicant is entitled to pursue the healthcare activity **without supervision** in Hungary.

In order to avoid registration problems in the Host Country, please contact the competent authority before applying for the Certificate of Good Standing if chamber membership and Operational Registration in Hungary is needed or not.

SAMPLE APPLICATION FORM IN ENGLISH AND IN HUNGARIAN

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 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 (Pursuant to Section 60/C of Act C of 2001 and 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 (Pursuant to Section 60/B of Act C of 2001 and with reference to Article 23., 27., 30., 33., 37., 43. of Directive 2005/36/EC)
- a certificate which attests the length of the healthcare activity pursued in Hungary (Pursuant to Section 60/B of Act C of 2001)
- a certificate of good standing (Pursuant to Section. 110/A of Act CLIV of 1997)
- a certificate which attests the level of the qualification (Pursuant to Section 60/A of Act C of 2001)
- other

Personal data (Please write with capitals)

Surname:

Given name:

Name at birth:

Mother's maiden name:

Place and date of birth:

Registered address:

Mailing 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 Hungarian Police Record or its certified copy
- original certificate from the employer or its certified copy
- 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 Office with regards to my application.

Date:

Signature

REQUEST concerning the issue of a certificate to be used in the recognition of the diploma, qualification in another country

AZ OKLEVÉL, BIZONYÍTVÁNY KÜLFÖLDÖN TÖRTÉNŐ ELISMERTETÉSÉHEZ SZÜKSÉGES HATÓSÁGI BIZONYÍTVÁNY KIADÁSA IRÁNTI KÉRELEM

Alulírott (név) kérem, hogy oklevelem/bizonyítványom
.....-i (ország neve) elismertetése céljából részemre a következő hatósági bizonyítványokat
kiállítani szíveskedjék (Kérjük, hogy X-szel jelölje a kért hatósági bizonyítványokat!):

- konformitást tanúsító hatósági bizonyítvány általános orvos, fogorvos, szakorvos, gyógyszerész,
- ápoló, szülésznő részére (a 2001. évi C. tv. 60/C. §-a alapján a 2005/36/EK irányelv 24., 25., 28.,
29., 31., 34., 35., 40-41., 44. cikke tekintetében)
- szerzett jogot tanúsító hatósági bizonyítvány általános orvos, fogorvos, szakorvos, gyógyszerész,
- ápoló, szülésznő részére (a 2001. évi C. tv. 60/B. §-a alapján a 2005/36/EK irányelv 23., 27., 30.,
33., 37., 43. cikke tekintetében)
- a magyarországi egészségügyi szakmai tevékenység időtartamát tanúsító hatósági bizonyítvány
(a
– 2001. évi C. tv. 60/B. §-a alapján)
- jó hírnév igazolás (1997. évi CLIV. tv. 110/A. §-a alapján)
- végzettségi szintet tanúsító hatósági bizonyítvány (a 2001. évi C. tv. 60/A. §-a, valamint a 2005/36/
EK irányelv 11. cikke alapján)
- egyéb:

Kérelmező személyes adatai (Kérjük nyomtatott nagy betűkkel kitölteni!)

Családi név:
Utónév:
Születési név:
Anyja születési neve:
Születési hely, idő:
Lakóhely:
Levelezési cím:
Telefon:
E-mail:
Alapnyilvántartási szám:

Kérelmemhez az alábbi dokumentumokat csatolom (Kérjük X-szel jelölni!):

- Útlevel/személyi igazolvány fénymásolata
- Lakcímkártya fénymásolata
- Bizonyítvány/oklevél fénymásolata
- Igazgatási szolgáltatási díj megfizetését igazoló csekkszelvény/átutalási bizonylat
- Eredeti hatósági erkölcsi bizonyítvány vagy annak hiteles másolata
- Eredeti munkáltatói igazolás vagy annak hiteles másolata
- Egyéb:

A hatósági bizonyítványokat a következő módon szeretném megkapni (Kérjük X-szel jelölni!):

- Személyesen
- Postai úton
- Meghatalmazott veszi át helyettem (meghatalmazás külön csatolandó)
- Egyéb:

Egyéb kérdés, megjegyzés:

Alulírott nyilatkozom, hogy a kérelemben feltüntetett adatok a valóságnak megfelelnek és
személyes adataim kezeléséhez hozzájárulok.

