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GOVERNMENT SEMMELWEIS UNIVERSITY

RECTOR: Prof. Dr. Ágoston Szél M. D., Ph.D., D. Sc.

CHANCELLOR: Dr. Károly Szász

VICE RECTORS: Prof. Dr. Ferenc Bánhidy M. D., Ph. D., D.Sc.
General Affairs
Prof. Dr. Péter Hermann D. M. D., M.Sc., Ph. D.
Educational Affairs
Prof. Dr. Béla Merkely M.D., Ph.D., D.Sc.
Clinical Affairs
Prof. Dr. György Bagdy Ph. D., D.Sc.
Scientific Affairs

DEANS: Prof. Dr. László Hunyady M. D., Ph.D., D. Sc.
Faculty of Medicine
Dr. Gábor Gerber D. M. D., Ph.D.
Faculty of Dentistry
Prof. Dr. Romána Zelkó dr. pharm., Ph.D.
Faculty of Pharmacy
Prof. Dr. Zoltán Zsolt Nagy M.D., Ph.D., Habil., D. Sc.
Faculty of Health Sciences
Dr. Péter Gaál M.D., M.Sc., Ph.D.
Faculty of Health and Public Services

PRESIDENT OF THE DOCTORAL COUNCIL:
Prof. Dr. József Tímár M.D., Ph.D., D. Sc.

DIRECTOR GENERAL (acting) OF FINANCE, INVESTMENT AND OPERATION:
Dr. Zsuzsanna Borbély Balogh

FOREIGN STUDENTS’ SECRETARIAT
DIRECTOR: Prof. Dr. Attila Mócsai M. D., Ph.D, D. Sc.

Academic Program Director for Medicine,
Dentistry and Pharmacy in English:
Prof. Dr. Márk Kollai M.D., Ph.D., D.Sc.
Basic Medical Science Center
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: (36-1) 266-0452; 317-0932
Fax: (36-1) 266-6734
e-mail: english.secretariat@semmelweis-univ.hu

English Secretariat Office: Basic Medical Science Center
1094 Budapest IX., Tűzoltó u. 37-47, first floor 1604
Phone: (36-1) 266-0452
Fax: (36-1) 266-6734
e-mail: english.secretariat@semmelweis-univ.hu

Website http://semmelweis.hu/english/education/english-language-program/
Head of Secretariat:  
**Ms. Olga Ványi B. A.** (459-1500/ ext 60078; english.secretariat@semmelweis-univ.hu)

Staff:  
**Ms. Adrienn Bácskai** (459-1500/ ext 60072; bacskai.adrienn@semmelweis-univ.hu)  
**Ms. Viktória Fekete** (459-1500/ ext 60071; fekete.viktoria@semmelweis-univ.hu)  
**Mr. Csaba Istvánfi** (459-1500/ ext 60077; istvanfi.csaba@semmelweis-univ.hu)  
**Ms. Tímea Jurászik** (459-1500/ ext 60080; juraszik.timea@semmelweis-univ.hu)  
**Ms. Tímea Kapisinszky** (459-1500/ ext 60479; kapisinszky.timea@semmelweis-univ.hu) – on leave  
**Ms. Andrea Kevi** (459-1500/ ext 60081; kevi.andrea@semmelweis-univ.hu)  
**Ms. Éva Kiss** (459-1500/ ext 60089; kiss.eva@semmelweis-univ.hu)  
**Ms. Sarolta Kokavecz** (459-1500/ ext 60074; kokavecz.sarolta@semmelweis-univ.hu)  
**Ms. Zenina Korponai** (459-1500/ ext 60479; korponai.zenina@semmelweis-univ.hu)  
**Ms. Edit Kovács** (459-1500/ ext 60075; kovacs.edit@semmelweis-univ.hu)  
**Mr. Szabolcs Piller** (459-1500/ ext 60479; piller.szabolcs@semmelweis-univ.hu)  
**Ms. Márta Reményi** (459-1500/ ext 60076; remenyi.marta@semmelweis-univ.hu)  
**Ms. Orsolya Sajtos** (459-1500/ ext 60073; sajtos.orsolya@semmelweis-univ.hu)  
**Ms. Sonia Stroe** (459-1500/ ext 60079; stroe.sonia@semmelweis-univ.hu)  
**Ms. Petronella Szabó** (459-1500/ ext 60081; szabo.petra@semmelweis-univ.hu)

Office hours:  
**Monday:** 1 p.m. – 3 p.m.  
**Tuesday:** 1 p.m. – 3.30 p.m.  
**Wednesday:** CLOSED  
**Thursday:** 9.30 a.m. – 12 p.m.  
**Friday:** 10 a.m. – 12 p.m.
## SCHEDULE FOR THE 2017/2018 ACADEMIC YEAR
*(Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmacy)*

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td><strong>Opening Ceremony</strong></td>
<td>September 2, 2017</td>
</tr>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Date of registration - 1st year</strong></td>
<td>September 6, 2017</td>
</tr>
<tr>
<td>- the other years</td>
<td>September 4, 5, 7, 8, 2017</td>
</tr>
<tr>
<td><strong>Place of registration</strong></td>
<td>English Secretariat</td>
</tr>
<tr>
<td><strong>Neptun Day – 1st year</strong></td>
<td>August 31, 2016</td>
</tr>
<tr>
<td><strong>Freshman’s Day – 1st year</strong></td>
<td>September 8, 2017</td>
</tr>
<tr>
<td><strong>First day of the semester</strong></td>
<td></td>
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<tr>
<td>Faculty of Medicine (1st– 5th years)</td>
<td>September 11, 2017</td>
</tr>
<tr>
<td>Faculty of Dentistry</td>
<td>September 11, 2017</td>
</tr>
<tr>
<td>Faculty of Pharmacy (1st– 4th years)</td>
<td>September 11, 2017</td>
</tr>
<tr>
<td><strong>Last day of the semester</strong></td>
<td></td>
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<tr>
<td>Faculty of Medicine (1st– 5th years)</td>
<td>December 15, 2017</td>
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<tr>
<td>Faculty of Dentistry</td>
<td>December 15, 2017</td>
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<tr>
<td>Faculty of Pharmacy (1st– 4th years)</td>
<td>December 15, 2017</td>
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<tr>
<td>5th year Pharmacy:</td>
<td></td>
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<tr>
<td>Practical training</td>
<td>July 17 – September 15, 2017</td>
</tr>
<tr>
<td><strong>The semester lasts for</strong> 5th year Pharmacy (12 weeks)</td>
<td>September 25 – December 15, 2017</td>
</tr>
<tr>
<td><strong>Examination period</strong></td>
<td></td>
</tr>
<tr>
<td>Faculty of Medicine (1st– 5th years)</td>
<td>December 18, 2017–February 2, 2018</td>
</tr>
<tr>
<td>Faculty of Dentistry (1st– 5th years)</td>
<td>December 18, 2017–February 2, 2018</td>
</tr>
<tr>
<td>Faculty of Pharmacy (1st – 5th years)</td>
<td>December 18, 2017–February 2, 2018</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Date of registration (1st– 5th years)</strong></td>
<td>January 29 – February 2, 2018</td>
</tr>
<tr>
<td><strong>Place of registration</strong></td>
<td>English Secretariat</td>
</tr>
<tr>
<td><strong>First day of the semester</strong> for 1st– 5th years Medicine and Dentistry</td>
<td>February 5, 2018</td>
</tr>
<tr>
<td><strong>Last day of the semester</strong> for 1st– 5th years Medicine and 1st– 4th years Dentistry</td>
<td>May 18, 2018</td>
</tr>
<tr>
<td>Last day of the semester for 5th year Dentistry</td>
<td>May 4, 2018</td>
</tr>
<tr>
<td><strong>Faculty of Pharmacy</strong></td>
<td></td>
</tr>
<tr>
<td><strong>First day of the semester (1st– 4th years)</strong></td>
<td>February 5, 2018</td>
</tr>
<tr>
<td><strong>Last day of the semester (1st– 4th years)</strong></td>
<td>May 18, 2018</td>
</tr>
<tr>
<td><strong>First day of the semester (practice)</strong> for 5th year</td>
<td>January 31, 2018</td>
</tr>
<tr>
<td><strong>Last day of the semester (practice)</strong> for 5th year</td>
<td>May 31, 2018</td>
</tr>
</tbody>
</table>
Examination period for Faculty of Medicine, Faculty of Dentistry
1st – 5th year Medicine May 22 – July 6, 2018
1st – 4th year Dentistry May 22 – July 6, 2018
5th year Dentistry May 7 – June 15, 2018

Faculty of Pharmacy
1st – 4th year May 22 – July 6, 2018

Exam held outside the academic year - EOAY Presumably August 27-31, 2018 in case it is held.

2017/2018 Schedule for 6th year Medicine July 17, 2017 – May 8, 2018

General Board Examination Period
Faculty of Medicine November 13-30, 2017
May 28 - June 20, 2018
August 21 – 31, 2018

Faculty of Dentistry June 18 – 22, 2018
Faculty of Pharmacy June 5 - 20, 2018

Graduation Ceremony for Dentistry July 7, 2018 (Saturday)
Graduation Ceremony for Pharmacy July 7, 2018 planned (Saturday)

Holidays
October 23, 2017 (Monday)
November 1, 2017 (Wednesday)
March 15, 2018 (Thursday)

Spring (including Easter) holidays
March 26 – April 2, 2018
May 1, 2018 (Tuesday)
May 21, 2018 (Whit Monday)

Research Students’ Conference:
February 7 – 8 – 9, 2018
No lectures or seminars for years 2–5/6:
on February 7 – 8 at the Faculty of Medicine and
at the Faculty of Pharmacy (Wednesday – Thursday),
on February 7 (Wednesday) at the Faculty
of Dentistry, decision about
February 8-9 will be made by the Faculty
of Dentistry

Faculty Day:
April 24, 2018 (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. Only credits with a value that is an integer may be assigned to a subject.

3. Credits can be completed by obtaining 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 mandatory credits for the term. If the credit value of the mandatory, alternative and optional subjects that can be added by the student and the subjects dropped in the previous year exceeds the maximum value that the student can add, the student may have the credit 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 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 mandatory subjects is obligatory 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 mandatory and alternative 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 mandatory and optional 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 pharmacology 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 mark-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) alternative subjects,
   c) optional subjects
   d) the name of the professor,
   e) the code, credit value, 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 redress is available for any adverse effect caused by failure to do so. Students who fail to fulfil their obligation to report any change in their data will be charged a 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,
Section 8

Suspension of student status

1. The student must register in the student information system during the period specified by the Faculty 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.

3. A person who has been admitted may defer the commencement of their studies for a maximum of two terms upon request. Requests for deferment must be made in writing, to the Dean’s Office of the Faculty. After the period of the deferment 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. the student has used the number of active terms specified in the Policy but has not finished their studies, or if the minimum number of the terms required for the completion of his studies and the number of the terms used by the student would exceed this number,

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.

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 15 July every year. The request must be accompanied by the original, completed mark-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 15 July every year. The request must be accompanied by the original, completed mark-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 mark-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 15 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 3.51-4.00.

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 it must declare that the student’s student status has been terminated and their name has been struck off from the register as a result of the transfer.

6. A self-funded student may request a transfer to the same state-funded programme if their adjusted credit index was at least 3.51 in the two consecutive terms preceding the transfer request. However, the transfer will only be performed if a state-funded place becomes available.
available. The places that have become available will be assigned based on the order established according to the adjusted credit index.

7. Transfers between programmes, faculties and training levels will only be possible if the content of the subjects completed are 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.

8. 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 in 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 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 repeat examination period should not be regarded as completed or obtained for the purpose of the provisions of this section.

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Section 15

Assessment of the student’s performance

Section 16

Announcement and addition of subjects

1. The mandatory 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 mandatory, alternative and optional 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 mandatory, alternative and optional 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. Mandatory 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 mandatory and optional 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 mark-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 mark-
book in the electronic student registration system, after which it will also record this fact
in the appropriate section of the student’s mark-book with the entry “Refused to sign”. If
the event of refusal to sign the mark-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 ma-
terials 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 unsatisfac-
tory 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 rel-
evant 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 educa-
tional organisational unit, the head of the Faculty may authorise adding the next term’s
unit for a given 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.

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 pre-
pared 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 con-
cerned of the approval of the subject criteria within 15 days.

5. The subject criteria must be published in the Academic Information Booklet in the tra-
ditional 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 depart-
ment’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 uninter-
rupted 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 submit-
ted 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 oppor-
tunities, 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 optional and alternative 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. The number of examination places offered in the repeat examination period must correspond to at least the number of students entitled to take a retake 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 markbook 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 mark-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 mark-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 index numbers of academic achievement

(1) The academic achievement of students must be recorded in the markbook if any and the student information system. The data in the student information system will be considered as authentic copies of the mark-book.

(2) The student must receive a mark-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 markbook if any; the head of the dean’s office (registry office) may confirm the authenticity of the entries by signing the markbook 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 markbook if any. These data can be confirmed by the signature of the dean of the competent faculty.

(7) The data in the markbook 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 markbook 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 optional 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 optional 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 must 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: distinction (5), merit (3), 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 fundamen-
tal 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 no-
tice 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 con-
cerned.

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 work-
place. If authorised by the head of department, the student may submit their degree the-
sis 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 out-
lines the requirements relating to the preparation of the degree thesis and the possibil-
ities 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 eval-
uates the results achieved by the student and advises the student on finalising the find-
ings.

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 re-
searcher 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 super-
visor 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 demon-
strated 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 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.

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:

\[
XD = \frac{Xn + D + l + Sz + Gy}{n + 4}
\]

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)
- \( l \) = 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 alphabet 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.
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 on the basis of the statutory authorisation in Section 21 (4) of Act CXXXIX of 2005 on Higher Education (hereinafter: Act), the Senate of Semmelweis University hereby passes the following detailed procedural rules (the procedural rules include the cited statutory provisions in bold):

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 ev-
idence 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](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. 2017/18/1) and the curriculum, then select “Subject list of the chosen curriculum” under „Subject type” to display compulsory and alternative subjects. The option “Other optional subjects” may be used if the institution concerned manages its optional subjects separated from the curricula. If you do not find any subject in this list, this only means that at your institution these optional 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 “Registrated 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.

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**Exam registration**

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

1. **List exams:** On entering the page for the first time all future exam dates announced in the current semester will appear, but you can filter the list. If you only want to see the exam dates of a given subject, select the subject from the “Subjects” roll-down menu, then click on the button “List exams”.

2. **Exam registration:** To register for an exam, click on “Register” in the line of the given date. The programme will report on the success or failure of exam registration.

3. **Canceling exam registration:** If you register for an exam by mistake or you simply change your mind and want to cancel your registration, click on „Cancel” next to the given exam. (Normally this can be done prior to the exam within the cancellation deadline. 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”.

THE DEPARTMENTS OF SEMMELWEIS UNIVERSITY

Semmelweis University, Faculty of Medicine

Department of Anatomy, Histology and Embryology
1094 Budapest IX., Tűzoltó u. 58.
Phone: 215-6920 / ext 53601 Dr. Székely, 53652 Dr. Csáki (Pharm.)
Head of the Department: Prof. Dr. Ágoston Szél

Institute of Biophysics and Radiation Biology
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: 267-6261 / ext 60211 Dr. Voszka, 60220 Dr. Módos (Pharm.)
Head of the Department: Prof. Dr. Miklós Kellermayer

Department of Genetics, Cell- and Immunobiology
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2940 / ext 56234 Dr. Holub, 56251 Dr. Láng,
56502 Dr. Semsei
Head of the Department: Prof. Dr. Edit Buzás

Department of Pharmacology and Pharmacotherapy
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2930 / ext 56267 Dr. Riba, 56337 Dr. Kató
Head of the Department: Prof. Dr. Péter Ferdinandy

Department of Forensic Medicine
1091 Budapest IX., Üllői út 93.
Phone: 215-7300 / Dr. Szólósi
Head of the Department: Prof. Dr. Éva Keller
Department of Medical Biochemistry
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: +36-1-4591500 / ext 60034 Dr. Léránt / 60066 Dr. Tóth
Head of the Department: Prof. Dr. László Tretter

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: 266-2615 / ext 60132 Dr. Keszler
Head of the Department: Prof. Dr. Gábor Bánhegyi

Institute of Human Physiology and Clinical Experimental Research
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: 210-0306 / ext 60311, 60312 Dr. Miklós
Head of the Institute: Prof. Dr. Zoltán Benyó

Department of Physiology
1094 Budapest IX., Tűzoltó u. 37-47.
Phone: 266-9180 / ext 60439 Dr. Várnai, 60450 Dr. Balla
Head of the Department: Prof. Dr. László Hunyady

Department of Pathophysiology
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2940 / ext 56357 Dr. Molnár
Head of the Department: Prof. Dr. Attila Tordai

Institute of Public Health
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2930 / ext 56313 Dr. Terebessy
Head of the Institute: Prof. Dr. Károly Cseh

Institute of Behavioral Sciences
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2953
Head of the Institute: Prof. Dr. József Kovács

Institute of Behavioral Sciences
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2930 / ext 56350 Dr. Kovács, 56115 Dr. Szántó, 56123 Dr. Salaveczech
Head of the Institute: Prof. Dr. Ferenc Túry

Institute of Medical Microbiology
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2959 / ext 56320 Dr. Ghidán, 56287 Dr. Dobay
Head of the Institute: Prof. Dr. Dóra Szabó

I. Department of Pathology and Experimental Cancer Research
1085 Budapest VIII., Üllői út 26.
Phone: 266-1638 / ext 54420 Dr. Zalatnai, ext 54425 Dr. Rácz
Head of the Department: Prof. Dr. András Matolcsy

II. Department of Pathology
1091 Budapest IX., Üllői út 93.
Phone: 215-7300
Head of the Department: Prof. Dr. András Kiss
Department of Anesthesiology and Intensive Therapy
1082 Budapest VIII., Üllői út 78. B-part of the building, 4th floor
Phone: 355-6565, 325-1100; / ext 62062 Dr. Vass, Dr. Kállai, Dr. Gyöngyösi
Head of the Department: Prof. Dr. János Gál

I. Department of Internal Medicine
1083 Budapest VIII., Korányi Sándor u. 2/A
Phone: 459-1500 / ext 51465 Dr. Studinger
Head of the Department: Prof. Dr. Miklós Szathmári

III. Department of Pathology
1091 Budapest IX., Üllői út 93.
Phone: 215-7300 / ext 53454 or 53456 Prof. Dr. Kiss
Head of the Department: Prof. Dr. József Timár

Department of Anesthesiology and Intensive Therapy
1082 Budapest VIII., Üllői út 78. B-part of the building, 4th floor
Phone: 355-6565, 325-1100; / ext 62062 Dr. Vass, Dr. Kállai, Dr. Gyöngyösi
Head of the Department: Prof. Dr. János Gál

I. Department of Internal Medicine
1083 Budapest VIII., Korányi Sándor u. 2/A
Phone: 459-1500 / ext 51465 Dr. Studinger
Head of the Department: Prof. Dr. Miklós Szathmári

II. Department of Internal Medicine
1088 Budapest VIII., Szentkirályi u. 46.
Phone: 266-0926 ext 55593, 55520, 55519 Dr. Hagymási
Head of the Department: Prof. Dr. Péter Igaz

III. Department of Internal Medicine
1125 Budapest XII., Kútvölgyi út 4.
Phone: 325-1100 ext 291 Dr. Keltai, 216 Dr. Jakab
Head of the Department: Prof. Dr. Tamás Masszi

Department of Dermatology, Dermatooncology and Venerology
1085 Budapest VIII., Mária u. 41.
Phone: 266-0465 / ext 55773 Dr. Tóth (Med.), 55776 Dr. Hídvégi (Dent.)
Head of the Department: Prof. Dr. Miklós Sárady

Department of Family Medicine
1125 Budapest XII., Kútvölgyi út 4.
Phone: 355-8530 Dr. Torzsa
Head of the Department: Prof. Dr. László Kalabay

Department of Otorhinolaryngology, Head and Neck Surgery
1083 Budapest VIII., Szigony u. 36.
Phone: 334-2384 / ext 52350 Dr. Bencsik
Head of the Department: Prof. Dr. László Tamás
I. Department of Pediatrics
1083 Budapest VIII., Bókay J. u. 53-54.
Phone: 334-3186/ ext 52728 Dr. Horváth, ext 52631 Dr. Krikovszky
Head of Department: Prof. Dr. Attila Szabó

II. Department of Pediatrics
1094 Budapest IX., Tűzoltó. u. 7-9.
Phone: 215-1380 ext 52958; 52926, Dr. Hauser, Dr. Bánsági, 52861; 52976 Dr. Müller
Head of the Department: Prof. Dr. András Szabó

Cardiovascular Center
Heart Center
Department of Cardiology
1122 Budapest XII., Városmajor. u. 68.
Phone: 458-6847; 458-6810 Dr. Bárczi
Head of the Department: Prof. Dr. Béla Merkely

Department of Neurology
1088 Budapest VIII., Balassa u. 6.
Phone: 210-0330 / ext 51123 Dr. Debreczeni, Dr. Scheidl
Head of the Department: Prof. Dr. Dániel Bereczki

Department of Neurosurgery
1145 Budapest XIV., Amerikai út 57.
Phone: 467-9325; 251-2999 / ext 325 Prof. Nyáry
Head of the Department: Prof. Dr. Péter Banczerowski

Department of Orthopedics
1113 Budapest XI., Karolina út 27.
Phone: 466-6059, Fax: 466-8747 Dr. Holnapy
Head of the Department: Prof. Dr. György Szőke

Department of Psychiatry and Psychotherapy
1083 Budapest VIII., Balassa u. 6.
Phone: 210-0330 / extension 51100
Head of the Department: Dr. János Réthelyi
Tutors: Dr. Hidasi 51217, Dr. Seres, 51230 Dr. Szily, 51229 Dr. Unoka
Education officer: Hajnal Kiss, Tünde Szécsi 51322 (Basement room 003.)

Department of Pulmonology
1125 Budapest XII., Diósárok u. 1/C
Phone: 355-9733 ext 57055 Dr. Orosz
Head of the Department: Prof. Dr. György Losonczy

Department of Radiology
1082 Budapest VIII., Üllői út 78/A
Phone: 210-0300 / ext 61659 Dr. Tárnoki
Head of the Department: Prof. Dr. Viktor Bérczi

I. Department of Surgery
1082 Budapest VIII., Üllői út 78.
Phone: 313-5216 / ext 52167 Dr. Kokas, ext 58916 Dr. Szűcs, ext 52120 Dr. Regáli
Head of the Department: Prof. Dr. László Harsányi
II. Department of Surgery
1125 Budapest XII., Kútvölgyi út 4.
Phone: 325-1100 / ext 57201 Dr. Ledniczky
Head of the Department: Dr. Gábor István

Department of Transplantation and Surgery
1082 Budapest VIII., Baross u. 23.
Phone: 267-6000; 459-1500 / ext 80157 Dr. Telkes
Head of the Department: Prof. Dr. Zoltán Máthé

Department of Surgical Research and Techniques
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 459-1500 / ext 56569 Dr. Szabó
Head of the Department: Prof. Dr. György Wéber

Department of Vascular Surgery
1122 Budapest XII., Városmajor u. 68.
Phone: 458-6700, Dr. Járányi
Head (assigned) of the Department: Prof. Dr. László Entz

Department of Ophthalmology
1085 Budapest VIII., Mária u. 39
Phone: 266-0513 / ext 51612 Dr. Resch
Head of the Department: Prof. Dr. Zoltán Zsolt Nagy

I. Department of Obstetrics and Gynecology
1082 Budapest VIII., Baross u. 27.
Phone: 266-0473 / ext 54250 Dr. Nagy, 54332 Dr. Joó
Head of the Department: Prof. Dr. János Rigó

II. Department of Obstetrics and Gynecology
1082 Budapest VIII., Úllői út 78/A
Phone: 210-0290 / ext 53106
Head of the Department: Prof. Dr. Nándor Ács

Department of Traumatology
1081 Budapest, VIII. Fiumei út 17.
1145 Budapest, XIV., Uzsoki u. 29.
Phone: 467-3851 Dr. Berta
Head of the Department: Prof. Dr. László Hangody

Department of Urology
1082 Budapest VIII., Úllői út 78/B
Phone: 210-0280 / ext 51135, 51147 Dr. Horváth
Head of the Department: Prof. Dr. Péter Nyirády

Department of Laboratory Medicine
1089 Budapest VIII., Nagyvárad tér 4., floor XIV.
Phone: 210-0278 / ext 56318 Prof. Szabó
Head of the Department: Prof. Dr. Barna Vásárhelyi
**Institute of Digital Health Sciences**  
1089 Budapest VIII., Ferenc tér 15. floor II.  
Phone: 488-7620; 210-0328 / ext 57620 Dr. Szócska  
Director: Dr. Miklós Szócska

**Center of Physical Education and Sport Sciences**  
1107 Budapest X., Zágrábi út 14.  
Phone: 215-9337, 262-5529, 264-1408, 262-5529  
Director: Kornélia Várszegi

**Semmelweis University, Faculty of Dentistry**

**Department of Prosthodontics**  
Dental Centre  
1088 Budapest VIII., Szentkirályi u. 47.  
Phone: 318-0011 ext 59322 Prof. Márton  
Head of the Department: Prof. Dr. Péter Hermann

**Independent Section of Radiology**  
Dental Centre  
1088 Budapest VIII., Szentkirályi u. 47.  
Phone: 459-1500 ext 59322 Prof. Márton  
Head of the Department: Prof. Dr. Csaba Dobó Nagy

**Department of Pedodontics and Orthodontics**  
Dental Centre  
1088 Budapest VIII., Szentkirályi u. 47.  
Phone: 318-0011 ext 59322 Prof. Márton  
Head (assigned) of the Department: Dr. Noémi Katinka Rózsa

**Department of Conservative Dentistry**  
Dental Centre  
1088 Budapest VIII., Szentkirályi u. 47.  
Phone: 318-0011 ext 59322 Prof. Márton  
Head of the Department: Dr. Zsuzsanna Tóth

**Department of Oral Biology**  
1089 Budapest VIII., Nagyvárad tér 4.  
Phone: 210-4415 ext 56310 Dr. Kerémi; 56420, 56173 Dr. Kádár  
Head of the Department: Prof. Dr. Gábor Varga

**Department of Oral Diagnostics**  
Dental Centre  
1088 Budapest VIII., Szentkirályi u. 47.  
Phone: 318-0011 ext 59322 Prof. Márton  
Head of the Department: Prof. Dr. Csaba Dobó Nagy

**Department of Oro-Maxillofacial Surgery and Stomatology**  
1085 Budapest VIII., Mária u. 52.  
Phone: 266-0457/ ext 55866, 55867 Dr. Szűcs  
Head of the Department: Dr. Zsolt Németh
Department of Periodontology
Dental Centre
1085 Budapest VIII., Szentkirályi u. 47.
Phone: 318-0011 ext 59322 Prof. Márton
Head of the Department: Prof. Dr. Péter Windisch

Department of General Dental Preclinical Practice
Dental Centre
1088 Budapest VIII., Szentkirályi u. 47.
Phone: 459-1472; 459-1500 ext 59112; 59322
Head and tutor of the Department: Prof. Dr. Krisztina Márton

Department in Community Dentistry
1085 Budapest VIII., Mikszáth Kálmán tér 5.
Phone: 317-6600, 317-2222; ext 60749 Dr. Németh
Head of the Department: Dr. Péter Kivovics

Semmelweis University, Faculty of Pharmacy

University Pharmacy, Department of Pharmacy Administration
1092 Budapest IX., Hőgyes Endre u. 9.
Phone: 476-3600 / ext 53010 Dr. Mesko, 3049 Dr. Mészáros
Head of the Institute: Prof. Dr. Romána Zelkó

Institute of Pharmacognosy
1085 Budapest VIII., Úllói út 26.
Phone: 317-2979 / ext 55372 Dr. Sólyomváry
Head of the Institute: Dr. Szabolcs Béni

Department of Pharmaceutics
1092 Budapest IX., Hőgyes Endre u. 7.
Phone: 476-3600 Dr. Hajdú, Dr. Antal, Prof. Marton
Head of the Department: Dr. István Antal

Institute of Pharmaceutical Chemistry
1092 Budapest IX., Hőgyes Endre u. 9.
Phone: 476-3600; 217-0891 Prof. Takács–Novák
Head of the Institute: Dr. Péter Horváth

Department of Pharmacodynamics
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-4411, 210-2927 / ext 56108 Prof. Tekes,
56324 Prof. Szökő, 56412 Dr. Tábi
Head of the Department: Prof. Dr. György Bagdy

Department of Organic Chemistry
1092 Budapest IX., Hőgyes Endre u. 7.
Phone: 476-3600 / ext 53025 Dr. Tétényi
Head of the Institute: Dr. István Mándity
Semmelweis University, Faculty of Health Sciences

Department of Nursing
1088 Budapest, Vas u. 17., room 150
Phone: +(36-1)486-5936
Head of the Department: Zoltán Balogh, RN, PT, M.Sc., Ph.D.

Department of Physiotherapy
1088 Budapest, Vas u. 17., room 305
Phone: +(36-1)486-5980
Head of the Department: Dr. Mónika Horváth, Ph.D.

Section of Physical Education
1088 Budapest, Vas u. 17., room 421
Phone: +(36-1)486-5850
Head of the section: Gábor Soós

Department of Dietetics and Nutrition Sciences
1088 Budapest, Vas u. 17., room 38
Phone: +(36-1)486-4820
Head of the Department: Katalin Tátrai-Németh, PhD

Department of Oxyology and Emergency Care
1088 Budapest, Vas u. 17., room 145
Phone: +(36-1)486-5840
Head of the Department: Péter L. Kanizsai, MD, PhD, DEAA

Department of Clinical Studies in Obstetrics and Gynaecology
1088 Budapest, Vas u. 17., room 144
Phone: +(36-1)486-4890
Head of the Department: János Rigó, M.D., Ph.D., DSc.

Department of Family Care Methodology
1088 Budapest, Vas u. 17., room 245
Phone: +(36-1)486-4840
Head of the Department: László Szabó, M.D., Ph.D. med. habil.

Department of Epidemiology
1088 Budapest, Vas u. 17., room 126
Phone: +(36-1)486-4870
Head of the Department: Dr. István Barcs, CSc.

Department of Clinical Studies
1088 Budapest, Vas u. 17., room F/9
Phone: +(36-1)486-5970
Head of the Department: Dr. Klára Gadó, Ph.D., M.D.

Department of Clinical Ophthalmology
1088 Budapest, Vas u. 17., room 20
Phone: +(36-1)486-5855
Head of the Department: Assistant Lecturer Dr. Illés Kovács M.D., Ph.D.
Department of Imaging and Medical Instrumentation
1088 Budapest, Vas u. 17., room 348
Phone: +(36-1)486-5960
Head of the Department: Attila Doros, M.D., Ph.D.

Department of Applied Psychology
1088 Budapest, Vas u. 17., room 343/A
Phone: +(36-1)486-4919
Head of the Department: Mária Hoyer, Ph.D.

Department of Addictology
1088 Budapest, Vas u. 17., room 312
Phone: +(36-1)486-4919
Head of the Department: József Rácz, MD, Ph.D., DSc.

Department of Morphology and Physiology
1088 Budapest, Vas u. 17., room 345
Phone: +(36-1)486-4940
Head of the Department: Gabriella Dörnyei, Ph.D.

Department of Social Sciences
1088 Budapest, Vas u. 17., room 312
Phone: +(36-1)486-4910
Head of the Department: Helga Feith, Ph.D.

Division of Foreign Languages and Communication – Faculty of Health Sciences
H-1088 Budapest, Vas u. 17., room 130
Phone: +(36-1) 486-4960 Fax: +(36-1) 486-4962 Bakó
Head of the Division: Katalin Zöldi Kovács Ph.D.

Departments of Loránd Eötvös University of Natural Sciences

Department of Analytical Chemistry
1117 Budapest XI., Pázmány Péter sétány 1/A
Phone: 372-2548; 372-2500 / ext 1241, 6426 Dr. Kurin-Csörgei, Dr. Béni 459-1500/53062 ext
Fax: 372-2592
Head of the Department: Dr. István Szalai

Department of Biology, Plant Anatomy
1117 Budapest XI., Pázmány Péter sétány 1/A
Phone: 381-2179 Dr. Kovács
Head of the Department: Prof. Dr. Béla Böddi

Department of Physical Chemistry
1117 Budapest XI., Pázmány Péter sétány 1/A
Phone: 372-2548 / ext 1209 Dr. Turányi, 1201 Dr. Turi
Fax: 372-2592
Head of the Department: Dr. Gáspár Győző Lány
National Ambulance Service
1134 Budapest XIII., Róbert Károly krt. 77.
Phone: 350-3737, Dr. Gorove, Dr. Mészáros, Dr. Schönborn; 350-6931,
Dr. Engelbrecht; 311-9850/ ext 113
Director-General: Dr. Gábor Göbl M. D.

Division of Foreign Languages and Communication – Faculty of Health Sciences
1088 Budapest, Vas u. 17.
Phone: +(36-1) 486-5801 /ext 64960 Sztankóné Horváth, Bakó
Head of the Division: Katalin Zöldi Kovács Ph.D.

Language Communication Center
1094 Budapest, Ferenc tér 15.
Phone/Fax: +(36-1) 215-9338; ext 53814
Director: Dr. Éva Kovács Ph.D.

EMBASSIES
To find the contact information of your Embassy in Hungary, please visit:
http://www.embassypages.com/hungary
Academic Staff

Faculty of Medicine

Department of Anatomy, Histology and Embryology

1094 Budapest, Tűzoltó utca 58.
Tel.: 215-6920    Fax.: 215-3064

Head of Department

Prof. Dr. Ágoston Szél
Full Professor

Full Professor
Prof. Dr. András Csillag
Prof. Dr. Mihály Kálmán
Prof. Dr. Miklós Ráthelyi

Professor Emeritus
Prof. Dr. Béla Halász
Prof. Dr. Kálmán Majorossy
Prof. Dr. Imre Oláh
Prof. Dr. Miklós Palkovits

Associate Professor
Dr. Alán Alpár (Deputy Head, Research)
Dr. Károly Altdorfer
Dr. Ágnes Csáki
Dr. Gábor Gerber (Dean of the Dental Faculty, General Deputy Head of Department)
Dr. Anna L. Kiss (Deputy Head, Teaching)
Dr. Andrea D. Székely (Course Director of the English Programme)

Adjunct Professor
Dr. Krisztina Herberth-Minkó
Dr. Katalin Kocsis
Dr. Márk Kozsurek
Dr. Dávid Lendvai
Dr. Ákos Lukáts
Dr. Viktória Verczki

Assistant Professor
Dr. Ildikó Bódi
Dr. Dávid Dóra
Dr. János Hanics
Dr. Sándor Katz
Nóra Pecsenye-Fejszák
Dr. András Szuák

Advisor (retired)
Dr. Katalin Gallatz
Dr. Árpád Kiss
Prof. Dr. Katalin Köves
Dr. Judith Molnár
Dr. Ágnes Nemeskéri
Dr. György Somogyi
Dr. Géza Tótpál
Prof. Dr. Tibor Wenger

Senior Scientist
Dr. Árpád Dobolyi
Dr. Zita Puskár
Dr. Zsuzsanna Tóth
Institute of Biophysics and Radiation Biology

1094 Budapest IX., Tűzoltó u. 37-47.
☎ 267-6261

Head of the Department: Prof. Dr. Miklós Kellermayer M.D., Ph.D., D.Sc.
Professor emeritus: Prof. Dr. Judit Fidy
Associate professor: Dr. Andrea Fekete, Dr. Katalin Blaskó,
Dr. Gabriella Csink, Dr. Levente Herényi, Dr. Károly Módos (tutor)
Assistant professor: Dr. István Voszka (tutor), Dr. Irén Nagy, Dr. Szabolcs Osváth,
Dr. Erika Balog

Department of Genetics, Cell- and Immunobiology

1089 Budapest, VIII. Nagyvárad tér 4.
☎ 210-2940, 210-2929

Head of the Department: Prof. Dr. Edit Buzás M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. András Falus
Prof. Dr. Csaba Szalai
Professor emeritus: Prof. Dr. György Csaba

Associate professor: Dr. Zsuzsanna Darvas, Dr. András K.Fülöp, Dr.
László Köhidai. Dr. György Nagy, Dr. Erna Pap,
Dr. Éva Pällinger, Dr. Sára Tóth
Assistant professor: Dr. Marianna Holub (tutor of Immunology), Dr.
Orsolya Láng (tutor of Biology and Medical
Biology- Cell Biology), Dr. Zoltán Pós, Dr. Viola
Tamási, Dr. Zoltán Wiener
Assistant lecturer: Dr. F. Ágnes Semsei (tutor of Genetics and
genomics), Dr. Katalin Szabó-Taylor
Research fellow: Dr. Eszter Lajkó, Dr. Barbara Molnár-Érsek,
V.Krisztina Vukman
Research assistant: András Gézsi, Nikolett Lupsa, Xabier Osteikoetxea
Department of Pharmacology and Pharmacotherapy

1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-2930, 210-4416

Head of the Department: Prof. Dr. Péter Ferdinandy M. D., Ph.D., D.Sc.
Full professor: Prof. Dr. Sándor Kerpel-Fronius
Professor emeritus: Prof. Dr. Zsuzsanna Fürst, Prof. Dr. Valéria Kecskeméti, Prof. Dr. Klára Gyires
Associate professor: Dr. Júlia Timár, Dr. László Köles, Dr. Pál Riba (tutor)
Assistant professor: Dr. Zsuzsanna Gyarmati, Dr. András Rónai, Dr. Erzsébet Kató (tutor)
Assistant lecturer: Dr. Andrea Szebeni

Department of Forensic Medicine

1091 Budapest, IX. Üllői út 93.
☎: 218-0437, 215-7300

Head of the Department: Prof. Dr. Éva Keller M. D., Ph. D., D.Sc.
Professor emeritus: Prof. Dr. Péter Sótonyi
Associate professor: Dr. Zoltán Szőlősi (tutor), Dr. Klára Törö
Assistant professor: Dr. Mártá Hubay

Department of Medical Biochemistry

1094 Budapest, IX. Tűzoltó u. 37-47.
☎ +36-1-2662773 +36-1-459-1500/60010 +36-1-4591500#60010
http://semmelweis.hu/biokemia/en/

Head of the department: Prof. Dr. László Tretter M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Veronika Ádám M.D., Ph.D., D. Sc.
Member of the Hungarian Academy of Sciences Prof. Dr. Kraszimir Kolev M.D., Ph.D., D.Sc.
Associate professor: Dr. Christos Chinopoulos, Dr. László Csanády,
Consultant: Dr. Pál Bauer, Prof. Raymund Machovich M.D., Ph.D., D.Sc.
Dr. György Szabados
Senior lecturer: Dr. Attila Ambrus, Dr. Judit Bak, Dr. Erzsébet Komorowicz,
Dr. István Léránt (course coordinator for the first and second year medical students, course coordinator of the second year dentistry students)
Dr. Beáta Töröcsik
Assistant lecturer: Dr. Katalin Bartha
Research fellow: Dr. Judit Dóczi
Assistant research fellow: Dr. Em Ben Sorum
Pharmacist: Dr. Erzsébet Tóth (course coordinator of the first year dentistry students and of pharmacy students)
Department of Medical Chemistry, Molecular Biology and Pathobiochemistry

1094 Budapest IX., Tűzoltó u. 37-47.
☎: 266-2615

Head of the Department: Prof. Dr. Gábor Bánhegyi M.D., D.Sc.
Full professor: Prof. Dr. József Mandl, Prof. Dr. Anna Faragó,
Prof. Dr. Miklós Tóth, Prof. Dr. László Buday
Associate professor: Dr. Mária Sasvári, Dr. András Hrabák,
Dr. Ágota Vér, Dr. Nándor Müller, Dr. Miklós Csala,
Dr. Csaba Sőti, Dr. Tamás Mészáros
Assistant professor: Dr. Gergely Keszler (tutor)

Institute of Human Physiology and Clinical Experimental Research

1094 Budapest IX., Tűzoltó u. 37-47.
☎: 210-0306

Head of the Department: Prof. Dr. Zoltán Benyó M.D, Ph.D., D.Sc.
Full professor: Prof. Dr. Péter Sándor,
Professor emeritus: Prof. Dr. Márk Kollai, Prof. Dr. Emil Monos
Associate professor: Dr. András Eke, Dr. György Nádasy, Dr. Tamás Ivanics
Dr. Ákos Zsembery, Dr. Zsuzsanna Miklós (tutor)
Assistant professor: Dr. Kornélia Ikrényi
Assistant lecturer: Dr. Levente Kiss, Dr. Eszter Mária Horváth,
Dr. Tamás Horváth

Department of Physiology

1094 Budapest IX., Tűzoltó u. 37-47.
☎: 266-9180

Head of the Department: Prof. Dr. László Hunyady M.D, Ph.D., D.Sc.
Full professor: Prof. Dr. Erzsébet Ligeti, Prof. Dr. Péter Enyedi,
Prof. Dr. Péter Várnai (course director),
Prof. Dr. Attila Mócsai, Prof. Dr. Miklós Geiszt
Professor emeritus: Prof. Dr. András Spáť, Prof. Dr. Attila Fonyó
Associate professor: Dr. Csilla Hably, Dr. Gábor Czirják, Dr. Gábor Petheő,
Dr. Krisztina Káldi
Assistant professor: Dr. Gábor Turu, Dr. Zoltán Jakus
Assistant lecturer: Dr. Dániel Csete, Dr. Ágnes Donkó, Dr. Dávid Győri,
Dr. Hajnal Kovács, Dr. Enikő Lázár, Dr. Gergő Szanda,
Dr. József Tóth
Tutor: Dr. András Balla
Department of Pathophysiology
1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-2940

Head of the Department: Prof. Dr. Attila Tordai M.D, Ph.D., D.Sc.
Full professor: Prof. Dr. László Rosivall, Prof. Dr. Ákos Koller
Professor emeritus: Prof. Dr. Lajos Szollár
Associate professor: Dr. Péter Hamar, Dr. Miklós Molnár (tutor)
Assistant professor: Dr. Miklós Mózes, Dr. László Tornóci
Assistant lecturer: Dr. Tünde Kriston

Institute of Public Health
1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-2930
Homepage: www.kozegeszsegsegtan.sote.hu

Head of the Department: Prof. Dr. Károly Cseh M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Tamás Simon, Prof. Dr. Anna Tompa
Associate professor: Dr. Judit Forrai, Dr. Péter Jakabfi,
Dr. József Ongrády, Dr. György Purebl
Assistant professor: Dr. Eleonóra Leffelholcz, Dr. Miklós Lelekes
Assistant lecturer: Dr. Katalin Antmann, Dr. András Terebessy (tutor)
Dr. Bence Komáromi T.

Institute of Behavioral Sciences
1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-2930; 210-2953 Fax: 210-2955

Head of the Department: Prof. Dr. József Kovács M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Ferenc Túry
Associate professor: Dr. György Purebl, Dr. Adrienne Stauder, Dr. Zsuzsa Szántó,
Dr. Imre Szebik
Assistant professor: Dr. Bernadett Babusa, Dr. Jenő Lőrincz, Dr. Gyöngyvér SalavecZ,
Dr. Orsolya Péter, Dr. Péter Ujma
Assistant lecturer: Ágnes Mezei, Dr. László Lajtai, Tamás Szalai, Dr Mónika Tóth
Psychologist: Dr. János Kollár

Institute of Medical Microbiology
1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-2959, 210-2930, 210-2940

Head of the Department: Prof. Dr. Dóra Szabó M.D., Ph.D.
Full professor: Prof. Dr. Károly Nagy, Prof. Dr. Ferenc Rozgonyi
Professor emeritus: Prof. Dr. Piroska Anderlik, Prof. Dr. Éva Ádám
Associate professor: Dr. Miklós Füzi, Dr. Csaba Jeney
Clinical chief doctor: Dr. Zsuzsanna Berek
Scientific advisor: Dr. Orsolya Dobay (tutor for Pharmacy)
Assistant professor: Dr. Csaba Maródi, Dr. Irén Budai, Dr. Katalin Kristóf
Assistant lecturer: Dr. Ágoston Ghidán (tutor for Medicine and Dentistry)
Tutor: Dr. Ágoston Ghidán
I. Department of Pathology and Experimental Cancer Research

☎: 459-1500, 266-1638

Head of the Department:
Full professor: Prof. Dr. András Matolcsy M.D., Ph.D, D.Sc.
Prof. Dr. Ilona Kovalszky, Prof. Dr. Péter Nagy,
Prof. Dr. Zoltán Sápi
Professor emeritus: Prof. Dr. Károly Lapis, Prof. Dr. Béla Szende,
Prof. Dr. András Jeney, Prof. Dr. László Kopper
Associate professor: Dr. Attila Zalatnai (tutor), Dr. Judit Pápay
Assistant professor: Dr. Ágota Szepesi, Dr. Beáta Hargitai, Dr. Botond Tímár
Assistant lecturer: Dr. Anita Mohos, Dr. Balázs Csernus, Dr. Eszter Tutányi,
Dr. Gergely Rácz (tutor), Dr. László Fónyad, Dr. Lilla Reiniger

II. Department of Pathology

1091 Budapest, IX. Üllői út 93.
☎: 215-7300

Head of the Department: Prof. Dr. András Kiss M.D., Ph.D., D.Sc.
Full Professor: Prof. Dr. Janina Kulka, Prof. Dr. József Tímár
Professor emeritus: Prof. Dr. Anna Kádár, Prof. Dr. Zsuzsa Schaff
Scientific advisor: Prof. Dr. Tibor Kerényi, Dr. Margit Kovács
Associate professor: Dr. György Illyés, Dr. Tibor Glasz
Assistant professor: Dr. Balázs Járay, Dr. Eszter Székely
Assistant lecturer: Dr. Hajnalka Győrffy, Dr. Magdolna Kardos, Dr. Lilla Madaras

Department of Anesthesiology and Intensive Therapy

1082 Budapest, VIII. Üllői út 78. B-part of the building, 4th floor
☎: 355-6565, 325-1100

Head of the Department: Prof. Dr. János Gál M.D., Ph.D., D.Sc.
Full Professor: Prof. Dr. István Pénzes
Associate professor: Dr. Balázs Hauser, Dr. Csaba Hermann, Dr. Krisztina Madách
Assistant professor: Dr. Gábor Élő, Dr. András Lorx
Assistant lecturer: Dr. András Kállai (tutor)
Clinical specialist: Dr. Melinda Kis-Tamás
Resident: Dr. Ádám Gyöngyösi (Tutor)
Clinical chief doctor: Dr. Péter Vass (tutor of Oxyology at the Division of Emergency Medicine and Oxyology)
Education coordinator: Borbála Kozma
I. Department of Internal Medicine

1083 Budapest, VIII. Korányi S. utca 2/A.
☎: 459-1500

Head of the Department: Prof. Dr. Miklós Szathmári M. D., Ph.D., D.Sc.
Professor emeritus: Prof. Dr. Ferenc Szalay, Prof. Dr. László Gerő
Full professor:
  Prof. Dr. János Papp, Prof. Dr. Gyula Tamás,
  Prof. Dr. Péter Kempler, Prof. Dr. Judit Demeter,
  Prof. Dr. Csaba Horváth
Associate professor:
  Dr. Margit Abonyi, Dr. István Barna, Dr. András Tislér,
  Dr. Péter Lakatos, Dr. Ádám Gy. Tabák
Assistant professor:
  Dr. Gabriella Győri, Dr. István Takács, Dr. Erika Márton,
  Dr. Fatima Varga, Dr. András Váradi
Assistant lecturer:
  Dr. Péter Studinger (tutor), Dr. Zsolt Hermányi, Dr. Péter Fuszak,
  Dr. Katalin Keresztes, Dr. Zsolt Nagy, Dr. Gábor Speer

II. Department of Internal Medicine

1088 Budapest, VIII. Szentkirályi u. 46.
☎: 266-0926

Head of the Department: Prof. Dr. Péter Igaz M.D., M.Sc., Ph.D., D.Sc.
Professor emeritus: Prof. Dr. Zsolt Tulassay, Prof. Dr. Edit Gláz
Full professor:
  Prof. Dr. Miklós Tóth, Prof. Dr. Anikó Somogyi
Associate professor:
  Dr. László Kőnya, Dr. Györgyi Műzes, Dr. László Herszényi,
  Dr. Gábor Békési, Dr. Gabriella Lengyel
Assistant professor:
  Dr. Krisztina Hagymási (tutor), Dr. Márk Juhász, Dr. Pál Miheller

III. Department of Internal Medicine

1125 Budapest, XII. Kútvölgyi út. 4.
☎: 325-1100

Head of the Department: Prof. Dr. Tamás Masszi M.D., Ph.D., D.Sc.
Full professor:
  Prof. Dr. Henriette Farkas, Prof. Dr. István Karádi,
  Prof. Dr. Pál Pánczél, Prof. Dr. Zoltán Prohászka,
  Prof. Dr. Emese Kiss
Associate professor:
  Dr. Lívia Jánoskuti, Dr. Judit Várkonyi
  András Verecke, Dr. Nóra Hosszúfalusi, Dr. Gábor Pálos
Assistant professor:
  Dr. Katalin Keltai (tutor), Dr. András Zsáry, Dr. Éva Palik,
  Dr. Judit Kocsis
Clinical chief doctor:
  Dr. László Jakab (tutor)
Department of Dermatology, Dermatooncology and Venerology

1085 Budapest, VIII. Mária u 41.
☎: 266-0465

Head of the Department: **Prof. Dr. Miklós Sárdy** M.D., Ph. D., D.Sc.
Deputy Head of the Department: Dr. Péter Holló M.D., Ph. D.
Full professor: Prof. Dr. Attila Horváth, Prof. Dr. Gyöngyvér Soós, Prof. Dr. Márta Marschalkó, Prof. Dr. Sarolta Kárpáti
Professor emeritus: Prof. Dr. Ferenc Rozgonyi
Associate professor: Dr. Beáta Somlai, Dr. Norbert Wikonkál
Assistant professor: Dr. Krisztina Becker, Dr. Nóra Erős, Dr. Ágnes Iringó Ottó, Dr. Györgyi Pónyai, Dr. Klaudia Preisz, Dr. Bernadett Hidvégi (tutor)
Assistant lecturer: Dr. Katinka Pónyai, Dr. József Szakonyi
Clinical chief doctor: Dr. Gyula Bottlik, Dr. Judit Hársing, Dr. Klára Szalai, Dr. Ágnes Szigeti
Clinical doctor: Dr. Péter Bognár, Dr. Károly Fodor, Dr. Ferenc Harmos, Dr. Zsófia Hatvani, Dr. Dorottya Kiss, Dr. Daniella Kuzmanovszki, Dr. Andrea Lukács, Dr. Pálma Silló, Dr. Béla Tóth (tutor), Dr. Veronika Tóth

Department of Family Medicine

1125 Budapest, XII. Kútvölgyi út. 4.
☎: 325-1100

Head of the Department: **Prof. Dr. László Kalabay** M.D., Ph.D.
Associate professor: Dr. Péter Torzs (tutor)

Department of Otorhinolaryngology, Head and Neck Surgery

1083 Budapest, VIII. Szigony u.36.
☎: 355-8530

Head of the Department: **Prof. Dr. László Tamás** M.D., Ph.D
Full professor: Prof. Dr. Gábor Répássy
Associate professor: Dr. Marianna Küstel, Dr. Ágnes Szirmai
Assistant professor: Dr. Zoltán Fent, Dr. Beáta Bencsik (tutor), Dr. Magdolna Szőnyi, Dr. Balázs Szabó, Dr. Helga Kraxner, Dr. Anita Gáborján
Assistant lecturer: Dr. Gábor Polonyi
I. Department of Pediatrics

1083 Budapest, VIII. Bókay János u. 53–54.
☎: 334-3186 training coordinator: Erzsébet Horváth ☎ 52728
Secretariat: titkarsag.gyer1@med.semmelweis-univ.hu
Office hours: Monday–Thursday: 8 a.m. – 11 a.m.; 3 p.m. – 4 p.m. Friday: CLOSED

Head of the Department: Prof. Dr. Attila Szabó M.D., Ph.D., DSc.
Full professor: Prof. Dr. Tivadar Tulassy, Prof. Dr. András Arató,
Prof. Dr. Tamás Machay, Prof. Dr. László Madácsy,
Prof. Dr. Tibor Verebély, Prof. Dr. Reusz György,
Prof. Dr. Hedvig Bodánszky, Prof. Dr. Endre Cserháti
Associate professor: Dr. Anna Köner, Dr. Gábor Veres, Dr. Antal Deszöfi,
Dr. Zita Halász, Dr. Bea Pászthy, Dr. Miklós Szabó,
Dr. Péter Tóth-Heyn, Dr. Lídia Balogh,
Assistant professor: Dr. János Bókay, Dr. Péter Sallay, Dr. Andrea Fekete,
Dr. Dora Krikovszky, Dr. Csaba Lódi, Dr. Andrea Luczay,
Dr. István Mátyus, Dr. Péter Mátyus, Dr. Kálmán Tory

II. Department of Pediatrics

1094 Budapest, IX. Tűzoltó u. 7-9.
☎: 218-6844, 215-1380

Head of the Department: Prof. Dr. András Szabó M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Rozália Kálmánchey, Prof. Dr. János Sólyom
Professor emeritus: Prof. Dr. Dezső Schuler, Prof. Dr. György Fekete
Associate professor: Dr. Tamás Szamosi, Dr. Erika Tomsits, Dr. Miklós Garami,
Dr. Mónika Csóka, Dr. Péter Hauser (tutor)
Assistant professor: Dr. Mária Ablonczy, Dr. Zita Halász, Dr. Margit Pataki,
Dr. Veronika Kovács
Assistant lecturer: Dr. Noémi Csoszánszki, Dr. Gabriella Filiczki, Dr. Zoltán Jenővári,
Dr. László Jókúti, Dr. Zoltán Kárádi, Dr. Andrea Luczay,
Dr. Judit Müller (tutor), Dr. Gergely Sárközi, Dr. Edit Varga,
Dr. Andrea Tölgyesi, Dr. Tamás Bense, Dr. András Kelecsényi,
Dr. Boglárka Bánsági (tutor)
Cardiovascular Center – Heart Center Department of Cardiology

1122 Budapest, XII. Városmajor u. 68.
☎: +36-1-458-6847; +36-1-458-6810 Fax: +36-1-458-6818
E-mail: cvc.oktatas@gmail.com

Head of the Department: Prof. Dr. Béla Merkely M.D., Ph.D., D.Sc.
Professor Emeritus: Károly Lozsádi M.D., Dr. Mátyás Keltai M.D., Ph.D.
Full professor: Ferenc Horkay M.D., Ph.D., D.Sc.
István Prédá M.D., Ph.D.
László Gellér M.D., Ph.D.
Associate professor: Dr. Dávid Becker, Endre Zima M.D., Ph.D.
Assistant professor: Margit György M.D.
Assistant lecturer: Astrid Apor M.D., Endre Zima M.D., Ph.D.

Clinical fellow: Elektra Bartha M.D. (consultant)
Krisztina Hosszú M.D., Orsolya Kiss M.D., Ph.D.
Ibolya Marozsán M.D. (consultant)
Andrea Nagy M.D., Attila Róka M.D., Pál Soós M.D., Ph.D.
Boglárka Szabó M.D., Zsolt Szélig M.D.
Szabolcs Szilágyi M.D., Andrea Szűcs M.D., Ph.D.
Gábor Szűcs M.D., Hajnalka Vágó M.D., Ph.D.
Vince Wagner M.D.

Scientific advisor: Miklós Tóth MD, PhD, DSc
Péter Vargha
PhD students: Balázs Berta MD, Pál Maurovich Horvat MD
Valentina Kutyifa MD, Gabriella Veress MD

Department of Neurology

1083 Budapest, VIII. Balassa u. 6.
☎: 210-0330, 210-0337

Head of the Department: Prof. Dr. Dániel Bereczki M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Anita Kamondi, Prof. Dr. Mária Judit Molnár
Professor emeritus: Prof. Dr. Mátyás Papp, Prof. Dr. Imre Szirmai
Associate professor: Dr. Tibor Kovács, Dr. Zsuzsanna Arányi, Dr. Csaba Ertsey
Assistant professor: Dr. Róbert Debreczeni (tutor)
Assistant lecturer: Dr. Sándor Illiczky, Dr. Magdolna Simó, Dr. Ildikó Vastagh,
Dr. Erika Scheidl (tutor)
Department of Neurosurgery

1145 Budapest, XIV. Amerikai út 57.
☎: +36 1 467 9325, +36 1 251 2999/325,
_address: +36 1 220 6471
E-mail: idegsebeszet@med.semmelweis-univ.hu
Web: http://semmelweis-egyetem.hu/idegsebeszet/
http://semmelweis-egyetem.hu/english/the-university/faculties/
faculty-of-medicine/departments/department-of-neurosurgery/

Office secretary: Katalin Jankus
E-mail: jankus.katalin@med.semmelweis-univ.hu
Head of the Department: Prof. Péter Banczerowski, M.D., Ph.D.
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).

Department of Orthopedics

1113 Budapest, XI. Karolina út 27.
☎: 466-6059 Fax: 466-8747

Head of the Department: Prof. Dr. György Szöke M.D., Ph.D., D.Sc.
Professor Emeritus: Prof. Dr. Tibor Vízkeley, Prof. Dr. György Bender
Full professor: Prof. Dr. Miklós Szendrői
Associate professor: Dr. Anikó Faluhelyi, Dr. József Lakatos, Dr. Ferenc Mády,
Assistant professor: Dr. Imre Antal, Dr. István Böröcz, Dr. László Sólyom,
Dr. Sándor Kiss
Assistant lecturer: Dr. Zoltán Bejek, Dr. Tamás Terebessy, Dr. Géza Kordás,
Dr. Gergely Holnapy (tutor)
Department of Psychiatry and Psychotherapy

1083 Budapest, VIII. Balassa u. 6.
☎: 210-0330

Head of the Department: Dr. János Réthelyi
Full professor: Prof. Dr. István Bitter
Prof. Dr., Gábor Faludi
Prof. Dr. Dóra Perczel-Forintos

Professor emeritus: Prof. Dr. László Tringer
Associate professor: Dr Brigitta Baran, Dr. Pál Czobor, Dr. Lajos Simon,
Dr. Judit Tolna, Dr. Zsolt Unoka (tutor for the fourth year)

Assistant professor: 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

Assistant lecturer: 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

Clinical senior specialist: Dr. Éva Csibri (part time), Dr. Andrea Sárosi
Clinical specialist: Dr. Csilla Bolyós (part time), Dr. Brigitta Blancz, Dr. Péter Döme,
Dr. Luca Egerváry, Dr. Mónika Eleméry, Dr. György Freschl,
Dr. Judit Lazár, Dr. Krisztina Seregi

Clinical doctor: Dr. Lívia Balogh
Residents: Dr. Anna Báthory, Dr. Nóra Brindza, Dr. Bodnár Katalin,
Dr. Klára Cszinzszky, Dr. Bálint Hajduска-Dér,
Dr. Levente Hermán, Dr. Péter Oczella, Dr. Attila Simor,
Dr. Szilvia Somogyi, Dr. Ádám Ferenc Szabó, Dr. Andrea Szegő,
Dr. Péter Szocsics, Dr. Katalin Szócs, Dr. Dominika Tóth,
Dr. István Vályi-Nagy, Dr. Réka Zsigmond

Psychologist: Gabriella Kamilla Balogh, Gergely Bíró, Tamás Halmai,
Eszter Tóth

External teachers with contract in the English program: Dr. Judit Ágnes Balázs, Dr. Gábor Gazdag

Department of Pulmonology

1125 Budapest, XII. Diósárok u. 1/C.
☎: 355-9733

Head of the Department: Prof. Dr. György Losonczy M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. Ildikó Horváth
Prof. Dr. Imre Hutás, Prof. Dr. Endre Vastag

Professor emeritus: Prof. Dr. Ákos Somoskövi, Dr. Márta Orosz (tutor),
Dr. Veronika Müller, Dr. Lilla Tamási, Dr. Gabriella Gálffy,
Dr. Anikó Bohács,

Assistant professor: Dr. Zoltán Bártfai, Dr. Gábor Horváth,
Dr. Zoltán Sütő, Dr. Klára Szondy, Dr. Erika Vajda,
Dr. Katalin Várdí Visy, Dr. András Wollák, Dr. Gabriella Zsámboki

Assistant lecturer: Dr. Judit Fúzy, Dr. Ildikó Géczi, Dr. Tamás Komáromi,
Dr. Csaba Mathé, Dr. Gabriella Muraközy, Dr. Andrea Nagy,
Dr. Zsuzsanna Orosz
Department of Radiology

1082 Budapest, VIII. Úllói út 78/A.

Head of the Department: Prof. Dr. Viktor Bérczi M.D., Ph.D., D.Sc.
Full Professor: Prof. Dr. Kálmán Hüttl
Associate professor: Dr. Zoltán Vígváry, Dr. Zsolt Tarján, Dr. Magdolna Dank, Dr. Kinga Karlinger, Dr. Ádám Mester
Assistant professor: Dr. Zsuzsa Dömötöri, Dr. Katalin Kiss, Dr. Géza Tóth, Dr. Klára Szalai, Dr. László Duffek, Dr. Béla Kári, Dr. László Torgyik, Dr. László Dávid Tárnoki (tutor)
Clinical chief doctor: Dr. Attila Kollár
Clinical doctor: Dr. Balázs Futácsi
Assistant lecturer: Dr. Erika Borbényi, Dr. Szabolcs Farkas, Dr. Péter Magyar, Dr. Tamás Györke, Dr. Gyöngyvér Szentmártoni, Dr. Júlia Szilvási, Dr. Éva Zergényi
Senior resident: Dr. Pál Batta, Dr. Anikó Bögér, Dr. Gábor Erdei, Dr. Ernő Frank, Dr. Ágnes Stefán, Dr. Andrea Vágó

I. Department of Surgery

1082 Budapest, VIII. Úllói út 78.

Head of the Department: Prof. Dr. László Harsányi M.D., Ph.D.
Full professor: Prof. Dr. Tibor Tihanyi
Professor emeritus: Prof. Dr. Lajos Flautner, Prof. Dr. Katalin Darvas, Prof. Dr. Péter Kupcsulik
Associate professor: Dr. Péter Kokas (tutor), Dr. István Pulay, Dr. Mária Tarjányi, Dr. Ambrus Magyar, Dr. János Horányi
Assistant professor: Dr. Ákos Szűcs (tutor), Dr. Krisztina Pinkola, Dr. Marianna Borsodi, Dr. Zsolt Csapó, Dr. Péter Lukovich
Assistant lecturer: Dr. Bálint Hargitai, Dr. András Papp, Dr. László Regáli (tutor), Dr. Hedvig Sas

II. Department of Surgery

1125 Budapest, XII. Kútvölgyi út 4.

Head of the Department: Dr. Gábor István M.D., Ph.D.
Tutor: Dr. György Ledniczky

Department of Transplantation and Surgery

1082 Budapest, VIII. Baross u. 23.

Head of the Department: Prof. Dr. Zoltán Máthé M.D., Ph.D.
Tutor: Dr. Gábor Telkes
I. Department of Surgery Department Section of Surgery

1096 Budapest, IX. Nagyvárad tér 1.
☎: 215-1489; 459-1500/54321  Fax: 317-2166
Head (assigned) of the Department: Prof. Dr. László Harsányi M.D., Ph.D.

Department of Surgical Research and Techniques

1089 Budapest, VIII. Nagyvárad tér 4.
☎: 459-1500/56569  Fax: 459-1500/56574
Head of the Department: Prof. Dr. György Wéber M.D., Ph.D.
Tutor: Dr. Györgyi Szabó

Department of Vascular Surgery

1122 Budapest, XII. Városmajor u. 68.
☎: 458-6700  Fax: 458-6746
E-mail: titkar@erseb.sote.hu
Head of the Department: Prof. Dr. László Entz M.D., Ph.D.
Tutor: Dr. Zsuzsanna Járányi

Department of Ophthalmology

1085 Budapest, VIII. Mária u. 39.
☎: 266-0513/54500
Head of the Department: Prof. Dr. Zoltán Zsolt Nagy M.D., Ph.D., D.Sc.
Full professor:
Prof. Dr. János Németh M.D., Ph.D., D.Sc.
Prof. Dr. Gábor Holló
Associate professor:
Dr. Zsuzsanna Récsán (Program Director for Dentistry)
Dr. András Papp
Assistant professor:
Dr. Mária Bausz, Dr. Mónika Ecsedy, Dr. Ágnes Füst,
Dr. Krisztina Knézy,
Dr. Illés Kovács (tutor for Dentistry Dr. Olga Lukáts),
Dr. Anna Szamosi, Dr. Zsuzsanna Szepessy, Dr. Jeannette Tóth,
Dr. Rita Vámos, Dr. Miklós Resch (tutor)
Assistant lecturer:
Dr. György Barcsay, Dr. Béla Csákány, Dr. Judit Dohán,
Dr. Zsuzsanna Géhl, Dr. Péter Köthy, Dr. Ákos Kusnyerik,
Dr. Erika Maka, Dr. Otto Maneschg, Dr. András Schneider,
Dr. Irén Szalai, Dr. Antal Szabó
I. Department of Obstetrics and Gynecology

1088 Budapest, VIII. Baross u. 27.
📞: 266-0473

Head of the Department: **Prof. Dr. János Rigó** M.D., Ph.D.
Full professor: Prof. Dr. Júlia Hajdú
Professor emeritus: Prof. Dr. Sándor Csőmör, Prof. Dr. Zoltán Papp
Associate professor: Dr. Péter Patkós (Deputy Director),
Dr. András Szánthó (Deputy Director), Dr. Zsolt Csapó,
Dr. Emma C. Molnár, Dr. Éva Görbe,
Dr. János Urbancsek, Dr. Anna Beke, Dr. Csaba Papp,
Dr. István Szabó, Dr. Ernő Tóth-Pál, Dr. Bálint Nagy,
Dr. Petronella Hupuczi

Assistant professor: Dr. Sándor Konrád, Dr. János Hidvégi, Dr. Márta Lipták,
Dr. Péter Somos, Dr. István Varga, Dr. László Csabay,
Dr. Mihály Silhavy, Dr. György Szendei, Dr. Márta Gávai,
Dr. Ágnes Harmath, Dr. Péterné Sembery, Dr. Nóra Dévényi,
Dr. Katalin Szirmai, Dr. Zoltán Magyar, Dr. Artúr Beke,
Dr. László Fedák, Dr. Attila Demeter,
Dr. Zsolt Ádám, Dr. Ervin Hrubý, dr. Judit Jeager

Assistant lecturer: Dr. András Újházy, Dr. Zorán Belics, Dr. Ákos Csaba,
Dr. József Gábor Joó (tutor), Dr. Barbara Kőhalmi,
Dr. Norbert Sipos, Dr. Tamás Bőze, Dr. Zoltán Bán,
Dr. Anikó Boda, Dr. Éva Csatlós, Dr. Zoltán Garamvölgyi,
Dr. István Karasztnai, Dr. Péter Fancsovits, Dr. Tibor Fekete,
Dr. Gábor Mezei, Dr. Ákos Murber, Dr. Levente Lázár,
Dr. Nándor Than, Dr Adrienn Horváth, Dr. Attila Rab,
Dr. Gabriella Demeter, Dr. Lilla Sass, Amrita Halmos,
Dr. Szabolcs Máté, Dr. Gyula Richárd Nagy (tutor),
Dr. Zsanett Szigeti, Dr. Zoltán Derzsy, Dr. Erik Hauzman,
Dr. Barbara Pete

II. Department of Obstetrics and Gynecology

1082 Budapest, VIII. Üllői út 78/a.
📞: 210-0290

Head of the Department: **Prof. Dr. Nándor Ács** M.D., Ph.D.
Full professor: Prof. Dr. Attila Pajor, Prof. Dr. Ferenc Bánhidy
Associate professor: Dr. Zsolt Melczer, Dr. Sándor Valent,
Dr. András Nobilis

Department of Traumatology

1145 Budapest, XIV., Uzsoki u. 29-41.
📞: 467-3851; fax: 467-3851

Head of the Department: **Prof. Dr. László Hangody** M.D., Ph.D., D.Sc.
Full professor: Prof. Dr. András Sárváry, Prof. Dr. Tibor Mózes
Assistant professor: Dr. Miklós Szebeny, Dr. István Baráth
Assistant lecturer: Dr. Tamás Gál, Dr. Ágnes Berta (tutor)
Department of Urology

1082 Budapest, VIII. Úllői út 78/B.
☎: 210-0330

Head of the Department: **Prof. Dr. Péter Nyirády** M.D., Ph.D.
Full professor: Prof. Dr. Imre Romics, Prof. Dr. Zsolt Kelemen
Associate professor: Dr. Antal Hamvas, Dr. József Pánovics,
Dr. Attila Keszthelyi
Assistant professor: Dr. Sándor Lovász, Dr. Miklós Szűcs,
Dr. Krisztina Szabó, Dr. Lajos Joós
Assistant lecturer: Dr. Stelios Mavrogenis, Dr. András Rusz, Dr. Attila Majoros,
Dr. Péter Riesz, Dr. Erzsébet Pénzes, Dr. Gergely Bánfi
Clinical doctor: Dr. András Horváth (tutor)

Department of Laboratory Medicine

1089 Budapest, VIII. Nagyvárad tér 4., floor XIV.
☎: 210-0278 / 56318

Head of the Department: **Prof. Dr. Barna Vásárhelyi** M.D., Ph.D., D.Sc.
Tutor: Prof. Dr. Antal Szabó Ph.D., D.Sc.

Department of Military-, Disaster- and Order Enforcement Medicine

1134 Budapest, XIII. Róbert Károly krt. 44.
☎: 465-1914; Fax: 465-1896
E-mail: katasztrofa@med.semmelweis-univ.hu

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

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

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

Department of Prosthodontics

1088 Budapest, VIII. Szentkirályi u. 47.
☎: 318-0011

Head of the Department: Prof. Dr. Péter Hermann D. M. D., M.Sc., Ph.D.
Full professor: Prof. Dr. Miklós Kaán
Professor emeritus: Prof. Dr. Tibor Fábián, Prof. Dr. Pál Fejérdy
Associate professor: Dr. Péter Kivovics, Dr. András Kóbor, Dr. Melinda Madléna, 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 Jáhn (tutor 4th year), Dr. Katalin Kalocsai, Dr. Mercédesz Linninger, Dr. Krisztina Mikulás (tutor 3rd year 2nd semester)
Clinical specialist: Dr. Péter Schmidt (tutor)

Independent Section of Radiology

1088 Budapest, VIII. Szentkirályi u. 47.
☎: 459-1500 ext 59128

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

Department of Pedodontics and Orthodontics

1088 Budapest, VIII. Szentkirályi u. 47.
☎: 318-0011

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

1088 Budapest, VIII. Szentkirályi u. 47.
☎: 318-0011

Head of the Department: **Dr. Zsuzsanna Tóth** D. M. D., Ph.D.
Professor emeritus: Prof. Dr. Árpád Fazekas
Associate professor: Dr. Károly Bartha, Dr. Zsolt Lohinai,
Dr. med. habil. Melinda Madléna
Assistant professor: Dr. Júlia Nemes, Dr. János Vág,
Dr. Milán Gyurkovics, Dr. Enikő Szabó
Assistant lecturer: 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

1089 Budapest, VIII. Nagyvárad tér 4.
☎: 210-4415

Head of the Department: **Prof. Dr. Gábor Varga** Ph.D., D.Sc.
Full professor: Prof. Dr. György Simon
Professor emeritus: Prof. Dr. Jolán Bánóczy, Prof. Dr. Tivadar Zelles
Associate professor: Dr. József Blazsek, Dr. Beáta Kerémi (tutor – 2nd semester)
Assistant professor: Dr. Kristóf Kádár (tutor – 1st semester),

Department of Oral Diagnostics

1088 Budapest, VIII. Szentkirályi u. 47.
☎: 459-1500/59161, 317-1044, fax: 459-1500/59165
Email: oral@fok.usn.hu

Head of the Department: **Prof. Dr. Csaba Dobó Nagy** D.M.D.

Department of Oro-Maxillofacial Surgery and Stomatology

1085 Budapest, VIII. Mária u. 52.
☎: 266-0457, fax: 266-0456
Email: titkarsag.arcallcsont@dent.semmelweis-univ.hu

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

1085 Budapest, VIII. Szentkirályi u. 47.
☎: 318-0011

Head of the Department: Prof. Dr. Péter Windisch D. M. D., D.Sc.
Full Professor: Prof. Dr. István Gera
Associate professor: Dr. György Kövesi, Dr. Erika Benedek, Dr. Ferenc Dőri
Assistant professor: Dr. Tibor Keglevich

Department of General Dental Preclinical Practice

Budapest 1088, Szentkirályi u. 47.
☎: 459-1472; 459-1500/59112; 59322

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

Department in Community Dentistry

1085 Budapest, VIII. Mikszáth Kálmán tér 5.
☎: 317-6600, 317-2222; 60749

Head of the Department: Dr. Péter Kivovics D. M. D., Ph.D.
Faculty of Pharmacy

University Pharmacy, Department of Pharmacy Administration
1092 Budapest, IX. Hőgyes Endre u. 9.
📞: 476-3600

Head of the Department: Prof. Dr. Romána Zelkó D.Sc.
Full professor: Prof. Dr. Zoltán Vincze Ph.D.
Associate professor: Dr. Lajos Gergő, Dr. Balázs Hankó, Dr. Ágnes Mészáros (tutor)
Assistant professor: Dr. Mária Nikolics, Dr. Andrea Meskó (tutor), Dr. Judit Balogh
Assistant lecturer: Dr. Mónika Hantos

Institute of Pharmacognosy
📞: 266-0120, 317-2979

Head of the Department: Dr. Szabolcs Béni Ph.D.
Full professor: Prof. Dr. Anna Blázovics Prof. Dr. Éva Szőke, Prof. Dr. Éva Lemberkovics
Professor honorary: Prof. Dr. Ágnes Kéry
Associate professor: Dr. László Kursinszki
Assistant professor: Dr. Andrea Balázs
Assistant lecturer: Dr. Anna Sólyomváry (tutor)

Department of Pharmaceutics
1092 Budapest, IX. Hőgyes Endre u. 7.
📞: 476-3600, /x: 217-0914

Head of the Department: Dr. István Antal Ph.D., habil.
Full professor: Prof. Dr. Sylvia Marton (tutor of the 5th year), Prof. Dr. Imre Klebovich, Prof. Dr. Miklós Zrínyi
Associate professor: Dr. Judit Dredán, Dr. Krisztina Ludányi
Assistant professor: Dr. Mária Hajdú (tutor of the 3rd year), Dr. Marianna Budai, Dr. Emese Bertalan-Balogh
Assistant lecturer: Dr. Katalin Pápai, Dr. Miléna Lengyel, Dr. Nikolett Kállai

Institute of Pharmaceutical Chemistry
1092 Budapest, IX. Hőgyes Endre u. 7.
📞: 217-0891

Head of the Department: Dr. Péter Horváth Ph.D.
Full professor: Prof. Dr. Béla Noszál, Prof. Dr. Krisztina Takács-Novák (tutor)
Associate professor: Dr. András Gergely, Dr. László Órfi
Assistant lecturer: Dr. Károly Mazák, Dr. Márta Mazák-Kraszni, Ákos Rácz
Department of Pharmacodynamics

1089 Budapest, VIII. Nagyvárad tér 4.
Tel: 210-2930

Head of the Department: Prof. Dr. György Bagdy D. Sc.
Full professor: Prof. Dr. Kornélia Tekes (course director, tutor)
Professor emeritus: Prof. Dr. Tamás Török
Dr. Éva Szőkö (course director)
Professor emeritus: Prof. Dr. Kálmán Magyar (member of the Academy)
Associate professor: Dr. László Tóthfalusi
Assistant lecturer: Dr. Tamás Tábi (tutor), Dr. Melinda Pálfi

Department of Organic Chemistry

Hőgyes E. u. 7, Budapest, H-1092, HUNGARY
http://semmelweis.hu/orgchem/hu/
Secretariat phone/fax: (36-1)-2170851
Educational Secretary (English course): (36-1)-476-3600 / extension 53025
Secretary of Students’ Scientific Association: (36-1)-476-3600 / extension 53055

Director
Dr. István Mándity, associate professor, Ph.D. (extension 53055)
mandity.istvan@pharma.semmelweis-univ.hu

Professor
Dr. Péter Mátyus, Ph.D., D.Sc. (extension 53005, 53055)
matyus.peter@pharma.semmelweis-univ.hu

Associate Professor
Dr. Gábor Krajsovszky, Ph.D. (extension 53021, 53055)
Secretary of Students’ Scientific Association
Educational Secretary (Hungarian and German course)
Vicedirector
krajsovszky.gabor@pharma.semmelweis-univ.hu

Assistant Professors
Dr. Andrea Czompa, Ph.D. (extension 53035)
czompa.andrea@pharma.semmelweis-univ.hu
Dr. Balázs Balogh, Ph.D. (extension 53851)
balogh.balazs@pharma.semmelweis-univ.hu
Dr. Levente Kárpáti, Ph.D. (extension 53085)
karpati.levente@pharma.semmelweis-univ.hu
Dr. Péter Tétényi, Ph.D. (extension 53025)
Educational Secretary (English course)
tetenyi.peter@pharma.semmelweis-univ.hu

Assistant Lecturers
Dr. Dóra Bogdán (extension 53018)
bogdán.dora@pharma.semmelweis-univ.hu
Kata Antal (extension 53035)
antal.kata@pharma.semmelweis-univ.hu
Dr. Ruth Deme, Ph.D. (extension 53038)
deme.ruth@pharma.semmelweis-univ.hu

Engineer
Róbert Ludmerczki (extension 53028)
ludmerczki.robert@pharma.semmelweis-univ.hu

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

In the following post the aim and structure of the teaching and research activities are summarized. The aim of the education in organic chemistry is to create an organic chemical basis for subsequent subjects in the curriculum of students at the Faculty of 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 (Rich-ter Gedeon, EGIS, Pannonpharma) organizations.

**Institute of Digital Health Sciences**

1094 Budapest, Ferenc tér 15. floor II.

Head of Department: **Dr. Miklós Szócska** Ph.D.

Full Professor: **Dr. habil Elek Dinya** Ph.D.

Associate professor: Dr. Zoltán Ádám Tamus Ph.D.

Assistant professor: Péter Dombai, Dr. Tamás Iváncsy Ph.D., Zoltán Sándor, Tamás Tóth, Dr. Gergely Zajzon

**Centre of Physical Education and Sport Sciences**


☎: 215-9337, 262-5529, 264-1408, 262-5529

Director: **Kornélia Várszegi**
Sport establishments: Sports Ground and Gymnastic Hall
Phone/fax: 262-5529, 264-1408

Népliget Tennis-court
Budapest, X. Vajda Péter u. 38.
☎: 262-9570

Fencing Hall
Budapest, V. Semmelweis u. 2.
☎: 267-0377

National Ambulance Service
1134 Budapest, XIII. Róbert Károly krt. 77.
☎: 350-3737, 350-0388; 350-6931
Director-General: Dr. Gábor Góbl M. D.
Dr. László Gorove (tutor), Dr. Judit Schönborn (tutor),
Dr. Hajnalka Mészáros (tutor), Dr. Imre Engelbrecht (tutor)

Division of Foreign Languages and Communication –
Faculty of Health Sciences
H-1088 Budapest, Vas u. 17., room 130
☎: +(36-1) 369-2694 Fax: +(36-1) 486-4962
Head of the Division: Katalin Zöldi Kovács Ph.D.
Tutor: Alexandra Bakó

Language Communication Center
1094 Budapest, Ferenc tér 15.
☎: +(36-1) 215-9338 Fax: +(36-1) 215-9338; ext 53814
Director: Dr. Éva Kovács Ph.D.

Central Library
1085 Budapest, VIII. Mikszáth Kálmán tér 5.
☎: 317-5030
General Director: Péter Szluka
Science secretary: Zsuzsa Margittai
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
## STUDY PROGRAMME

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

### First year

#### 1st semester

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKFIZ325_1A</td>
<td>Basics of Biostatistics and Informatics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>–</td>
</tr>
<tr>
<td>AOKFIZ326_1A</td>
<td>Medical Biophysics I.</td>
<td>1,5</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Medical Chemistry</td>
<td>3</td>
<td>3,5</td>
<td>6</td>
<td>semi-final#</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Medical Biology</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>semi-final</td>
<td>–</td>
</tr>
<tr>
<td>AOKMAG425_1A</td>
<td>Medical Sociology*</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>semi-final</td>
<td>–</td>
</tr>
<tr>
<td>AOKANT003_1A</td>
<td>Anatomy, Histology, and Embryology I.</td>
<td>2,5</td>
<td>6</td>
<td>8</td>
<td>semi-final</td>
<td>–</td>
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<tr>
<td>AOKLEK228_1A</td>
<td>Hungarian Medical Terminology I.</td>
<td>–</td>
<td>4</td>
<td>4</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVLEK229_1A</td>
<td>Medical Terminology (Latin)</td>
<td>–</td>
<td>2</td>
<td>2</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOKTSI009_1A</td>
<td>Physical Education I.</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>signature</td>
<td>–</td>
</tr>
</tbody>
</table>

**Total Number of Credit Points from Obligatory Subjects**  

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.

| 31 | (in case Med. Soc. is taken in the 1st semester)   |
| 29 | (in case Med. Soc. is taken in the 2nd semester)   |
## STUDY PROGRAMME

### First year

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKFI326_2A</td>
<td>Medical Biophysics II.</td>
<td>1.5</td>
<td>2</td>
<td>3</td>
<td>final</td>
<td>Medical Biophysics I.</td>
</tr>
<tr>
<td>AOKOBI463_1A</td>
<td>Medical Biochemistry I.</td>
<td>2</td>
<td>1.5</td>
<td>3</td>
<td>pract. mark</td>
<td>Medical Chemistry</td>
</tr>
<tr>
<td></td>
<td>Molecular Cell Biology I.</td>
<td>2.5</td>
<td>4</td>
<td>6</td>
<td>semi-final</td>
<td>Medical Chemistry Medical Biology</td>
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<tr>
<td>AOKANT003_2A</td>
<td>Anatomy, Histology, and Embryology II.</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>semi-final</td>
<td>Anatomy, Histology, and Embryology I.</td>
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<tr>
<td>AOKOMS218_1A</td>
<td>First Aid</td>
<td>6 hours /</td>
<td>8 hours /</td>
<td>0</td>
<td>signature</td>
<td>–</td>
</tr>
<tr>
<td></td>
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<td>sem.</td>
<td>sem.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOKLEK228_2A</td>
<td>Hungarian Medical Terminology II.</td>
<td>–</td>
<td>4</td>
<td>2</td>
<td>pract. mark</td>
<td>Hungarian Medical Terminology I.</td>
</tr>
<tr>
<td>AOKTS1009_2A</td>
<td>Physical Education II.</td>
<td>–</td>
<td>1</td>
<td>0</td>
<td>signature</td>
<td>–</td>
</tr>
<tr>
<td>AOKNSG331_1A</td>
<td>Summer Nursing Practice</td>
<td>–</td>
<td>1 month / 170 hours</td>
<td>signature</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>AOKMAG425_1A</td>
<td>Medical Sociology*</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>semi-final</td>
<td>–</td>
</tr>
<tr>
<td>AOVINF244_1A</td>
<td>Introduction to Medical Informatics (Obligatory elective subject) **</td>
<td>–</td>
<td>1</td>
<td>1</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVCSA248_1A</td>
<td>Medical Profession (Obligatory elective subject) **</td>
<td>0.67</td>
<td>1.33</td>
<td>2</td>
<td>pract. mark</td>
<td>–</td>
</tr>
</tbody>
</table>

### 2nd semester

#### Total Number of Credit Points from Obligatory Subjects

- 28 (in case Med. Soc. is taken in the 2nd semester)
- 26 (in case Med. Soc. is taken in the 1st semester)

*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!)

3 Gray’s Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by A. W. Vogl, A. Mitchel Elsevier;  03/04/2014; ISBN 9780702051319
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
15 Hrabák: Selected Collection of Chemical Calculations and Biochemical Exercises. Bp. Semmelweis Kiadó

Recommended textbooks:

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 prossected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, enbalmed 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 ans 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.

Type of exams: oral and written.
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!)