Kelt:

kérelmező aláírása

Az oklevél, bizonyítvány külföldön történő elismertetéséhez szükséges hatósági bizonyítvány
kiadása iránti kérelem

EXTRA CURRICULAR FEES

Defined by the current Regulations on Compensation and Benefits of Semmelweis University. It is to be tracked on the website.

IMPORTANT

Registration requirements

Please note that the date of registration for the first semester is between **3 - 7 September, 2018** and for the second semester is between **28 January - 1 February, 2019**. In order to fulfill the registration requirements, you must **pay your tuition fee**, you must bring your **index** (where it is still compulsory) **complete with all the signatures and grades, the summer practice certificate**.

EXTRA CURRICULAR FEES AFTER GRADUATION

Defined by the current Regulations on Compensation and Benefits of Semmelweis University. It is to be tracked on the website.

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 'NEKazonosító'
- 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”.

FREQUENTLY ASKED QUESTIONS - FAQ-s

- **What are the Foreign Students’ Secretariat’s office hours?**

Where: EOK (Basic Medical Science Center) 37-47 Tűzoltó utca, 1st Floor, room 1.604

Monday	1 p.m. to 3 p.m.
Tuesday	1 p.m. to 3:30 p.m.
Wednesday	closed
Thursday	9:30 a.m. to 12 p.m.
Friday	10 a.m. to 12 p.m.

Online at <http://semmelweis.hu/english/education/english-language-program/>

- **Where do I get the information and forms necessary for my studies?**

<http://semmelweis.hu/english/education/english-language-program/official-forms/>

- **How do I get my class schedule for the next term?**

<http://ora.semmelweis.hu/tervezet/>

- **How do I get my class schedule for the current term?**

<http://ora.semmelweis.hu/aktualis/>

- **How do I get my class schedule for the previous term?**

<http://ora.semmelweis.hu/regi/>

- **How many credits do I need to graduate from the Faculty of Medicine?**

360

- **How many credits do I have to take 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.

As a general guideline, you should as a minimum, take 30 credits on average in each term to reach the required 360 credits by the end of the 6th year.

- **How many credits do I have to earn in order to remain at school?**

Students whose cumulative credit amount falls below certain prescribed standards are dismissed from the University. Such dismissal occurs, if after completing the fourth active semester the cumulative credit amount from compulsory and obligatory elective courses is less than 50% of the credit points that can be obtained from compulsory courses in the given period.

- **What is my study 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.

- **When do I have to submit the form for my completed summer practice?**

You must submit the form of completion for the nursing practice before the start of the 3rd year, for the internal medicine practice before the start of the 4th year and for surgery practice before the start of the 5th year. Please note: students are not allowed to proceed to the next year unless the form of completion is submitted to the Foreign Students' Secretariat before registration.

- **Where can I get blank forms for my summer practice?**

Please visit <http://semmelweis.hu/english/education/english-language-program/official-forms/>

- **When is my tuition fee due?**

Before registration for both semesters

- **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.

- **What is my tuition per semester?**

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.

- **What sum should I transfer to ensure full payment of the tuition fee?**

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. It is your responsibility to ensure timely and full payment of your tuition.

- **How do I transfer tuition so that the exact amount shows up in the account of the academic program?**

Each term several students fall behind with their tuition payments. The following is to prevent any misunderstandings: The tuition fee is due in full by registration for both semesters. Anything less than the total tuition fee, paid on or before the above mentioned dates, is considered deficient. Since you are responsible for covering any international wire transfer fees incurred while making your payment, you should speak with your bank to ensure that Semmelweis University

will receive the full amount due; it is your responsibility to be aware of any fees or currency fluctuations that might render your tuition deficient. Your tuition fee does not include the bank charges/ transfer fees; these must be paid apart from your tuition fee. Any and all wire transfer fees incurred by all banks are the student's responsibility to pay. It is important for you to keep in mind that ensuring that your tuition fee has been paid properly is your responsibility. The tuition fee is recognized as paid, if the full amount has been received and shows up in the bank account.

- **What should I do when applying for summer practice at a Semmelweis department?**

You can choose to perform your summer internships at the departments/ hospitals of Semmelweis University. You do not need to get accreditation forms for Semmelweis hospitals but you will be required to submit the form of completion once you are done with your summer practice. To organize your practice and ensure that you will be accepted you should contact the relevant department 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.

- **How do I calculate my average?**

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.		Ø

$$\Sigma : 27 + 12 + 20 + 15 + 24 + 15 + 10 = 123$$

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.

- **How do I pay my missed exam fees online?**

Go to Finances/ Payment
Transcribe item
Payment titles: Service
Service type: Missed exam fee
Create item/ Pay in
Pay by credit card
You will be directed to <https://www.otpbankdirekt.hu>

- **How do I pay re-take exam fees online?**

Go to Finances/ Payment
Transcribe item
Payment titles: Retake
Create item/ Pay in
Pay by credit card
You will be directed to <https://www.otpbankdirekt.hu>

- **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.

- **How do I order a check for my 3rd or 4th exam in a given subject?**

First, please read the section titled "Extra curricular fees" in the Calendar, where you'll find the different extracurricular fees. 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”.

To pay online you will have to select 'Payment by credit card' from the two payment options offered to you.

- **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 medical condition 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 download and fill out an exemption form from <http://semmelweis.hu/english/education/english-language-program/official-forms/>

Then, you must show the completed 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. 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 exempt 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. Before forwarding your PE exemption request to the Educational Board of each faculty, your health condition will be checked by a licensed Hungarian health care practitioner, too. **The deadline to submit your exemption request is prior to registration.**

- **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 exam 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 academic year (1 exam, and 2 retakes). 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 Chemistry in the 1st semester (1 exam and 1 retake), you will only have 1 remaining opportunity for a retake in the following semester (plus the one extra 4th chance, if you haven't used it already that 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 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. It is the department's responsibility to submit 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 the 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

Email: 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, Üllöi út 26. Room 202

Contact Information

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ERASMUS Institutional Coordinator

Tel: (+36 1) 459-1500, ext. 55827

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Email: erasmus@semmelweis-univ.hu

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Coordinator Assistant

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SEMMELEWEIS 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

It is an association made up of students from different faculties at the Semmelweis University in different years with very different nationalities and backgrounds. Their aim is to give voice to the international student community at the 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 the 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.

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 THE SEMMELWEIS UNIVERSITY

To support the talented and gifted students the Senate of the 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.

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. 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 active student life and a motivating environment to prospective students. Following graduation, students of the Faculty can immediately be involved in different areas (ex.: health care, tourism, education, sociology) and they are able to improve their close and broad environment.

Facts and Figures

The Faculty of Health Sciences celebrated its 40th anniversary in 2015. Since its foundation, more than 23000 students graduated from the Faculty and today about 3500 students are studying at this institution. The Faculty is very proud of its library containing more than 50000 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. More than 30 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 annually.

The Faculty's Asian relations have also been largely extended by establishing a fruitful relationship with Shanghai Jiao Tong University School of Medicine (SJTU), moreover, 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 program, students study in Hungary during the first 4 years, while they can get acquainted with the science of Chinese Medicine at the Chinese university in the last year.

We are also proud of having operated our bilingual (Italian and English) BSc Physiotherapy training in Lugano, Switzerland since 2009. Over 250 students participate in our programme there. The scale of our international relationship 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 many possibilities are provided to our students to participate in and to build international professional connections.