Recommended textbooks:
2 Bräuer: Sobotta Flashcards (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.
8 The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384
9 Regional Anatomy, by T Tömöl , Medicina 2008, ISBN 963 242 186 8


### 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dissection room</td>
</tr>
<tr>
<td>Week 1</td>
<td>1. The role of anatomy, histology and embryology in the medical curriculum. Terminology  2. The cell, cellular membrane, endoplasmic reticulum  3. Cell nucleus, mitochondrium, peroxysome</td>
<td>General introduction to practical work in the dissection room, tools and rules  Upper limb Bones</td>
</tr>
<tr>
<td>Week</td>
<td>Lectures</td>
<td>Practical sessions</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Dissection room</td>
</tr>
<tr>
<td><strong>Week 3.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>General arthrology and myology. Joints, muscles and movements of the shoulder and the upper girdle</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Muscles and actions of the elbow joint</td>
<td></td>
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<tr>
<td><strong>Week 4.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Joints, muscles and actions of the wrist and the hand</td>
<td>Upper limb Dissection of the muscles, vessels and nerves of the flexor and extensor sides</td>
</tr>
<tr>
<td>11.</td>
<td>Connective tissue cells</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Connective tissue fibres, types and formation. Extracellular matrix</td>
<td></td>
</tr>
<tr>
<td><strong>Week 5.</strong></td>
<td></td>
<td></td>
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<tr>
<td>14.</td>
<td>Supporting tissues (cartilage, bone)</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Ossification, bone remodelling</td>
<td></td>
</tr>
<tr>
<td><strong>Week 6.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Components, muscles, joints and ligaments of the vertebral column. Intervertebral, atlantooccipital and atlantoaxial joints</td>
<td>Bones and muscles of the trunk. Demonstration of the muscles of the neck, back and abdomen.</td>
</tr>
<tr>
<td>17.</td>
<td>Ribs, components and movements of the thorax. Abdominal muscles, rectus sheath.</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Muscles, fasciae and movements of the neck. Back muscles, occipital muscles</td>
<td></td>
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<tr>
<td><strong>Week 7.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Muscles and actions of the hip joint</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Muscles and actions of the knee joint</td>
<td></td>
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<tr>
<td><strong>Week 8.</strong></td>
<td></td>
<td></td>
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<tr>
<td>22.</td>
<td>Subinguinal hiatus. Inguinal canal. Adductor and femoral canals</td>
<td>Lower limb Dissection of the muscles, vessels and nerves of the dorsal side</td>
</tr>
<tr>
<td>23.</td>
<td>Muscles and joints of the foot. Architecture of the foot</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Lectures</td>
<td>Practical sessions</td>
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<tr>
<td>--------------</td>
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<tr>
<td></td>
<td></td>
<td>Dissection room</td>
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<tr>
<td>Week 9.</td>
<td>25. Muscle tissue</td>
<td>Lower limb</td>
</tr>
<tr>
<td></td>
<td>26. Gametes, fertilization, cleavage and blastulation</td>
<td>Dissection of the muscles, vessels and nerves of the</td>
</tr>
<tr>
<td></td>
<td>27. Implantation, bilaminar embryo. Fetal membranes, umbilical cord.</td>
<td>dorsal side</td>
</tr>
<tr>
<td></td>
<td>Structure of the placenta, placental circulation</td>
<td></td>
</tr>
<tr>
<td>Week 10.</td>
<td>28. Molecular basis for gastrulation. Formation, differentiation and</td>
<td>Lower limb</td>
</tr>
<tr>
<td></td>
<td>derivatives of the germinal layers.</td>
<td>Dissection of the muscles, vessels and nerves of the</td>
</tr>
<tr>
<td></td>
<td>29. Neurulation, folding of the embryo. Body axes, left-right lateralization and asymmetry.</td>
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<td></td>
<td>30. Formation of the primary tissues. Homeobox genes, stem cells</td>
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<tr>
<td>Week 11.</td>
<td>31. Histology of vessels.</td>
<td>Lower limb</td>
</tr>
<tr>
<td>Nov. 14-18.</td>
<td>32. Bony framework of the skull. Sphenoid and ethmoid</td>
<td>Dissection of the muscles, vessels and nerves of the</td>
</tr>
<tr>
<td></td>
<td>33. Temporal bone. Internal and external skull base</td>
<td>ventral side</td>
</tr>
<tr>
<td>Week 12.</td>
<td>34. Facial skeleton. Orbit, nasal cavity</td>
<td>Bones of the skull</td>
</tr>
<tr>
<td></td>
<td>35. Skull. Infratemporal and pterygopalatine fossae</td>
<td>Internal and external skull bases</td>
</tr>
<tr>
<td></td>
<td>36. Nervous tissue. Glial cells</td>
<td></td>
</tr>
<tr>
<td>Week 13.</td>
<td>37. Temporomandibular joint, muscles of mastication; muscles of facial</td>
<td>Bones of the facial skeleton, mandible. Orbit, nasal</td>
</tr>
<tr>
<td></td>
<td>expression</td>
<td>cavity, pterygopalatine fossa</td>
</tr>
<tr>
<td></td>
<td>38. Development of the skull, fontanelles.</td>
<td>Temporomandibular joint</td>
</tr>
<tr>
<td></td>
<td>39. Development of the limbs and the vertebral column together with the</td>
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<tr>
<td>Week 14.</td>
<td>40. Developmental malformations</td>
<td>Muscles of mastication and facial expression</td>
</tr>
<tr>
<td></td>
<td>41. Clinical anatomy of the musculoskeletal system</td>
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<td></td>
<td>42. Clinical anatomy of the musculoskeletal system</td>
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<td></td>
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<td>Placenta, umbilical cord</td>
</tr>
</tbody>
</table>

**Midterm test 2:** Epithelia, connective and supporting tissue. General embryology
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)
- Visceroocranium, 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dissection room</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Histology lab</td>
</tr>
</tbody>
</table>
| 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  
<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical sessions</th>
<th>Histology lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 5.</td>
<td>13. Chambers of the heart, external features. Structure of heart wall, myocardium, valves, anuli fibrosi</td>
<td>Dissection of the heart</td>
<td>Respiratory system: larynx, trachea, lung</td>
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<tr>
<td></td>
<td>15. Structure and development of the diaphragm</td>
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<tr>
<td>Week 6.</td>
<td>16. Development of the heart (primitive heart tube, development of atria)</td>
<td>Dissection of the heart</td>
<td>Heart</td>
</tr>
<tr>
<td></td>
<td>17. Development of the heart (development of ventricles, malformations). Fetal circulation</td>
<td></td>
<td>Esophagus, cardia, fundus, pylorus of the stomach</td>
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<td>18. Morphology and histology of the esophagus and the stomach.</td>
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<tr>
<td>Week 7.</td>
<td>19. Morphology and histology of the duodenum and the pancreas</td>
<td>1. Revision 2. <strong>Midterm test 1</strong> Heart, great vessels, development of the heart. Morphology and development of the internal organs of the head, neck, thorax and diaphragm.</td>
<td>Duodenum, jejunum ileum, colon, vermiform appendix</td>
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<tr>
<td></td>
<td>20. Morphology and histology of the jejunum and ileum</td>
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<td>21. Morphology and histology of the large intestine and rectum.</td>
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<tr>
<td>Week 8.</td>
<td>22. Morphology of the liver and biliary system. Portal vein</td>
<td>Dissection of abdominal internal organs</td>
<td>Liver, gall bladder, pancreas</td>
</tr>
<tr>
<td></td>
<td>23. Histology of the liver and biliary system</td>
<td>Dissection of the visceral complex. Celiac trunk, liver, duodenum</td>
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<td></td>
<td>24. Development of the mid- and hindgut. Development of the liver and the pancreas</td>
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<td>27. Histology of the urinary system</td>
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<tr>
<td>Week 10.</td>
<td>28. Morphology and coats of the testicle.</td>
<td>Cadaver dissection Organ supplied by the inferior mesenteric artery</td>
<td><strong>Midterm test 2</strong>, Lymphatic organs, respiratory system, gastrointestinal tract, urinary system</td>
</tr>
<tr>
<td></td>
<td>29. Histology of the testicle. Spermatogenesis</td>
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<tr>
<td></td>
<td>30. Morphology and histology of the epididymis, spermatic cord, seminal vesicle and prostate</td>
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Easter break
### Week 11.
- 32. Development of the veins.
- 33. Morphology and histology of penis and male urethra.

<table>
<thead>
<tr>
<th>Lectures</th>
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<tbody>
<tr>
<td>31. Development of the arteries; malformations.</td>
</tr>
<tr>
<td>32. Development of the veins.</td>
</tr>
<tr>
<td>33. Morphology and histology of penis and male urethra.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissection room</td>
</tr>
<tr>
<td>Cadaver dissection Retroperitoneum, pelvic organs Dissection of the visceral complex</td>
</tr>
<tr>
<td>Histology lab</td>
</tr>
<tr>
<td>Male genital system: testis, epididymis, spermatic cord</td>
</tr>
</tbody>
</table>

### 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

<table>
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<td>34. Structure of pelvic floor, male perineum</td>
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<td>35. Morphology and histology of the ovary and the uterine tube, oogenesis</td>
</tr>
<tr>
<td>36. Morphology and histology of the uterus, divisions and content of the broad ligament</td>
</tr>
</tbody>
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<tr>
<td>Dissection room</td>
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<tr>
<td>Cadaver dissection Male genital system</td>
</tr>
<tr>
<td>Histology lab</td>
</tr>
<tr>
<td>Male genital system: Seminal vesicle, prostate, penis, glans penis.</td>
</tr>
</tbody>
</table>

### Week 13.
- 37. Morphology and histology of the vagina and the external genital organs, female perineum
- 38. Development and malformations of the urinary system

<table>
<thead>
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<th>Lectures</th>
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<tbody>
<tr>
<td>37. Morphology and histology of the vagina and the external genital organs, female perineum</td>
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<tr>
<td>38. Development and malformations of the urinary system</td>
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<tbody>
<tr>
<td>Dissection room</td>
</tr>
<tr>
<td>Cadaver dissection Female genital system</td>
</tr>
<tr>
<td>Histology lab</td>
</tr>
<tr>
<td>Female genital system: ovary, corpus luteum, uterine tube</td>
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</tbody>
</table>

### 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

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>40. Major lymphatic ducts</td>
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<tr>
<td>41. Lymphatic drainage of the head&amp;neck, thoracic and abdominal regions</td>
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<td>42. Clinical and radiologic anatomy of the internal organs</td>
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<th>Practical sessions</th>
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<tbody>
<tr>
<td>Dissection room</td>
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<tr>
<td>Revision Abdominal and pelvic organs</td>
</tr>
<tr>
<td>Histology lab</td>
</tr>
<tr>
<td>Female genital system: uterus (proliferation, secretion), vagina</td>
</tr>
</tbody>
</table>

### 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 linguæ
- 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture (1 hour/week)</th>
<th>Practice (2 hours/week)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction</td>
<td>Graphical representation of functions</td>
</tr>
<tr>
<td>2.</td>
<td>Role of “change” in theory and in practice</td>
<td>The most important functions and their representation by computer</td>
</tr>
<tr>
<td>3.</td>
<td>Descriptive statistics</td>
<td>Use of excel tables</td>
</tr>
<tr>
<td>4.</td>
<td>Elements of probability calculus</td>
<td>Mean, standard deviation, variance, standard error</td>
</tr>
<tr>
<td>5.</td>
<td>Probability calculus and statistics</td>
<td>Descriptive statistics</td>
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<tr>
<td>6.</td>
<td>Principles of hypothesis testing</td>
<td>Hypothesis testing 1.: t-tests</td>
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<tr>
<td>7.</td>
<td>Parametric and non-parametric tests for comparison of two groups</td>
<td>Hypothesis testing 2.: non-parametric tests</td>
</tr>
<tr>
<td>8.</td>
<td>Comparison of more groups, analysis of variance</td>
<td>Hypothesis testing 3.: Mann-Whitney U-test</td>
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<tr>
<td>9.</td>
<td>Examination of dependence relations of variables</td>
<td>Analysis of variance</td>
</tr>
<tr>
<td>10.</td>
<td>Evaluation of diagnostic tests</td>
<td>Categorical variables, contingency table</td>
</tr>
<tr>
<td>11.</td>
<td>Human body as signal source, signal processing</td>
<td>Regression analysis</td>
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<tr>
<td>12.</td>
<td>Concept of information, databases</td>
<td>Calculation of correlation</td>
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<tr>
<td>13.</td>
<td>Clinical databases</td>
<td>Bioinformatical databases</td>
</tr>
<tr>
<td>14.</td>
<td>Evidence based medicine, role of mathematical logics in diagnostics</td>
<td>Publication databases, clinical databases</td>
</tr>
</tbody>
</table>
# MEDICAL BIOPHYSICS I.

Tutor: *Dr. István Voszka*

## First Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture (1.5 hours per week)</th>
<th>Laboratory (2 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radiations (basic concepts)</td>
<td>Laboratory safety rules</td>
</tr>
<tr>
<td>2</td>
<td>Properties of electromagnetic radiations; wave and corpuscular nature</td>
<td>Resonance</td>
</tr>
<tr>
<td>3</td>
<td>Attenuation of radiation</td>
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<td>X-ray diagnostics</td>
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<td>Polarimeter</td>
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<td>12</td>
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## MEDICAL BIOPHYSICS II.

### Second Semester

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<td>Sine wave oscillators (high frequency heat therapy, ultrasound)</td>
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<td>Audimetry</td>
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<td>Isotope diagnostics</td>
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<td>Diffusion; transport across membrane</td>
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<td>Resting potential and its local changes</td>
<td>Flow of fluids. Electric model of vascular circulation</td>
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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, $\sigma$ and $\pi$ bonds, hybrid orbitals, hybridization of carbon. Electron pair repulsion, geometry of molecules, bond angle. Molecular orbital theory.

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

Electrolytes

**Electrochemistry**

**Thermodynamics**

**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.

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**II. Inorganic chemistry**

**Properties of non-metals**

**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.

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**III. Organic chemistry**

**General properties of organic compounds**
Compounds with more than one chiral center: diastereomerism, mezo-forms. Separation of optical isomers.

Classification of hydrocarbons based on their carbon backbone

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.
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.

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
Inorganic chemistry: Tóth: Concise inorganic chemistry for Medical Students (manuscript)  
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)  
   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)  
   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)
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: Bronstadt-Lawry concept. Conjugated acids and bases. Lewis concept of acids and bases.
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\(_2\)PO\(_4\) and NaHPO\(_4\)). Acid (Arrhenius theory), base (Arrhenius theory), self ionization of water, ion-product constant for water (water product, Kw), 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)

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


28. Entropy change, spontaneous and reversible processes, the 2nd law of thermodynamics. The 3rd law of thermodynamics, absolute and standard entropies.


**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.


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.


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.**

1. 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
2. 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.**
   - different hybridization of diamond and graphite, coordinative bond in CO, CO as a poison, structure of carbon dioxide, greenhouse gases, equilibrium of carbonic acid, hardness of water caused by alkali earth metal hydrocarbonates; cyanides as poisonous compounds.
4. 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
   - structures of nitrite/nitrate, oxides of nitrogen, ammonia, possible oxidation states of nitrogen.
   - different phosphoric acids, biological role of phosphates
7. Oxygen and its compounds: allotropes, oxides, peroxides, superoxides.
   - ozone, ozone shield, free radicals of oxygen, Haber-Weiss reaction, Fenton-reaction.
   - surface tension, maximal density at 4°C, hydrogen bondings and their role in the high boiling point, constant and removable hardness of water
   - structures of sulfide, sulfite, sulfate, thiosulfate ions, practical aspects of the dilution of sulfuric acid
    - 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
11. Chlorine and its compounds.
    - structures of oxyanions of chlorine, formation of NaOCl, properties of HCl and NaCl
    - 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)
    - role of KMnO₄, different oxidation states of iron, organic iron compounds, poisonous effect of heavy metals, photosensitivity of silver halogenides, utilization of platinum electrodes
14. 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)

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)
   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, stereogeneic (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.
   SN1 reaction, SN2 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.
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 Hückel’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. Electronic structure of open-chain and cyclic ethers; physical properties, miscibility, chemical reactivity: coordinative bonding, basicity, Zeisel test, nucleophilic attack of epoxides, peroxoethers.
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, aldol formation, acetal formation, formation of ketimines, oximes, hydrazones, Schiff’s bases).
20. Organic thio-compounds. Thioalcohols, thioethers, sulfinic and sulfonic acids.

Alkane, alkene, alkyne, Hückel’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, peroxoethers, thiol, thion, thioether, disulfide, sulfide, sulfoxide, sulfone, sulfonate, carbonyl group, aldehyde, ketone, quinone, β-unsaturated carbonyl compounds, amphoterism, desmotropism, protective groups, dimerization, parafomaldehyde, 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 Fe²⁺ concentration
10. Iodometry: principles, factorization of titrating solution
11. Iodometry: principles, determination of sodium hypochlorite concentration
12. Complexometric titration: determination of unknown Cu²⁺ concentration
13. Complexometric titration: determination of Ca²⁺ and Mg²⁺ 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, thiosulfate, 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, diethylene, 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, \(\beta\)-hydroxybutyric acid, pyruvic acid, acetoacetic acid, citric acid, cis-aconitic acid, isocitric acid, \(\alpha\)-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 \textit{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.
- \textit{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.
- 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


- **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 I. 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 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.


- 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 twelveth 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 ≥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.

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

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

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

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:
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

**Type of the subject:** 1 practice / week  
**code:** AOVINF2441A  
**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)  
Péter Dombai (lecturer)

**Term:** spring  
**The exercise of the subject 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.  
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).

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. 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:
Practical exercise

Type of the exam: –

Exam requirements: –

Mode of the application for the exam: –

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

Tutor: Dr. Hajnalka Mészáros

Topics

- BLS (Basic Life Support)
- BLS
- AED (Automated External Defibrillator). PAD (Public Access Defibrillation)
- BLS + AED (management of situations)
- BLS + AED (Management of situations)
- Fractures, dislocation, sprain. Slings.
- 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 pharmaceutics. 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 pharmaceutics.
   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 pharmaceutics;

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

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)

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&view=article&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.
### STUDY PROGRAMME

#### Second Year

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKANT003_3A</td>
<td>Anatomy, Cell, Histology and Embryology III.</td>
<td>3</td>
<td>4</td>
<td>7</td>
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<td>Anatomy, Cell, Histology and Embryology II., Medical Biochemistry, Molecular and Cell Biology I.</td>
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<tr>
<td>AOKELT226_1A</td>
<td>Medical Physiology I.</td>
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<td>5</td>
<td>11</td>
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<td>Anatomy, Cell, Histology and Embryology II., Medical Biochemistry, Molecular and Cell Biology I., Medical Biophysics II.</td>
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<td>2.5</td>
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<tr>
<td></td>
<td>Molecular Cell Biology II.</td>
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<td>AOKMAG398_2A</td>
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<td>2</td>
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</tbody>
</table>

**Total Number of Credit Points from Compulsory Subjects**: 30

<table>
<thead>
<tr>
<th>Obligatory elective subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOVCSA249_1A</td>
</tr>
</tbody>
</table>

**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
<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
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<th>Examination</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>AOKANT003_4A</td>
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<td>2</td>
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<td>Medical Physiology II.</td>
<td>6</td>
<td>4,5</td>
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<td>final#</td>
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<td>AOKOBI290_3A</td>
<td>Medical Biochemistry III.</td>
<td>3</td>
<td>2,5</td>
<td>5</td>
<td>final#</td>
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<tr>
<td>AOKLEK228_4A</td>
<td>Hungarian Medical Terminology IV.</td>
<td>–</td>
<td>4</td>
<td>2</td>
<td>pract. mark</td>
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<td>AOKTSI009_4A</td>
<td>Physical Education IV.</td>
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<td>AOKNSG331_1A</td>
<td>Compulsory Nursing Practice (in summer, either after the 1st year or the 2nd year)</td>
<td>–</td>
<td>170 hours workload</td>
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<td>signature</td>
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</tbody>
</table>

**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!)


Recommended textbooks:

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 prospected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, enbalmad 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 ans 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.

**Type of exams:** oral and written.

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!)**


**Recommended textbooks:**

## 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

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<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Dissection room</th>
<th>Histology lab</th>
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<td></td>
<td><strong>Week 1</strong></td>
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</table>
| 1.   | Introduction to the study of the nervous system  
Meninges, hemispheres, the lateral ventricles | Divisions of the brain, meninges, arteries and veins of the brain, surface structures of the brain, basis cerebri.  
Specimen demonstration: dura mater, sinuses |               |
| 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.  
| | | |
|      | **Week 2** | Lateral ventricles, third ventricle  
Brain stem, fourth ventricle, cerebellum | |
| 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 | | |
|      | **Week 3** | Cross sections of the brain.  
Specimen demonstration: spinal cord together with the membranes | |
| 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 | | |
|      | **Week 4** | 1. Revision  
2. **Midterm test 1:** Anatomy and development of the brain and the spinal cord | |
| 10.  | Cells of the CNS: neurons, glia cells. Axon, dendrite, synapses, synaptic transmission,  
Microscopy of the cerebral cortex. Cortical fields, Brodmann areas | Dissection of the back muscles, suboccipital trigone.  
Nervous system I. Peripheral nerve, motor end plate, spinal cord, brain-stem | |
<p>| 11.  | | | |
| 12.  | Sensory systems | | |
|      | <strong>Week 5</strong> | | |
| 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 | | |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Dissection room</th>
<th>Histology lab</th>
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<tbody>
<tr>
<td>Week 6</td>
<td>16. Diencephalon, thalamic nuclei</td>
<td>‘In situ’ dissection of the spinal cord. Demonstration of the spinal ganglia, spinal nerves, membranes.</td>
<td>Nervous system II. Cerebellar and cerebral cortices Pineal body</td>
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<td>17. Introduction to cranial nerves. Classification of sensory, motor and autonomic nuclei</td>
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<td>18. Reticular formation, monoaminergic systems</td>
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<td><strong>Week 7</strong></td>
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<td>19. Microscopy of the brainstem</td>
<td>‘In situ’ brain dissection, Demonstration of the membranes, ventricles, thalamus, brain stem, cranial nerve exits.</td>
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<td>20. Trigeminal nerve, trigeminal neuralgia</td>
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<td>21. Cranial nerves 3, 4, 6, 7. Central and peripheral paresis</td>
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<td><strong>Week 8</strong></td>
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<td>22. Glossopharyngeal, vagus, accessory and hypoglossal nerves</td>
<td>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)</td>
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<td>23. Sympathetic nervous systems</td>
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<td>24. Parasympathetic nervous systems. Autonomic innervation and reflexes of pelvic organs</td>
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<td><strong>Week 9</strong></td>
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<td>25. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation</td>
<td>Cranial nerves 10, 11 and 12 Dissection of the submandibular, carotid, median cervical regions</td>
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<td>26. Inner coat of the eyeball, retina. Morphological basis for colour vision.</td>
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<td>27. Optic nerve, visual pathway, visual cortex, disorders. Visual reflexes</td>
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<td><strong>Week 10</strong></td>
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<td>28. Extraocular muscles and eye movements, conjugated eye movements, strabism. 3D vision</td>
<td>1. <strong>Midterm test 2</strong>. (written) Microscopy of CNS, cranial nerves 2. Dissection of the eye (coats and muscles, chambers, optic nerve)</td>
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<td>30. Skin and appendages. Mammary gland</td>
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<td><strong>Week 11</strong></td>
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<td>31. The organ of hearing in general. External ear, auditory tube, tympanic cavity, tympanic membrane, auditory ossicles</td>
<td>Dissection of orbit, extraocular muscles</td>
<td>Organs of special senses I. Eyeball, retina, lacrimal gland</td>
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<td>32. Bony and membranous labyrinth. Vestibular system</td>
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<td>33. Spiral organ of Corti. Auditory pathway, auditory cortex</td>
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<td><strong>Week 12</strong></td>
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<td>34. Development of the auditory and vestibular system. Clinical relevances</td>
<td>Dissection and demonstration Tympnic cavity, inner ear, temporal bone</td>
<td>Organs of special senses II. Organ of Corti, palm skin, scalp skin, mammary gland</td>
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<td>35. Olfactory and gustatory systems</td>
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<td>36. Limbic system</td>
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<td><strong>Week 13</strong></td>
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<td>37. The hypothalamo-hypophysial system. The pituitary gland</td>
<td>Midterm test 3: Organs of special senses, head and neck regions</td>
<td>Endocrine organs Pituitary, thyroid, parathyroid, suprarenal glands, Endocrine cells in the testicle, ovary, corpus luteum and pancreas</td>
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<td>38. Endocrine organs: pineal body, thyroid, parathyroid, adrenal glands</td>
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<td>39. Patient demonstration</td>
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<td><strong>Week 14</strong></td>
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<td>40. Drugs of abuse, opiates, endogenous cannabinooids and receptor mediated actions in the CNS</td>
<td>Revisions Brain in situ, cranial nerves</td>
<td>Revision</td>
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<td>41. Research in the field of neuroscience</td>
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<tr>
<td></td>
<td>42. Research in the field of neuroscience</td>
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</table>
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)
- 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 Vth 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, accomodation
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
# 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Dissection room</th>
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</table>
| Week 1 | Topographical anatomy of the lower limb, gait mechanism | Ventral regions of the limbs *(prosections)*  
Lower limb (bones, joints, muscles, vessels, nerves) |
| Week 2 | Topographical anatomy of the upper limb, axillary fossa | Ventral regions of the limbs *(prosections)*  
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. | Ventr al regions of the thorax, mammary region *(prosections)*  
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 *(prosections)*. 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 *(prosections)*. 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. Ventr al regions of limbs *(prosections)* |
| Week 7 | Topographical and sectional anatomy of the male pelvis and perineum. | **Midterm test 1. Ventr al 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 *(prosections)*  
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 *(prosections)*  
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 *(prosections)*  
Topographical and sectional anatomy of the male pelvis and perineum. |
| Week 11 | Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances. | **Midterm test 2. Dorsal regions**  
Topography of the nuchal regions, trunk, limbs and perineum. |
<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Dissection room</th>
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<tbody>
<tr>
<td>Week 12</td>
<td>Histological revision of ground tissues. Histology of vessels and lymphatic organs including cell biological relevances.</td>
<td>Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses.</td>
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<td>Topographical anatomy of the nasal cavity, paranasal 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 and neck region.</td>
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<tr>
<td>Week 13</td>
<td>Histology of the respiratory system and the gastrointestinal tract including cell biological relevances.</td>
<td>Prosected specimen demonstration of the final examination. Cross sections, placenta, fetus.</td>
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<tr>
<td>Week 14</td>
<td>Histology of the urinary and genital systems including cell biological relevances.</td>
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**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

Department of Physiology

Subject code: AOKELT446_1A, AOKELT446_2A
Credit Points: 10 (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
Year: 2017/2018

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:

First semester

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.
3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.
5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).
Second semester

2. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
5. Hormonal regulation of intermediar metabolism.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioral mechanisms, motivation; emotion.

Practices, I. semester:

- 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
- Measurement of cardiac output in rat
- Investigation of cardiac functions in situ
- Blood pressure measurement in humans
- Echocardiography
- Computer simulation: Neuromuscular junction
- 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

Practices, II. semester:

- 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
- Pulse wave in human
- Electromyography (EMG), nerve conduction velocity
- Human acid-base examinations (Astrup)
- Oral glucose tolerance test (OGTT)
- Human pulmonary function tests - Body plethysmography
• EEG-demonstration
• 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 5 in the first semester and 4.5 in the second semester. 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 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 practices 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. 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 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 (I) theoretical question results in an overall failed (1) final exam.

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 exams:

Semi-final exam: material of the Medical Physiology I.
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:
Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days. 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:

MEDICAL BIOCHEMISTRY II

Teaching Secretary: **Dr. István Léránt**

**Fall Semester**

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

Teaching Secretary  
Dr István Léránt  
+36-1-4591500#60034 +36-20-6632267

Student Affairs Secretary  
Mr Zsolt Ozsváth  
+36-1-4591500#60061

Lab coordinator  
Dr Katalin Bartha  
+36-1-4591500#60032

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Chemical neurotransmission. Cholinergic neurotransmission. Biosynthesis of acetylcholine, receptors, acetylcholine esterase. Molecular mechanism of exocytosis</td>
</tr>
<tr>
<td>Week 3</td>
<td>Noradrenergic neurotransmission. Biosynthesis and metabolism of norepinephrine. Synaptic uptake. Molecular mechanisms of adrenergic, dopaminergic and serotoninergic neurotransmission</td>
</tr>
<tr>
<td>Week 4</td>
<td>GABAergic neurotransmission. NO: Regulatory role of NO. Nitric oxide synthase. Guanylate cyclase. Molecular effects of nitric oxide</td>
</tr>
<tr>
<td>Week 5</td>
<td>Glutamatergic neurotransmission. General properties of ion channels. General properties of ion channels. Methods for studying ion channels.</td>
</tr>
<tr>
<td>Week 9</td>
<td><em>Biotransformation:</em> 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.</td>
</tr>
<tr>
<td>Week 10</td>
<td>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.</td>
</tr>
<tr>
<td>Week 11</td>
<td>Therapeutic targeting of signal transduction pathways. Calcium signalling</td>
</tr>
<tr>
<td>Week 12</td>
<td><em>The role of thyroid hormones</em></td>
</tr>
<tr>
<td>Week 13</td>
<td><em>Biosynthesis of steroid hormones in the adrenal cortex.</em> 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.</td>
</tr>
<tr>
<td>Week 14</td>
<td><em>Biosynthesis of sexual hormones.</em> Cyclic changes in the ovaries, the cooperation of granulosa and theca interna cells. Placental progesterone and estradiol synthesis. <em>Eicosanoids: prostaglandins, thromboxanes and leukotrienes.</em> The cyclooxygenase and the lipoxygenase pathways. Effects of eicosanoids on: platelet aggregation, gastric mucosal protection, myometrial contractility, inflammation.</td>
</tr>
</tbody>
</table>
# Laboratory program and seminars – Fall Semester

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

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+36-1-4591500#60034 +36-20-6632267

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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 semes-
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**


**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)**

*Institute of Behavioural Sciences*

*Type of the course:*

*code: AOKMAG398_2A*

*credit: 2 credits*

*Presenter of the course: Dr. Adrienne Stauder*

*Course leader: Dr. Ferenc Túry*

**Semester: 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:**

**Week 1-7: Lectures:**

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

Week 2: The specialties of age in medical communication: communication with ill children

Week 3: Doctor-patient collaboration and motivational interviewing to promote behavior change.
Week 4: Suggestive communication in medical practice.
Week 5: Communication about functional complaints
Week 6: Telemedicine.
Week 7:

**Week 5-12: Seminars**

Week 5: Seminar. Communication in everyday life and in the medical practice. The role of non-verbal and metacommunicative signs in communication.

Week 6: 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?


**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. Participation list will be recorded at the end of every lecture/seminar.

**Justification of the absence in the lectures and examinations:** medical certificate

**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**

**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;
9. The role of suggestions in doctor-patient communication.

„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
    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:**

**Recommended text books:**

**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 Oláh

Department of Human Morphology and Developmental Biology

Introduction to developmental biology
  Comparative embryology, epigenesis and preformation, evolutionary embryology, medical implications

Regulatory elements of the ontogenesis I.
  Hormones, growth factors, transcription factors, instructive and permissive interactions

Regulatory elements of the ontogenesis II.
  DNA-methylation, X chromosome inactivation, genomic imprinting

Cell-cell and cell-extracellular matrix interactions
  Adhesion molecules, integrins, cytoskeleton and cell movement, cell polarization

Cell lineages
  Fate map, stem cells, peripheral blood fibrocytes, cell specification, polarity in biological system

Neurogenesis
  Origin of neural cells, switch between neuronal and glial fates, axonal specificity, synaptic plasticity

Neural crests and placods
  Origin of neural crest and placods, 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)**
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)**
NOTE
PRE-CLINICAL MODULE
### STUDY PROGRAMME

#### Third year

#### 5th semester

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKKORS10_1A</td>
<td>Pathophysiology I.</td>
<td>1,5</td>
<td>3</td>
<td>4</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
<tr>
<td>AOKMIK022_1A</td>
<td>Medical Microbiology I.</td>
<td>1,5</td>
<td>2,5</td>
<td>4</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
<tr>
<td>AOKPTK023_1A¹</td>
<td>Pathology I.</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
<tr>
<td>AOKGEN025_1A</td>
<td>Immunology</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>semi-final#</td>
<td>Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
<tr>
<td>AOKBL2517_1A³</td>
<td>Internal Medicine – Propedeutics</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
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<td>AOKBL3307_1A⁴</td>
<td></td>
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<tr>
<td>AOKBVI026_1A</td>
<td>Medical Aspects of Disaster Preparedness and Response I.</td>
<td>1×2/semester</td>
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<tr>
<td>AOKLEK228_5A</td>
<td>Hungarian Medical Terminology V.</td>
<td>–</td>
<td>4</td>
<td>2</td>
<td>final</td>
<td>Hungarian Medical Terminology IV.</td>
</tr>
</tbody>
</table>

**Total Number of Credit Points from Compulsory Subjects:** 28

**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 1st Department of Internal Medicine  
⁴ 3rd Department of Internal Medicine  
# The grade influences the qualification of the Diploma.
<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKKORS10_2A</td>
<td>Pathophysiology II.</td>
<td>1,5</td>
<td>2,5</td>
<td>4</td>
<td>final#</td>
<td>Pathophysiology I., Immunology</td>
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<tr>
<td>AOKMIK022_2A</td>
<td>Medical Microbiology II.</td>
<td>1,5</td>
<td>2</td>
<td>3</td>
<td>final#</td>
<td>Medical Microbiology I., Immunology</td>
</tr>
<tr>
<td>AOKPTK023_2A</td>
<td>Pathology II.</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>final#</td>
<td>Pathology I.</td>
</tr>
<tr>
<td>AOKBL1027_1A</td>
<td>Internal Medicine I.</td>
<td>1,5</td>
<td>3</td>
<td>5</td>
<td>semi-final</td>
<td>Internal Medicine – Propedeutics, Pathophysiology II.*, Pathology II. *</td>
</tr>
<tr>
<td>AOKMAG398_2A</td>
<td>Behavioral Sciences II. (Medical Psychology)</td>
<td>1</td>
<td>2,5</td>
<td>3</td>
<td>final</td>
<td>Behavioral Sciences I. (Medical Communication) Medical Sociology,</td>
</tr>
<tr>
<td>AOKBVI026_2A</td>
<td>Medical Aspects of Disaster Preparedness and Response II.</td>
<td>1x2/semester</td>
<td>–</td>
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<tr>
<td>AOKKMI020_1A</td>
<td>Basic Surgical Techniques</td>
<td>0,5</td>
<td>1,5</td>
<td>2</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II.</td>
</tr>
<tr>
<td>AOKFIZ036_1A</td>
<td>Medical Imaging</td>
<td>12/semester</td>
<td>16/semester</td>
<td>2</td>
<td>semi-final</td>
<td>Medical Biophysics, Anatomy, Cell, Histology, and Embryology IV.</td>
</tr>
<tr>
<td>AOKGEN030_1A</td>
<td>Genetics and Genomics</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>semi-final#</td>
<td>Medical Biochemistry, Molecular and Cell Biology III.</td>
</tr>
<tr>
<td>AOKNSG332_1A</td>
<td>Internal Medicine Practice (in summer)</td>
<td>–</td>
<td>170 hours workload</td>
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<td>signature</td>
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</table>

**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.

1st Department of Pathology
2nd Department of Pathology
1st Department of Internal Medicine
3rd 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!)


Recommended textbooks:

18 Zalatnai A.: 500 Practice Questions about Pathology (Semmelweis University of Medicine)
19 Illyés Gy.: Path Nebulo 2000. Version 1.0 (English-Hungarian)
20 Székely E.: Practice on Histopathology I-II. (Semmelweis University of Medicine) - video
**PATHOPHYSIOLOGY AND CLINICAL LABORATORY DIAGNOSTICS I-II.**

**Department of Pathophysiology**  
Director: **Dr. Attila Tordai**  
Tutor: **Dr. Miklós Molnár**

**5th semester**

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

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

**Institute of Medical Microbiology**
Program Director: **Dr. Dóra Szabó**
Tutor: **Dr. Ágoston Ghidán**

**First Semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (1.5 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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.</td>
</tr>
<tr>
<td>3.</td>
<td>Defence mechanisms of the host against infections. Active and passive immunisation. Vaccines.</td>
</tr>
<tr>
<td>5.</td>
<td>Introduction to the classification of medically important bacteria: fundamentals of taxonomic, epidemiological, nosological, as well as pathogenetical classification. Gram-positive non-spore forming rods: Corynebacterium, Listeria, Erysipelothrix, Lactobacillus Normal flora of the vagina.</td>
</tr>
<tr>
<td>10.</td>
<td>Pathogens of the gastrointestinal tract II: Yersinia (yersiniosis), Shigella (shigellosis), Salmonella (salmonellosis). The enteral fever (Salmonella typhi and paratyphi), as well as Yersinia pestis.</td>
</tr>
<tr>
<td>12.</td>
<td>Acid-fast bacteria: Mycobacterium, Nocardia. Actinomyces</td>
</tr>
<tr>
<td>14.</td>
<td>Rickettsiales, Chlamydiales, Mycoplastmatales</td>
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</tbody>
</table>
# First Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Bacteriology Practicals (2.5 hours per week)</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td><strong>Introduction. Rules and instrumentation of the safe handling of microbes. Safety in the laboratory. Basic microbiological methods I: Microscopic examinations.</strong></td>
</tr>
<tr>
<td>2.</td>
<td>Basic microbiological methods II: Cultivation of bacteria and biochemical activity of bacteria</td>
</tr>
<tr>
<td>3.</td>
<td>Basic microbiological methods III: Sterilisation. Disinfection</td>
</tr>
<tr>
<td>4.</td>
<td>Basic microbiological methods IV: Susceptibility of bacteria to antimicrobial drugs</td>
</tr>
<tr>
<td>5.</td>
<td>Basic microbiological methods V: In vitro immunological reactions</td>
</tr>
<tr>
<td>7.</td>
<td>Systematic bacteriology II: Identification of Gram-positive cocci: Staphylococcus</td>
</tr>
<tr>
<td>8.</td>
<td>Systematic bacteriology III: Identification of Gram-positive cocci: Streptococcus</td>
</tr>
<tr>
<td>9.</td>
<td>Systematic bacteriology IV: Identification of Gram-negative cocci and coccobacilli, and Gram negative aerobic rods</td>
</tr>
<tr>
<td>10.</td>
<td>Systematic bacteriology V: Identification of Gram-negative facultative anaerobic rods</td>
</tr>
<tr>
<td>11.</td>
<td>Systematic bacteriology VI: Identification of the aerobic and anaerobic spore-forming bacteria, as well as the obligate anaerobic and microaerophilic bacteria</td>
</tr>
<tr>
<td>12.</td>
<td>Midterm examination II. and Systematic bacteriology VII: Identification of irregular Gram-positive rods</td>
</tr>
<tr>
<td>13.</td>
<td>Systematic bacteriology VIII: Spirochaetes</td>
</tr>
<tr>
<td>14.</td>
<td>Systematic bacteriology IX: Rickettsiae, Chlamydiales and Mycoplasmatales</td>
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</tbody>
</table>
# MEDICAL MICROBIOLOGY II.

## Second Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (1,5 hours per week)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Medical Mycology</td>
</tr>
<tr>
<td>2.</td>
<td>Medical Parasitology – 1</td>
</tr>
<tr>
<td>3.</td>
<td>Medical Parasitology – 2</td>
</tr>
<tr>
<td>4.</td>
<td>Medical Parasitology – 3</td>
</tr>
<tr>
<td>5.</td>
<td>General Virology</td>
</tr>
<tr>
<td>6.</td>
<td>DNA viruses – 1</td>
</tr>
<tr>
<td>7.</td>
<td>DNA viruses – 2</td>
</tr>
<tr>
<td>8.</td>
<td>RNA viruses – 1</td>
</tr>
<tr>
<td>9.</td>
<td>RNA viruses – 2</td>
</tr>
<tr>
<td>10.</td>
<td>RNA viruses – 3</td>
</tr>
<tr>
<td>11.</td>
<td>Hepatitis viruses</td>
</tr>
<tr>
<td>12.</td>
<td>Retro viruses. AIDS. Viral oncogenesis</td>
</tr>
<tr>
<td>13.</td>
<td>Slow viruses and Prions. Control of viral diseases. Antiviral chemotherapy</td>
</tr>
<tr>
<td>14.</td>
<td>Iatrogenic and Nosokomial infections</td>
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<table>
<thead>
<tr>
<th>Week</th>
<th>Practicals (2 hours per week)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Medical Mycology</td>
</tr>
<tr>
<td>2.</td>
<td>Medical Parasitology – 1</td>
</tr>
<tr>
<td>3.</td>
<td>Medical Parasitology – 2</td>
</tr>
<tr>
<td>4.</td>
<td>Medical Parasitology – 3</td>
</tr>
<tr>
<td>5.</td>
<td>Midterm exam I. General Virology</td>
</tr>
<tr>
<td>6.</td>
<td>DNA viruses</td>
</tr>
<tr>
<td>7.</td>
<td>RNA viruses</td>
</tr>
<tr>
<td>8.</td>
<td>Midterm exam II.</td>
</tr>
<tr>
<td>9.</td>
<td>Clinical Bacteriological Diagnosis – 1: Skin, wound and eye infections</td>
</tr>
<tr>
<td>10.</td>
<td>Clinical Bacteriological Diagnosis – 2: Respiratory tract infections</td>
</tr>
<tr>
<td>12.</td>
<td>Clinical Bacteriological Diagnosis – 4: Bacteraemia, sepsis, endocarditis, meningitis</td>
</tr>
<tr>
<td>13.</td>
<td>Summary and review</td>
</tr>
<tr>
<td>14.</td>
<td>Practical exam</td>
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PATHOLOGY I.