Leadership, Dean's Office

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Vice Deans **István Vingender Ph.D.** – Academic Affairs
Prof. János Rigó M.D., Ph.D., D.Sc. – Clinical Affairs
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Information about the BSc and MSc 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 (BSc) Programmes

1. Nursing and Patient Care BSc Programme

Specialized programmes: Physiotherapy (Hungarian, English), Nursing (Hungarian, English), Midwifery (Hungarian, English), Dietetics (Hungarian, English), Paramedics (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 different 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 BSc 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 healthcare 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 deliveries and the mother-infant connection, assess and register their observations. Midwives individually assist deliveries, take care of the protection of the perineum and of the treatment of the woman and the newborn 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 (oxygenology), able to perform triage, on an individual basis and also 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, 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)

2. Health Care and Disease Prevention BSc Programme

Specialized programmes: Health Visitor (Hungarian, English), Public Health Care Inspector (Hungarian)

Health Visitor

The health visitor is present in the families' life during the most important steps of life: during pregnancy, reception of the newborn 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, analyze, 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 BSc 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 BSc 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)

II. Master of Science (MSc) Programmes

Physiotherapy MSc 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 MSc 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 MSc programme

Emergency Nursing

Geriatric Nursing

Community Nursing

Qualification

Nurse

Languages

Hungarian, English

Nutritional Sciences MSc Programme (Joint training of Semmelweis University and Szent István University)

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 MSc 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 programs 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 Consulting (Hungarian)
- Wellness Management (Hungarian)
- Health Care Project Management (Hungarian)
- Special Translation and Interpretation in Health Sciences (Hungarian)
- Clinical Epidemiology (Hungarian)
- Traditional Chinese Therapy (Hungarian)
- Rehabilitation-Creative Therapy (Hungarian)
- English Language Medical Communicator (Hungarian)
- Podiatrist (Hungarian)

DEPARTMENTS

INSTITUTE OF APPLIED HEALTH SCIENCES

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 is 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

BSc 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 BSc Nursing 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.

MSc 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 needles-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 program 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. More information on the common webpage: <http://www.cut.ac.cy/careProject/publications/>

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 apply a project. Funding was received from Life Long Learning Program-Erasmus Academic Networks for a project for the years 2013-2016. More information is available on the projects' webpage: <http://ellan.savonia.fi>

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 BSc 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 program 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 newborn and the postpartum mother. The BSc Midwifery program 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, 240 ECTS credits.

Research

Members of the Department's staff support projects and research in different fields of healthcare and healthcare 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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Background

Underwater therapy equipment was used in the Császár baths as early as 1891. The first physiotherapy training in Hungary, which was more of 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 3-semester Master 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 BSc programme the supervised clinical practice takes place from 1st to 7th semester (two to three weeks), and in the 8th semester (12 weeks) at a variety of medical centres. Physiotherapy programme comprises an independent graduate project corresponding to 1152 clinical practice hours, which is equal with 48 credits. The Master 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 BSc and MSc 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-semester long criteria subject, the Physical Education (PE) for each full-time BSc student. PE classes enable students to several opportunities for sport (swimming, volley-ball, 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 Szent István University.

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 program, 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. 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 the Health Sciences Researches programme.

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 Dietoterpap Interventions
- Innovation in public catering
- Disease Specific Nutrition Therapy and Communication Method
- Examination of 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 labeling 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 behaviors
- Members of the Department's staff are actively involved in the boards of different 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 specialty 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 at the Faculty of Dentistry.

Besides theoretical and practical BSc trainings we offer postgraduate specialist trainings for qualified nurses and paramedics, and regular accredited courses in different 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.
- Closely connected with the new University Emergency Centre where practical teaching takes place.
- 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 MSc training programme targeting the intrahospital emergency care has been started result-

ing 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 topics:

- 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.