1st Dept. of Pathology and Experimental Cancer Research
Tutor: Dr. Gergely Rác

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
   Histopathology practices
   Autopsy demonstration
   Nutmeg liver H&E (1)
   Cardiac fibrosis in liver H&E (7)
   Pulmonary edema H&E (2)

2. Cell injury
   Haemosiderin in alveolar macrophages H&E (8)

3. Cell injury
   Thromboembolism H&E (3)
   Hemorrhagic infarction of the lung H&E (4)
   Anemic infarction of the kidney H&E (5)
   Emolliation of the brain H&E (6)
   Fatty degeneration of the liver H&E (12)

4. Inflammation
   Phlegmone H&E (13)

5. Inflammation
   Cerebral abscess H&E (14)
   Fibrinous pericarditis H&E (15)
   Pseudomembranous colitis (16)

6. Wound healing, regeneration and fibrosis
   Actinomycosis H&E (98)

7. Immunopathology
   Candidiasis PAS (17)
   Aspergillosis (slide demonstration)
   Acute appendicitis H&E (66)
   Oxyuris in appendix H&E (67)

8. Neoplasia
   Chronic polypous sinusitis H&E (18)

9. Neoplasia
   Chronic abscess (9)
   Granulation tissue H&E (19)
   Foreign-body granuloma H&E (20)

10. Neoplasia
    Metaplasia (slide demonstration)

11. Genetic diseases
    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)

12. Haemodynamic disorders
    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)

13. Haemodynamic disorders
    Leiomyoma H&E (37)
    Leimyosarcoma (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) |
| 14. Environmental and nutritional pathology | Benign nephrosclerosis H&E(46) |
| 14. Environmental and nutritional pathology | Coronary-sclerosis H&E(47) |
| 14. Environmental and nutritional pathology | Polyarteritis nodosa H&E (48) |
| 14. Environmental and nutritional pathology | Giant cell arteritis H&E (49) |
| 14. Environmental and nutritional pathology | 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) |
| 16. Blood vessels | Myocardial infarction, old H&E (43) |
| 16. Blood vessels | Myocarditis H&E(44) |
| 16. Blood vessels | Endocarditis H&E(96) |
| 17. Heart | IRDS H&E (50) |
| 18. Heart | Lobar pneumonia H&E(51) |
| 18. Heart | Bronchopneumonia H&E (52) |
| 18. Heart | Pneumoconiosis H&E (54) |
| 18. Heart | Pleurafibrosis H&E (97) |
| 19. Respiratory system | Miliary tuberculosis in lung H&E (55) |
| 20. Respiratory system | Tuberculotic lymphadenitis H&E (56) |
| 20. Respiratory system | Sarcoidosis H&E (57) |
| 20. Respiratory system | Oat cell carcinoma of the lung H&E (58) |
| 20. Respiratory system | Mesothelioma H&E (59) |
| 20. Respiratory system | Nasopharyngeal carcinoma (slide demonstration) |
| 21. Respiratory system | Warthin-tumor (slide demonstration) |
| 21. Respiratory system | Mucoepidermoid carcinoma (slide demonstration) |
| 21. Respiratory system | Adenoid cystic carcinoma (slide demonstration) |
| 21. Respiratory system | Chronic peptic ulcer H&E (60) |
| 21. Respiratory system | Chronic gastritis H&E (61), Giemsa (62) |
| 21. Respiratory system | Signet ring cell carcinoma of the stomach H&E(63), PAS (64) |
| 21. Respiratory system | 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) |
| 24. Infectious diseases | Carcinoid H&E (53) |
| 24. Infectious diseases | Peritoneal carcinosis H&E (99) |
| 25. Gastrointestinal tract | Organ demonstration |
## PATHOLOGY II.

### Second Semester

<table>
<thead>
<tr>
<th>Lectures (3 hours per week)</th>
<th>Histopathology practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Liver and biliary system</td>
<td>Alcoholic hepatitis H&amp;E(70)</td>
</tr>
<tr>
<td>30. Liver and biliary system</td>
<td>Chronic hepatitis H&amp;E (71)</td>
</tr>
<tr>
<td>31. Liver and biliary system</td>
<td>Liver cirrhosis H&amp;E(72)</td>
</tr>
<tr>
<td></td>
<td>Hepatocellular carcinoma H&amp;E (73)</td>
</tr>
<tr>
<td></td>
<td>Cavenous haemangiomia of liver H&amp;E (35)</td>
</tr>
<tr>
<td>32. Kidney</td>
<td>Chronic cholecystitis H&amp;E(74)</td>
</tr>
<tr>
<td>33. Kidney</td>
<td>Chronic pancreatitis H&amp;E(75)</td>
</tr>
<tr>
<td></td>
<td>Acute hemorrhagic necrotising pancreatitis H&amp;E(76)</td>
</tr>
<tr>
<td></td>
<td>Pancreatic pseudocyst (slide demonstration)</td>
</tr>
<tr>
<td></td>
<td>Adenocarcinoma of pancreas H&amp;E (77)</td>
</tr>
<tr>
<td></td>
<td>Islet cell tumor of pancreas (slide demonstration)</td>
</tr>
<tr>
<td>34. Urinary tract</td>
<td>Diabetic nodular glomerulosclerosis</td>
</tr>
<tr>
<td></td>
<td>(Kimmelstiel-Wilson) H&amp;E (78)</td>
</tr>
<tr>
<td>35. Male genital syste</td>
<td>Glomerulonephritis H&amp;E (79)</td>
</tr>
<tr>
<td></td>
<td>End stage kidney H&amp;E (80)</td>
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<tr>
<td></td>
<td>Acute rejection in transplanted kidney H&amp;E (22)</td>
</tr>
<tr>
<td>36. Gynecologic pathology</td>
<td>Acute pyelonephritis H&amp;E (81)</td>
</tr>
<tr>
<td>37. Gynecologic pathology</td>
<td>Chronic pyelonephritis H&amp;E (82)</td>
</tr>
<tr>
<td></td>
<td>Renal cell carcinoma H&amp;E (83)</td>
</tr>
<tr>
<td></td>
<td>Normal adrenal cortex (slide demonstration)</td>
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<tr>
<td></td>
<td>Wilm's tumor H&amp;E(84)</td>
</tr>
<tr>
<td></td>
<td>Transitional cell carcinoma H&amp;E (28)</td>
</tr>
<tr>
<td>38. Neonatology</td>
<td>Nodular hyperplasia of the prostate H&amp;E(85)</td>
</tr>
<tr>
<td>39. Breast</td>
<td>Adenocarcinoma of prostate H&amp;E(87)</td>
</tr>
<tr>
<td></td>
<td>Seminoma H&amp;E (88)</td>
</tr>
<tr>
<td></td>
<td>Embryonal carcinoma (slide demonstration)</td>
</tr>
<tr>
<td></td>
<td>Teratoma H&amp;E(89)</td>
</tr>
<tr>
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Phylloid tumor (slide demonstration)  
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Invasive lobular carcinoma H&E (104)  
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| 46. Skin | Normal bone marrow H&E (127) |
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Multiple myeloma H&E (106)  
Amyloidosis Congo (21) |
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| 49. Bones and joints | Colloid goiter H&E (110) |
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Malignant melanoma H&E (40)  
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| 55. Nervous system | Meningeoma H&E (119)  
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| 56. Nervous system | Review |
| 57. Clinicopathologic conference | Review |

Semifinal Exam: Autopsy demonstration on the last autopsy practice will be graded 1 to 5. This grade, if not 1, will be added to the scores of written test. Written test is composed of 100 Qs (true-false, simple choice, problem solving, combination, multiple choice, relations, medical term, assay, scores are 0-65:1; 66-73:2; 74-83:3; 84-89:4; 90-105:5). Further details available in the semifinal exam protocol provided one month before examination period.
PATHOLOGY AND HISTOPATHOLOGY I - II.

2nd Department of Pathology
Head of Department: Prof. Dr. András Kiss

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Histopathology practices - slides for the histopathology exam and slide demonstrations
General information - Lectures, practices, competition
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Schedule for the academic year

Lectures

1st Semester

Introduction - History of pathology, its significance in medicine. Health and sickness. - Clinicopathology - Demonstration of establishing diagnosis from biopsy specimen to the pathological report and therapeutic suggestion. Introduction of the “4D Pathology” internet based teaching resource.

Cell injury Reversible cell injury (hydropic swelling, atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia, intracellular storage). Irreversible cell injury (necrosis, apoptosis, ischemic cell injury, external agents, calcification, hyaline, aging).

Hemodynamic disorders

Inflammation I.

Inflammation II:
Chronic inflammation. fibrosis, scarring. Granulomatous inflammations: (tuberculosis, syphilis. etc.)

Environmental and nutritional pathology.
Smoking, alcoholism, drugs. iatrogenic injuries. Environmental chemical and physical factors. Obesity, protein malnutrition, vitamins.

Genetic and developmental disorders. Gene pathology I.

Genetic and developmental disorders. Gene pathology II.

Neoplasia I.
Neoplasia II.
Molecular mechanisms of tumor development: protooncogenes, oncogenes, tumor suppressor genes, growth factors, tumor associated inherited genetic disorders.

Neoplasia III.
Tumor growth, tumor progression, metastasis. Familiar cancer.

Neoplasia IV.

Neoplasia V.
Prognostic factors in tumor pathology. Staging and grading of tumors. TNM. Handling of surgical biopsy material.

Childhood Tumors
(ALL, Wilms tumor, medulloblastoma, hepatoblastoma, retinoblastoma, neuroblastoma, Ewing sarcoma, osteosarcoma)

Methods of diagnostic pathology: Diagnostic parameters, requirements, which guide the clinical protocols. Molecular diagnostics of tumors. Targeted therapy.

Clinical pathology - aspiration cytology
Tumor Screening, Cytodiagnostics. The morphologic and technical basis of aspiration cytology. Aim and clinical-pathological use of the technique. Basic cytopathological morphology of benign and malignant lesions. Cases will be presented in which aspiration cytology revealed the nature of disease or changed the clinical diagnosis. (non-neoplastic and neoplastic lesions).

Cardiovascular Pathology I.
Microvascular disease. Diseases of veins and lymphatic vessels.
Tumors of vessels.

Cardiovascular Pathology II.

Cardiovascular Pathology III.

Head and neck

Respiratory system I.
Conducting airways (congenital abnormalities, infections, bronchial obstructions and aspiration).
Lung parenchyma (congenital abnormalities, infections, pneumonia). Diffuse alveolar damage (ARDS, iatrogenic damage, hemorrhage). Chronic obstructive pulmonary diseases (COPD - obstruction, bronchitis, asthma, bronchiolitis, emphysema). Restrictive lung diseases: e.g. pneumoconiosis, sarcoidosis).

Respiratory system II.

Gastrointestinal tract I.
Esophagus (anatomy and developmental disorders, inflammation, trauma, tumors).

Gastrointestinal tract II.
Stomach (congenital abnormalities, inflammations, peptic ulcer, neoplasms). Small intestine (congenital disorders, infections, vascular disease, Crohn-disease, malabsorption, Whipple’s disease, neoplasms, pneumatosis cystoides)
Gastrointestinal tract III.

Bones and joints
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

Infectious diseases
Diseases caused by viruses (tick-borne viruses, polio, variola, herpes, CMV, EBV, rubella, varicella, mumps, influenza), Rickettsiae, Spirochetes.
Bacteria (tularaemia, pertussis, legionella, brucellosis, listeriosis, clostridial infections (tetanus, botulism), Streptococci) Actinomycosis. Mycobacteria (tbc, leprosy). Protozoa (malaria, toxoplasmosis, amebiasis)

Clinical pathology – Cases with relevant clinicopathological importance will be presented.

2nd Semester

Liver and biliary system I.

Liver and biliary system II.

Liver and biliary system III.
Gallbladder and bile ducts (congenital anomalies, cholecystitis, cholelithiasis, cholangitis, neoplasms).

TDK Conference

Pancreas I.
Pathology of the exocrine pancreas: Developmental abnormalities, inflammations, tumors of the exocrine pancreas.

Pancreas II.
Pathology of the endocrine pancreas: Diabetes mellitus.

Endocrinology

Kidney Pathology I.

Kidney Pathology II.

Kidney Pathology III.
Tumors of the kidney. Kidney transplantation.
**Uropathology**

**Male genital system**
Diseases of the epididymis, testis, prostate, penis and scrotum.

**Gynecologic pathology I**

**Gynecologic pathology II.**

**Neonatology**

**Breast I**
Symptoms and diagnosis of breast diseases. Malformations. Benign symptomatic lesions (inflammations, fibrocystic disease, epithelial dysplasia and its significance, benign tumors)

**Breast II**

**Blood and lymphoid organs I.**

**Blood and lymphoid organs II.**

**Blood and lymphoid organs III.**

**Nervous system I.**

**Nervous system II.**
Demyelinating diseases. Neurodegenerative diseases. Pathology of the eye and ear. Metabolic diseases

**Dean’s Day**

**Nervous system III.**

Immunopathology II. - Autoimmune diseases.
Etiology. Monosystemic diseases (e.g. chr. Athrophic gastritis, myasthenia gravism Basedow dis., Hashimoto thy-reoiditis, Addison dis., Insulin dependent diabetes mellitus, Sclerosis multiplex) and Oligo- polysystemic diseases (e.g. SLE, Sjögren sy, RA, scleroderma, dermatomyositis)

Skin Basic notions in skin pathology.

List of textbooks
3 Szende B., Suba Zs Introduction to Histopathology (Medicina, 1999)

Recommended literature

General Informations: www.path2.sote.hu

Online available case center: http://casecenter-korb2.sote.hu/casecenter/
User name and password for Java version: student_jav
User name and password for Panoramic Viewer version: student_pv

Panoramic Viewer free download: http://www.3dhistech.com/

Practice test: http://casecenter-korb2.sote.hu/espractice/

The Case Center and the Practice Test is allowed to use after 4 p.m. only!!

Dr. Tibor Schönfeld shall be approached with technical problems regarding server availability:
e-mail: schonfeld.tibor@med.semmelweis-univ.hu
Histopathology practices and slides for the final examination

1. practice
Introduction into the practice of pathology – methods and approaches
Introduction of the “4D Pathology”: internet based teaching resource.

2. practice
Hemodynamic disorders I.
Acute congestion - Pulmonary edema
Chronic congestion in lung - Haemosiderin in alveolar macrophages (‘heart failure cells’)
Chronic congestion in liver - Nutmeg liver
Nutmeg liver with fibrosis
Centrolobular necrosis

3. practice
Hemodynamic disorders II.
Thromboembolism – organising thrombus
Anemic infarction of the kidney
Hemorrhagic infarction of the lung

4. practice
Inflammation, regeneration
Acute appendicitis
Fibrinous pericarditis
Granulation tissue
Foreign-body granuloma
Candidiasis

5. practice
Neoplasia I.
Squamous cell metaplasia of the cervix
HPV infection in condyloma acuminatum
High grade dysplasia of the cervix (CIN III)
Invasive squamous cell carcinoma of the cervix

6. practice
Neoplasia II.
Benign and malignant epithelial tumors
Nomenclature
Squamous cell papilloma
Squamous cell carcinoma of the larynx
Tubulovillous adenoma of the colon
Adenocarcinoma of the colon
Squamous cell carcinoma metastasis in lymph node
Adenocarcinoma metastasis in liver
Adenocarcinoma metastasis in lung
Adenocarcinoma metastasis in brain

7. practice
Neoplasia III.
Benign and malignant mesenchymal tumors
Histological differential diagnosis based on immunohistochemistry
Leiomyoma
Leimyosarcoma
Lipoma
Liposarcoma
Hemangioma of the skin
Angiosarcoma

8. practice
Childhood tumors
Nephroblastoma (Wilms’ tumor)
Neuroblastoma
Osteosarcoma
Rhabdomyosarcoma

9. practice
Histology of cardiovascular diseases
Arteriosclerosis in the kidney
Arteriosclerosis in the coronary artery
Acute myocardial infarction
Healed myocardial infarction
Infective endocarditis
10. practice
Histology of lung diseases I.
Non-tumorous lung diseases
IRDS
Bronchopneumonia
Miliary tuberculosis in lung
Sarcoidosis (Boeck’s disease)

11. practice
Histology of lung diseases II.
Tumors of the lung
Small cell carcinoma of the lung
Squamous cell carcinoma of the lung
Adenocarcinoma of the lung
Mesothelioma
Lung metastasis

12. practice
Histology of gastrointestinal tract diseases I.
Upper GI tract
Mixed tumor of the parotid gland
Squamous cell carcinoma of the oesophagus
Chronic peptic ulcer of the stomach
Chronic gastritis, Helicobacter pylori
Signet ring cell carcinoma of the stomach
Gastric GIST

13. practice
Histology of gastrointestinal tract diseases II.
Non-tumorous bowel diseases
Villous atrophy in small intestine – Celiac disease
Ulcerative colitis
Crohn’s disease
Pseudomembranous colitis

14. practice

2nd Semester

15. practice
Histology of liver diseases
Alcoholic hepatitis – fatty degeneration
Viral hepatitis
Liver cirrhosis
Hepatocellular carcinoma
Cavernous haemangioma
Adenocarcinoma metastasis

16. practice
Histology of pancreatic diseases
Chronic pancreatitis
Acute pancreatitis
Adenocarcinoma
Neuroendocrine tumor

17. practice
Histology of diseases of endocrine system
Adrenal gland and thyroid
Nodular hyperplasia of adrenal gland
Adrenal cortical adenoma
Multinodular colloid goiter
Hashimoto thyreoiditis
Follicular adenoma of the thyroid gland
Papillary carcinoma of the thyroid gland

18. practice
Histology of urologic diseases I.
Kidney, urinary tract
Acute purulent pyelonephritis
End stage kidney
Renal cell carcinoma
Urothelial (transitional) cell carcinoma

19. practice
Histology of urologic diseases II.
Prostate, testicle
Nodular hyperplasia of the prostate
Adenocarcinoma of the prostate
Seminoma
Embrional carcinoma of the testis
20. practice
Histology of gynecological diseases I.
Uterus

Extraterine (tubal) gravidity
Endometriosis
Endometrial hyperplasia (simplex)
Endometrioid adenocarcinoma

21. practice
Histology of gynecological diseases II.
Ovary

Mucinous cystadenoma
Mucinous cystadenocarcinoma
Serous papillary cystadenofibroma
Serous papillary cystadenocarcinoma
Teratoma / Dermoid cyst

22. practice
Histology of breast diseases

Fibrocystic disease
Fibroadenoma, phylloid tumor
Intraductal carcinoma (DCIS)
Invasive ductal carcinoma
Invasive lobular carcinoma

23. practice
Histology of hematological diseases

Reactive lymph node
Hodgkin's lymphoma (nodular sclerosing)
Non-Hodgkin lymphoma in lymph node (high grade)
Extranodal lymphoma in the stomach (MALT)

24. practice
Histology of CNS diseases

Purulent meningitis
Meningeoma
Glioblastoma multiforme
Brain metastasis

25. practice
Histology of skin diseases

Seborrheic keratosis
Basocellular carcinoma – Krompecher tumor
Naevus pigmentosus
Malignant melanoma

26. practice
Pathology of the Eye and its Appendices (theory and practice)

27. practice
Histology of cases discussed at autopsies

28. practice
Repetition – consultation

General information

Lectures

The topics of the lectures include both general and systemic pathology. To provide a more practical, clinicopathological aspect of the subject, systemic pathology is emphasized in the lectures but all of them include general aspects.

Each lecture lasts 1 hour 10 minutes and is illustrated with macroscopic and microscopic photographs, as well as with electronmicroscopic photographs or radiologic images, illustrating the material presented. Occasionally interesting autopsy cases will be demonstrated at the end of the lectures.

It is compulsory to visit the lectures, since the semifinal and final exams are partly based on them. The 2nd Department of Pathology may record the absences and those students who are missing more than 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 histology practices (histology practice and autopsy hall practice counts separately) can be missed in each semester. Autopsy hall practices can be repeated and verified by the signature of the tutor of another group. In case the absences exceed the allowed limit the student will not be accepted for examination.

The histopathology practices provide basic histopathology skills and ability to describe lesions. 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 the recently introduced 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 from 4 p.m. till 8 a.m. every day.

On the autopsy practices the students can learn the basic skills of autopsy and will practice to recognize the pathologic lesions and will gain skills to demonstrate and describe them. The emphasis is on the clinicopathologic aspects of the discussed cases. If there is no autopsy available on a practice organ demonstration will take place on plastinated organs. Alternatively, visit of the laboratories (Laboratory of Histopathology, Laboratory of Immunhistochemistry and Laboratory of Molecular Pathology) of the Department will be held.

The information provided on autopsies, lectures and demonstrations is part of the medical secret. The preservation of the medical secret also mandatory for the 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 at lectures and practices (including autopsy and histology practices). The material presented during the tuition is the property of the Department and their presentation is directly controlled by the Department. Therefore 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 head of the Department. The Department reserves the rights to completely control the communication of the information about the Department.

Mid-term exams: There are two mid-term exams in each semester. The participation and successful absolvation (mark of at least of 2) of the mid-term exam is compulsory. At the end of the first semester there is an autopsy (organ) demonstration, as well. The mark of the autopsy (organ) demonstration (in the 1st semester) will be added to the final score of the written test in case one is over the passing limit. In case one fails or does not participate the mid-term exam in the given time, the exam should be retaken otherwise the student will not be accepted for examination.

Competition

There will be a competition in pathology held in two turns on the 11th and 13th week of the II. semester. 25 macroscopic photographs will be projected in the first turn and the diagnoses must be given. Further, written multiple choice test about microscopic pictures and case reports will be part of the first round as well. The students with the best results (up to 8 people, depending on the number of participants) will participate in the second round, where a complete autopsy report should be written based on previously sectioned organs, and 2 digital histological slides to be recognized. Both turns are passworded. The results will be announced on the last lecture of the semester. Those who pass into the second round will be exempted from test writing, those who recognize the histology slide in
the second round are exempted from histology in the final. The first three ranked students - the winners - will be awarded. The first three ranked students should also participate on the final examination and answer only theoretical questions.

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:

MATERIAL FOR SEMIFINAL: The material of the lectures of the I. Semester 2016 / 2017 ending with the lecture of the Pathology of Environmental and nutritional pathology.

1. Prerequisites:
   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. Autopsy hall practices can be repeated and verified by the signature of the tutor of another group. The visit of the lectures is obligatory. If one does not fulfil (proved by the signed absence lists) the above mentioned prerequisites the 2nd Department of Pathology has the right for not acknowledging the semester.

Mid-term exams: Participation on 2 mid-term exams on each semester is obligatory.

2. Autopsy demonstration will be held on the last autopsy hall practice. One should be able to recognize the organ (complex), orientate 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 average result (1-5) of the autopsy demonstration and the two mid-term exams will be added in percentage in case one 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 100 questions. The students have 100 minutes for writing the test. The test is given in one session, there will be no rest break during the examination. Your place is determined by the actual supervisor. The written test will be held in the Histopathology practice room using the teleconsultation/telexamination 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. After the final sending of the test for evaluation, the computer will evaluate the test. The result is immediately available and will be stored for the record. 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, however, the false statements of the multiple choice questions will result in one point deduction in order to avoid randomly crossing every
answer of the multiple choice questions. Every answer should be marked in the computer. Before final sending of the answers 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 61 %. Each correct answer is worth of 1 point. If you did not reach 61 percent or more you have failed.

- 0-60 %: 1
- 61-70 %: 2
- 71-80 %: 3
- 81-90 %: 4
- 91-100 %: 5

**Suspension:** If you have any problem during the test, ask the supervisor. In case of communicating, unacceptable behaving, 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 case 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 indexes are collected by the supervisor before starting the exam. Students having no index are not allowed to take 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 be posted on the billboards. Additional dates will not be available. 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 the 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 next trial 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 cannot 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.
9. Written test - types of questions:
The written test will be held in the Histopathology practice room using the teleconsultation/telexamination 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. After the final sending of the test for evaluation, the computer will evaluate the test. The result is immediately available and will be stored for the record. **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, however, the false statements of the multiple choice questions will result in one point deduction in order to avoid randomly crossing every answer of the multiple choice questions. Altogether, the deductions cannot conclude a negative score, the worst score for one question is 0. Every answer should be marked in the computer. Before final sending of the answers for evaluation the answers might be changed.

**FINAL**

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 oral lectures. **The written test is compulsory part of the exam! The passing limit is 61 %.** The test is given in one session, there will be no rest break during the examination. Your sitting order is determined by the actual supervisor.

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, however, the false statements of the multiple choice questions will result in one point deduction on order to avoid randomly crossing every answers of the multiple choice questions. Every answer should be marked in the computer. Before final sending of the answers for evaluation the answers might be changed.

*The three theoretical topics of the oral examination are drawn by the student from the pool of theoretical questions. The list of theoretical questions to be drawn will be published on the website of the institute in the beginning of the semester.*

*The material for the examinations is based on the book, the lectures and practices as well!!*

The examination will take place at the 2\textsuperscript{nd} Department of Pathology starting with the written test in the Histology Practice Room.

The exam begins sharp at 8.30 a.m. for the final!!!

**MEETING POINT:** In the Histology Practice Room at the 2\textsuperscript{nd} Dept. of Pathology !!!

The indexes are collected by the supervisor before starting the exam. Students having no index are not allowed to take examination!
Written test - types of questions:
The written test will be held in the Histopathology practice room using the teleconsultation/telexamination 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 questions and regarding the numbering of the questions as well. The will be randomly selected from a pool by the computer. After the final sending of the test for evaluation, the computer will evaluate the test. The result is immediately available and will be stored for the record. **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 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, however, the false statements of the multiple choice questions will result in one point deduction on order to avoid randomly crossing every answers of the multiple choice questions. Every answer should be marked in the computer. Before final sending of the answers for evaluation the answers might be changed.

**Evaluation:** The passing level is 61%. Each correct answer is worth of 1 point. If you did not reach 61 percent or more you have failed.

| 0–60 %: | 1 |
| 61–70 %: | 2 |
| 71–80 %: | 3 |
| 81–90 %: | 4 |
| 91–: | 5 |

After the test writing examinees are required to take the histology part of the final. Two slides from the exam 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, correct diagnosis should be given. The Histology part can not be examined by the tutor of the student.

Following the test and the histology **organ demonstration** is held. During this part of the exam you will get cut, prepared organs or organ complexes, and you should correctly demonstrate them. One should be able to orientate the organ properly, to describe and evaluate the pathological alterations and establish the diagnoses. Finally, **theoretical topics** 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!!**

**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 one retakes an exam to improve the previous mark it is not granted that mark of the retake exam cannot 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).** 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.

**By retake examination in case of failure the written test or/and the histology exam should not be repeated in case one has reached at least grade 3 on these parts before.**

**In case one passed but unsatisfied with the result the complete examination should be repeated except the written test/histology part with grade 5.**

**Failure on any part of the exam excludes a result of 5!!** You must also register and indicate that this is the first, second, etc. retake exam. During registration the chosen examination form should also be indicated.
Announcement of the results: is held at the same day, usually early afternoon (depending on the number of examinees per day). Indexes can be obtained in the office of Prof. Dr. Tímár (passing by the doorman’s cabine to the right, at the end of the corridor take a left turn).
However, it should be kept in mind that the final mark is not merely the mathematical average of the given grades! Additional factors, for example your midterm grades, your general performance during the academic year (evaluated by your tutor), the point scores of your written test, 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 failed exam.

Suspension: If you have any problem during the test, ask the supervisor. In case of communicating, unacceptable behaving, 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 case will be prepared and signed by the teachers.

INTERNAL MEDICINE Propedeutics

1st Dept. of Internal Medicine Tutor: Dr. Péter Studinger
2nd Dept. of Internal Medicine Tutor: Dr. Krisztina Hagymási
3rd Dept. of Internal Medicine Tutor: Dr. Katalin Keltai

In 2017/18 Internal Medicine Propedeutics and Internal Medicine I. are taught by the 1st and 2nd 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 endocrine diseases. The neuroendocrine regulation and its disorders. Acquisition of knowledge of medical toxicology.

IMMUNOLOGY

Department of Genetics, Cell and Immunobiology
Course director: Prof. Dr. Edit Buzás
Tutor: Dr. Marianna Csilla Holub
Subject code: AOKGEN025_1A
Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III.

Credits: 4

<table>
<thead>
<tr>
<th>Lectures (2 hr / week)</th>
<th>Practicals / Seminars (2 hr / week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The role, processes, organs and cells of the immune system</td>
<td>Basic terms, organs and cell of the immune system</td>
</tr>
<tr>
<td>2. Principles of natural immunity</td>
<td>Methods based on antigen-antibody interactions I.</td>
</tr>
<tr>
<td>3. The complement system; inflammation and acute phase reaction</td>
<td>Methods based on antigen-antibody interactions II: Flow cytometry</td>
</tr>
<tr>
<td>4. Antigen, – presentation and MHCs</td>
<td>Methods based on antigen-antibody interactions III: Immunoserology</td>
</tr>
<tr>
<td>5. Antigen receptors and their formation</td>
<td>Cell culturing</td>
</tr>
<tr>
<td>6. T lymphocytes and cell-mediated immune response</td>
<td>Immunization and vaccination</td>
</tr>
<tr>
<td>7. B lymphocytes and humoral immune response</td>
<td>Complement assays; Migration of immune cells</td>
</tr>
<tr>
<td>8. Hypersensitivity</td>
<td>HLA typing; Consultation</td>
</tr>
<tr>
<td>9. Immunological tolerance; natural and pathological autoimmunity</td>
<td>Midterm test (written)</td>
</tr>
<tr>
<td>10. Mucosal immunity; immune response in infections</td>
<td>Hypersensitivity I.</td>
</tr>
<tr>
<td>11. Antitumor immunity; immunodeficiencies</td>
<td>Hypersensitivity II-IV.; Immunological databases</td>
</tr>
<tr>
<td>12. Immunology of transplantation and pregnancy</td>
<td>Screening methods for autoantibodies,</td>
</tr>
<tr>
<td>13. Immunopharmacology</td>
<td>Biological therapies</td>
</tr>
<tr>
<td>14. Neuro- and psychoimmunology and review</td>
<td>Consultation</td>
</tr>
</tbody>
</table>

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 Nagyvárad Square, Operating training center, 1089 Budapest, Nagyvárad sqr 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 patent and surgical team before operation, surgical tools and instruments, wound management, laparoscopic instruments and techniques.
Recommended for students interesting in manual fields of medicine.

Practices are held on every second week (7x135 minutes).
1. The operating room.
2. Knoting and suturing on in vitro models.
3. Knoting and suturing on in vivo models.
4. Operations on small animals I.
5. Operations on small animals II.

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: Prof. Dr. József Kovács
Tutor: Dr. Gyöngyvér Salavec

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.

Department:
Institute of Behavioral Sciences
Department of Psychology
NET Building, 20th floor
Tel: 210-2953
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:

Recommended text books:
PROBLEM BASED MEDICAL PHYSIOLOGY

Course Director: Prof. Dr. László Hunyadi 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 discusssable 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)

- 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)
- Imaging in nuclear medicine. Basic principles of nuclear medicine. Radiopharmacons. Instruments (SPECT, PET, hybrid equipments)
- 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: AOKBV1026_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: to be issued later

**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:**  
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 Sensei
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. Transmission of genetic information
3. Genetic variations
4. Cytogenetics
5. Epigenetics
6. Monogenic inheritance (Autosomal inheritance)
7. Role of sex in inheritance
8. Genetics of biological processes
9. Introduction to genomics. Methods in genomics
10. Genomic approach of complex inheritance
11. Population genetics and genomics
12. Evolution genetics and genomics
13. Pharmaco- and nutrigenetics and genomics
14. Metagenomics, ELSI (ethical, legal and social aspects of human genetics)

Practices (2 hours per week):
1-2. Transmission of genetic information
3-4. Cytogenetics I, II
5. Study of monogenic inheritance, pedigree analysis
6. Factors effecting the expression of genotype
7-8. Molecular genetic methods and applications in human genetics I, II
9. Consultation
10. Midterm (written)
11. Evaluation of of molecular genetic studies
12. Molecular and cytological consequences of some monogenic disorders
13. Complex inheritance
14. Consultation

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 80). Students have to reach more than 50% of both the exam scores (40) and total scores (60) 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)
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)
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

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOVNEI263_1A</td>
<td>History of Medicine</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVANT457_1A</td>
<td>Developmental Biology I.</td>
<td>2</td>
<td>–</td>
<td>3</td>
<td>pract. mark</td>
<td>Anatomy, Cell, Histology and Embryology II.</td>
</tr>
<tr>
<td>AOVKPK088_1A</td>
<td>Library Informatics</td>
<td>2</td>
<td>–</td>
<td>3</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVKIK099_1A</td>
<td>Clinical Physiology of Respiration and Respiratory Diseases</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>Medical Physiology II.</td>
</tr>
<tr>
<td>AOVGEN083_1A</td>
<td>Basic Cell Biology</td>
<td>2</td>
<td>–</td>
<td>3</td>
<td>pract. mark</td>
<td>Anatomy, Cell, Histology and Embryology I.</td>
</tr>
<tr>
<td>AOVDEM156G1A</td>
<td>Teaching assistance (Demonstrator)</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
<td>Only 2nd 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</td>
</tr>
<tr>
<td>AOVDEM215G1A</td>
<td>Teaching assistance II. (Demonstrator)*</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVTDK158G1A</td>
<td>Work within the union of research students (TDK munka)</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
<td>–</td>
</tr>
<tr>
<td>AOVCSA249_1A</td>
<td>Introduction to Clinical Medicine</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>Medical Profession</td>
</tr>
<tr>
<td>AOVCSA248_1A</td>
<td>Medical Profession</td>
<td>0.67</td>
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<td>pract. mark</td>
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<td>AOVFIZ475_1A</td>
<td>Mathematical and Physical Basis of Medical Biophysics</td>
<td>1</td>
<td>–</td>
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### 2nd semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
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</thead>
<tbody>
<tr>
<td>AOVNEI263_1A</td>
<td>History of Medicine</td>
<td>2</td>
<td>–</td>
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<td>pract. mark</td>
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<tr>
<td>AOVANT458_1A</td>
<td>Clinical anatomy – propedeutics</td>
<td>2</td>
<td>–</td>
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<td>pract. mark</td>
<td>Anatomy, Cell, Histology and Embryology III.</td>
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<tr>
<td>AOVANT457_2A</td>
<td>Developmental Biology II.</td>
<td>2</td>
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<td>Developmental Biology I.</td>
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<tr>
<td>AOVKIK102_1A</td>
<td>Clinical cardiovascular physiology</td>
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<tr>
<td>AOVINF244_1A</td>
<td>Introduction to Medical Informatics</td>
<td>–</td>
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<tr>
<td>AOVKPK088_1A</td>
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<td>–</td>
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<tr>
<td>AOVDEM156H1A</td>
<td>Teaching assistance (Demonstrator)</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
<td>Only 2nd 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</td>
</tr>
<tr>
<td>AOVDEM215H1A</td>
<td>Teaching assistance II. (Demonstrator)*</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
<td>–</td>
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<tr>
<td>AOVTDK158H1A</td>
<td>Work within the union of research students (TDK munka)</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>pract. mark</td>
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*2nd TDK research and/or demonstrator activity*
### ELECTIVE SUBJECTS

#### 1st semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>AOSMAG392_1A</td>
<td>Art of Learning</td>
<td>2</td>
<td>–</td>
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<td>pract. mark</td>
<td>–</td>
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<tr>
<td>AOSMAG318_1A</td>
<td>Social media in medicine</td>
<td>2</td>
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<td>AOSMAG505_1A</td>
<td>The theory and the practice of Mindfulness Based Stress Reduction</td>
<td>2</td>
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<td>Traditional Chinese Medicine</td>
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<td>AOSMAG507_2A</td>
<td>Highlights on Mental Health and Mental Treatment (Culture in Medicine II.)</td>
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<td>AOSMAG336_1A</td>
<td>Culture in Medicine, Culture of Medicine</td>
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<td>AOVGEN083_1A</td>
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<td>Medical Genomics</td>
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<td>Medical Biochem., Molecular and Cell Biology I, II, III</td>
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<td>Subject Code</td>
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<td>pract. mark</td>
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<td>AOSLEK340_1A</td>
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<td>AOSGRI374_1A</td>
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<td>Social media in medicine</td>
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<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>–</td>
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<tr>
<td>AOSMMS174_1A</td>
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<td>2</td>
<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>basic module</td>
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<tr>
<td>AOSMAG336_1A</td>
<td>Culture in Medicine, Culture of Medicine</td>
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<td>pract. mark</td>
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<td>Problem based medical physiology</td>
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<tr>
<td>AOVKIK102_1A</td>
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<td>–</td>
<td>2</td>
<td>pract. mark</td>
<td>Medical Physiology II.</td>
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<tr>
<td>AOSNEI246_1A</td>
<td>History of Medical Professionalism</td>
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<td>AOSGEN142_1A</td>
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<tr>
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<td>–</td>
<td>2</td>
<td>pract. mark</td>
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<td>AOSGEN176_1A</td>
<td>Chemotaxis – Its significance in biology and clinical sciences</td>
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<td>pract. mark</td>
<td>Medical Chemistry</td>
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<tr>
<td>AOSFRM394_1A</td>
<td>Introduction to Pharmacological Research</td>
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<td>pract. mark</td>
<td>Medical Biochemistry, Molecular and Cell Biology I.</td>
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<tr>
<td>AOSANT494_1A</td>
<td>Systems Neuroscience</td>
<td>–</td>
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### STUDY PROGRAMME

#### Fourth Year

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>AOKFRM034_1A</td>
<td>Pharmacology and Pharmacotherapy I.</td>
<td>2.5</td>
<td>2.5</td>
<td>5</td>
<td>semi-final</td>
<td>Medical Physiology II. Medical Biochemistry and Molecular Cell Biology III. Pathophysiology and Clin. Lab. Diagn. II.</td>
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<tr>
<td>AOKNEI335_1A</td>
<td>Public Health and Preventive Medicine I.</td>
<td>1</td>
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<td>Pathology II., Pathophysiology and Clin. Lab. Diagn. II.</td>
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<tr>
<td>AOKBL3029_2A²</td>
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<td>1.5</td>
<td>3</td>
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<td>Immunology Pathophysiology and Clin. Lab. Diagn. II.</td>
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<td>AOKSB1343_1A</td>
<td>Surgery I.</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<td>Pathology II., Basic Surgical Techniques Pathophysiology and Clin. Lab. Diagn. II.</td>
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<tr>
<td>AOKKAR292_3A</td>
<td>Internal Medicine III. - Cardiology</td>
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<td>semi-final</td>
<td>Internal Medicine II. * Medical Microbiology II. Pharmacology and Pharmacotherapy I. *</td>
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<tr>
<td>AOKFUL042_1A</td>
<td>Otorhinolaryngology (either)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final #</td>
<td>Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques, Surgery I. *</td>
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<tr>
<td>AOKBOR043_1A</td>
<td>Dermatology (or)</td>
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<td>semi-final #</td>
<td>Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I. Pharmacology and Pharmacotherapy I. *</td>
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<tr>
<td>AOKPUL047_1A</td>
<td>Pulmonology (either in the 1st or in the 2nd semester)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>Pathology II. Internal medicine - propedeutics</td>
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<td>AOKPSI050_1A</td>
<td>Psychotherapy in medical practice</td>
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<td>1</td>
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<td>Medical Psychology Medical Communication Internal medicine - propedeutics</td>
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<td>0</td>
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<td>semi-final #</td>
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<tr>
<td>AOKRAD049_1A</td>
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<td>4</td>
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<td>Medical Imaging Anatomy, Cell, Histology and Embryology IV. Pathology II.</td>
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<tr>
<td>AOKHKT026_3A</td>
<td>The Medical Fundamentals of Disaster Resolution III.</td>
<td>1x2 /semester</td>
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<td>criteria requirement</td>
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</table>

Total Number of Credit Points from Compulsory Subjects 37, 34, 33, 31 or 30

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

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>AOKFRM034_2A</td>
<td>Pharmacology and Pharmacotherapy II.</td>
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<td>2.5</td>
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<td>Pharmacology and Pharmacotherapy I. Medical Microbiology II. Internal medicine - propedeutics</td>
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<tr>
<td>AOKNEI335_2A</td>
<td>Public Health and Preventive Medicine II.</td>
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<td>Public Health and Preventive Medicine I.</td>
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<tr>
<td>AOKSB1343_2A</td>
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<td>4</td>
<td>semi-final</td>
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<td>AOKORT048_1A</td>
<td>Orthopaedics</td>
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<td>2</td>
<td>3</td>
<td>semi-final #</td>
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<tr>
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<td>Otorhinolaryngology (either)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final #</td>
<td>Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques Surgery I. *</td>
</tr>
<tr>
<td>AOKBOR043_1A</td>
<td>Dermatology (or)</td>
<td>1.5</td>
<td>2.5</td>
<td>4</td>
<td>semi-final #</td>
<td>Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I. Pharmacology and Pharmacotherapy I. *</td>
</tr>
<tr>
<td>AOKPUL047_1A</td>
<td>Pulmonology (either in the 1st or in the 2nd semester)</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>AOKNSG333_1A</td>
<td>Summer surgery practice</td>
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<td>1 month/170 hours</td>
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**Total Number of Credit Points from Compulsory Subjects** 30, 27, 26, 24 or 23

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 1st Department of Internal Medicine  
2 2nd Department of Internal Medicine  
3 3rd 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!)


Recommended textbooks:

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
8. Davis-Christopher: Textbook of Surgery / Synopsys for students (Sabiston)
11. full-text online access: http://gateway.ut.ovid.com/gw1/ovidweb.cgi?New+Database=Single|0&S=IDNJHKIDNGILPL00
12. Shimizu’s Textbook of Dermatology – accessible online also
19 Dermatology Editor: Otto Braun-Falco, Gerd Plewig, Helmut H. Wolff, Walter Burgdorf Publisher: Springer Verlag; 3rd edition (November 2009)
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, 2017/2018, first semester):**


2. *Pharmacokinetics* (drug absorption, distribution, elimination). *Clinical pharmacokinetic principles*  
   *Drug interactions*


4. *Introduction to the Neurotransmission* (central and autonomic system). *General Anesthetics*

5. *Pharmacology of Cholinergic Transmission. Skeletal Muscle Relaxants. Local Anesthetics*


8. *Sedative-hypnotic and Anxiolytic Drugs*

9. *Antidepressants and Mood-stabilizing Agents. Antiseizure Drugs*


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*


**Topic of Pharmacology and Pharmacotherapy II (Year 4, 2017/2018, second semester):**

1. *Drugs Used in Coagulation Disorders. Agents Used in Cardiac Arrhythmias*

2. *Drugs Used in Angina Pectoris. Antihyperlipidemic Agents. Diuretics and antiuretics*

3. *Drugs Used in Heart Failure. Antihypertensive Agents*


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.

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence the student can attend another class the same week.

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:
2 Materials discussed during lectures and seminars.
PUBLIC HEALTH AND PREVENTIVE MEDICINE I.

Institute: Department of Public Health
Location: NET building, 1089 Budapest, Nagyvárad 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 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 your 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
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 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.

1st Dept. of Internal Medicine Tutor: Dr. Péter Studinger
2nd Dept. of Internal Medicine Tutor: Dr. Krisztina Hagymási
3rd Dept. of Internal Medicine Tutor: Dr. Katalin Keltai

In 2017/18 Internal Medicine II. is taught by the 3rd 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.


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. High blood pressure and the heart
3. Ischaemic heart disease I.
   atheroslerosis
   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
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://cvc-oktatas.blogspot.com//
SURGERY I.

I. Department of Surgery
II. Department of Surgery
Department of Transplantation and Surgery

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

First Semester

Lectures (2 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. Anaerob 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 technics, sutures etc.
Bleeding and blood clotting. Technics 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 technics. Sutures, knots, clips, etc. -
Laparoscopic technics.
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 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 cholelithiasys and biliary surgery
Pancreas I. - Acut pancreatitis
Pancreas II. (Chr. 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.

Practice (2 hours per week)
Clinical examinations.

Lecture (1 hour per week)

Diagnostical methods of the ear.
Evaluation of different types of perforations of the tympanic membrane. Cadaver bone practice.
Routine audiology. Uning fork practice.

Physiology and lesions of the vestibular system. ENG. CCPG.
Evaluation of different otological cases.

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.
Dyspnoe 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. Middle and lateral neck masses.

Practice (2 hours per week)

Operating theatre. Video.
Examination of the vestibular system. Programming.
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.

Direct and Indirect of the voice. Laryngoscopy. Videostroboscopy.
Emergency management of suffocation.


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
Dento-maxillofacial radiology
Computer tomography (CT) in the maxillofacial surgery
Pediatric dentistry and orthodontics
Cariology and endodontics
Consultation

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester. Final examination.
DERMATOLOGY

Department of Dermatology-Venerology and Dermatooncology
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:
The goal of the training:
- a. Knowledge of diagnostics, ethiopathogenesis and treatment of skin diseases concerning the competency of general practitioners.
- b. 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, autoimmun 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 antytripsin 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.
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.
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
Palliative operation.
Diseases of the knee. Recurrent dislocation of the patella.
Osteochondritis of the tibial tubercle (Osgood-Schlatter disease). Osteochondrosis
Chondromalacia of the patella. Meniscus lesions.
necrosis of the bones of the foot. Osteoarthritis of the joints of the foot. Flatfoot.
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
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)

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)

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)

Second 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:**

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<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>0 - 60%</td>
<td>1 (Failed)</td>
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<td>61 - 70%</td>
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<td>91 - 100%</td>
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Exam dates: You will be notified about the dates offered by the Department before the exam period and they will be finalized at the Staff-Student meeting.

Taking examination before the exam period is not allowed.

The sign up procedure is controlled and regulated by the NEPTUN software and the Department cannot interfere with system. The officially signed up student will be scheduled for examination. The list of examinees is completed 2 days before the date of exam; then NEPTUN system automatically closes the sign up list.

**Diagnostic profile of the Department**
The Central Laboratory at Semmelweis University forms the basis of the Department. It performs more than 400 different tests in the field of clinical chemistry, hematology, hemostasis, serology, endocrinology, therapeutic drug level monitoring and clinical microbiology with an annual number over 3 million. The laboratory is classified as FJ-3 meaning that it provides a 24 hour service for 7 days a week. Laboratory reports are provided through GLIMS lab informatics system integrated to eMedSolution.

**Research at the Department**
Laboratory tests are performed in the majority of clinical studies and drug research. In order to use the results more efficiently the colleague who is directly involved in performing the lab tests also participates in study design and evaluation. Therefore, clinical laboratories at the University are active partners of researchers and medical doctors. The major research profile of the Institute is to characterize specific patterns of biomarkers predictive for specific disorders. Characteristic examples are the determination of immune phenotype and analysis of kinetic alteration of intracellular analytes with flow cytometry, measurement of cytokine levels with biochips, genomic analyses (genotyping and gene expression arrays). These instruments and the professional knowledge are also available for research purposes. Medical students are welcome to do research in any of the fields listed above.

**Useful and update information about the Institute and the subject of Laboratory Medicine can be found at home page:** Semmelweis.hu/laboratorium
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;
e-mail: kovacs.jozsef@med.semmelweis-univ.hu

Department:
Institute of Behavioral Sciences
Department of Bioethics
NET Builiding, 19th, 20th floor
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
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

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:

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.


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, nasogastical 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.
Participation 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 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, panaritium. 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.
CLINICAL MODULE

Faculty of Medicine
5th year
## STUDY PROGRAMME

### Fifth Year

#### 9th semester

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKBL3029_4A³</td>
<td>Internal Medicine IV.</td>
<td>1,5</td>
<td>3</td>
<td>4</td>
<td>semi-final</td>
<td>Internal Medicine I., Internal Medicine III. - Cardiology, Pharmacology and Pharmacotherapy II.</td>
</tr>
<tr>
<td>AOKBL1027_4A⁴</td>
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<tr>
<td>AOKSB1343_3A</td>
<td>Surgery III.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>semi-final</td>
<td>Surgery II.</td>
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<tr>
<td>AOKNO1480_1A</td>
<td>Obstetrics and Gynaecology I.</td>
<td>2</td>
<td>1 week/sem</td>
<td>4</td>
<td>pract. mark</td>
<td>Pathology II., Pathophysiology and Clinical Lab. Diagnostics II., Surgery II.</td>
</tr>
<tr>
<td>AOKGY1054_1A¹</td>
<td>Pediatrics I.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>pract. mark</td>
<td>Pharmacology and Pharmacotherapy II. Internal Medicine III. - Cardiology</td>
</tr>
<tr>
<td>AOKGY2055_1A²</td>
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<tr>
<td>AOKPSI057_1A</td>
<td>Psychiatry I.</td>
<td>1,5</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>Pharmacology and Pharmacotherapy II. Neurology I. *</td>
</tr>
<tr>
<td>AOKNEU056_1A</td>
<td>Neurology I.</td>
<td>2</td>
<td>1,5</td>
<td>3</td>
<td>pract. mark</td>
<td>Anatomy, Histology and Embriology IV. Pathology II. Internal Medicine III. - Cardiology</td>
</tr>
<tr>
<td>AOKIGS399_1A</td>
<td>Forensic Medicine I.</td>
<td>1</td>
<td>1,5</td>
<td>2</td>
<td>semi-final</td>
<td>Anatomy H. E. IV., Genetics and Genomics, Pathology II.</td>
</tr>
<tr>
<td>AOKANE427_1A</td>
<td>Intensive Therapy and Anaesthesiology</td>
<td>1,5</td>
<td>1,3</td>
<td>2</td>
<td>semi-final</td>
<td>Surgery II., Pharmacology and Pharmacotherapy II., Internal Medicine III. (Cardiology)</td>
</tr>
<tr>
<td>AOKURO060_1A</td>
<td>Urology</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>Surgery II. Radiology</td>
</tr>
</tbody>
</table>

| **Total Number of Credit Points** | **28** |

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1 1st Department of Pediatrics  
2 2nd Department of Pediatrics  
3 3rd Department of Internal Medicine  
4 1st and 2nd Department of Internal Medicine
**Fifth Year**

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Compulsory Subjects</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOKBL3029_5A³</td>
<td>Internal Medicine V.</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>semi-final</td>
<td>Internal Medicine IV. Neurology II. * Forensic Medicine II. *</td>
</tr>
<tr>
<td>AOKBL1027_5A⁴</td>
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<tr>
<td>AOKNO1480_2A</td>
<td>Obstetrics and Gynaecology II.</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>semi-final</td>
<td>Obstetrics and Gynaecology I.</td>
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<tr>
<td>AOKGY1054_2A¹</td>
<td>Pediatrics II.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>semi-final</td>
<td>Pediatrics I.</td>
</tr>
<tr>
<td>AOKGY2055_2A²</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOKPSI057_2A</td>
<td>Psychiatry II.</td>
<td>1,5</td>
<td>2</td>
<td>4</td>
<td>pract. mark</td>
<td>Psychiatry I.</td>
</tr>
<tr>
<td>AOKNEU056_2A</td>
<td>Neurology II.</td>
<td>2</td>
<td>1,5</td>
<td>4</td>
<td>semi-final</td>
<td>Neurology I.</td>
</tr>
<tr>
<td>AOKGIS399_2A</td>
<td>Forensic Medicine II.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>semi-final#</td>
<td>Forensic Medicine I.</td>
</tr>
<tr>
<td>AOKANE426_1A</td>
<td>Oxyology – Emergency Medicine</td>
<td>1,5</td>
<td>1,1</td>
<td>1</td>
<td>semi-final</td>
<td>Internal Medicine III. - Cardiology Surgery II.</td>
</tr>
<tr>
<td>AOKTRA063_1A</td>
<td>Traumatology</td>
<td>1,5</td>
<td>2</td>
<td>3</td>
<td>semi-final</td>
<td>Anatomy, Cell, Histology and Embriology IV., Radiology Surgery I.</td>
</tr>
<tr>
<td>AOKCSA061_1A</td>
<td>Family Medicine</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>semi-final</td>
<td>Internal Medicine III. – Cardiology Public Health and Preventive Medicine II.</td>
</tr>
<tr>
<td>AOKSZE065_1A</td>
<td>Ophthalmology</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>semi-final#</td>
<td>Anatomy, Cell, Histology and Embriology IV., Internal Medicine III. – Cardiology, Surgery II.</td>
</tr>
</tbody>
</table>

**Total Number of Credit Points**

| 32 |

* The prerequisite is that registration has been done for the marked subject – corequisite - as well
1 1st Department of Pediatrics
2 2nd Department of Pediatrics
3 3rd Department of Internal Medicine
4 1st and 2nd Department of Internal Medicine
# The grade influences the qualification of the Diploma
LIST OF TEXTBOOKS (The list may change!)

2. Lecture Notes of Forensic Medicine Ed. by Péter Sótonyi, Éva Keller, Semmelweis Publisher, 2008.
13. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

Recommended textbooks:

4. Silver, Kempe Bryn and Fulginiti’s Handbook of Pediatrics. Appleton and Lange. ISSN 0440-192
10. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
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 2017/2018 academic year.

INTERNAL MEDICINE IV.

1st Dept. of Internal Medicine Tutor: Dr. Péter Studinger
2nd Dept. of Internal Medicine Tutor: Dr. Krisztina Hagymási
3rd Dept. of Internal Medicine Tutor: Dr. Katalin Keltai

In 2017/18 Internal Medicine IV. and V. are taught by the 1st and 2nd Department!

First Semester

Course: Internal Medicine
Type: compulsory
Total weeks: lecture 14, seminar 0, practical 14
Hours per week: lecture 1, + 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.

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, + block system practical
Form of tuition: lecture, bedside practice
Mode of assessment: theoretical exam (semi-final)


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

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.
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. Polycistic 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.
PLEDIASTRICS I.
1st Dept. Tutor: Dr. Dóra Krikovszky
2nd Dept. Tutor: Dr. Péter Hauser

LECTURES IN PAEDIATRICS FOR 5th GRADE MEDICAL STUDENTS

First Semester

Location: II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

**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
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. I. floor
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: II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

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. I. floor
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 Paediatrics – 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, institu-
 tionally 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.
ANAESTHESIOLOGY AND INTENSIVE THERAPY

Tutor: Dr. András Kállai
       Dr. Ádám Gyöngyösi

First Semester

Lectures and Practice

Short history of Anesthesiology
The pharmacology of Anesthesiology
a) Intravenous anesthetics
b) Volatile anesthetic agents
c) Opioid and other analgetics
d) Muscle relaxant drugs
e) Local anesthetics
f) Other drugs of importance for Anesthesia

Anesthetic instruments
a) The anesthetic machine
b) Anesthetic systems
c) Checking of the anesthetic systems and the common faults
d) Instruments of monitoring

Preoperative assessments
a) Functional loading of the operation
b) Preoperative examination, investigations
c) Estimation of the functional reserve of the patient
d) The anesthetic significance of the coexisting diseases
   - cardiac diseases
   - vascular diseases (including hypertension)
   - pulmonary diseases
   - neurological diseases (including head injury)
   - hepatic diseases
   - renal diseases
   - hematologic diseases
   - endocrine diseases
   - disorders of the fluid, ionic and acid/base balance
   - malignancies
   - infections
   - the polytraumatized patients
   - other conditions:
     ...advanced age
     ...neonates, infants
     ...pregnancy
     ...morbid obesity
     ...rare diseases
e) Preoperative therapy
f) Premedication
g) Choice of the method of Anesthesia
**Lectures and Practice**

The practical conduct of general Anesthesia  
- Preparation  
- Induction of Anesthesia  
- Maintenance of the patient airway  
- Intraoperative fluid management  
- Maintenance of the Anesthesia  
- Termination of the Anesthesia, recovery  
- Anesthetic complications

Regional anesthetic techniques

Pain relief  
- Acute pain (including postoperative pain)  
- Chronic pain

Postoperative complications

**Emergency and critical care**

Primary and advanced cardiopulmonary life support  
Techniques and procedures of critical care  
- Techniques of airway maintenance  
- Techniques of intravenous access  
- Evaluation of the fluid, ionic and acid/base balance  
- Principles of fluid management  
- Transfusion, blood products  
- Principles of enteral and parenteral nutrition

**Lectures and Practice**

- Equipment and techniques of ventilatory therapy  
- Techniques of support and replacement of renal function  
- Critical care monitoring  
- Invasive techniques of critical care  
- Special pharmacology of critical care  
  - inotropic drugs  
  - use of antibiotics  
  - anticoagulation  
  - steroid treatment  
  - other drugs

**Lectures and Practice**

Diseases requiring intensive therapy  
- Respiratory failure  
  - acute (including ARDS and asthmatic attack)  
  - chronic  
- Cardiovascular diseases  
  - acute myocardial infarction  
  - severe dysrhythmias  
  - heart failure
thrombotic and embolic diseases
aneurysms
c) Shock states
hypovolaemic shock
cardiogenic shock
septic and toxic shock states
anaphylactic reactions
d) Acute renal failure
e) Acute hepatic failure
f) Severe hematologic disorders (including DIC)
g) Gastrointestinal diseases leading to critical conditions
(incl. pancreatitis)
h) Critical states of endocrinopathies
i) Neuromuscular diseases requiring intensive therapy
(incl. head injuries)
j) Severe infections (including peritonitis, AIDS), Sepsis
k) Toxicology
l) Critical care of the traumatic patient
m) Burns, Hypothermic injuries
n) Problems related to obstetrics  Resuscitation of the newborn
o) Multiple organ failure

Lectures and Practice

Special topics of critical care
a) Policies of admissions and refusals of the ICUs
b) Prognostic score systems
c) Ethical and legal issues of critical care
d) Complications and risks of the intensive therapy
e) Policies of sedations and pain management)
f) Military and civil disasters
g) Transport of the critically ill patient
TRAUMATOLOGY

Department of Traumatology
Head of Department: Prof. Dr. László Hangody
Tutor: Dr. Ágnes Berta

Type of subject: Mandatory
credit points: 4

First Semester

Lectures (1.5 hours per week) Practice (2 hours per week)

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, thoracal, abdominal, spinal and pelvic injuries as well as the treatment of polytraumatized patients also belong to the field of trauma care.

Syllabus (weekly schedule):

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. Pelvic and lower extremity injuries
6. Conservative fracture treatment methods
7. Identification and treatment of complications
8. Legal and medical insurance aspects of health care
9. 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 (thoracal, abdominal, pelvic)
7. Polytrauma
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, casting techniques, and the uses of orthesises 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. If there is an interest in attending on duty shifts, students may discuss this and make an appointment with their teacher, where they will have an opportunity to perform basic surgical interventions under supervision.

Attendance criteria and absences:
Lecture attendance:
Recommended. Attendance will not be taken.
Practice attendance:
During the course of the semester, three absences are allowed. Any further absence must be repeated in the following manner: One on-duty shift per absence at our department. The student must attend at least 8 practices in order to be allowed to take the midterm exam.

Verification of absences from practices of from the exam:
We can only accept hospital discharge papers for verification of more than three absences from practices or the absence from the exam, proving the student was continuously hospitalized during that time period. The written exam at the end of the semester is mandatory; the unjustified absence from the exam entails a failing mark.

Mid-semestertest 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 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 8 practices during the semester. We also cannot verify the semester or allow the student to take the midterm examination if the student was absent from more than three practices which are unjustified or unrepeated by participating in one on-duty shift per absence.

Grading:
1. Written (multiple choice test), only one date is ensured for this exam. The unjustified absence from the exam entails a failing mark.
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 2 time periods per week for the repeated oral examination.

Type of exam: written (multiple choice test)
Make-up exam: oral

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. The written exam at the end of the semester is mandatory; the unjustified absence from the exam entails a failing mark.

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

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 cristalline 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.
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.
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 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, slide presentation, patient and/or case presentation. 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:
3. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

Other suggested books:
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers

First Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture title</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Basic principles of neurological diagnosis. The anamnesis. The connection between symptoms, localization and causes of neurological diseases.</td>
</tr>
<tr>
<td>2.</td>
<td>Patient examination I. Cranial Nerves (part 1).</td>
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<tr>
<td>3.</td>
<td>Patient examination III. Motor system (part 1)</td>
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<tr>
<td>4.</td>
<td>Patient examination IV. Motor system (part 2)</td>
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<tr>
<td>5.</td>
<td>Patient examination II. Cranial Nerves (part 2)</td>
</tr>
<tr>
<td>6.</td>
<td>Patient examination V. The sensory system</td>
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<tr>
<td>7.</td>
<td>The cortex</td>
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<td>8.</td>
<td>The spinal cord. The peripheral nervous system.</td>
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<td>10.</td>
<td>The cerebellum</td>
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<td>12.</td>
<td>Inflammatory disorders, AIDS.</td>
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<td>13.</td>
<td>Tumors of the nervous system</td>
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<tr>
<td>14.</td>
<td>Neuroradiology (CT, MRI, angiography)</td>
</tr>
</tbody>
</table>
Week Practice
1. Basic principles of neurological diagnosis. The anamnesis. The connection between symptoms, localization and causes of neurological diseases.
2. Assessment of the paresis. Examination of muscle tone and trophy.
3. The mono- and polysynaptic reflexes. The pyramidal signs. The upper and lower motoneuron lesion.
5. Examination of the I. and II. Cranial nerve. The visual fields.
7. The V cranial nerve.
8. The facial nerve palsy.
10. Examination of the sensory system.
11. The coordination. The cerebellar functions (neo-, paleo-, and archicerebellum).
12. Examination of the spine and spinal cord. The vegetative functions. Signs of meningeal irritation.
13. The brainstem syndromes. The reticular activating system.
14. Practical exam

Second Semester

Week Lecture title
1. Headache
2. Aphasia
3. Cerebrovascular diseases (part 1)
4. Cerebrovascular diseases (part 2)
5. Epilepsy
6. Multiple sclerosis
7. Movement disorders (part 1)
8. Movement disorders (part 2)
9. Aneurysm, subarachnoideal bleeding and vascular malformations
10. Dementia
11. Neuromuscular diseases. Encephalopaties
12. Genetic abnormalities in neurologic disorders
13. Written semifinal exam

Week Practice
1. Diagnostic procedures I.: EEG, evoked potentials, EMG, Doppler, CSF
2. Diagnostic procedures II.: Neuroradiology, X-ray, CT, MRI, etc.
4. Hyperkinesia and dystonia.
7. Memory dysfunction, dementia.
8. The cognitive functions
10. Examination of muscle disorders.
11. Examination of polyneuropathies.
13. Practical exam
14. Consultation, questions and answers.
Neurology Examination Question List for Vth 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
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.
### EMERGENCY MEDICINE – OXIOLOGY

Dept. of Anesthesiology and Intensive Therapy  
Division of Emergency Medicine and Oxyology  
Tutor: Dr. Peter Vass

#### Second Semester

**Compulsory subject: Emergency Medicine and Oxylogy (EMO) – program and topics**

<table>
<thead>
<tr>
<th>1 credit</th>
<th>Lectures</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pain syndromes. As long as it hurts you know that you are alive.</td>
<td>Headache, chest and abdominal pain, backpain. The basics of pain management.</td>
</tr>
<tr>
<td></td>
<td>Environmental accidents.</td>
<td>Electrocuton, drowning, near-drowning, heat exhaustion, heat stroke, hypothermia. What to do on the scene and in the ED.</td>
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<tr>
<td></td>
<td>Group of symptoms in emergency</td>
<td>Dyspnoe, vertigo, syncope, nausea and vomiting, diarrhoea, weakness. Allergic reactions.</td>
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<td></td>
<td>Prehospital emergency services as integral parts of emergency care.</td>
<td>First aid, primary emergency systems, levels of rescue, connection of ambulance with hospital care.</td>
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<tr>
<td>Lectures</td>
<td>Remarks</td>
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<tr>
<td>Perfuse it or lose it.</td>
<td>Things you’ve missed from pathophys but will surprise you in acute situations.</td>
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<tr>
<td>Emergency cardiac care. From the sliding door to the PCI.</td>
<td>Syncope, heart failure, ACS.</td>
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<tr>
<td>Acute neurological deficit. Time is brain.</td>
<td>Stroke, altered mental states, convulsions.</td>
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<tr>
<td>Paediatric emergencies. The same but downsized?</td>
<td>The most requent emergency situations in kids. Special view of paediatric emergency care.</td>
<td></td>
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<tr>
<td>The severely injured patient. The future: Die Hard 6.</td>
<td>Trauma, burns, compartment syndromes.Integration, teamwork, damage control.</td>
<td></td>
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<tr>
<td>Massive bleeding. The dynamic approach of coagulopathies.</td>
<td>How to deal with bleeding patients?</td>
<td></td>
</tr>
<tr>
<td>Toxicology. Alle Ding sind Gift-any stuff is a poison. Two steps above earth.</td>
<td>Toxidromes. Aspecific and specific care. Substances of abuse.</td>
<td></td>
</tr>
<tr>
<td>Fever, infections, sepsis. &quot;Blood poisoning&quot; in the 20th century.</td>
<td>Severe heat imbalance, the emergency aspects of sepsis.</td>
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</tbody>
</table>

**Types of practices in Emergency Medicine - Oxylogy:**


**PBL-SBAR: Problem Based Learning SBAR communication practice (2x45 min)** Acquaintance and practice of SBAR-communication method in emergency situations. Kommunikation with patient and relatives in critical situations and during end of life care procedure. Communication practice between dispatch and HCP on the scene.

**PBL-PoCT: Problem Based Learning Point-of-Care-Technology practice (2x45 min)** Acquaintance of the Point of Care Technologies (types of tools and techniques, indication and importance in emergency care)

**PBL-Triage: Problem Based Learning – Triage practice (2x45 min)** Patient classification (time window, micro- and macroallocation). Hospital and prehospital triage systems. CTAS. Situation based practice with the use of CTAS (Canadian Triage Acuity Scale)

**PBL-Team: Problem Based Learning – Team work (2x45 min)** During simulation act as team member and team leader. Presentation and practice during simulations of non-technical skills to make teamwork better. Teammember non-technical skills presentation and practice during simulations.

**6 hour ER rotation: 6 hour rotation at an Emergency Unit Practices (6x45 min shift „on call duty”)** 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. Planing and management of diagnostic for emergency patient. PoCT. Planing of treatment of emergency patient Kommunikation 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 infections diseases and antimicrobial treatment.
The first two lessons discuss the specific features of antimicrobial therapy, the basic principles of em-
piric treatment and the pharmacokinetic/pharmacodynamic concept that substantiates the application of antimicrobials in term 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:

4. Material of the lectures online availability

Lectures

Basic principles of antimicrobial therapy. Microbiological diagnosis, as the basis of antimicrobial therapy. The concept of “drug of choice”
Diagnosis of infectious diseases: clinical relevance of the various diagnostic tests
Optimisation of antimicrobial therapy. The pk/pd approach, correlation of dosage and clinical efficacy.
Infectious diseases with exanthemas
Upper respiratory tract infections (common cold, acute and chronic rhinosinusitis, acute otitis, tonsillopharyngitis). Epidemiology, the influence of age. Theoretical considerations and practice.
Community acquired pneumonia. Epidemiology, the difficulties of etiological diagnosis. The impact of emerging bacterial resistance on the clinical efficacy of antibiotics. The modern approach and practice based on it
Intraabdominal infections (primary and secondary peritonitis, cholecystitis). Urinary tract infections.
Central nervous system infections. Meningitis, etiological diagnosis, antimicrobial treatment.
Tropical diseases. HIV and AIDS.

Important note: Attendance at 70% of the lectures is compulsory. The end semester grade is the result of the multiple choice test.

Recommended textbooks:

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.
7. Electrochemistry. Oxidation and reduction, redox systems in the living cells.
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 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. Lívia Vasas PhD. – Central Library  
Institute: Semmelweis University Central Library, 1088 Budapest, Mikszáth Kálmán tér 5, 1st floor  
Duration: One semester, 30×45 minutes (10×3 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 Scientoemtry (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
   - 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
   - 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
Alpha fetoprotein (AFP)
Genetic amniocentesis
Pathology of multiple pregnancy
Genetic counseling
General aspects of decision making regarding the fate of pregnancy
Elements of phenotype analysis
Embryopathology and fetal pathology
Sphingolipidoses
Mucopolysaccharidoses and 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 (Martin-Bell syndrome)
Disturbances of sex differentiation.
Intrauterine bacterial infections. Congenital rubella syndrome. Further viral and chlamydial infections. Congenital toxoplasmosis
Prenatal screening for fetal malformations and trisomies
ANAESTHESIA AND INTENSIVE THERAPY

Dept. of Anesthesiology and Intensive Therapy

First Semester

Lectures

Molecular aspects of anaesthesia
Sleep, depth of anaesthesia and awareness
Monitoring in anaesthesia and intensive therapy
Safety in anaesthesia and intensive therapy
Significance of coexisting diseases for anaesthesia
Applied physiology of respiratory therapy
The principles of the respiratory therapy
Haematology in anaesthesia and intensive therapy
Day-case anaesthesia. Anaesthesia of patients suffering from IHD
The policy of antibiotics
Multiple organ-systems failure
Endocrine and metabolic responses to surgery and anaesthesia
Interventional bronchoscopy
Acute and chronic pain
Moral and legal problems in anaesthesia and intensive therapy

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.
Respiratory Disorders of Newborns.
Ventilation of the Neonate.
Cardiac Diseases of Newborns.
Surgical Diseases of Newborns.
Metabolic Problems of Newborns.
Paraphysiology of Body Fluids. Fluid and Electrolyte Management.
Neonatal Neurology.
Infections of the Newborns. Prevention and Treatment.
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:

- 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 infections.

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.
10. Dermatologic manifestations of hematological diseases and hematological symptoms of dermatologic diseases.
11. Immunocytopenias.
14. Infectious complications of hematological diseases
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.
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


13. Consultation

Important: 3 absences are allowed. Doctor’s certificate is required to certify absence from the exam.

Exam requirement: written test

Textbook:
CLINICAL CARDIOVASCULAR PHYSIOLOGY

AOVKIK102_1M

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
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.
CARDIORESPRATORIC 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. Historical introduction. Measurements in medicine. Specialty in design of medical devices
2. General metrology. Basics of measurement techniques and control theory
3. Sampling of continuous signals. Digitizing analogue signals
4. Computer acquisition and analysis of physiological data. Cardiovascular telemetry
5. Invasive and noninvasive blood pressure measurements in the laboratory and clinics
6. Investigating the electrical activity of the heart. Principles of ECG amplifier design
7. Home monitoring of cardiovascular health status in humans
8. Investigation of adaptive processes in the cardiovascular system
9. Direct and indirect methods to determine cardiac output and peripheral blood flow
10. Experimental methods to study pulmonary function. Determination of blood gases, acid-base balance and blood glucose
11. Neurophysiological measurements (action potentials, brain stem evoked potentials)
12. Significance of objective studies in the practice of audiology
13. Studying brain function by functional imaging systems (CT, MRI, PET, PET-CT)
14. Experimental methods to study nociception and pain

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. From the cry of a newborn to the last breath: holistic approach to breathing and breathing difficulties
3. Invasive diagnostic methods
4. Chest imaging
5. Smoking, e-cigarettes, smoking cessation
6. Lung development, lung diseases in childhood
7. Precision medicine in lung cancer
8. Cystic fibrosis: orphan drugs and the price of a Porsche
9. Pokemon Go and real diseases in the virtual space of the lung
10. COPD: Number 3 killer for 2020- how to curb the figure
11. Something in the air: inhaled medications
12. Interventional pulmonology
13. Pulmonary circulation, pulmonary hypertension
14. COPD exacerbation

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.
MEDICINAL, EPIDEMIOLOGICAL, AND SOCIAL ASPECTS OF DRUG ABUSE

Department of Pharmacology and Pharmacotherapy
Course director: Prof. Dr. Susanna Fürst

Second semester

Credit: 2

Topics:


**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.

**Marijuana (hash, THC)** Pharmacological action of cannabinoids. Cannabinoid receptors and their endogenous ligands.


**Epidemiological data.** Significance of epidemiological data collection. Forms of questionnaires. Tendency of drug abuse, national (Hungarian) and international data. High risk groups.


**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 crystalline.** Role, task and potential of governmental and non-governmental crystalline 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.


**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
   Dr. Dani Vilmos
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 ETICS 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

Fred Rosner: Pioneers in Jewish Medical Ethics, Jason Aronson, New Jersey, 1997
Rabbi Moshe Tendler–Fred Rosner: Practical Medical Halachah, Association of Orthodox Jewish Scientists, New Jersey 1990

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

CLA\NICAL 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 the head and neck: molecular epidemiology, treatment and rehabilitation.
Cancer of the lung: molecular biology, NSCLC, SCLC.
Cancer of the 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.
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 Immsuppression
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.

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 Kõhidai

Credits: 2

Second Semester

Lectures (2 hours per week):

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Migratory responses of cells – General significance of chemotaxis in biology</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>2.</td>
<td>Phylogeny of signaling molecules and their receptors with special respect to chemotaxis</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>3.</td>
<td>Chemotaxis in invertebrates and vertebrates</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>4.</td>
<td>Chemotaxis in Inflammatory cells I.: Antigen presenting cell, monocytes-macrophages, eosinophils and neutrophils</td>
<td>Kohidai László, MD, PhD</td>
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<tr>
<td>5.</td>
<td>Chemotaxis in bacteria - A well studied signaling pathway</td>
<td>Kohidai László, MD, PhD</td>
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<tr>
<td>6.</td>
<td>Genetical backgrounds of bacterial chemotaxis</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>7.</td>
<td>Inflammation and chemotaxis</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>8.</td>
<td>Immunological aspects and their clinical implications in general</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>9.</td>
<td>Phagocytosis: the target reaction of chemotaxis</td>
<td>Szabó Rita, PhD</td>
</tr>
<tr>
<td>10.</td>
<td>Chemotactic ligands – Characterization of their genomics and proteomics</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>11.</td>
<td>Chemokines</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>12.</td>
<td>The optimal chemotactic ligand</td>
<td>Kohidai László, MD, PhD</td>
</tr>
<tr>
<td>13.</td>
<td>Clinical approaches – Tumor biology</td>
<td>Láng Orsolya, MD, PhD</td>
</tr>
<tr>
<td>14.</td>
<td>Does persist ‘Life’ without ‘Chemotaxis’?</td>
<td>Kohidai László, MD, PhD</td>
</tr>
</tbody>
</table>

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:

http://www.med20course.com
http://www.scienceroll.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
Recapitulation, feedback and evaluation.
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 prerequisition 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, refraining, 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.
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://scienceroll.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 int he 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 the them and how these knowledges can be used to get to know the pathomechanisms of these diseases and to reveal novel therapy and drug tagets. There are also lectures about pharmacogenomics and how our genes influences our responses to different environmental effects. As genomics belongs to sytems biology, a lecture introduces to basic terms of systems biology, and concentrating on diseases, some examples of the application and utilization of this scientific field are also be shown.

Planned lectures:
- Introduction to genomics, the human genom
- Multifactorial diseases
- Genomic methods
- Asthma, allergy
- Type 1 diabetes mellitus
- Type 2 diabetes mellitus
- Obesity
- High blood pressure
- Atherosclerosis
- Alzheimer and Parkinson diseases
- Gene-environmental interactions
- Pharmacogenomics
- Systems biology

Prerequisite subjects: Medical Biochemistry, Molecular and Cell Biology I, II and III.
**Systems Neuroscience**

*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  
4. Single neurons and beyond  
5. Neocortex: from structure to function  
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

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**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, Úllói út 26.
Phone: +(36-1) 486-4960 Fax: +(36-1) 486-4962 Bakó
Head of the Division: **Katalin Zöldi Kovács Ph.D.**
## OBLIGATORY ELECTIVE SUBJECTS

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>Lectures</th>
<th>Pricals</th>
<th>Credit Points</th>
<th>Examinations</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOVANE104_1A</td>
<td>Anesthesiology and Intensive Therapy</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>Pract mark</td>
<td>Surgery II.</td>
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<tr>
<td>AOVFRM252_1A</td>
<td>Medicinal, Epidemiological, and Social Aspects of Drug Abuse</td>
<td>2</td>
<td>2</td>
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<td>Pract mark</td>
<td>Pre-clinical module</td>
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<td>AOPRT108_2A</td>
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<td>2</td>
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<td>Pathology final</td>
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<td>AOVBL2112_1A</td>
<td>Clinical Endocrinology</td>
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<td>Clinical Hematology</td>
<td>2</td>
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<td>AOVBL2130_1A</td>
<td>Clinical Oncology</td>
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<td>Pre-clinical module</td>
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<tr>
<td>AOVGY1120_1A</td>
<td>Neonatology</td>
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<tr>
<td>AOVKIK102_1A</td>
<td>Clinical cardiology</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>Pract mark</td>
<td>Medical Physiology II.</td>
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## ELECTIVE SUBJECTS

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<th>Subject Code</th>
<th>Subject</th>
<th>Lectures</th>
<th>Practicals</th>
<th>Credit Points</th>
<th>Examination</th>
<th>Prerequisite</th>
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<tr>
<td>AOVSIF105_1A</td>
<td>Antibiotic therapy &amp; infectology</td>
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<td>pract. mark</td>
<td>Pre-clinical module Pharmacology and Pharmacotherapy II.</td>
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<td>AOSKIK151_1A</td>
<td>Cardiorespiratorical and neurophysical</td>
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<td></td>
<td>measuring techniques</td>
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<td>AOSMAG318_1A</td>
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<tr>
<td>AOVSB2129_1A</td>
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<tr>
<td>AOVGY1283_1A</td>
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<td>AOVIDS279_1A</td>
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<td>AOSMMS174_1A</td>
<td>Traditional Chinese Medicine</td>
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<tr>
<td>AOSGEN134_1A</td>
<td>Introduction to Epigenetics</td>
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<td>Immunology</td>
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<tr>
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<td>Clinical Hungarian</td>
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<td>Inflammation Biology</td>
<td>2</td>
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<td>Immunology, Molecular Cell Biology II.</td>
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<td>AOVEMK444_1A</td>
<td>Healthcare Management</td>
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<td>pract. mark</td>
<td>Internal Medicine I.</td>
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</table>
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: Prof. Dr. Miklós Szathmári
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
(In 2017/18 Internal Medicine belongs to the 3rd Department!)

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. Péter Kokas, 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. Ágnes Berta

Vascular surgery

Department of Vascular Surgery
Budapest, XII., Városmajor u. 68. Phone: (+36-1) 458-6700
Head of the Department: Dr. Péter Sótonyi 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., Tűzoltó u. 7-9. Phone: 215-1380 / ext. 52892
Head of the Department: Prof. Dr. András Szabó
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: Judit Schönborn Farkas

Transfusion Course
Department of Pathophysiology
1089 Budapest VIII., Nagyvárad tér 4.
Phone: 210-2940
Head of the Department: Prof. Dr. Attila Tordai
# STUDY PROGRAM

<table>
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<tr>
<th>Subject code</th>
<th>Internship</th>
<th>Required number of weeks</th>
<th>Credits</th>
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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

**Please note the followings:**

1. When **not at Semmelweis University** the two weeks Traumatology is to be completed at a surgical department providing **neurochirurgia** as well.
2. It is strongly required to keep the instructions of Article 24 of the Examination and Studies Regulations concerning the requirements of the **diploma work** focusing especially on the **deadlines**.
3. The **final exams** can be done only on the exam **dates** published by the clinical departments of Semmelweis University.

Please note: there are no individual requests and the rule should be kept **strictly**.
INTERNAL MEDICINE

To be present for at least 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Term</th>
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<tbody>
<tr>
<td>HO</td>
<td>house officer</td>
</tr>
<tr>
<td>SHO</td>
<td>senior house officer</td>
</tr>
<tr>
<td>PR</td>
<td>per rectum</td>
</tr>
<tr>
<td>NG</td>
<td>nasogastric</td>
</tr>
<tr>
<td>GA</td>
<td>general anesthetic</td>
</tr>
<tr>
<td>CVP</td>
<td>central venous pressure</td>
</tr>
<tr>
<td>ITU</td>
<td>intensive therapy unit</td>
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</table>

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

Type of subject: Mandatory
Code: AOKTRA075_SA
Credit points: 0
Time period: 2 weeks
The work hours of the practice are 30 hours/week and includes one 16 hour on-duty shift.
Head of Department: Prof. Dr. Hangody László

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, physiology, physics, general surgery, neurology, radiology, and the clinical subjects (ENT, ophthalmology, urology), as well as general and specific traumatology learned in the 5th year 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: 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-canulating
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 as well as one 16 hour on-duty shift.

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 16 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:

Type of exam:
Oral exam. One traumatolgy topic within the surgery exam.

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:

List of textbooks, notes, study-aids and references:
The Trauma Manual:
TRAUMA AND ACUTE CARE SURGERY. Third edition
Editors: Andrew B. Peitzman, Michael Rhodes, C. William Schwab, Donald M. Yealy, Timothy C. Fabian
Publisher: Wolters Kluwer / Lippincott Williams & Wilkins

VASCULAR SURGERY

Department of Vascular Surgery
Type of the subject: mandatory
Code: AOKSBE066_SA
Credits: 0
Interval of practice: 1 week
Time of practice: 30 hours a week.

SYLLABUS OF THE SUBJECT

I: Reception, assignment, and tutor appointment
The 6th grade students who registered themselves to the certain term, should appear on the first day of the practice (usually on Monday) at 8 am at the English course coordinator (Zsuzsanna Jaranyi M.D., associate professor). They can get information of the meeting point at the reception. From 8 am till 8:30 the students get their coats and their lockers. After this, they are assigned to their tutor. Our aim is the „one tutor-one student” principle, but this is not possible often, due to the numerous students at same time (4-5 students have 1 tutor). During the practice course it is the tutor’s task to introduce the whole range of the vascular surgical procedures to the students: like the morning ward round – physical examination of the patients – diagnostical steps of vascular diseases – treatment strategy – knowledge of operative techniques – early control, medical therapy, recognition and treatment of adverse events, long term prognosis of patients who underwent vascular surgical operations and the activities of the outpatient clinic.

II: Activities in wards
The student participates in the ward rounds with the tutor’s guidance, where he can get acquainted with the admitted patients’ history, the type of the previously performed operations, or even with the planned operative opportunities. The tutor involves the student in the features of the arterial and venous patient examination: like recording the patient history, listing the risk factors of the vascular diseases, palpation, auscultation, and examination with mini Doppler, performing special tests (Trendelenburg-, Perthes probe, postural-, capillary refill test), including or excluding cardiac co morbidities (ECG, ECHO, history findings), and finding other co morbidities, which affect with the surgical treatment.
III: Diagnostic possibilities of patients with vascular diseases
Students should spend at least one day in the angiography, carotid duplex scan, and CT/MRI laboratories, where they could get acquainted with the most common invasive and non-invasive diagnostic 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 certifies 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)
- Prenatal 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 nightduty (no sleep in). Students’ activity in the wards,
at the Outpatient Clinic and during duty, and also the case report is evaluated by the student’s tutor on an
assessment sheet. The assessment form and the case report must be presented at the final exam. During
the training period two days of absence are allowed.

Final examination
One can register for the exam only through the Neptun-system.
The final examination consists of:
1. practical part: neurological examination skills, decision making, tested at the bedside;
2. theoretical part: 3 theoretical questions.
   Examinations start at 10 a.m. Students must present their index book, assessment form, case
   report and in case of retake the permission from the Office of Dean.
   On event of failing the earliest possible retake is 10 days later.

Official textbooks:
1. Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients
3. Lindsay,Bone,Callender:Neurology and Neurosurgery Illustrated. Churchill Livingstone

Other suggested books:
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
6th year Medical Student Clinical Neurology Learning Objectives
Neurologic History and Examination

1. Perform a competent history, noting the following factors:
   A. Establish the onset, progression and character of the disorder identifying all related symptoms.
   B. Perform a standard neurologic review of symptoms with regard to personality, memory, headaches, pain, seizures, impairments of consciousness, vision, hearing, language function, swallowing, coordination, gait, weakness, sensory alterations, sphincter disturbance, and involuntary movements.

2. Perform a neurologic examination
   A. Perform a screening mental status examination to include: level of consciousness assessment, and aphasia assessment.
   B. Examine for meningismus, straight leg raising maneuver.
   C. Cranial nerve examination
   D. Motor examination including: tone, strength and bulk, pronator drift, abnormal movements.
   E. Perform a reflex examination (muscle stretch reflexes, superficial reflexes, pathologic reflexes)
   F. Coordination examination including finger-to-nose- test, heel-to-shin test, rapid alternating movements.
   G. Gait examination: stance and Romberg test, gait, tandem gait, ability to rise from sitting, toe walking and heel walking.
   H. Perform sensory examination including primary modalities (pain, temperature, position, vibration) and secondary/cortical modalities (stereognosis, graphesthesia, double simultaneous stimulation).

I. Acquire the following skills:
   A. Anatomic and physiologic basis of the neurologic examination.
   B. Competent history, physical and neurologic examination.
   C. Localize the lesion using the clinical database.
   D. Develop a differential diagnosis of the clinical problem.
   E. Assess the acuteness of neurological diseases, recognize neurological emergencies.
   F. Formulate a plan of investigation and management.

II. Describe the indications, techniques, results, contraindications and risks of the followings:
   A. Lumbar puncture (investigation of CSF)
   B. EEG, EMG, ENG, Transcranial magnetic stimulation
   C. CT, MRI, SPECT, PET
   D. Carotid and transcranial ultrasound

III. Disorders of motor function
   A. Differentiate between upper and lower motor neuron lesion (UMN, LMN).
   B. UMN facial weakness and LMN facial weakness.
   C. Disorders of coordination. Recognize symptoms of cerebellar disorders.
      Define ataxia, dysmetria, wide-based gait, and discuss the localization.
   D. Define and differentiate involuntary movement disorders: tremor, rigidity, spasticity, athetosis, chorea, dystonias, myoclonus, tics. Discuss the findings and treatment of: Parkinson’s disease, essential tremor, tardive dyskinesia, Huntington’s chorea, Wilson’s disease.