INSTITUTE FOR HEALTH PROMOTION AND CLINICAL METHODOLOGY

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 Epidemiology

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Background

As the legal successor of the Department of Public Health, the Department for Epidemiology is the newest institutional unit of the Institute for Health Promotion and Clinical Methodology. The overall duty of the Department 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 BSc 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 health-care 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 Ph.D. 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 (Ph.D research)
- Family planning and maternity plans of Health Visitor and Police Officer 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

INSTITUTE OF HEALTH DIAGNOSTIC

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 that 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 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 BSc 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 of mainly Semmelweis University and the 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, paramedic/ambulance officer 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 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. Higher interest 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.

INSTITUTE OF BASIC HEALTH SCIENCES

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 etiology 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: behaviour risk factors/"pathogens" (possibilities of intervention for correction of risk behaviour) behaviour health preservation / „immunogenic". Making research of 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 participate 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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Head of Department

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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 programs in collaboration with other institutions in Hungary or abroad. The new fields of addiction medicine like gambling and Internet-addiction are also 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 Counselor” specialization, which is the first and only opportunity to study addiction counseling in our country. The most important specialists of this field are our invited teachers, too. Our counselors 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 behavior, biological and ethic sides of human behavior, 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 BSc program 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 healthcare 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
- Signaling 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
- Gerontokineziology – 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 that is COHEHRE 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 BSc and MSc 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 organises the Health Care Project Manager postgraduate course (in Hungarian) from 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 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 BSc has 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 relating to the programme.

The Health Care Management BSc programme enables graduates of the course to successfully design and construct client centred health tourism programs, to analyse statistical data relating to tourism, and 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 importance to the innovation of our methods of instruction. To keep a continuous interdisciplinary discussion about this topic, we have organized five 'Professional Days on Teaching and Research Methodologies' so far. Most of our staff have experiences in teaching in 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 hosts different professional days and conferences in the past years.

Due to this work, in 2016 the Department has organized the 5th Professional Day and Conference on Patient Rights. The next edition of this bi-yearly event is due on the fall of 2018. The aim of the conference is was to examine the current ethical and legal issues arising in the everyday practice of health care with the involvement of 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 relating 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 2016 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 is being 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 Services, 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 field 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 programs.

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 socioeconomic 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 healthcare professionals in VET sector.

Division of Foreign Languages and Communication

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Background

The Division of Foreign Languages and Communication is a unit of the Department of Social Sciences.

Education

The main tasks of the Division of Foreign Languages and Communication are to plan and develop the principles and system of language education at the Faculty of Health Sciences; to teach Medical Latin, Health Care Terminology, English and German for Healthcare Purposes to full-time and part-time students. Students with a B2 language certificate also receive language training; they can choose from various competence-based courses. The Division offers a wide variety of elective courses (from Interpreting medical diagnoses and prescriptions through Abstract writing to Computer-aided translation) to provide opportunity for further language development.

The Division coordinates the postgraduate Medical Translation and Interpreting program as well as the English Language Medical Communication program.

The Division of Foreign Languages and Communication is also responsible for teaching Medical Terminology and Hungarian as a Foreign Language to foreign students enrolled in the English and German programs of the Faculty of Medicine, and the English programs of the Faculty of Pharmacy and the Faculty of Health Sciences.

Our division functions as a teaching practice venue for teacher trainees of Hungarian as a foreign language of Károli Gáspár University of the Reformed Church of Hungary.

All our courses are supplemented by textbooks/seminar notes compiled by our teachers and an on-line language learning program specially designed for teaching Health Care Terminology and Language for Healthcare Purposes.

The Faculty is a test venue for the state accredited Professional Language Certification (PROFEX).

The members of the Division also take part in the work of various professional associations, such as the Hungarian Association of Applied Linguists and Language Teachers and the National Association of Teachers and Researchers of Languages for Specific Purposes (SZOKOE).

Research

The Division's research interests include the origins of the functional approach in Hungarian linguistics, linguistic identity, logical relationships in healthcare translations, and exploring the terminological awareness of health science students.