IV. Disorders of sensation
   A. Differentiate central sensory disorders from peripheral sensory disorders.
V. Disorders of vision
   A. Localize the lesions causing vision disorders and visual field defects.
   B. Differentiate papilledema from papillitis.
   C. The innervation deficit of the ocular muscles.
   D. Recognize gaze problems and nystagmus.
   E. Assess rystalli abnormalities.

VI. Episodic disorders
   A. Seizure disorders: generalized and partial seizures, distinguish seizure from syncope.
   B. Describe Todd’s postictal phenomenon.
   C. Evaluation of a patient for new-onset seizure.
   D. The anticonvulsants, their indications and side effects.
   E. Management of a patient in status epilepticus.
   F. Narcolepsy and obstructive sleep apnea.

VII. Cerebrovascular diseases
   A. Define the following: asymptomatic carotid bruit, TIA, amaurosis fugax, ischemic infarct, lacunar infarct, hemorrhagic infarct, parenchymal hemorrhage, SAH.
   B. The clinical features of various territorial infarcts.
   C. Treatment options to prevent infarction in atrial fibrillation and carotid stenosis.
   D. The clinical features for hypertensive parenchymal hemorrhage.
   E. The clinical picture and diagnosis of SAH. Early medical/surgical management of a patient with a SAH.

VIII. Multiple sclerosis (MS)
   A. The criteria for the clinical diagnosis of MS.
   B. The treatment of MS.

IX. Head trauma
   A. Define the temporal profile, symptoms and treatment of: commotion, concussion, anterograde and retrograde amnesia, subdural hematoma, epidural hematoma, contusion or hemorrhage, liquorrhea.

X. Dizziness and disorders of hearing
   A. Define vertigo, and contrast it with other type of dizziness.
   B. Describe nystagmus, hanging head test (Hallpike maneuver), calorics.
   C. Identify the clinical features of: benign paroxysmal positional vertigo, vestibular neuronitis, Meniere’s disease, brainstem TIA with vertigo, acoustic neuroma.

XI. Disorders of higher cognitive functions
   A. Define and assess: dementia, delirium, amnesia, confabulation, hallucination.
   B. Define normal-pressure hydrocephalus.
   C. Define the anatomical basis for aphasia and dysarthria.
   D. Differentiate the aphasias on the basis of ability to produce speech, comprehension, naming, repetition.

XII. Disorders of altered consciousness
   A. Define hypnoid and non-hypnoid unconsciousness.
   B. The anatomic basis of consciousness.
   C. Assess the comatose patient, evaluation and treatment.
   D. Localize the following: decorticate and decerebrate rigidity, conjugately deviated eyes, pathologic respiration, pinpoint pupils, anisocoria, intact versus absent oculocephalic response, intact versus disconjugate ice water calorics.
   E. Diagnosis and management of increased intracranial pressure (ICP).
   F. Symptoms of uncal and other herniations.
XIII. Headaches and facial pain
   A. Clinical features of migraine, cluster headache, tension headache, trigeminal neuralgia, “organic” headache.
   B. Treatment for common headaches.

XIV. Brain tumors
   A. Clinical presentation and diagnosis of primary brain tumors.
   B. Metastatic tumors to the brain in adults.

XV. Infections
   A. Bacterial meningitis, viral meningitis, encephalitis including herpes simplex, chronic meningitis, brain abscess. Neurosyphilis. Lyme disease.
   B. HIV and the nervous system.

XVI. Spinal cord disorders
   A. Neurological symptoms caused by compression, transsection 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, mononeurosis 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 aphasias
7. Classification of unconscious conditions
8. Examination of the unconscious patient
9. Unconsciousness due to metabolic origin
10. Neurological emergencies
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.
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.
5. Syndromes of pons and mesencephalon lesions
6. The muscle tone control
7. Neuroanatomical basis of sensory disturbances
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 scelrosis
6. Hystopathological classification of brain tumors
7. Metastatic tumors of the brain
8. Paraneoplasias of the nervous system (PML, neuropathies, cerebellar deg., Lambert-Eaton sy.)
9. Disorders associated with parkinsonian syndrome
10. Treatment of Parkinson's disease
11. Hyperkinetic movement disorders
12. Hyperkinesias
13. Classification of encephalopathies
14. Primary degenerative dementias
15. Multiple system atrophy
16. Disturbed cerebrospinal fluid circulation (hydrocephalus)
17. Syndrome of brachial plexus damage
18. Syndrome of radial, ulnar and median nerve damage
19. Syndrome of lumbosacral plexus damage
20. Etiology of polyneuropathies
21. Neuropathies in diabetes mellitus
22. Inherited neuropathies (Charcot-Marie, Dejerine-Sottas)
23. Low back pain, and cervical disk disease
24. Malformation of the spine and spinal cord
25. Symptoms of the disorder of spinal cord
26. Motoneuron diseases
27. Muscular dystrophies
28. Muscle disorders
29. Primary headache syndromes
30. The neuralgias
31. The physiological sleep and the sleep disorders
32. Genetic disorders in neurology (Huntington chorea, fragile X, dystrophia myotonica
PSYCHIATRY

Department of Psychiatry and Psychotherapy
Tutor: Dr. Erika Szily

Teaching Psychiatry for the sixth-year students at the Department of Psychiatry and Psychotherapy at Semmelweis University

The goals of the psychiatric practices (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 the sample that is available on the website of our Clinic. Before the oral exam they have to discuss this case report with the responsible tutor who will give a mark for it. Students are not allowed to take their final exam without a marked case report. We have a certificate form on our website containing all the details students must bring from the hospital where they have completed their rotation.

The link is: http://semmelweis.hu/pszichiatria/oktatas/the-english-version-can-be-found-here/

Objectives/target abilities:
- The ability how to obtain a complete and reliable history
- The method of asking about specific psychiatric symptoms or how to evaluate the information provided by the patients including:
  - orientation and attention
  - affect
  - thought disorder
  - memory
  - psycho-motor abilities
  - perception
  - motivation, intellect and personality
- The ability of noticing states of potential psychiatric emergency
- The ability to recognize specific symptoms that can refer to any hidden psychiatric problem which is not told by the patients
- The ability of summarizing all the gained information in a detailed case report
- The ability of establishing a tentative diagnosis and to know what kind of tests (either laboratory or psychological or neuro-radiological, etc) are needed for the correct diagnosis
- Being aware of the most important effects and side/adverse effects of drugs used in psychiatry
- To learn that the practitioner must always consider the possible existence of psychiatric disorders even when there are a lot of somatic symptoms, since they can also appear as a result of psychiatric diseases
We have 5 wards with different profiles in our Clinic. Students must join these wards according to their schedule made by our training coordinator. Everybody has a tutor within the ward he or she is scheduled to. The tutor presents the specific profile of that particular ward, but they also have the opportunity to go and see other wards, too. They spend a day at the out-patient department of our Clinic, which is very useful because there are many patient examinations referred from other departments of Semmelweis University. Thus, they can gain insight into the most important psychiatric features of internal medicine, neurology, surgery etc. Students must join for one all-night-duty and they have to participate in the emergency treatment performed during this period.

Under the supervision of an appointed physician students have to:
- Participate in the work of one unit;
- Evaluate patients independently;
- Write a detailed case history of one patient which has to be presented at the exam;
- Participate in consultations.

The internship in Psychiatry has to be completed at a Department of a University or in a Teaching Hospital which has a contract with a University. Students completing the internship abroad have to present a document of evaluation (i.e. Certificate downloadable from our website) indicating their performance during the internship and a grade from 5 (excellent) to 1 (failure).

Requirements
1. The 6th year includes a 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

2 weeks = 10 workdays; working together with a GP tutor in his office and accompanying him/her on house calls:

4 consulting hours/day
10 house calls/2 weeks

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, onor 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 immunglobulin 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 extracorporal 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 coagula-
   tion 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 Góbl

Syllabus

During the 2 weeks (60 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: 60 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 both terms, that is on November 26 and on January 3 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.
GENERAL INFORMATION

Deadline of paying the tuition fee in the 6th year: the first part is to be paid between September 4-8, 2017, the second part between January 29 – February 2, 2018.

Students who only complete the compulsory 2 weeks of Pediatrics and 1 week Transfusion course at Semmelweis University can ask for 20% reduction of their tuition fee under condition they hand in all the acceptance letters – that first have to be approved by the relevant Clinical Departments of Semmelweis University as well – latest until December 15, 2017. Please write a letter of request addressed to the Academic Program Director when applying for the reduction! The reduction will be made from the 2nd part of the tuition fee. (If the tuition fee is paid in one sum, the reduction will be made in September.) 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, 2018! For the August exam latest until July 15, 2018 and for the November exam latest until October 15, 2018!
– 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 loose or forget it abroad, etc.)
FACULTY OF DENTISTRY

Study Programs since the 2010/11 academic year
### Study program for students started studies in the 2010/11 academic year

#### BASIC MODULE

<table>
<thead>
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# 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

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**Total Credit 33**

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**Total Credit 32**
## CLINICAL MODULE

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#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

### 8th semester

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#The grade influences the qualification of the diploma.
15 credits should be gained from the elective subjects during th 5-year studies.
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*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry*
### CLINICAL MODULE

#### 10th semester

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<td>Prosthodontics IV.</td>
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**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**

<table>
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<td>C8L3P5</td>
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</tr>
<tr>
<td>compulsory</td>
<td>Physical Bases of Dental Materials</td>
<td>C2L2P0</td>
<td>semifinal</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical Chemistry</td>
<td>C6L3P3,5</td>
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<tr>
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<td>practice mark</td>
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**Total Credit**: 25

**2nd semester**

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**Total Credit**: 30
### BASIC MODULE

#### 3rd semester

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<td>compulsory</td>
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<td>Neuroanatomy, Histology, Embryology II.</td>
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<tr>
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<td>C3L1P2</td>
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<tr>
<td>compulsory</td>
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**Total Credit** 30

#### 4th semester

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<td>practice mark</td>
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<td>C2L0P4</td>
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**Total Credit** 34

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#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

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<tr>
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<td>C2L0P2</td>
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<tr>
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**Total Credit**: 31

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<tr>
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<td>C4L1P3</td>
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**Total Credit**: 33
### CLINICAL MODULE

#### 7th semester

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*Total Credit 39*

#### 8th semester

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</tr>
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</table>

*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

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</tr>
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</table>

*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

<table>
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* 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 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

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<th>examination</th>
<th>prerequisites</th>
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<tr>
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<tr>
<td>compulsory</td>
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**Total Credit** 28

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<td>Hungarian Medical Terminology I.</td>
</tr>
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<td>semifinal</td>
<td>Physical Bases of Dental Materials</td>
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**Total Credit** 29
### 3rd semester

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**Total Credit**: 30

### 4th semester

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**Total Credit**: 34

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# 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

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**Total Credit**: 30

#### 6th semester

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**Total Credit**: 33
### CLINICAL MODULE

#### 7th semester

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<td>C2L1P1</td>
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**Total Credit: 41**

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### CLINICAL MODULE

#### 8th semester

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**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

<table>
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<td>Clinical Dentistry I.*</td>
<td>C3L0P6</td>
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<tr>
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<td>C3L0P3</td>
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<td>Prehospital Emergency Medicine</td>
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<td>C3L0P3</td>
<td>practice mark</td>
<td>Prosthodontics III.</td>
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<tr>
<td>compulsory</td>
<td>Oral Medicine</td>
<td>C1L1P0</td>
<td>Semifinal</td>
<td>Pharmacology and Toxicology II.</td>
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</table>

**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

<table>
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<td>Conservative Dentistry IV.</td>
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<td>C3L0P3</td>
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**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

<table>
<thead>
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<th>subjects</th>
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</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>Anatomy, Histology, Embryology I.</td>
<td>C8L3P5</td>
<td>semifinal</td>
</tr>
<tr>
<td>compulsory</td>
<td>Physical Bases of Dental Materials</td>
<td>C2L2P0</td>
<td>semifinal</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical Chemistry</td>
<td>C6L3P3</td>
<td>final#</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical Biology (Cell Biology)</td>
<td>C3L2P1</td>
<td>final#</td>
</tr>
<tr>
<td>compulsory</td>
<td>Biophysics I.</td>
<td>C3L1.5P2</td>
<td>semifinal</td>
</tr>
<tr>
<td>compulsory</td>
<td>Hungarian Medical Terminology I.</td>
<td>C4L0P4</td>
<td>practice mark</td>
</tr>
<tr>
<td>obligatory elective</td>
<td>Medical Latin I.</td>
<td>C2L0P2</td>
<td>practice mark</td>
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<tr>
<td>compulsory</td>
<td>Physical Education I.</td>
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**Total Credit**: 28

##### 2nd semester

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<tr>
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<td>Biophysics I., Physical Bases of Dental Materials</td>
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<tr>
<td>compulsory</td>
<td>Biochemistry, Molecular and Cellbiology I.</td>
<td>C7L3P3</td>
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<td>Hungarian Medical Terminology II.</td>
<td>C2L0P4</td>
<td>practice mark</td>
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<tr>
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<td>General Dental Materials</td>
<td>C1L1P0</td>
<td>semifinal</td>
<td>Physical Bases of Dental Materials, Biophysics I.</td>
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<td>C1L0P1</td>
<td>practice mark</td>
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<tr>
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<td>C3L1P2</td>
<td>semifinal</td>
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<tr>
<td>obligatory elective</td>
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<tr>
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<tr>
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<tr>
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**Total Credit**: 31
### BASIC MODULE

#### 3rd semester

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<td>C7L3P4</td>
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</tr>
<tr>
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<td>semifinal</td>
<td>Biochemistry, Molecular and Cellbiology I.</td>
</tr>
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<td>C11L6P5</td>
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<td>Odontotechnology and Prostodontics Preclinical Course I.</td>
<td>C3L1P2</td>
<td>practice mark</td>
<td>General Dental Materials, Anatomy, Histology, Embryology II.</td>
</tr>
<tr>
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<td>Hungarian Medical Terminology III.</td>
<td>C2L0P4</td>
<td>practice mark</td>
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<tr>
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#### 4th semester

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<td>C6L3P2</td>
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<td>Anatomy, Histology, Embryology III.,</td>
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<tr>
<td>compulsory</td>
<td>Biochemistry, Molecular and Cellbiology III.</td>
<td>C5L3P2</td>
<td>final#</td>
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<tr>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Odontotechnology and Prostodontics Preclinical Course I.</td>
</tr>
<tr>
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<td>practice mark</td>
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</tr>
<tr>
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<td>C2L0P4</td>
<td>practice mark</td>
<td>Hungarian Medical Terminology III.</td>
</tr>
<tr>
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<td>General Dental Materials, Anatomy, Histology, Embryology II.</td>
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# 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

<table>
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<td>C4L1P3</td>
<td>semifinal</td>
<td>Anatomy (Maxillofacial Anatomy) IV.</td>
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<td>General and Oral Microbiology</td>
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<td>final#</td>
<td>Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.</td>
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<td>General and Oral Pathophysiology</td>
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<tr>
<td>Basic Immunology</td>
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<td>C3L2P1</td>
<td>semifinal</td>
<td>Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.</td>
</tr>
<tr>
<td>Hungarian Dental Terminology I.</td>
<td>compulsory</td>
<td>C2L0P4</td>
<td>practice mark</td>
<td>Hungarian Medical Terminology IV.</td>
</tr>
<tr>
<td>Oral and Maxillofacial Surgery, Pre-clinical course</td>
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<td>Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.</td>
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<tr>
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</tr>
<tr>
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<td>C3L1P2</td>
<td>practice mark</td>
<td>Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.</td>
</tr>
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## Pre-Clinical Module

### 6th Semester

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<th>Credit Code</th>
<th>Examination</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III</td>
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<tr>
<td>compulsory</td>
<td>Internal Medicine I.</td>
<td>C3L2P2</td>
<td>practice mark</td>
<td>General and Oral Pathophysiology, Pathology</td>
</tr>
<tr>
<td>compulsory</td>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Oral and Maxillofacial Surgery, Pre-clinical course</td>
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<tr>
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<td>C5L3P2</td>
<td>final#</td>
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<tr>
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<td>Genetics and Genomics</td>
<td>C2L2P1</td>
<td>final#</td>
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<td>C4L2P2</td>
<td>final#</td>
<td>Pathology, General and Oral Microbiology, General and Oral Pathophysiology</td>
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</tr>
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<td>C4L1P3</td>
<td>practice mark</td>
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</tr>
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<td>semifinal</td>
<td>Medical and Dental Physiology II.</td>
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<tr>
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<tr>
<td>compulsory</td>
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<td>Pathology</td>
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<td><strong>Total Credit</strong></td>
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</tbody>
</table>

**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)
<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
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<td>final#</td>
<td>Radiation protection, Pathology, General and Oral Microbiology</td>
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<td>C4L1P3</td>
<td>practice mark</td>
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<tr>
<td>compulsory</td>
<td>Internal Medicine II.</td>
<td>C3L2P1</td>
<td>semifinal</td>
<td>Internal Medicine I., Genetics and Genomics</td>
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<tr>
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<td>C4L1P3</td>
<td>practice mark</td>
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<td>C2L2P0</td>
<td>semifinal</td>
<td>Oral Biology, Pathology, Oral Pathology</td>
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<td>C2L1P1</td>
<td>semifinal</td>
<td>Pathology, Biochemistry, Molecular and Cellbiology III.</td>
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<td>C7L1P6</td>
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| Total Credit  |                                              |             |              |                                                                                | 40
# Clinical Module

## 8th Semester

<table>
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<th>Prerequisites</th>
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<td>Conservative Dentistry and Endodontics III.</td>
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**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

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<tbody>
<tr>
<td>compulsory</td>
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*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry*
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<th>prerequisites code</th>
<th>prerequisites</th>
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* 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

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<th>prerequisites</th>
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<tbody>
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<td>C2L2P0</td>
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<tr>
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<td>Medical Chemistry</td>
<td>C6L3P3</td>
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<tr>
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<td>Medical Biology (Cell Biology)</td>
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<td>C3L1.5P2</td>
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<tr>
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<td>practice mark</td>
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<td>Medical Latin I.</td>
<td>C2L0P2</td>
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**Total Credit** 26

##### 2nd semester

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<tr>
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<td>C2L0P4</td>
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<td>Hungarian Language</td>
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<td>General Dental Materials</td>
<td>C1L1P0</td>
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<td>Physical Bases of Dental Materials, Biophysics I.</td>
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**Total Credit** 33
### BASIC MODULE

#### 3rd semester

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<td>Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I.</td>
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<td>Biochemistry, Molecular and Cellbiology II.</td>
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<td>Odontotechnology and Prosthodontics Preclinical Course II.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Odontotechnology and Prosthodontics Preclinical Course I.</td>
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#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

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## PRE-CLINICAL MODULE

### 6th semester

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<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
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<tr>
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<td>C4L1P3</td>
<td>practice mark</td>
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<td>practice mark</td>
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<td>C2L1P1</td>
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### 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

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**Total Credit** 40
## CLINICAL MODULE

### 8th semester

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#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

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*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry*
## CLINICAL MODULE

### 10th semester

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**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

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<th>prerequisites</th>
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**Total Credit** 26

### 2nd semester

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<td>Physical Bases of Dental Materials</td>
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<tr>
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**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)**
<table>
<thead>
<tr>
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<th>credit code</th>
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<th>prerequisites</th>
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<td>C5L3P2</td>
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<td>Biochemistry, Molecular and Cellbiology I., Biophysics II.</td>
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# SEMMELWEIS UNIVERSITY / FACULTY OF DENTISTRY

## BASIC MODULE

### 4th semester

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</tr>
<tr>
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<tr>
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<td>General Dental Materials, Anatomy, Histology, Embryology II.</td>
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</table>

**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

<table>
<thead>
<tr>
<th>subjects code</th>
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<th>credit code</th>
<th>examination</th>
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</tr>
</thead>
<tbody>
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<td>final#</td>
<td>Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice</td>
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<tr>
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<td>C0L2 hours/sem</td>
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**Total Credit** 30

**Explanation**

15 credits should be gained from the elective subjects during the 5-year.

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)
# PRE-CLINICAL MODULE

## 6th semester

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<td>practice mark</td>
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<td>C4L1P3</td>
<td>practice mark</td>
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<td>C4L1P3</td>
<td>practice mark</td>
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<td>Oral Diagnostics I.</td>
<td>C2L1P1</td>
<td>semifinal</td>
<td>Pathology, General and Oral Pathophysiology</td>
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<td>compulsory</td>
<td>Dento-Alveolar practice (summer, minimum 1 week)</td>
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**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

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<td>C4L2P2</td>
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<td>Radiation protection Pathology, General and Oral Microbiology</td>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontics I., Prosthodontics I.</td>
</tr>
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<td>C3L2P1</td>
<td>semifinal</td>
<td>Internal Medicine I., Genetics and Genomics</td>
</tr>
<tr>
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<td>Oral and Maxillofacial Surgery II.</td>
<td>C4L1P3</td>
<td>practice mark</td>
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<td>C2L2P0</td>
<td>semifinal</td>
<td>Oral Biology, Pathology, Oral Pathology</td>
</tr>
<tr>
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<td>C2L1P1</td>
<td>semifinal</td>
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<tr>
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<tr>
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<td>semifinal</td>
<td>Pathology</td>
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<tr>
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<td>C3L1P2</td>
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<p>| Total Credit | 38 |</p>
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<td>practice mark</td>
<td>Conservative Dentistry and Endodontics II., Prosthodontics II.</td>
</tr>
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<td>Internal Medicine II.</td>
</tr>
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<td>semifinal</td>
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<td>practice mark</td>
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<td>semifinal</td>
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<td>final#</td>
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<td>final#</td>
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<td><strong>Total Credit</strong></td>
<td><strong>26</strong></td>
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</tbody>
</table>

**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

<table>
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<th>prerequisites</th>
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</thead>
</table>
| 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

<table>
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<td>practice mark</td>
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<tr>
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<td>C3L0P3</td>
<td>final#</td>
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<td>semifinal</td>
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### 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

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<th>Examination</th>
<th>prerequisites</th>
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<td>C8L3P5</td>
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<tr>
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<td>Physical Bases of Dental Materials</td>
<td>C2L2P0</td>
<td>semifinal</td>
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</tr>
<tr>
<td>compulsory</td>
<td>Medical Chemistry</td>
<td>C6L3P3</td>
<td>final#</td>
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</tr>
<tr>
<td>compulsory</td>
<td>Medical Biology (Cell Biology)</td>
<td>C3L2P1</td>
<td>final#</td>
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<tr>
<td>compulsory</td>
<td>Biophysics I.</td>
<td>C3L1.5P2</td>
<td>semifinal</td>
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</tr>
<tr>
<td>compulsory</td>
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<td>C2L0P4</td>
<td>practice mark</td>
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<tr>
<td>obligatory elective</td>
<td>Medical Latin I.</td>
<td>C2L0P2</td>
<td>practice mark</td>
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</tr>
<tr>
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<td>C0L0P1</td>
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## BASIC MODULE

### 2nd semester

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<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
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<td>C8L3P4</td>
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<td>Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.</td>
</tr>
<tr>
<td>compulsory</td>
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<td>C5L2P2</td>
<td>final#</td>
<td>Biophysics I., Physical Bases of Dental Materials</td>
</tr>
<tr>
<td>compulsory</td>
<td>Biochemistry, Molecular and Cellbiology I.</td>
<td>C7L3P3</td>
<td>semifinal</td>
<td>Medical Chemistry, Medical Biology (Cellbiology)</td>
</tr>
<tr>
<td>compulsory</td>
<td>Hungarian Medical Terminology</td>
<td>C2L0P4</td>
<td>practice mark</td>
<td>Hungarian Language</td>
</tr>
<tr>
<td>compulsory</td>
<td>General Dental Materials</td>
<td>C1L1P0</td>
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**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

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**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

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<th>prerequisites</th>
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<td>final#</td>
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<td>C4L2P2</td>
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<td>General and Oral Pathophysiology</td>
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</tr>
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<td>C5L3P2</td>
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<td>C3L1P2</td>
<td>practice mark</td>
<td>Anatomy (Maxillofacial Anatomy) IV, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.</td>
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**Total Credit** 30

Explanations:
- **15 credits** should be gained from the elective subjects during the 5-year program.
- # The grade influences the qualification of the diploma.
- **C** = Credit point
- **L** = Lecture (hours/week)
- **P** = Practice (hours/week)
## PRE-Clinical Module

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<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
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**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

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<td>semifinal</td>
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<p>| Total Credit | 38  |</p>
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</table>

**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

<table>
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<td>C3L0P3</td>
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<td>Internal Medicine III., First Aid</td>
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<tr>
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<td>C3L0P3</td>
<td>practice mark</td>
<td>Prosthodontics III., Conservative Dentistry and Endodontics III.</td>
</tr>
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<td>C1L0P1</td>
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<td>Oral Diagnostics I.</td>
</tr>
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<td>semifinal</td>
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*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)
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<th>prerequisites code</th>
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<tr>
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<td>Clinical Dentistry II. *</td>
<td>C3L0P6</td>
<td>practice mark</td>
<td>Clinical Dentistry I.</td>
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<td>Conservative Dentistry and Endodontics V</td>
<td>C3L0P3</td>
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<td>Endodontics IV., Prosthodontics IV.</td>
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<tr>
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<td>Obstetrics and Family Planning</td>
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<td>Internal Medicine III., First Aid</td>
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<tr>
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<td>Diploma Work</td>
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<td>C4L1P3</td>
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<tr>
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<tr>
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<td>Pedodontics I.</td>
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<tr>
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<td><strong>Total Credit</strong></td>
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</table>

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

1st year

FACULTY OF DENTISTRY

BASIC MODULE
New Study Program for students starting studies in the 2017/18 academic year is to be introduced. Details available before starting the academic year.

### BASIC MODULE

#### 1st semester

<table>
<thead>
<tr>
<th>subjects code</th>
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<tbody>
<tr>
<td>compulsory</td>
<td>Anatomy, Histology, Embryology I.</td>
<td>C8L3P5</td>
<td>semifinal</td>
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<td>compulsory</td>
<td>Physical Bases of Dental Materials</td>
<td>C2L2P0</td>
<td>semifinal</td>
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<td>compulsory</td>
<td>Medical Chemistry</td>
<td>C6L3P3.5</td>
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<td>compulsory</td>
<td>Medical Biology (Cell Biology)</td>
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<tr>
<td>compulsory</td>
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<td>C2L0P4</td>
<td>practice mark</td>
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<td>Medical Latin I.</td>
<td>C2L0P2</td>
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#### 2nd semester

<table>
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<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Anatomy, Histology, Embryology II.</td>
<td>C8L3P4</td>
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<td>Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.</td>
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<tr>
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<tr>
<td>compulsory</td>
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<td>C7L3P3</td>
<td>semifinal</td>
<td>Medical Chemistry, Medical Biology (Cellbiology)</td>
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<tr>
<td>compulsory</td>
<td>Hungarian Medical Terminology</td>
<td>C2L0P4</td>
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<td>Hungarian Language</td>
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<tr>
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<td>General Dental Materials</td>
<td>C1L1P0</td>
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<td>Physical Bases of Dental Materials</td>
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<tr>
<td>obligatory elective</td>
<td>First aid</td>
<td>C1L0P1</td>
<td>practice mark</td>
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<td>Medical Latin I.</td>
</tr>
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<tr>
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<td>Prerequisite of registering to the 3rd semester</td>
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<td>compulsory</td>
<td>Nursing Practice (summer, 2 weeks)</td>
<td>C0L0P30</td>
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<td>Prerequisite of registering to the 3rd semester</td>
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<td><strong>Total Credit</strong></td>
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</table>

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!)

## Recommended textbooks:
3. **Sasvári-Müllner: Bioorganic Compounds 4 kötet.** (Bp.)
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 maxillofacial 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.

**Type of exams:** first, second and third semesters: semifinal examination, fourth semester: final exam from the subjects of the four semesters.

**ECTS credits:** four semesters together: 27 (first semester: 8; second semester: 7; third semester: 7; fourth semester: 5)

---

**First Semester**

Lectures: 3 hours per week
Laboratory: 5 hours per week, 3 hours Anatomy, 2 hours Histology

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Dissecting room</th>
<th>Histology lab</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General osteology. Composition of the extremities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concept and types of tissues, epithelial tissue, simple epithelia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Skull. Sphenoid and ethmoid bones</td>
<td>Osteology.</td>
<td>Simple epithelia: simple sqamous (mesothel, pleura); simple cuboidal (kidney); simple columnar (gall bladder); pseudostratified (trachea)</td>
</tr>
<tr>
<td></td>
<td>Temporal bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stratified epithelia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Calvary, base and interior of the skull</td>
<td>Osteology.</td>
<td>Stratified epithelia: squamous, non keratinizing (esophagus); squamous keratinizing (skin); columnar (male urethra); transitional (urinary bladder)</td>
</tr>
<tr>
<td></td>
<td>Facial skeleton, orbit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glandular epithelium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Mandible</td>
<td>Osteology.</td>
<td>Glandular epithelia: goblet cells (colon); merocrine gland (salivary gland); apocrine gland (prostate); holocrine gland (sebaceous gland).</td>
</tr>
<tr>
<td></td>
<td>Maxilla, maxillary sinus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nasal cavity, paranasal sinuses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Oral cavity, pterygopalatine and infratemporal fossae</td>
<td>Osteology.</td>
<td>Connective tissue, fibres: collagen fibres (tendon); elastic fibres (vessel wall); reticular fibres (liver); differential staining of the fibres (skin); ground substance (umbilical cord)</td>
</tr>
<tr>
<td></td>
<td>Connective tissue, cells. Blood, hematopoiesis.</td>
<td></td>
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<tr>
<td></td>
<td>Connective tissue, fibres, types of the connective tissue</td>
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<tr>
<td>Week</td>
<td>Lecture</td>
<td>Dissecting room</td>
<td>Histology lab</td>
</tr>
<tr>
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</table>
| 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.  
Edenochondral 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. *Introduction to human embryology. Gametogenesis, fertilization. Cleavage* | 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. Blastulation, implantation, decidua  
38. The embryonic disc. Formation of the germinal layers (ecto-, endo- and mesoderm).  
41. Early embryonic circulation. Structure of the placenta; placental circulation  
42. Development of the vertebral column, the locomotor system and the skull. Fontanelles | Consultation in embryology  
Revision. | Revision. |
# ANATOMY, HISTOLOGY AND EMBRYOLOGY II.

Lectures: 3 hours per week  
Laboratory: 4 hours per week, 2 hours Anatomy, 2 hours Histology

## Second Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dissection room</td>
</tr>
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</table>
| 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 |
|      | 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 |
| 2.   | 7. Development of the heart (Film)  
     8. Development of the arteries and veins, malformations  
| 3.   | 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 |
| 4.   | 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 |
| 5.   | 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 |
| 6.   | 19. Morphology and histology of the liver and biliary system. Portal vein  
     20. Development of the fore-, mid- and hindgut  
     21. Peritoneum, cross sections | Demonstration of peritoneum, dissection of abdominal organs, vessels. | Liver, gall bladder, pancreas |
| 7.   | 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 | |

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<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical sessions</th>
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<tr>
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<td>Dissection room</td>
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<tr>
<td>10.</td>
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<td>Dissection: visceral complex (abdominal organs, vessels)</td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td>Test III.: Anatomy and dev. of gastrointestinal and respiratory systems, cross sections of the thorax and abdomen</td>
</tr>
<tr>
<td></td>
<td>34. 35. Morphology and histology of penis and male urethra 36. Morphology and histology of the ovary and the uterine tube. Oogenesis.</td>
<td>Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels Dissection of the abdominal and pelvic visceral complexes</td>
</tr>
<tr>
<td>12.</td>
<td>(Competition 1st round)</td>
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<tr>
<td></td>
<td>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)</td>
<td>Dissection of abdominal and pelvic visceral complexes. Demonstration of pelvic situs.</td>
</tr>
<tr>
<td>13.</td>
<td>(Competition 2nd round)</td>
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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
4. Methods for structure examination (diffraction, microscopic, spectroscopic methods)
6. Ceramics, polymers, composites.
10. Other physical (optical, electrical, thermal) properties of materials
11. Comparison of the properties of dental materials
13. Physical bases of implantology.
MEDICAL CHEMISTRY

Department of Medical Chemistry, Molecularbiology and Pathobiochemistry
Detailed information on the subject is available on our website under http://semmelweis.hu/orvosi-vegytan/en/students/medchem/

MEDICAL BIOLOGY (Cell Biology)

Department of Genetics, Cell- and Immunobiolog
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
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: midterm grade (30%), oral test grade (20%) and written test grade (50%).


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-vegytan/en/students/molcellbiol1/

**BIOPHYSICS I.**

Tutor: *Dr. István Voszka*

**First Semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture (1.5 hours per week)</th>
<th>Laboratory (2 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radiations (basic concepts)</td>
<td>Laboratory safety rules</td>
</tr>
<tr>
<td>2</td>
<td>Properties of electromagnetic radiations; wave and corpuscular nature</td>
<td>Resonance</td>
</tr>
<tr>
<td>3</td>
<td>Attenuation of radiation</td>
<td>Emission spectroscopy. Light sources</td>
</tr>
<tr>
<td>4</td>
<td>Luminescence and its applications</td>
<td>Spectrophotometry</td>
</tr>
<tr>
<td>5</td>
<td>Lasers and their medical applications</td>
<td>Optical lenses; light microscope</td>
</tr>
<tr>
<td>6</td>
<td>Thermal radiation, thermography. Biological effects of light</td>
<td>Detection of nuclear radiations</td>
</tr>
<tr>
<td>7</td>
<td>Production and spectrum of X-radiation Cyclotron; Linear accelerator;</td>
<td>Oscilloscope</td>
</tr>
<tr>
<td>8</td>
<td>Attenuation of X-radiation, interactions</td>
<td>Special light microscopes X-ray diagnostics</td>
</tr>
<tr>
<td>9</td>
<td>Atomic structure; Radioactive decay law Gamma-radiation and its detection</td>
<td>Optics of the eye</td>
</tr>
<tr>
<td>10</td>
<td>Radiotherapy, radiosurgery; Isotope diagnostics</td>
<td>Polarimeter</td>
</tr>
<tr>
<td>11</td>
<td>SPECT, PET</td>
<td>Coulter counter</td>
</tr>
<tr>
<td>12</td>
<td>Beta-radiation, beta-decay</td>
<td>Determination of skin-impedance</td>
</tr>
<tr>
<td>13</td>
<td>Alpha-radiation, alpha-decay Interaction with matter</td>
<td>Concentration determination with refractometer</td>
</tr>
<tr>
<td>14</td>
<td>Dosimetry</td>
<td>Repetition</td>
</tr>
<tr>
<td></td>
<td>Radiation protection; estimation of risk</td>
<td></td>
</tr>
</tbody>
</table>
**BIOPHYSICS II.**

**Second Semester**

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

**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:** 2017/18 I.

**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 patient 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
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 beneficience.
   - 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: anti-speciesism.
• 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 Remmelink 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
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
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:
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:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction: basic concepts of sociology</td>
<td>Lecture</td>
</tr>
<tr>
<td>2</td>
<td>Socio-dental indicators of oral health; inequalities in dental health</td>
<td>Lecture</td>
</tr>
<tr>
<td>3</td>
<td>The psycho-social consequences of oral disease</td>
<td>Lecture</td>
</tr>
<tr>
<td>4</td>
<td>Illness behavior: oral health</td>
<td>Lecture</td>
</tr>
<tr>
<td>5</td>
<td>Dentistry as a profession, The dentist- patient relationship,</td>
<td>Lecture</td>
</tr>
<tr>
<td>6</td>
<td>Major current issues of dental care systems</td>
<td>Lecture</td>
</tr>
<tr>
<td>7</td>
<td>Midterm exam</td>
<td>Lecture</td>
</tr>
<tr>
<td>8</td>
<td>Introduction to practices, guide to reading and presentations</td>
<td>Practice</td>
</tr>
<tr>
<td>9</td>
<td>Social inequalities and dental health</td>
<td>Practice</td>
</tr>
<tr>
<td>10</td>
<td>Psycho-social factors in dentistry; from etiology to the experience of illness,</td>
<td>Practice</td>
</tr>
<tr>
<td>11</td>
<td>Intercultural dentistry</td>
<td>Practice</td>
</tr>
<tr>
<td>12</td>
<td>Dental fear and anxiety</td>
<td>Practice</td>
</tr>
<tr>
<td>13</td>
<td>The profession of dentistry, Dental health care delivery systems</td>
<td>Practice</td>
</tr>
<tr>
<td>14</td>
<td>Patient satisfaction with dental care, cosmetic dentistry</td>
<td>Practice</td>
</tr>
</tbody>
</table>

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 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

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
Dangerous scene. Safety measurements on the scene. Call for an ambulance.
Emotional viewpoints of managing emergencies.
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
Fainting. Shock. Allergy
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 performance of the above mentioned requirements at the last practice will be evaluated with “accepted” or “not accepted”.

MEDICAL INFORMATICS

Institute of Digital Health Sciences
Course Director: Dr. Miklós Szócska

Credit: 3
1 hour/week lecture and 2 hours/week practice

| THEMES |
|------------------|------------------|
| 1. Introduction. Data and information in health care. Outlook on telemedicine. | Lecture |
| 2. Data transmission and telecommunication. The internet. | Lecture |
| 3. WEB 2.0 and the health care system. | Lecture |
| 4. Data security and safety | Lecture |
| 5. Electronic patient record | Lecture |
| 6. Digital signature | Lecture |
| 7. eHealth and telemedicine | Lecture |

| Practice |
|------------------|------------------|
| 1. Getting Started With The Internet. TCP/IP | Practice |
| 2. Mobile communication: HW | Practice |
| 3. Mobile communication: SW | Practice |
| 5. Extracting data from a nutrition database using MS Access. | Practice |
| 6. Basics of Spredsheeting. | Practice |
| 7. Diet planning using MS Excel. | Practice |
| 8. Diagram making using MS Excel | Practice |
| 9. Open key cryptography | Practice |
| 10. Digital signature I. | Practice |
| 11. Digital signature II. | Practice |
| 12. Presentation using Microsoft PowerPoint. | Practice |

Related reading
J.H. van Bemmel: Handbook of Medical Informatics
Printed version: Bohn Stafleu Van Loghum, Houten/Diegem 1996
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.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–50%</td>
<td>1</td>
</tr>
<tr>
<td>51–60%</td>
<td>2</td>
</tr>
<tr>
<td>61–75%</td>
<td>3</td>
</tr>
<tr>
<td>76–89%</td>
<td>4</td>
</tr>
<tr>
<td>90–100%</td>
<td>5</td>
</tr>
</tbody>
</table>

Textbooks:
Teaching material
### Medical Latin I.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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</td>
</tr>
<tr>
<td>2.</td>
<td>Anatomical planes and directions of the human body. Possessive and attributive construction in anatomical terms (Genitive Singular; agreement of the adjective and noun)</td>
</tr>
<tr>
<td>3.</td>
<td>The anatomy of the bones. Declensions of adjectives; subjective and possessive construction with adjectives</td>
</tr>
<tr>
<td>4.</td>
<td>The anatomy of the bones. Exercises with possessive constructions.</td>
</tr>
<tr>
<td>5.</td>
<td>The cranium and the facial bones. Common endings of the 3rd declension</td>
</tr>
<tr>
<td>6.</td>
<td>The cranium and the facial bones. Plural phrases in anatomy (Nominative Plural)</td>
</tr>
<tr>
<td>7.</td>
<td>1st midterm</td>
</tr>
<tr>
<td>8.</td>
<td>Articulations and muscles of the head. Possessive phrases in plural (Genitive Plural)</td>
</tr>
<tr>
<td>9.</td>
<td>Articulations and muscles of the head. Exercises on possessive phrases in plural</td>
</tr>
<tr>
<td>10.</td>
<td>Exercises on vocabulary and grammar of the previous lessons</td>
</tr>
<tr>
<td>11.</td>
<td>Exercises on vocabulary and grammar of the previous lessons</td>
</tr>
<tr>
<td>12.</td>
<td>Review</td>
</tr>
<tr>
<td>13.</td>
<td>2nd midterm</td>
</tr>
<tr>
<td>14.</td>
<td>Evaluation of student performance; retake of the midterms</td>
</tr>
</tbody>
</table>

### Medical Latin II.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Grammatical exercises to maxillofacial anatomy and dental diagnoses. Introduction to medical prescription: <em>gramma, litra, gutta; numerals</em></td>
</tr>
<tr>
<td>2.</td>
<td>Grammatical exercises to maxillofacial anatomy and dental diagnoses. Using Genitive and Accusative in the prescription</td>
</tr>
<tr>
<td>3.</td>
<td>Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural; prepositions with Accusative</td>
</tr>
<tr>
<td>4.</td>
<td>Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural with prepositions: prescriptions and diagnoses (ICD)</td>
</tr>
<tr>
<td>5.</td>
<td>Exercises on maxillofacial anatomy and dentistry. Verb forms in prescriptions (Imperative, passive and active voice)</td>
</tr>
<tr>
<td>6.</td>
<td>Exercises on maxillofacial anatomy and dentistry. Practising verbal forms in prescriptions; packaging materials used in pharmacology</td>
</tr>
<tr>
<td>7.</td>
<td>1st midterm</td>
</tr>
<tr>
<td>8.</td>
<td>Exercises on maxillofacial anatomy and dentistry. The Ablative Singular and Plural; prepositions with Ablative</td>
</tr>
<tr>
<td>9.</td>
<td>Exercises on maxillofacial anatomy and dentistry. The Ablative Singular and Plural in diagnoses</td>
</tr>
<tr>
<td>10.</td>
<td>Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin</td>
</tr>
<tr>
<td>11.</td>
<td>Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin</td>
</tr>
<tr>
<td>12.</td>
<td>Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin</td>
</tr>
<tr>
<td>13.</td>
<td>2nd midterm</td>
</tr>
<tr>
<td>14.</td>
<td>Evaluation of student performance; retake of the midterms</td>
</tr>
</tbody>
</table>
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 – A. 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. Győrfy: *Mi a panasz?*
R. Halász: *Anamnézis magyarul*
Á. Silló: *Szituációk*
A. Marthy – Á. Végh: *Egészségére!*

**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!
## STUDY PROGRAMME

### BASIC MODULE

#### 3rd semester

<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>Anatomy, Histology, Embryology III.</td>
<td>C7L3P4</td>
<td>semifinal</td>
<td>Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Medical Latin II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Biochemistry, Molecular and Cellbiology II.</td>
<td>C5L3P2</td>
<td>semifinal</td>
<td>Biochemistry, Molecular and Cellbiology II., Biophysics II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical and Dental Physiology I.</td>
<td>C9L6P3.5</td>
<td>semifinal</td>
<td>Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Biophysics II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Odontotechnology and Prosthodontics Preclinical Course I.</td>
<td>C3L1P2</td>
<td>practice mark</td>
<td>General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Hungarian Dental Terminology I.</td>
<td>C2L0P4</td>
<td>practice mark</td>
<td>Hungarian Medical Terminology</td>
</tr>
<tr>
<td>compulsory</td>
<td>Physical Education III.</td>
<td>C0L0P1</td>
<td>signature</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credit** 26

#### 4th semester

<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>Anatomy (Maxillofacial Anatomy) IV.</td>
<td>C6L3P2</td>
<td>final#</td>
<td>Anatomy, Histology, Embryology III., Biochemistry, Molecular and Cellbiology II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Biochemistry, Molecular and Cellbiology III.</td>
<td>C5L3P2</td>
<td>final#</td>
<td>Biochemistry, Molecular and Cellbiology II., Medical and Dental Physiology I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical and Dental Physiology II.</td>
<td>C9L6P3.5</td>
<td>final#</td>
<td>Medical and Dental Physiology I., Biochemistry, Molecular and Cellbiology II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Odontotechnology and Prosthodontics Preclinical Course II.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Odontotechnology and Prosthodontics Preclinical Course I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Conservative Dentistry and Endodontics, Pre-clinical I.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Odontotechnology and Prosthodontics Preclinical Course I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Hungarian Dental Terminology II.</td>
<td>C4L0P4</td>
<td>practice mark</td>
<td>Hungarian Dental Terminology I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>General Dental Preclinical Practice</td>
<td>C4L1P3</td>
<td>semifinal</td>
<td>General Dental Materials, Anatomy, Histology, Embryology II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Physical Education IV.</td>
<td>C0L0P1</td>
<td>signature</td>
<td></td>
</tr>
</tbody>
</table>

**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)
LIST OF TEXTBOOKS (The list may change!)

5. A.Newbrun: Cariology Quintessence. ISBN 0867152052

Recommended textbooks:

## 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Dissecting room</th>
<th>Histology lab</th>
</tr>
</thead>
</table>
| 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. **Differentiation of the neural tube, development of the spinal cord** | 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.  
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  
Microscopy of the CNS | Nervous system II. |
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Dissecting room</th>
<th>Histology lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>19. Microscopy of the hypothalamus</td>
<td>Dissection of the ventral regions of the limbs. Microscopy of the CNS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20. The hypothalamo-hypophysial system</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21. Introduction to cranial nerves. Sensory, motor and autonomic nuclei</td>
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<tr>
<td>8.</td>
<td>22. Trigeminal nerve, ophthalmic division</td>
<td>Dissection of the ventral regions of the limbs. <strong>Test II: Microscopic structure of the central nervous system, cranial nerves</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23. Trigeminal nerve, maxillary division</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>24. Trigeminal nerve, mandibular division</td>
<td></td>
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<tr>
<td>9.</td>
<td>25. Endocrine organs: pituitary and pineal glands</td>
<td>Dissection of dorsal regions of the limbs. Demonstration of head and neck regions. Cranial nerves</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26. Endocrine organs: thyroid, parathyroid, adrenal glands</td>
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<tr>
<td></td>
<td>27. <strong>Facial and glossopharyngeal nerves</strong></td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>28. Vagus, accessory and hypoglossal nerves</td>
<td>Dissection of dorsal regions of the limbs. Demonstration of head and neck regions. Cranial nerves. Dissection of the eye</td>
<td>Endocrine organs</td>
</tr>
<tr>
<td></td>
<td>29. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>30. Inner coat of the eyeball, retina</td>
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<tr>
<td></td>
<td>32. External muscles and movements of the eye</td>
<td></td>
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<tr>
<td></td>
<td>33. Protective and lacrimal apparatus of the eye. Development of the eye</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>34. External ear, tympanic membrane, auditory tube Tympanic cavity, auditory ossicles</td>
<td>Demonstration of head and neck regions Organs of special senses</td>
<td>Organs of special senses I.</td>
</tr>
<tr>
<td></td>
<td>35. Bony and membranous labyrinth</td>
<td></td>
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<tr>
<td></td>
<td>36. Spiral organ of Corti. Development of the auditory and vestibular system</td>
<td></td>
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</tr>
<tr>
<td>13.</td>
<td>37. Auditory pathway, auditory cortex</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>38. <strong>Vestibular system</strong></td>
<td></td>
<td>Organs of special senses II. Skin.</td>
</tr>
<tr>
<td></td>
<td>39. Olfactory and gustatory systems</td>
<td></td>
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</tr>
<tr>
<td>14.</td>
<td>40. Limbic system</td>
<td>Demonstration of head and neck regions Organs of special senses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41. Parasymathetic and sympathetic nervous systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42. <strong>Skin and appendages. Mammary gland</strong></td>
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<td></td>
</tr>
</tbody>
</table>
ANATOMY, HISTOLOGY AND EMBRYOLOGY IV.

Second Semester

**Lectures:** 3 hour per week  
**Laboratory:** 2 hours per week

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Dissection room</th>
</tr>
</thead>
</table>
| 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 Teeth |
| 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  
| 8.   | 22. Blood vessels of the head and neck region  
23. The lymphatic system and the cutaneous innervation of the head&neck region | Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&neck regions. Regional anatomy of the head |
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 |

Easter break
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Dissection room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>29. The reflex arc of mastication, the neuroanatomy of trigeminal neuralgia</td>
<td>Demonstration of the final’s specimen: parapharyngeal space, cross section of the head and the neck</td>
</tr>
<tr>
<td></td>
<td>30. Nerves of the head&amp;neck region II. CN 7 and 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31. Nerves of the head&amp;neck region III CN 10, 11 and 12</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>32. Superficial regions and muscles of the head</td>
<td>Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&amp;neck regions.</td>
</tr>
<tr>
<td></td>
<td>33. Deep regions of the head.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34. Topography of the orbit</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>37. Muscles and fasciae and the deep regions of the neck</td>
<td>Demonstration of the final’s specimen: parapharyngeal space, cross section of the head and the neck</td>
</tr>
<tr>
<td>(Competition 1st round)</td>
<td>38. Sectional anatomy of the head</td>
<td></td>
</tr>
<tr>
<td></td>
<td>39. Sectional anatomy of the neck</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>40. The cranial parasymathetic and sympathetic system</td>
<td>2nd Midterm: Topographical and sectional anatomy of the head and neck regions including the visceral organs</td>
</tr>
<tr>
<td>(Competition 2nd round)</td>
<td>41. Topography of the neurocranium</td>
<td></td>
</tr>
<tr>
<td></td>
<td>42. The clinical significance of the SMAS</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>43. Histology I.</td>
<td>Summary and repetition</td>
</tr>
<tr>
<td></td>
<td>44. Histology II.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45. Radiological anatomy of the jaws, teeth and the maxillary sinus</td>
<td></td>
</tr>
</tbody>
</table>
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.

Schedule of the subject:

First semester

1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.
3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.
5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).
Second semester

2. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
5. Hormonal regulation of intermedier metabolism.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioral mechanisms, motivation; emotion.

Practices, I. semester:
- Typing of Blood Groups, Blood Coagulation Test
- Blood cell counting, determination of hemoglobin concentration and hematocrit, measurement of erythrocyte sedimentation rate
- Leukocyte differential count on peripheral blood smear
- Recording and analyzing the human ECG
- Blood pressure measurement in humans
- Computer simulation: Skeletal and smooth muscle
- Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Practices, II. semester:
- Circulatory and respiratory reflexes in rabbit
- Human pulmonary function tests
- Smooth muscle of rabbit small intestine
- Oral glucose tolerance test (OGTT)
- Human acid-base examinations (Astrup)
- EEG-demonstration
- Electrooculography (EOG) and investigation of the vestibular system
- Electromyography (EMG), nerve conduction velocity
- Computer simulation: Studies on circulatory reactions of a virtual rat

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. Absence from the exam must be certified at the Head of 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 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:
Absence from the exam must be certified at the head of department or course director within 3 working days. 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:
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

**Manual training** (3 hours per week)

Clinical dental anatomy, histology.

Oclusion

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 V. Facial Cavity preparation for amalgam and Tooth-Colored Material.

Class II. Cavity preparation for Amalgam.

Class III. Cavity preparation for Tooth-Colored Material.

Class IV. Disto-Incisal Cavity Preparation for Tooth-Colored Material.

Class II. Cavity preparation for Tooth Colored Material. Tunnel preparations for proximal Restorations.

Class II. Cavity preparations for Gold (metal) inlay and gold onlay restorations.

Class I, IV, V, VI. Cavity preparation for gold inlay restorations

Cavity preparations for Composit resin and porcelain inlay restorations.

Pin-retained restorations (type of pins, Indications and contraindications).

Preparation for Porcelain Veneers.

**Note:** The maximum number of absences in a semester is 3.

During the semester 3 midterm examinations should be passed.

Practical course grade.
GENERAL DENTAL PRECLINICAL PRACTICE

Department of General Dental Preclinical Practice
Head and tutor: 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.
5. Infection Control. Disinfection and Sterilization in Dentistry.
6. Organization of the Dental Team. Fluid Control, Four-handed Dental Treatment.

Recommended textbook:
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 edentolousness was simulated through fabrication of complete dentures, while in the second semester students prepared 3-unit bridges and single crowns on partial edentolous 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
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 trial in procedure
9. Fitting of dentures, Short time and long time recall procedures.
10. Types of the prosthetic appliances
11. Gnathological aspects in making complete denture
12. Partial edentulosity, and partial dentures (RPD)
13. Labside and chairside steps of making partial and complex denture
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 Restaurations
9. Veneering of fixed appliances
10. Metal free fixed restauration, CAD/CAM technology
11. History of implant dentures, labside and chairside steps
12. Explanation of different kind of implant systems. Impression methods of implant cases
13. Dental cements
14. Consultation

Practical sessions
1. Handing out of the instruments introduction
2. Tooth preparation 24 and 27 for fixed partial denture
3. Tooth preparation 24 and 27 for fixed partial denture
4. Tooth preparation 24 and 27 for fixed partial denture
5. Tooth preparation 24 and 27 for fixed partial denture
6. Two-phase impression
7. Antagonistic impression, bite-registration
8. Preparation of the sectional model, mounting of the average value articulator
9. Waxing up of the four-unit bridge: Adaptadep 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
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: Shricks and madness – CBS and the mirage of the normal
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. Győrffy: 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. Győrffy: 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, 30×45 minutes (10×3 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)
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.*

See all the other detailed curricula at General Medicine, 2\textsuperscript{nd} year
PRE-CLINICAL MODULE
## STUDY PROGRAMME

### PRE-CLINICAL MODULE

#### 5th semester

<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
</table>
| 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. | COL2 hours/sem | signature |

**Total Credit** 30

Explanation

15 credits should be gained from the elective subjects during the 5-year  
# The grade influences the qualification of the diploma  
C = Credit point  
L = Lecture (hours/week)  
P = Practice (hours/week)
## PRE-CLINICAL MODULE

### 6th semester

<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>Conservative Dentistry and Endodontics I.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Internal Medicine I.</td>
<td>C3L2P2</td>
<td>practice mark</td>
<td>General and Oral Pathophysiology, Pathology</td>
</tr>
<tr>
<td>compulsory</td>
<td>Oral and Maxillofacial Surgery I.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>General and Oral Pathophysiology</td>
</tr>
<tr>
<td>compulsory</td>
<td>Oral Biology</td>
<td>CSL3P2</td>
<td>final#</td>
<td>Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Genetics and Genomics</td>
<td>C2L2P1</td>
<td>final#</td>
<td>General and Oral Microbiology, Anatomy (Maxillofacial Anatomy) IV.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Oral Pathology</td>
<td>C4L2P2</td>
<td>final#</td>
<td>Pathology, General and Oral Microbiology, General and Oral Pathophysiology</td>
</tr>
<tr>
<td>compulsory</td>
<td>Preventive Dentistry II.</td>
<td>C1L1P0</td>
<td>final#</td>
<td>Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Prosthodontics I.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Odontotechnology and Prosthodontics Preclinical Course III., Conservative Dentistry and Endodontics, Pre-clinical II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Radiation protection</td>
<td>C2L1.5P1</td>
<td>semifinal</td>
<td>Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Hungarian Dental Terminology IV.</td>
<td>C2L0P4</td>
<td>final</td>
<td>Medical and Dental Physiology II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Oral Diagnostics I.</td>
<td>C2L1P1</td>
<td>semifinal</td>
<td>Hungarian Dental Terminology III.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Medical Aspects of Disaster Preparedness and Response II.</td>
<td>C0L2 hours/sem</td>
<td>signature</td>
<td>Pathology, General and Oral Pathophysiology</td>
</tr>
<tr>
<td>compulsory</td>
<td>Dento-Alveolar practice (summer, minimum 1 week)</td>
<td>C0L0P30</td>
<td>signature</td>
<td>prerequisite of registering to the 7th semester</td>
</tr>
</tbody>
</table>

# 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!)

8. A. Newbrun: Cariology Quintessence. ISBN 0-867152052
23. Medical Genetics and Genomics (e-book)

## Recommended textbooks:

GENERAL AND ORAL PATHOPHYSIOLOGY

Department of Oral Biology
Lecturer: Prof. Dr. Gábor Varga
Tutor: Dr. Kristóf Kádár M.D.

First Semester

<table>
<thead>
<tr>
<th>Lectures (2 hours per week)</th>
<th>Practices (2 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiology of gastric disorders. GERD. Peptic - and duodenal ulcer. Intestinal digestion and absorption. Diseases and regulation of exocrine pancreas. Acute and chronic pancreatitis</td>
<td>Gastric function</td>
</tr>
<tr>
<td>Shock. Circulatory failure in shock. Various mediators in shock. Depressed functions in various tissue in shock.</td>
<td>ECG-I (Rhythm, frequency, axis, development of various waves on the normal ECG)</td>
</tr>
<tr>
<td>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</td>
<td>ECG-2 (Defects of excitation. ES)</td>
</tr>
<tr>
<td>Lipid metabolism. Absorption and metabolism of lipids. Regulatory and endocrine effect of VAT.</td>
<td>Urine analysis, renal function tests</td>
</tr>
<tr>
<td>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)</td>
<td>Proteins, malnutrition astic function</td>
</tr>
<tr>
<td>Acute and chronic complications and oral side of diabetes. (Oral manifestations in diabetes.)</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Pain sensation: central and oral mechanisms.</td>
<td>Clinico-chemical assays for endocrine disorders</td>
</tr>
<tr>
<td>Pathophysiology of malignancies.</td>
<td>Molecular laboratory diagnostic</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Lectures (3 hours per week)</th>
<th>Practices (2 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lecture</strong></td>
<td>Laboratory</td>
</tr>
<tr>
<td>Introduction. Historical backgrounds.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Acute inflammation. Vascular and cellular events.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Acute inflammation. Morphological patterns.</td>
<td>HISTOLOGY</td>
</tr>
<tr>
<td>Chronic inflammation.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Extracellular matrix. Repair. Wound healing.</td>
<td>HISTOLOGY</td>
</tr>
<tr>
<td>Immunopathology. Cellular components. Immunologically mediate tissue injury.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Transplantation. Immunodeficiency. Autoimmune diseases.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Neoplasia. Classification. Histological diagnosis. Invasion and metastasis.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Growth patterns.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Carcinogenesis.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Epidemiology of malignancies. Preblastomatosis. Screening.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Tumor therapy. Tumor immunology.</td>
<td>HISTOLOGY</td>
</tr>
<tr>
<td>Benign and malignant tumors of epithelial and mesenchymal origin.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Developmental and genetic diseases.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Environmental and nutritional pathology</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Hemodynamic diseases. Water and electrolyte disturbances.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Edema. Shock.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Hyperaemia. Haemorrhage. Thrombosis.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Embolism. Infarct.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Infectious and parasitic diseases. Viral and bacterial diseases.</td>
<td>HISTOLOGY</td>
</tr>
<tr>
<td>Tuberculosis. Syphilis. Leprosy. Diseases caused by fungi, nematodes, cestodes.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Aneurysms. Tumors.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Heart diseases. Congenital, ischemic, hypertensive heart diseases.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Rheumatic heart disease. Inflammatory diseases. Cardiomyopathy.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Respiratory system. Pathology of larynx and trachea. Lung cancer.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Lesions affecting lung parenchyma.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Gastrointestinal tract. Esophagus. Stomach.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Small and large intestine. Peritoneum.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Liver and biliary system. Mechanism of jaundice. Hepatic failure.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Acute and chronic hepatitis.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Liver cirrhosis. Toxic injury. Tumors</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Kidney. Non-inflammatory lesions. Inflammatory glomerular lesions.</td>
<td>HISTOLOGY</td>
</tr>
<tr>
<td>Urinary tract and male reproductive system</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Fallopian tube. Ovary. Placenta and neonatal pathology.</td>
<td>AUTOPSY</td>
</tr>
<tr>
<td>Gestational throphoblastic disease.</td>
<td>AUTOPSY</td>
</tr>
</tbody>
</table>
Pathology of the breast. AUTOPSY
Disorders of the mononuclear phagocyte system. Acute and chronic myeloproliferative syndromes. AUTOPSY
Endocrine system. AUTOPSY
Gallbladder and extrahepatic bile ducts. Pancreas. Diabetes. AUTOPSY
Head and neck pathology. AUTOPSY
Bones and joints, skeletal muscles. AUTOPSY
Pediatric oncology. AUTOPSY
Nervous system. Trauma. Circulatory and inflammatory diseases. AUTOPSY
Demyelinating and metabolic diseases. AUTOPSY
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.
Hypercementosis. Resorption of the teeth.
Diseases of the pulp. Periapical lesions.
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.
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

<table>
<thead>
<tr>
<th>Lectures (2 hours per week)</th>
<th>Practices (2 hours per week)</th>
</tr>
</thead>
</table>
| Introduction to microbiology. General bacteriology (morphology, physiology and cultivation of bacteria)  
Bacterial genetics.                                      | Introduction to basic microbiology. Microscopic examination of bacteria (staining procedures).  
Cultivation of aerobic and anaerobic bacteria (culture media, colony morphology of bacteria). |
| Infections and diseases (pathogenesis of bacterial infection, virulence, importance of biofilm formation). Specific and non-specific host defences. Active and passive immunization.  
Sterilization and disinfection. Antibacterial chemotherapy (mode of actions, resistance, side effects).  
Gram-positive facultative and obligate anaerobic cocci. Gram-negative facultative anaerobic, microaerophilic and obligate anaerobic cocci and coccobacilli.  
Gram-positive aerobic and anaerobic rods. Gram-positive spore-forming rods.  
Gram-negative facultative anaerobic rods. Gram-negative anaerobic rods.  
Spirochetes. Importance of bacterial infections involving the oral, perioral tissues and salivary glands.  
Medical importance of fungi (general mycology, chemotherapy of fungal infections). Importance of fungal infections involving the oral and perioral tissues.  
Protozoa (general characterization and the most important human pathogenic protozoa). Helminths (general characterization and the most important human worms).  
Important respiratory pathogen viruses. Important enterally transmitted viruses.  
Hepatitis viruses. Retroviruses (AIDS).  
Viruses and cancer.  
Arbo- and robovirus infection. Rabies. Slow viruses. Viral infections involving the oral, perioral tissues and salivary glands.  
Antibiotic susceptibility of bacteria  
In vitro antigen-antibody reactions (serological methods).  
Gram-positive and -negative cocci and coccobacilli  
Gram-positive rods (Corynebacterium, Lactobacillus, Actinomyces).  
Gram-negative rods (Enterobacteriaceae)  
Gram-negative anaerobic rods (Bacteroides, Prevotella, Porphyromonas, Fusobacterium, Leptotrichia).  
Gram-positive spore-forming aerobic and anaerobic rods (Bacillus, Clostridia)  
Medically important fungi  
Medically important protozoa. Medically important helminths.  
General virology (cultivation of viruses, cell-virus interactions, serological tests and molecular techniques used in laboratory diagnosis of viral diseases)  
Pathogenesis and symptomatology of viral diseases.  
Summary of microbiological laboratory techniques and diagnostic procedures. Consultation. |

More than 3 semester absences invalidate the semester.
BASIC IMMUNOLOGY

Department of Genetics, Cell and Immunobiology
Course director: Prof. Dr. Edit Buzás
Tutor: Dr. Marianna Csilla Holub
Subject code: FOKGEN037_1A
Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III.
Credits: 3

<table>
<thead>
<tr>
<th>Lectures (2 hr / week)</th>
<th>Practicals / Seminars (1 hr / week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The role, processes, organs and cells of the immune system</td>
<td>Basic terms, organs and cell of the immune system</td>
</tr>
<tr>
<td>2. Principles of natural immunity</td>
<td>Methods based on antigen-antibody interactions I.</td>
</tr>
<tr>
<td>3. The complement system; inflammation and acute phase reaction</td>
<td>Methods based on antigen-antibody interactions II.: Flow cytometry</td>
</tr>
<tr>
<td>4. Antigen, antigen presentation and MHCs</td>
<td>Methods based on antigen-antibody interactions III.: Immunoserology</td>
</tr>
<tr>
<td>5. Antigen receptors and their formation</td>
<td>Complement assays</td>
</tr>
<tr>
<td>6. T lymphocytes and cell-mediated immune response</td>
<td>Migration of immune cells</td>
</tr>
<tr>
<td>7. B lymphocytes and humoral immune response</td>
<td>Consultation</td>
</tr>
<tr>
<td>8. Midterm exam (written)</td>
<td>HLA typing</td>
</tr>
<tr>
<td>9. Hypersensitivity</td>
<td>Immunization and vaccination</td>
</tr>
<tr>
<td>10. Immune response in infections, immunodeficiencies</td>
<td>Hypersensitivity I.</td>
</tr>
<tr>
<td>11. Tolerance and autoimmunity</td>
<td>Hypersensitivity II-IV.</td>
</tr>
<tr>
<td>12. Immunology of transplantation; Antitumor immunity</td>
<td>Screening methods for autoantibodies</td>
</tr>
<tr>
<td>13. Mucosal immunity</td>
<td>Biological therapies</td>
</tr>
<tr>
<td>14. Immunopharmacology, acute phase reaction and review</td>
<td>Consultation</td>
</tr>
</tbody>
</table>

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, PRE-CLINICAL II.

Department of Conservative Dentistry
Head of Department: Dr. Zsuzsanna Tóth D.M.D., Ph.D.

First Semester

Phantom-course (Pre-clinical laboratory course)

Lectures (1 hour/week)

- Amalgam and tooth color restorations (indications and contraindications, mixing amalgam, mercury hygiene, silicate cement, acrylic resin, composite resin).
- Amalgam restorations (indications; contraindications; inserting cement bases; mixing amalgam; mercury hygiene, finishing and polishing restoration).
- Tooth-colored restorations (acrylic resin, acid etch technique, matrices for composite resins, reading bonding, agent along with either self-curing or light-activated composite resin, insertion of composite resins, finishing composite resin, glanzing the restoration).
- The rubber dam.
- Direct gold restoration (inlay).
- Indirect inlay-onlay restoration.
- The dental pulp. Diagnosis of pulpal damage.
- Endodontic morphology and access cavities.

Practices/Manual training (3 hours/week)

- Cavity preparation from mirror view (indirect method)
- Pulp protection, plastic restorations.
- Finishing and polishing of amalgam restorations

- Class III., IV., V. restorations.
- Cavity preparation in extracted teeth.
- Esthetic restoration in extracted teeth.
- Direct filling restorations. Practical exam.
- Access cavity preparation.
- Working length determination
- Cleaning and shaping of root canal I.

- Cleaning and shaping of root canal II.
- Obturation of root canal I.
- Obturation of root canal II.
- Completion of the root canal filling
- Reconstruction of root canal treated teeth

Note: The maximum number of absences in a semester is 3. During the semester three midterm examinations should be passed. Practical course grade
CONSERVATIVE DENTISTRY AND ENDODONTICS I.

Second Semester

**Lectures** (1 hour/week)  
(3 hours/week)

- Treatment of the patients in lying position “four-handed” method
- Morphology, histology and physiology of dental pulp
- Treatment plan
- Isolation in Operative Dentistry and Endodontics
- Aetiology of dental caries. Current concept of dental caries
- Systemic factors in development of dental caries
- Equipment and instruments of cavity preparation
- Caries therapy (I): amalgams
- Caries therapy (II): composite restorations
- Caries therapy (III): glass ionomers
- Adhesive filling-technique and materials
- Preventive stand points in modern therapy of restorations
- The anatomy of teeth and pulp tissues
- Pathological alterations of pulp and periapical tissue

**Practices**

- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice
- Clinical practice

During the second semester students have to make:
- 3 amalgams fillings
- 3 esthetic fillings
- 15 hours assistance

**Note:** The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester Practical course grade.
## PREVENTIVE DENTISTRY I.

**Department of Conservative Dentistry**  
**Tutor:** Dr. Károly Bartha

### First Semester

Lectures 1 (hour/week)

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Primary, secondary and tertiary prevention. Health-protection, health-education: collective, group and individual prophylaxis. Dental-prophylaxis</td>
</tr>
<tr>
<td>2</td>
<td>Caries. Caries-indexes and epidemiological relations. Characteristics of Hungarian epidemiology</td>
</tr>
<tr>
<td>3</td>
<td>Caries-aetiology. Plaque. Risk-factors</td>
</tr>
<tr>
<td>4</td>
<td>Caries incipient and remineralisation</td>
</tr>
<tr>
<td>5</td>
<td>Oral hygiene</td>
</tr>
<tr>
<td>7</td>
<td>Strategy for prevention of periodontal diseases.</td>
</tr>
<tr>
<td>8</td>
<td>Possibilities in prevention of orthodontic anomalies.</td>
</tr>
<tr>
<td>9</td>
<td>Midterm exam</td>
</tr>
<tr>
<td>10</td>
<td>Fluorides</td>
</tr>
<tr>
<td>11</td>
<td>Systemic and local fluoride-prevention</td>
</tr>
<tr>
<td>12</td>
<td>Fissure-sealing</td>
</tr>
<tr>
<td>13</td>
<td>Infection control</td>
</tr>
<tr>
<td>14</td>
<td>Other possibilities in caries prevention</td>
</tr>
</tbody>
</table>

Practices (2 hours/week)  
Seminar or clinical practice
# PREVENTIVE DENTISTRY II.

## Second Semester

Lectures 1 (hour/week)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prevention in pregnancy and in the intrauterine life to the age of three</td>
</tr>
<tr>
<td>2</td>
<td>Dental plaque - Biofilm</td>
</tr>
<tr>
<td>3</td>
<td>Oral hygiene – toothpastes</td>
</tr>
<tr>
<td>4</td>
<td>Organization and realization of collective prevention</td>
</tr>
<tr>
<td>5</td>
<td>Cervical sensitivity, dentinal hypersensitivity and erosion</td>
</tr>
<tr>
<td>6</td>
<td>Integrated preventive dentistry – prosthodontics</td>
</tr>
<tr>
<td>7</td>
<td>Integrated preventive dentistry – preventive fillings</td>
</tr>
<tr>
<td>8</td>
<td>Integrated preventive dentistry – Finishing, polishing of fillings</td>
</tr>
<tr>
<td>9</td>
<td>Midterm exam</td>
</tr>
<tr>
<td>10</td>
<td>Integrated preventive dentistry – orthodontics</td>
</tr>
<tr>
<td>11</td>
<td>Dental public health programs. Primary and secondary prevention in screening program for oral cancer</td>
</tr>
<tr>
<td>12</td>
<td>Care of handicapped and hospitalized patients</td>
</tr>
<tr>
<td>13</td>
<td>The role of dental hygienists in dental practice</td>
</tr>
<tr>
<td>14</td>
<td>Iatrogenic damaging factors</td>
</tr>
</tbody>
</table>
PROSTHODONTICS I.

Second Semester

The reasons and the consequences of the tooth loss. Complains, medical history, extra-oral and intra-oral examination, treatment plans, and prognosis at endentulous patient. Infection control in dentistry. The upper and the lower denture bearing area.

First impression, casting, outline of the special tray. Second (working) impression, mucostatic and mucodisplacive techniques. Beading and boxing, casting of working impression.

Basic gnathology. (OVD, RVD, freeway space, RCP, ICP, Posselt diagram)

Basic gnathology. (canine guidance, unilateral and bilateral balanced occlusion)

Jaw registration. (type of articulators, face bow registration).

Mounting in articulator, setting up the teeth.

Try-in procedure, flasking and packing (processing) at complete denture.

Fitting and advice to the patient. Short time and long time recall procedures.

Complex functional approach. Implant techniques.

Emergency denture. Immediate denture.

Copy denture.

Relining, rebasing, repairing of complete denture.

Consultation.

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
FIRST SEMESTER

ODONTO-TECHNOLOGY AND PROSTHODONTICS PRECLINICAL COURSE –practices

Topics of the practices:
1. Delivering of the instruments.
2. Tooth preparation for solo crown, tooth 13
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. Midterm. Finishing and polishing of the light cured crown made for the 13 tooth
10. Steps of constructing metal based removable partial dentures. Wax pattern fabrication for a mandibular metal base plate. Grading
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)
14. Practical final examination

SECOND SEMESTER

INTERNAL MEDICINE I.

Introduction to internal medicine.
History taking.
Physical examination


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 rata 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.
Rheumatic fever. Valvular heart disorders.
Infective endocarditis. Disorders of the pericardium.
Cor pulmonale.
Cardiac arrhythmias. Conduction disturbances.
Hypertension.
Atherosclerosis. Thromboangiitis obliterans.
Raynaud’s phenomenon.
Headache. Dental relation of the heart diseases

Practicing injection technique
The physical examination of the abdominal organs
The medical considerations of dentistry and dental considerations of internal medicine
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 tooth extraction
- Minor oral surgery
- Midterm Demonstration
- 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).
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
dentinal and cemental solubility demineralization
-remineralization-phenomena
Abnormal development and mineralization of renamel,
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
Nutritional and hormonal influences on salivary
gland function and saliva composition. – Immune
and non-immune defense mechanisms – Salivary
secretion of drugs – S. gland regeneration
sideorblastic, 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 – Neuoro-physiology of mastication – Kinesology

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
Plaque associated diseases – Structures adhering to dental pellicle
– 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

**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:

a.) to reach the minimum level of a written theoretical evaluation,
b.) to present orally two of the main theoretical questions, and also,
c.) 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.
3. Examination of oral mucosa. Stomato-oncological screening.
6. Fábián and Fejérdy Classification of partially edentulous arches.
7. Orthodontic Diagnostics and treatment plan.
9. Endodontic Diagnostics and emergency interventions
12. Role of diagnostics in Esthetic Dentistry. Optical and formal characteristics of the teeth. Diagnostics and rehabilitation with the harmony of dentures and the face.
13. Diagnostic failures in general praxis.
14. Early diagnosis and preventive approach

Rules of practices

Activity of the students:
1. Clinical evaluation and registration of medical and dental conditions, extraoral and intraoral examination of the patients, stomato-oncological cheque-up. Registration of medical and dental history.
2. Documentation of the above, taking oral photos, and preparing diagnostic casts.
3. Making decisions about additional diagnostic methods, X-ray examinations, referrals and consultations.
4. Making diagnosis and complete preliminary treatment planning.
5. Preparing written case-demonstrations including history, clinical finding, diagnosis, preliminary treatment plan and conclusions.
6. Written case demonstrations should be made at home, with the use of the students notes in the practice. Students are responsible for and should take great care about the patients personal rights. No personal data, medical certificate, x-ray pictures or other relevant findings can be brought home, for preparation of the case demonstrations! (only the notes made by the student during the practice, containing no personal data, no official documentation.)

Written theoretical evaluation will be organized in one of the practices in this semester.
Semmelweis University / Faculty of Dentistry

Faculty of Dentistry Exam:
Practical hours should be visited during 2 days. The time of practices is between 8.00 a.m – 1.00 p.m. Semifinal exam will be organized at the end of third year, second semester.
Minimal expectations: reaching the minimum level of the written theoretical evaluation (mark 2) presentation of three written case-demonstrations reaching the minimum quality level (mark 2) Non-performance of the minimal expectations invalidate the semester!

Textbook:

Recommended books:

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. Transmission of genetic information
3. Genetic variations
4. Cytogenetics
5. Epigenetics
6. Monogenic inheritance (Autosomal inheritance)
7. Role of sex in inheritance
8. Genetics of biological processes
9. Introduction to genomics. Methods in genomics
10. Midterm
11. Genomic approach of complex inheritance
12. Population genetics and genomics
13. Evolution genetics and genomics
14. Pharmaco- and nutrigenetics and genomics

Practices (1 hours per week):

1-2. Transmission of genetic information
3-4. Cytogenetics I, II.
5. Study of monogenic inheritance, pedigree analysis
6. Factors effecting the expression of genotype
7-8-9. Molecular genetic methods and applications in human genetics I, II
10. Consultation
11. Evaluation of molecular genetic studies
12. Molecular and cytological consequences of some monogenic disorders
13. Complex inheritance
14. Consultation

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.
The semester is finished by a written exam (single choice and essay questions, family tree, karyogram, evaluation of molecular genetic studies etc.). The exam grade will be calculated from the sum of midterm scores (maximum 40) and exam scores (maximum 80). To pass the exam students have to reach more than 50% of both the exam scores (40) and total scores (60). 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

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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!
## SEMMELWEIS UNIVERSITY / FACULTY OF DENTISTRY

### STUDY PROGRAMME

#### CLINICAL MODULE

<table>
<thead>
<tr>
<th>7th semester</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>subjects code</th>
<th>subjects</th>
<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>General and Dental Radiology</td>
<td>C4L2P2</td>
<td>final#</td>
<td>Radiation protection, Pathology, General and Oral Microbiology</td>
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<tr>
<td>compulsory</td>
<td>Conservative Dentistry and Endodontics II.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontics I., Prosthodontics I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Internal Medicine II.</td>
<td>C3L2P1</td>
<td>semifinal</td>
<td>Internal Medicine I., Genetics and Genomics</td>
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<tr>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Oral and Maxillofacial Surgery I., Oral Pathology, Radiation protection</td>
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<tr>
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<td>C2L2P0</td>
<td>semifinal</td>
<td>Oral Biology, Pathology, Oral Pathology</td>
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<tr>
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<td>Pharmacology, Toxicology I.</td>
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<td>semifinal</td>
<td>Pathology, Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.</td>
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<tr>
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<td>C7L1P6</td>
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<td>Prosthodontics I., Conservative Dentistry and Endodontics I.</td>
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<tr>
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<td>practice mark</td>
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<tr>
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<td>Neurorology</td>
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<td>semifinal</td>
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<tr>
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<td>Psychiatry</td>
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<tr>
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<td>Dental Ethics</td>
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<td>Pathology</td>
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<tr>
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<td>Gnathology</td>
<td>C3L1P2</td>
<td>final#</td>
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<tr>
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<td>Public Health</td>
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<td>final#</td>
<td>General and Oral Microbiology</td>
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<td>C0L0P1</td>
<td>signature</td>
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<tr>
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<td>Pediatrics</td>
<td>C1L1P0.5</td>
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<td>Internal Medicine I., Pathology</td>
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### Total Credit

38
## CLINICAL MODULE

### 8th semester

<table>
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<th>subjects code</th>
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<th>prerequisites</th>
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</thead>
<tbody>
<tr>
<td>compulsory</td>
<td>Conservative Dentistry and Endodontics III.</td>
<td>C4L1P3</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontics II., Prosthodontics II.</td>
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<td>Internal Medicine III.</td>
<td>C1L1P0</td>
<td>final#</td>
<td>Internal Medicine II.</td>
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<tr>
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<td>Oral and Maxillofacial Surgery III.</td>
<td>C4L1P3</td>
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<td>Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Periodontology II.</td>
<td>C4L1P3</td>
<td>semifinal</td>
<td>Periodontology I., Internal Medicine II.</td>
</tr>
<tr>
<td>compulsory</td>
<td>Pharmacology, Toxicology II.</td>
<td>C3L1P2</td>
<td>final#</td>
<td>Pharmacology, Toxicology I.</td>
</tr>
<tr>
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<td>C4L1P3</td>
<td>practice mark</td>
<td>Prosthodontics II., Conservative Dentistry and Endodontics II.</td>
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<tr>
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<td>Surgery</td>
<td>C3L2P1</td>
<td>final#</td>
<td>Internal Medicine I., Pathology</td>
</tr>
<tr>
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<td>Implantology I.</td>
<td>C1L1P0</td>
<td>semifinal</td>
<td>Oral and Maxillofacial Surgery II. Periodontology I.</td>
</tr>
<tr>
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<td>Community Dentistry II.</td>
<td>C0L1P1,5</td>
<td>signature</td>
<td>Community Dentistry I.</td>
</tr>
<tr>
<td>obligatory elective</td>
<td>Ophthalmology</td>
<td>C1L1P0.5</td>
<td>final#</td>
<td>Pathology, Anatomy (Maxillofacial Anatomy) IV.</td>
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<tr>
<td>obligatory elective</td>
<td>Otorhinolaryngology</td>
<td>C1L1P0.5</td>
<td>final#</td>
<td>Pathology, Anatomy (Maxillofacial Anatomy) IV.</td>
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<tr>
<td>compulsory</td>
<td>General Dentistry practice (summer, 4 weeks)</td>
<td>C0L0P30</td>
<td>signature</td>
<td>prerequisite of registering to the 9th semester</td>
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**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!)

7. Rajna Péter: Ideg- és elmegyógyászati szakkifejezések
Recommended textbooks:

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
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 antisympathtonic 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, glycyclyclines, linezolid
13. Antituberculotics, special antibiotics (polymyxins, bacitracin, nitrofurantoin, phosphomycin)
14. Antifungal, antiprotozoal and antihelmintic 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
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, prescription writing
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. Prescription writing
8. Clinical use of local anesthetics
11. 2nd midterm exam. Prescription writing
12. Pharmacology of the gastrointestinal tract
13. Immunopharmacology. Treatment of rheumatoid 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.
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.
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.
Cytomegalovirus. Epstein-Barr virus. Influenza. AIDS.

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.
Urinary 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)
(3 hours per week)
Infection control
Root canal treatment: preparation of access cavity: determination of working length, importance of X-ray in Endodontics
Root canal treatment: cleaning and shaping
Root canal treatment: making preparation of the root-canal for filling. Obturation of the root canal
Practices
Clinical practice
Clinical practice
Clinical practice
Clinical practice

452
Reconstruction of root-canal treated teeth: post & core
Indications and methods of endodontics surgery
Emergency treatment in Endodontics
Complications and failures in the course of root canal treatment
Endodontic microbiology
Endodontic Periodontic Interrelationship
New instruments in endodontics (The Endox-Endodontic System)
Caries therapy. Cast metal restoration
Caries therapy: ceramic and composite inlays
Preparation for Crown

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester

CONSERVATIVE DENTISTRY AND ENDODONTICS III.

Second Semester

Lectures/Seminars (1 hour per week)  Practices (3 hours per week)
Preventive Endodontics: protecting the pulp  Clinical practice
Evaluation of success and failure in Endodontics  Clinical practice
Esthetic dentistry: Bleaching discolored teeth.  Clinical practice
Internal and External  Clinical practice
Direct fillings of molars: amalgam or composite  Clinical practice
Local anesthesia in Conservative Dentistry and its complications  Clinical practice
Treatment of cervical lesion  Clinical practice
New equipment and methods in Conservative Dentistry  Clinical practice
Indications and techniques of veneer  Clinical practice
Discussion of thesis of diploma work  Clinical practice
Discussion of thesis of diploma work  Clinical practice
Special dental treatment of some general diseases (AIDS, hepatitis, diabetes, epilepsy, etc.).  Clinical practice
Principles of the Oral Health Insurance System.  Clinical practice
“Anatomie” of dental praxises.  Clinical practice
Management of Traumatized Teeth  Clinical practice
Special cavity preparation. (Tunnel, slot, mini cavities)  Clinical practice

Note: The maximum number of absences students in a semester is 3. More than 3 absences invalidate the semester. Practical course grade.

During the second semester have to make:
3 amalgam fillings
3 esthetic restorations
1 root canal filling
1 inlay
15 hours assistance
PROSTHODONTICS II.

First Semester

Topic of the lectures (weekly, numbered):

1. The reasons and the consequences of tooth loss
2. Infection control in prosthodontics
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. Gnathological aspect of fixed and removable partial dentures
11. Clinical and laboratorial steps of fixed partial dentures
12. Fix appliances, types of crown and bridges
13. Post and core restorations
14. Consultation

PROSTHODONTICS III.

Second Semester

Topic of the lectures (weekly, numbered):

1. Diagnosis and treatment planning
2. Oral health for the partially edentulous patient
3. Principles of partial denture design
4. Construction of removable partial dentures
5. Classification of the partially edentulous dental arches
6. Treatment planning for the class 0., IA. and IB. dental arches
7. Treatment planning for the class 2A. dental arches
8. Treatment planning for the class 2B. dental arches
9. Treatment planning for the class 2A/l. and 3. dental arches
10. Implants in prosthodontics
11. Maxillo-facial prosthetics
12. Parodontologic aspects of Prosthodontic Treatments
13. Orthodontic aspects of prosthodontics
14. 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
- Oesophagal surgery (injuries, diverticula, malignant diseases)
- Gastric and duodenal surgery (benign diseases)
- Gastric and duodenal surgery (malignant diseases)
- Surgery of gall-bladder and extrahepatic biliary system
- Surgery of the small intestines and colorectum (benign and malignant diseases)
- Appendicitis
- Surgery of the liver, pancreas and spleen. (injuries, inflammatory diseases and tumors)
- Bowel obstructions
- Hernias
- Basic principles in vascular surgery
- Shock. Cardiopulmonary resuscitation. intensive therapy
- General principles of traumatology.
- First aid.
- Traumatological management of catastrophes.
- Burned patients.
- Urology Consultation

**Practices** (1 hour per week)

- Visiting patients’ ward
- Visiting operating theater
- Visiting patients’ ward
- Visiting operating theater
- Visiting operating theater
- Visiting patients’ ward
- Visiting patients’ ward
- Visiting patients’ ward
- 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.

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 salivary glands.
- Odontogenic cysts I.
- Odontogenic cysts II.
- Odontogenic cysts III
- Surgical endodontics. I.
- Surgical endodontics. II.
- Dental implantology
- Preprothetic surgery
- Consultation

Practices (3 hours per week)
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- 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

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)
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
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

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
Pulp cavity landmarks of the maxilla (lectures)
Extraction of the teeth Normal radiographic anatomy: Anatomic
landmarks of the mandible (lecture)
Root canal therapy Development of the teeth, Deciduous teeth (lect.)
Recognition of the teeth, anatomic
landmarks and caries
Periapical lesions Development of the teeth, deciduous
teeth, extraction of the teeth
Periodontal disease Periapical lesions

1st midterm

Cysts of the jaws Periodontal disease

2nd midterm

Hypercementosis Cysts of the jaws
Excessive bone formation
Injuries to teeth
Osteomyelitis
Tumors Hypercementosis
Apicoectomy Excessive bone formation
Injuries to teeth
Osteomyelitis
Anomalies Tumors, apicoectomy
Salivary gland diseases Anomalies
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: Prof. Dr. István Bitter
Department of Psychiatry and Psychotherapy

Lectures: 1/week
Examination: Semi-final

Textbook:

Schedule
Subject of psychiatry, classification of disorders, diagnostic methods (lecture)
Case demonstration (psychiatric interview, signs and symptoms)
Affective disorders (lecture)
Case demonstration (depression)
Anxiety, anxiety disorders, somatoform disorders (lecture)
Case demonstration (anxiety disorder)
Organic psychiatry (lecture)
Case demonstration (dementia)
Substance related disorders (lecture)
Case demonstration (alcohol abuse)
Schizophrenia and associated disorders (lecture)
Case demonstration (schizophrenia)
Psychotherapy (lecture)
Emergency in psychiatry, legal aspects (lecture)
Case demonstration, consultation (Z. Hidasi)

Note: The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. Semi-final exam: oral exam (based on 2x11 questions)
NEUROLOGY

Tutor: Dr. Sándor Ilniczky

First Semester

Classroom lectures:

Cranial nerves and the brainstem
The motor system
The sensory system, pain syndromes
Altered consciousness. Emergency in neurology
Diagnosis and treatment of cerebrovascular disorders
Epilepsy and sudden loss of consciousness
Movement disorders
Inflammatory disorders and tumors of the nervous system

Bedside practice, patient demonstration
Recognition of neurological symptoms – examination of cranial nerves
Examination of the motor system
Evaluation of neurological symptoms
Emergency in neurology
Demonstration of cerebrovascular patients
Diagnosis of epilepsies
Special investigation of patients with movement disorders

Requirements:

Attendance of the lectures
Participation on the patient demonstration (maximum 1 absence from 7 practices)
Semifinal exam: the written exam consists of 50 simple choice questions, including the topics of the lectures and the basic literature listed below. For those who are not able to be present at the written exam, or fail, we provide a date for oral exam.

Basic reading:

Suggested reading:
PERIODONTOLOGY I, II.

Department of Periodontology

First Semester

Lectures (2 hours per week)
Exam: semi-final

Second Semester

Lectures (1 hour per week)  Practices (3 hours per week)

Introduction to Periodontology  Clinical practice
The morphology of the periodontium,  Clinical practice
histology and embryology of the periodontium  Clinical practice
The dental plaque. Its origin and role in the periodontal  Clinical practice
diseases. Periodontal microbiology
Oral immunobiology  Clinical practice
Oral immunopathology  Clinical practice
Drugs and chemicals used in the periodontology  Midterm Demonstration
Pathomechanism of the periodontal disease  Clinical practice
Clinical forms of periodontal diseases  Clinical practice
Acute necrotizing ulcerative gingivitis  Clinical practice
Pregnant gingitis, Periodontal diseases with endocrine background.
Non-plaque related periodontal conditions  Clinical practice
Oral mucous membrane diseases located on the gingiva  Clinical practice
Periodontal diseases of the child and adolescents  Clinical practice
Epidemiology of the periodontal diseases  Clinical practice
Periodontal diseases and the patients’ behavior  Clinical practice
Periodontitis as a behavioral disease
Oral prophylaxis and prevention of periodontal diseases  Midterm Demonstration
Measures of individual and group education and motivation
Periodontal charting, periodontal indices  Clinical practice
Medical and dental history of the periodontal patients
General appraisal of the etiology of periodontal disease  Clinical practice
Rational for therapy.
Consultation  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

<table>
<thead>
<tr>
<th>Lectures (1.5 hours per week)</th>
<th>Practicals (2 hours per week)</th>
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<tbody>
<tr>
<td>Definition of Public Health; Past, present and future of Public Health</td>
<td>Introduction Basic demographical data</td>
</tr>
<tr>
<td>Demography: International and Hungarian situation</td>
<td>Public Health Program of EU</td>
</tr>
<tr>
<td>General epidemiology Analytical and intervention methods on field of chronic non-communicable diseases</td>
<td>Visit into the Central Kitchen of the University</td>
</tr>
<tr>
<td>Lifestyle: smoking, alcohol consumption, drug-abuse</td>
<td>Practical aspects of epidemiological investigations: study-planning and analysis</td>
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<tr>
<td>Epidemiology and prevention of non-communicable diseases I</td>
<td>Dentist’s task on prevention of non-communicable diseases I: smoking, alcohol consumption and drug-prevention</td>
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<tr>
<td>Epidemiology and prevention of non-communicable diseases II</td>
<td>Dentist’s task on prevention of non-communicable diseases II: HBP-prevention</td>
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<tr>
<td>Epidemiology and prevention of Cancer</td>
<td>Dentist’s task on prevention of non-communicable diseases III: cancer-prevention Screening-screening programs</td>
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<tr>
<td>Environmental health: water, soil, air</td>
<td>Dentist’s task on environmental health problems</td>
</tr>
<tr>
<td>Occupational health</td>
<td>Dentist’s task on occupation diseases prevention</td>
</tr>
<tr>
<td><strong>Lectures (1.5 hours per week)</strong></td>
<td><strong>Practicals (2 hours per week)</strong></td>
</tr>
<tr>
<td>Basics of healthy diet; Nutrition disorders</td>
<td>Assessment of nutritional status; nutritional disorders;</td>
</tr>
<tr>
<td>Mother-, child and youth health care</td>
<td>Basics of healthy diet; Computer planning and controlling diet in public catering</td>
</tr>
<tr>
<td>General Epidemiology of communicable diseases – International and Hungarian aspects</td>
<td>Family planning, Youth health</td>
</tr>
<tr>
<td>Nosocomial Infections Reemerging, emerging and deliberately emerging infections</td>
<td>General epidemiology of communicable diseases Immunization, Vaccination programs</td>
</tr>
<tr>
<td>Ethic of Public Health</td>
<td>Sterilization, disinfection Laboratory investigations in case of communicable diseases Nosocomial infections</td>
</tr>
<tr>
<td>Structure and financing of Health Care Systems</td>
<td>Food-hygiene; food-borne diseases</td>
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</tbody>
</table>
DENTAL ETHICS

First Semester

Bioethics
Course Syllabus.

Institute of Behavioral Sciences
Course Director: Prof. Dr. József Kovács
(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 patient 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
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 beneficience.
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? 
Refusal of life sustaining treatment by competent and incompetent patients. 
Possibilities to extend the autonomy of patients: living will, durable power of attorney, substituted judgement, etc. 
The concept of medically futile treatment. 
Ethical problems of the treatment of handicapped newborns. (The debate about the treatment of spina bifida babies, the Baby Doe case, the legal situation, etc.)

12. week
Ethical questions of human experimentation. 
Possible forms of experimentation on humans. 
Contradiction between the two roles of the physician. (Healer and scientist.) 
The ethics of Randomized Controlled Clinical Trials. (RCT) 
Randomization and prerandomization.

13. week
Ethical questions of organ- and tissue transplantation. 
Some problems of justice concerning kidney transplantation and chronic haemodialysis. 
Ethical questions of transplantation from living kidney donors. 
The concept of death. 
Ethical questions of organ harvesting from the dead. 
The debate about the market of organs. 
Ethical questions of using embryo- or foetal tissue in human therapy. 
Ethical problems of using anencephal newborns as organ donors.

14. week
The rights of patients. 
The role of patient’s rights in the transformation of the paternalistic physician-patient relationship. 
Moral versus legal rights. 
A list of basic rights of patients. 
Mechanisms to ensure the realizations of patient’s rights. (Patient’s rights advocates, ombudsman, hospital ethics committees, institutional review boards, arbitration, etc.)
**Course Faculty:**
Prof. József Kovács, MD, PhD, (Head of the Department of Bioethics), 210-2930/56350; e-mail: kovjozs@net.sote.hu
Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@yahoo.com
Imre Szebik, MD, PhD e-mail: szebimre@net.sote.hu
Jeno Lorincz, MD, JD e-mail: lorjen@net.sote.hu

**Department:**
**Institute of Behavioral Sciences**  
**Department of Bioethics**
NET Building, 19th, 20th floor  
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
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. Parafunctons
13. Temporomandibular Disorders
14. Test

IMPLANTOLOGY I. – lecture

Department of Oro-Maxillofacial Surgery and Stomatology
Lecturer: Dr. Árpád Joó-Fancsaly

Course Syllabus:

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 Peridontics 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
### CLINICAL MODULE

#### 9th semester

<table>
<thead>
<tr>
<th>subjects code</th>
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<th>credit code</th>
<th>examination</th>
<th>prerequisites</th>
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<tr>
<td>compulsory</td>
<td>Clinical Dentistry I.*</td>
<td>C2L0P6</td>
<td>practice mark</td>
<td>Conservative Dentistry and Endodontology III., Prosthodontics III.</td>
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<tr>
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<td>Conservative Dentistry and Endodontology IV</td>
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<td>practice mark</td>
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<tr>
<td>obligatory elective</td>
<td>Forensic Dentistry</td>
<td>C1L1P0</td>
<td>semifinal</td>
<td>Pharmacology, Toxicology II.</td>
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<td>Oral and Maxillofacial Surgery IV.</td>
<td>C5L1P3</td>
<td>practice mark</td>
<td>Oral and Maxillofacial Surgery III.</td>
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<tr>
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<td>Implantology II.</td>
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<td>Oral and Maxillofacial Surgery III.</td>
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<tr>
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<td>Periodontology III.</td>
<td>C3L1P2</td>
<td>practice mark</td>
<td>Periodontology II.</td>
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<tr>
<td>obligatory elective</td>
<td>Prehospital Emergency Medicine</td>
<td>C1L1P0</td>
<td>semifinal</td>
<td>Internal Medicine III., First Aid</td>
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<tr>
<td>compulsory</td>
<td>Prosthodontics IV.</td>
<td>C3L0P3</td>
<td>practice mark</td>
<td>Prosthodontics III., Conservative Dentistry and Endodontology III.</td>
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<td>Oral Diagnostics II.</td>
<td>C1L0P1</td>
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<td>Oral Diagnostics I.</td>
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<td>Oral Medicine</td>
<td>C1L1P0</td>
<td>semifinal</td>
<td>Pharmacology and Toxicology II.</td>
</tr>
</tbody>
</table>

*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

<table>
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<th>credit code</th>
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<td>C3L0P6</td>
<td>practice mark</td>
<td>Clinical Dentistry I.</td>
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<tr>
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<td>C3L0P3</td>
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<td>Conservative Dentistry and Endodontics IV., Prosthodontics IV.</td>
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<td>obligatory elective</td>
<td>Dermatology</td>
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<td>Pharmacology, Toxicology II.</td>
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<td>Obstetrics and Family Planning</td>
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<td>Internal Medicine III., First Aid</td>
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<td>obligatory elective</td>
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<td>compulsory</td>
<td>Pedodontics II</td>
<td>C6L1P4</td>
<td>final#</td>
<td>Pedodontics I.</td>
</tr>
<tr>
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<td>Periodontology IV.</td>
<td>C3L1.5P2</td>
<td>final#</td>
<td>Periodontology III.</td>
</tr>
<tr>
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<td>Prosthodontics V.</td>
<td>C3L0P3</td>
<td>final#</td>
<td>Prosthodontics IV., Conservative Dentistry and Endodontics IV.</td>
</tr>
</tbody>
</table>

### 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)
LIST OF TEXTBOOKS (The list may change!)


Recommended textbooks:

8. Online: www.lib.sote.hu – Adatbázisok, adattárak – OVID – Books@OVID – Dermatology – Fitzpatrick’s Dermatology in General Medicine
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.
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.

Practices (0.5 hour week)
Routine clinical examinations in practice.
Routine audiology. Operating theater. Videodemonstration.
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

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 edentoulossness, 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-V.

Department of Conservative Dentistry
Head of Department: Dr. Zsuzsanna Tóth D.M.D., Ph.D.

First Semester

No lectures  Practices (3 hours/week)
Clinical dentistry 6 hours/week

Second Semester

No lectures  Practices (3 hours/week)
Clinical dentistry 6 hours/week

During the first semester the students have to make:
5 amalgam fillings, 7 esthetic restorations, 2 root-canal fillings, 1 inlay
During the second semester the students have to make:
5 amalgam fillings, 7 esthetic restorations, 2 root-canal fillings, 1 inlay
ORAL AND MAXilloFACIAL SURGERY IV.

Tutor: Dr. Attila Szûcs

First Semester

**Lectures** (1 hour / week)
- Precanceroses.
- Benign tumors of the soft tissues in the head and neck region.
- Benign tumors of the bone tissues in the head and neck region.
- Malignant tumors of the head and neck region. I.
  (Diagnostics, pathology, epidemiology)
- Malignant tumors of the head and neck region. II.
  (Surgical therapy)
- Malignant tumors of the head and neck region. III.
  (Complex therapy)
- Secondary treatment of cleft lip and palate. Orthognatic Surgery
- Biomaterials.
- Esthetical consideration in maxillofacial surgery
- Risk patient treatment in oral surgery I.
  (internal diseases, fainting, antifebrile and painkiller treatment)
- Sinus lifting.
- Dentoalveolar deformities.
- Guest speaker
- Consultation

**Practices** (5 hours / week)
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery
- Practicing minor oral surgery

**Midterm Demonstration**

**Note:** The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester three midterm examinations should be passed. Practical course grade
ORAL AND MAXILLOFACIAL SURGERY V.

Second Semester

Lectures (1 hour / week) Practices (3 hours / week)
Diseases of the temporomandibular joint Part I. (Pathology, diagnostics)
Diseases of the temporomandibular joint Part II. (Therapy)
Peripheral nerve disorders in the head and neck region. Rehabilitation after the paresis of the Facial nerve
Antibiotic treatment in dental surgery
Maxillofacial reconstructive surgery Part I. (Reconstruction of soft tissues and bone by local flaps)
(Reconstruction by microvascular grafts)
Modern diagnostic methods in oral and maxillofacial surgery
Systematic diseases in the head and neck region
The promotion of the osteogenesis by distraction methods
Biomaterials in the maxillofacial surgery
Guest speaker
Consultation

Practice
Two weeks' clinical practice at the in-patient ward of the clinic
(1st week in the morning, 2nd week in the afternoon hours, every day)
Practical course grade and final examination

Note: The maximum number of absences in a semester is 3.
More than 3 absences invalidate the semester.
During the semester three midterm examinations should be passed.

PEDODONTICS I.

Department of Orthodontics and Pediatrics Dentistry

First Semester

Lectures (1 hour/week)

The subject, the connection and significance of pedodontics.
Induction of caries, caries theories, and indices.
General aspects of caries prevention.
Possibilities of caries prevention and fluoridophylaxe.
Development of the teeth, anatomy and dentition of primary teeth.
Structure and physiology of the hard dental tissues, and its practical significance.
Disturbances of development of the permanent and primary teeth.
Caries of primary teeth. Treatment of caries of primary teeth.
Consecutive illnesses of caries of primary teeth.
Mechanism of second dentition.
Physiological and pathological phenomena in second dentition.
Caries and treatment of permanent teeth.
Endodontic treatment of immature teeth.
Consultation.

**Practice** (5 hours/week)
Treatment of patients.
Type of evaluation: Practical grade (1-5 grading system)

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**PEDODONTICS II.**

**Second Semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (1 hour/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radiology in pedodontics.</td>
</tr>
<tr>
<td>2</td>
<td>Minor oral surgery in pedodontics, local anaesthesia.</td>
</tr>
<tr>
<td>3</td>
<td>General anaesthesia.</td>
</tr>
<tr>
<td>4</td>
<td>Prothesis in pedodontics.</td>
</tr>
<tr>
<td>5</td>
<td>Traumatic injuries of primary and permanent teeth.</td>
</tr>
<tr>
<td>6</td>
<td>Complex therapy of traumatic injuries of permanent teeth.</td>
</tr>
<tr>
<td>7</td>
<td>Parodontology and oral diseases in childhood.</td>
</tr>
<tr>
<td>9</td>
<td>Administration of medicine in pedodontics.</td>
</tr>
<tr>
<td>10</td>
<td>Diagnostic competition.</td>
</tr>
<tr>
<td>11</td>
<td>Organizing of pedodontic treatment and nursing. Administration and documentation.</td>
</tr>
<tr>
<td>12</td>
<td>Significance of agegroup in pedodontics.</td>
</tr>
<tr>
<td>13</td>
<td>Consultation.</td>
</tr>
</tbody>
</table>

**Practice** (4 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.

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 teleradiogram.
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 (5 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 (4 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?
- The rational of periodontal cause related therapy
- Clinical and radiological periodontal diagnostics
- Oral hygienic, Gingival and Periodontal indices
- The treatment of periodontal emergency cases
- The stages of the comprehensive periodontal treatment I.
- The stages of the comprehensive periodontal treatment II.
- Professional oral hygiene I. Supragingival scaling
- Professional oral hygiene II. Supragingival scaling
- Professional oral hygiene III. Correcting plaque retention factors
- Oral hygienic education, tooth brushing
- The instruments of the individual oral hygiene
- Reevaluation of the patients. Antibiotics.
- Rational of periodontal surgery
- Cause related periodontal surgery I. Givigectomy
- Cause related periodontal surgery II. Modified Widman
- 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)**

**Seminar (2 hours/week)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (Part One)</th>
<th>Seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reevaluation II. Correcting phase in periodontal surgery</td>
<td>Literature review</td>
</tr>
<tr>
<td>2</td>
<td>Correcting periodontal Surgery - Mucogingival surgery I.</td>
<td>Clinical case conference</td>
</tr>
<tr>
<td>3</td>
<td>Mucogingival Surgery Gingival esthetics II.</td>
<td>Literature review</td>
</tr>
<tr>
<td>4</td>
<td>Periodontal regeneration</td>
<td>Clinical case conference</td>
</tr>
<tr>
<td>5</td>
<td>Periodontal regenerative processes – biological barrier membranes</td>
<td>Literature review</td>
</tr>
<tr>
<td>6</td>
<td>Periodontal regenerative processes – growths factors and other biochemical means</td>
<td><strong>Midterm Demonstration</strong></td>
</tr>
<tr>
<td>7</td>
<td>Prosthodontic rehabilitation I.</td>
<td>Clinical case conference</td>
</tr>
<tr>
<td>8</td>
<td>Prosthodontic rehabilitation II. The white esthetics</td>
<td>Clinical case conference</td>
</tr>
</tbody>
</table>
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:

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:**


**Recommended books:**


“hand-outs” will be prepared and presented for the students by the lecturers

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**PREHOSPITAL EMERGENCY MEDICINE**

**National Ambulance Service**

Program Director: **Dr. Gábor Gőbl**

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 oxylogy
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 Hídvégi

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.
Glaucoma (pathomechanismus).
Glaucoma (conservative and surgical treatment).

Practical guide (0,5 hour/week)
Anatomy of the eye. Patient’s history.
Objective and subjective symptoms of eye-diseases.
Eyelids and lacrimal system.
Examination of the anterior segment of the eye (focal light, slit lamp).
Refractive errors. Checking of visual acuity.
Basics of orthoptics.
Examination of the refractive media and retina. (Ophthalmoscope)
Diagnosis of glaucoma (perimetry, checking of intraocular pressure, gonioscopy.
Treatment of glaucoma.
First aid in cases of ocular injuries.
First aid in sudden visual loss.
Differential diagnostic approach of the “red eye”.
Differential diagnostic approach of the “painful” eye.
Consultation.

Semi-final examination
FORENSIC DENTISTRY

Department of Forensic Medicine
Tutor: Dr. Zoltán Szőlősi

First Semester

Lectures (1 hour/week)

The discipline of forensic medicine, relation to law, the legal aspects of dentistry
Injuries
Asphyxia
Identification
Toxicology I.
Toxicology II.
Alcohol and narcotics
The legal aspects of clinical medicine I.
The legal aspects of clinical medicine II.
Facial and cranial injuries
Sudden death, SIDS
Risk and malpractice in dentistry
Forensic psychiatry
Autopsy demonstration
Autopsy demonstration

Semi-final examination

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 premalignacies 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, lifestyle, 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, morbidites and mortality data
2. Etiological factor and pathomechanisms 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. lightning devices)
11. Contemporary diagnostical 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 Dőbrentey

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

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
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 Prosthetic 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 nostrificated
### First Year

#### 1st semester

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>General and Inorganic Chemistry I. Practice GYASKASKG1A</td>
<td>–</td>
<td>5</td>
<td>5</td>
<td>–</td>
<td>practical course grade</td>
</tr>
<tr>
<td>General and Inorganic Chemistry I. GYASKASKE1A</td>
<td>4+1</td>
<td>–</td>
<td>5</td>
<td>–</td>
<td>semi-final</td>
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<tr>
<td>Introduction to Health Informatics I. Practice GYINFBEIG1A</td>
<td>–</td>
<td>1</td>
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<td>–</td>
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<tr>
<td>Introduction to Health Informatics I. GYINFBEIE1A</td>
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<td>–</td>
<td>2</td>
<td>–</td>
<td>semi-final</td>
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<tr>
<td>Biophysics I. Practice GYFIZBIFG1A</td>
<td>–</td>
<td>3</td>
<td>2</td>
<td>–</td>
<td>practical course grade</td>
</tr>
<tr>
<td>Biophysics I. GYFIZBIFE1A</td>
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<td>–</td>
<td>3</td>
<td>–</td>
<td>semi-final</td>
</tr>
<tr>
<td>Biology I. Practice GYGENBILG1A</td>
<td>–</td>
<td>2</td>
<td>2</td>
<td>–</td>
<td>practical course grade</td>
</tr>
<tr>
<td>Biology I. GYGENBILE1A</td>
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<td>–</td>
<td>2</td>
<td>–</td>
<td>semi-final</td>
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<td>History of Sciences, Propedeutics GYEGYTPPE1A</td>
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**Total Credit**: 33
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<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
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<td>2</td>
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<td>semi-final</td>
</tr>
<tr>
<td>Physical Education II. GYTSITSNG2A</td>
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<td>signature</td>
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<tr>
<td>First Aid GYTRAELSE1A</td>
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</table>

**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!)

2. Genetics and Genomics (e-book)
7. Mihalik: Botany for Students of Pharmacy. (Szeged)
11. Körös: Inorganic Chemistry. (Szeged)

Recommended textbooks:

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

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

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.
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 chi-squared 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 F-test. 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.
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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Practice</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>The cell membrane: structure and function</td>
<td>The light microscope in use</td>
</tr>
<tr>
<td>2.</td>
<td>Structure and function of the nucleus I</td>
<td>General view of the cell. Light and electron microscopic microtechnique.</td>
</tr>
<tr>
<td>3.</td>
<td>Structure and function of the nucleus II</td>
<td>Cell nucleus. Cyto(histo)chemistry</td>
</tr>
<tr>
<td>4.</td>
<td>Endoplasmic reticulum and the ribosomes</td>
<td>Endoplasmic reticulum</td>
</tr>
<tr>
<td>5.</td>
<td>Golgi complex, secretion and protein transport</td>
<td>Golgi complex</td>
</tr>
<tr>
<td>6.</td>
<td>Lysosomes, endocytosis, vesicular transport</td>
<td>Midterm (written)</td>
</tr>
<tr>
<td>7.</td>
<td>Structure and function of mitochondria and peroxisomes</td>
<td>Secretion. Immunohistochemistry</td>
</tr>
<tr>
<td>8.</td>
<td>The cytoskeleton</td>
<td>Endocytosis. Cellular digestion. Enzyme-histochemistry</td>
</tr>
<tr>
<td>9.</td>
<td>Cellular movement</td>
<td>Cell and tissue culture</td>
</tr>
<tr>
<td>11.</td>
<td>Extracellular regulation of cells, signal transduction I</td>
<td>Cytoskeleton and cellular movement</td>
</tr>
<tr>
<td>12.</td>
<td>The cell cycle and its regulation I</td>
<td>Cell surface differentiation, ultrastructure of cellular junctions</td>
</tr>
<tr>
<td>13.</td>
<td>The cell cycle and its regulation II</td>
<td>Midterm (written)</td>
</tr>
<tr>
<td>14.</td>
<td>Cellular aging and programmed cell death (apoptosis)</td>
<td>Cell death (necrosis and apoptosis)</td>
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</table>

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practices</th>
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<tbody>
<tr>
<td>1.</td>
<td>Meiosis</td>
<td>Typical and atypical mitosis</td>
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<tr>
<td>2.</td>
<td>Introduction to human genetics; human genom</td>
<td>Meiosis and gametogenesis</td>
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<tr>
<td>3.</td>
<td>Mutations and polymorphisms I.</td>
<td>Cytogenetics I.</td>
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<td>4.</td>
<td>Mutations and polymorphisms II.</td>
<td>Cytogenetics II.</td>
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<tr>
<td>5.</td>
<td>Epigenetics</td>
<td>Introduction to human genetics; special methods of human-genetics</td>
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<tr>
<td>6.</td>
<td>Cytogenetics I.</td>
<td>Molecular genetics I.</td>
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<tr>
<td>7.</td>
<td>Cytogenetics II.</td>
<td>Midterm I (written)</td>
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<td>8.</td>
<td>Autosomal inheritance I.</td>
<td>Molecular genetics II.</td>
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<td>9.</td>
<td>Autosomal inheritance II.</td>
<td>Molecular genetics III.</td>
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<tr>
<td>10.</td>
<td>Role of sex in inheritance</td>
<td>Application of genetic methods in the study monogenic inheritance I.</td>
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<tr>
<td>11.</td>
<td>Genetics of sex</td>
<td>Application of genetic methods in the study monogenic inheritance II.</td>
</tr>
<tr>
<td>12.</td>
<td>Relationship of genom and environment.</td>
<td>Complex inheritance</td>
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<tr>
<td>13.</td>
<td>Pharmacogenetics, -genomics</td>
<td>Midterm II.</td>
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<tr>
<td>14.</td>
<td>Gene and genom manipulation</td>
<td>Consultation</td>
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</table>

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

**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 NoszáI, Dr. István Szalai
Tutor: Dr. Krisztina Kurin-Csőrgői

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 molecule polarity. 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. Kp and Kc. 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
The phase diagram of water. Crystal structures, unit cell. The rate of
crystallization. Sublimation.
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.
Preparation of inorganic compounds by oxidation-reduction reactions.

Practicals (5 hours per week)
Safety instructions. General instructions on the requirements. Recrystallization of KA1(SO₄)₂. 12 H₂O. Sublimation of iodine.
Chemical purification of sodium chloride.
Water purification using ion exchange resins.
Distillation of hydrochloric acid.
Preparation of CuSO₄. 5 H₂O

Preparation of (NH₄)₂SO₄. H₃BO₃ from borax (Na₂B₄O₇)
Preparation of CaHPO₄. 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 Cu₂O and FeSO₄

Preparation of precipitated sulfur.
Experimental observation of direction of redox reactions (standard potentials).
Preparation of a double salt (Mohr salt, (NH₄)₂ Fe(SO₄)₂. 6 H₂O
Preparation of a buffer solutions.
Preparation of Cu(NH₃)₄ SO₄ and Co Hg(SCN)₄ 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


2  Chemistry of hydrogen, oxygen, nitrogen and carbon.


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.


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


11  The dynamics of coordination compounds: Complex equilibria, ligand exchange rates. The coordination chemistry of alkali metal ions. (Hostguest complexation.)

Metals in biology


13  Metals in biomineralization. Metal-induced toxicity. The biomedical use of metal complexes and metal complexation.

The chemistry of the environment

A brief overview of the chemistry of the lithosphere, hydrosphere and atmosphere.
ANALYTICAL CHEMISTRY I.

Qualitative Chemical Analysis
Lecturer: Dr. István Szalai, Dr. Norbert Szoboszlay
Practical: Dr. István Szalai, Dr. Norbert Szoboszlay
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.
Summary of properties of elements and reactions of Group III cations.
Solubility and complex ion equilibria and application in qualitative analysis of ions.

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 cations.
Part II: Al\(^{3+}\), Mn\(^{2+}\), Zn\(^{2+}\). Analysis of unknown mixture of the third analytical group.

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Mitochondrion and respiration.</td>
<td>Simple tissues, meristems.</td>
</tr>
<tr>
<td>7</td>
<td>Amino acid and protein metabolism. The N cycle. Protein bodies, protein mobilization. Protein secretion.</td>
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<tr>
<td>8</td>
<td>Formation of alkaloids and phenolics. Lignification. Vacuole, cell sap, osmoregulation, crystal formation, autophagy, autolysis.</td>
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<tr>
<td>9</td>
<td>Nucleic acid metabolism. The nucleus. Plant specificities of mitosis and meiosis.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Organizational types of plants. The cormophyte plant body. Tissues, tissue system. Meristems.</td>
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</tr>
<tr>
<td>11</td>
<td>Dermal tissue system.</td>
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<tr>
<td>12</td>
<td>Conductive tissue system.</td>
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<tr>
<td>13</td>
<td>Ground tissue system.</td>
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<tr>
<td>14</td>
<td>Secretory structures.</td>
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</tr>
</tbody>
</table>

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.
The aim of the subject is to introduce 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.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, general Embryology</td>
</tr>
<tr>
<td>2</td>
<td>Basic tissue</td>
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<td>3</td>
<td>Bone, joint and muscle types</td>
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<td>4</td>
<td>Ossification, development of the vertebral column</td>
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<td>5</td>
<td>Heart and its development</td>
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<td>6</td>
<td>Blood vessels</td>
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<td>7</td>
<td>Blood, development of the blood cells</td>
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<td>8</td>
<td>Lymphatic organs</td>
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<td>9</td>
<td>Respiratory system</td>
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<td>10</td>
<td>Development of lung and intestines</td>
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<td>11</td>
<td>Intestinal tract.</td>
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<td>12</td>
<td>Digestive glands</td>
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<td>13</td>
<td>Kidney</td>
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<td>14</td>
<td>Ureter, urinary bladder, urethra</td>
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<tr>
<td>15</td>
<td>Inner and outer genitals</td>
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<td>16</td>
<td>Development of the urogenital organs</td>
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<td>17</td>
<td>Endocrine gland</td>
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<td>18</td>
<td>Development of the nervous system</td>
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<td>19</td>
<td>Spinal cord.</td>
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<td>20</td>
<td>Oblongate medulla, pons, mesecephalon</td>
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<td>21</td>
<td>Diencephalon, neurosecretion</td>
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<td>22</td>
<td>Cerebral cortex</td>
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<td>23</td>
<td>Cerebellum, extrapyramidal system</td>
</tr>
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<td>24</td>
<td>Olfactory and limbic systems</td>
</tr>
<tr>
<td>25</td>
<td>Eye, optic tracts and centers</td>
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<tr>
<td>26</td>
<td>Auditory and static system</td>
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<tr>
<td>27</td>
<td>Gustatory buds, skin and accessory organs</td>
</tr>
<tr>
<td>28</td>
<td>Development of the sensory organs</td>
</tr>
<tr>
<td>29–30</td>
<td>Repetition, complementary day for holidays</td>
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</table>
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.
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? 
   Narcotic controls.
   Pharmaceutical literature: treatises, pharmacopeias, formularies, journals, 
   periodicals.
13 Ordering of drug preparation. Pharmacy, galanic 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 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:**

**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))

**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.semelweis.hu/dei

Recommended literature:
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 pharmaceutics. 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 pharmaceutics.
   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 pharmaceutics;

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 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)

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)
## STUDY PROGRAMME

### Second Year

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<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Analytical Chemistry (quantitative) I.</td>
<td>2</td>
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<td>7</td>
<td>GYASKANKG1A GYEGYMATE2A GYASKASKE2A</td>
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<tr>
<td>Physical Chemistry II.</td>
<td>1</td>
<td>4</td>
<td>5</td>
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<td></td>
</tr>
<tr>
<td>GYFKTFIKG2A</td>
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<td></td>
<td></td>
<td>Physical Chemistry I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colloid Chemistry I.</td>
<td>2</td>
<td>–</td>
<td>2</td>
<td>GYFKTFIKE1A</td>
<td>semi-final</td>
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</tr>
<tr>
<td>GYKOLKOLE1A</td>
<td></td>
<td></td>
<td></td>
<td>Physical Chemistry I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry II. Practice</td>
<td>–</td>
<td>5,5</td>
<td>4</td>
<td>GYSZKSZKE1A</td>
<td>practical course grade</td>
<td></td>
</tr>
<tr>
<td>GYSZKSZKG2A</td>
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<td></td>
<td></td>
<td>Organic Chemistry I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry II.</td>
<td>4</td>
<td>–</td>
<td>5</td>
<td>GYSZKSZKE1A</td>
<td>final #</td>
<td></td>
</tr>
<tr>
<td>GYSZKSZKE2A</td>
<td></td>
<td></td>
<td></td>
<td>Organic Chemistry I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungarian Medical Terminology IV. *</td>
<td>–</td>
<td>4</td>
<td>2</td>
<td>GYLEKMSZG1A</td>
<td>practical course grade</td>
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</tr>
<tr>
<td>GYLEKMSZG4A</td>
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<td></td>
<td>Hungarian Language III.</td>
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<td></td>
</tr>
<tr>
<td>Physical Education IV.</td>
<td>–</td>
<td>1</td>
<td>0</td>
<td>signature</td>
<td></td>
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</tr>
<tr>
<td>GYTSITSNG4A</td>
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<td></td>
</tr>
<tr>
<td>Summer Practice I. **</td>
<td>–</td>
<td>35</td>
<td>4</td>
<td>GYASKAKKE2A, GYSZKSZKE2A</td>
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<tr>
<td>GYSZGNSZG1A</td>
<td></td>
<td></td>
<td></td>
<td>Analytical Chemistry II. Organic Chemistry II.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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!)


Recommended textbooks:

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
14. World of Molecules II, Compiled by Péter Mátyus, contribution by Gábor Krajsovzsky, formatted by Balázs Balogh, Department of Organic Chemistry, Semmelweis University, matyus.peter@pharma.semmelweis-univ.hu (2011)

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# QUANTITATIVE ANALYTICAL CHEMISTRY I.

**Tutor: Dr. Krisztina Kurin-Csörgei**

## First Semester

<table>
<thead>
<tr>
<th>Lectures (2 hours per week)</th>
<th>Practicals (5 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic</strong></td>
<td><strong>Task</strong></td>
</tr>
<tr>
<td>Introduction. Review of some elementary concepts. Titrimetric methods of analysis.</td>
<td>Introduction. Laboratory introduction; Safety and order in the laboratory; The schedule of the semester; Practical and theoretical requirements in the semester</td>
</tr>
<tr>
<td>Acid-base reactions, repetition of different calculations. Titration curves in acid-base titration.</td>
<td>Calibration</td>
</tr>
<tr>
<td>End point detection Acid-base indicators.</td>
<td>Acidi-Alkalimetry</td>
</tr>
<tr>
<td>Standard solutions in acid-base acid titrations and the survey of the most important methods.</td>
<td>Acidi-Alkalimetry</td>
</tr>
<tr>
<td>Acid-base titrations in non-aqueous solutions. Determination of organic bases in glacial acetic acid.</td>
<td>Acidi-Alkalimetry</td>
</tr>
<tr>
<td>Effects of common ion, pH, complex formation and redox processes on precipitation.</td>
<td>Acidi-Alkalimetry (Instrumental)</td>
</tr>
<tr>
<td>Formation and morphology of precipitates. Development and treatment of precipitates.</td>
<td>Acidi-Alkalimetry</td>
</tr>
<tr>
<td>Important methods in precipitation gravimetry.</td>
<td>Acidi-alkalimetry; Chelatometry</td>
</tr>
<tr>
<td>Precipitation titrimetry.</td>
<td>Chelatometry</td>
</tr>
<tr>
<td>Complex formation, chelate effect. Stability constant. Complexometric and chelatometric titrations.</td>
<td>Chelatometry aceticum</td>
</tr>
<tr>
<td>Effect of pH and foreign ligands on ions the apparent stability constant. Chelatometric titrations. Titration curves. Methods of end point detection.</td>
<td>Gravimetry</td>
</tr>
<tr>
<td>Types and applicability of EDTA titrations.</td>
<td>Argentometry</td>
</tr>
<tr>
<td>Redox reactions and their mechanism. The redox potential and its calculation.</td>
<td>Komplexometry Supplements</td>
</tr>
<tr>
<td>The effect of pH, the complex and precipitate formations on redox potential. Redox equilibria.</td>
<td>Supplements Closing</td>
</tr>
</tbody>
</table>
### QUANTITATIVE ANALYTICAL CHEMISTRY II.

#### Second Semester

<table>
<thead>
<tr>
<th><strong>Lectures</strong> (2 hours per week)</th>
<th><strong>Practicals</strong> (5 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic</strong></td>
<td><strong>Task</strong></td>
</tr>
<tr>
<td>Titrations curves in oxidimetry. Titrations with permanganate solution.</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>Permanganometry</td>
</tr>
<tr>
<td>Titrations with chromate and cerium (IV). Bromatometry I.</td>
<td>Permanganometry</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Bromatometry II. Reactions with periodate and their analytical use.</td>
<td>Chromatometry</td>
</tr>
<tr>
<td></td>
<td>Bromatometry</td>
</tr>
<tr>
<td>Iodometric titrations and other reductometric methods.</td>
<td>Bromatometry</td>
</tr>
<tr>
<td></td>
<td>Cerimetry</td>
</tr>
<tr>
<td>Sampling and preparatory processes in analytical chemistry.</td>
<td>Iodometry</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions between electromagnetic radiations and materials. Emission spectroscopy.</td>
<td>Iodometry</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Flame emission photometry, atomic absorption spectrophotometry. ICP-ES and ICP-MS possibilities.</td>
<td>Iodometry</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Molecular absorption spectroscopy in UV-VIS region as well as in IR.</td>
<td>Optional measurements</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Possibilities of spectrophotometric method(s) in complex systems.</td>
<td>Instrumental Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Separation methods in analytical chemistry.</td>
<td>Optional measurements</td>
</tr>
</tbody>
</table>
### Lectures (2 hours per week)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillation, extraction and their possibilities.</td>
<td>Spectrophotometry</td>
</tr>
<tr>
<td></td>
<td>Semi-quantitative analysis</td>
</tr>
<tr>
<td>Different planar chromatographic methods and their use in pharmaceutical analyses. Gas chromatographic methods.</td>
<td></td>
</tr>
<tr>
<td>High performance liquid chromatography. Supercritical fluid extraction and chromatography.</td>
<td>Optional measurements</td>
</tr>
<tr>
<td>HPCE and its future application. Survey on analytical chemistry.</td>
<td>Final test</td>
</tr>
<tr>
<td></td>
<td>Determination</td>
</tr>
<tr>
<td>Summary.</td>
<td>Supplements</td>
</tr>
<tr>
<td></td>
<td>Closing</td>
</tr>
</tbody>
</table>

### Practicals (5 hours per week)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectrophotometric determination of iron content in multivitamin tablets</td>
<td></td>
</tr>
<tr>
<td>Spectrophotometric determination of phosphate content in egg shell</td>
<td></td>
</tr>
<tr>
<td>Semi-quantitative analysis using “Merko-quant” testpapers</td>
<td></td>
</tr>
</tbody>
</table>

### 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. Potentimetric 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.

Lecturer: **Prof. Dr. Péter Mátyus**  
Tutor: **Dr. Péter Tétényi**

## First Semester

| Week | Lectures (4+1*** hours per week) | Practices | **Practicals**  
|------|----------------------------------|-----------|------------------------------------------------------
| 1    | Qualitative molecular orbital theory of organic compounds |           | (seminars: 2 hours biweekly, practices: 8 hours biweekly) |
| 5    | Isomerism. Steric and electronic effects in organic compounds and reactions. | 2-6       | Nomenclature of organic compounds without C=O bond |
| 6-7  | Alkenes, alkynes, and their cyclic analogs. Cis-trans isomerism. Elimination. Addition to carbon-carbon double bond. | 3-6       | Basic methods for preparations of organic compounds (5 preparations) |
| 8    | Delocalized systems. Aromaticity and linear and cyclic antiaromaticity. Interpretation of concerted reactions. |           |                                      |
| 9    | Aromatic hydrocarbons. Electrophilic aromatic substitution |           |                                      |
| 10   | Spectroscopy of organic compounds. |           |                                      |
| 11-12| Organic halogen compounds. Nucleophilic substitution in aliphatic and aromatic compounds. | 5-6       | Spectroscopic analysis of organic compounds |
| 13   | Organic compounds containing C-O single bonds (alcohols, phenols and their derivatives). Acidity of organic compounds. |           |                                      |
| 14   | Amines and other nitrogen containing compounds. Basicity of organic compounds. Organic sulfur compounds. |           |                                      |

*** number of hour (1) for introductory lecture
ORGANIC CHEMISTRY II.

Second Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (4+1*** hours per week)</th>
<th>Practices</th>
<th>Practicals (seminars: 2 hours bi-weekly, practices: 8 hours biweekly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4</td>
<td>Carboxylic acids and their derivatives.</td>
<td>1-6</td>
<td>Nomenclature of organic compounds with C=O bond, of heterocyclic and of bioactive compounds</td>
</tr>
<tr>
<td>5</td>
<td>Carbonic acids and their derivatives. Polyfunctional organic compounds.</td>
<td>1-6</td>
<td>Spectroscopic analysis of organic compounds</td>
</tr>
<tr>
<td>6</td>
<td>Carbohydrates. Stereochemistry of organic compounds having more than one center of chirality.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Amino acids, peptide, proteins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-9</td>
<td>electron excessive heteroaromatic compounds.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>electron deficient heteroaromatic compounds.?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Terpenoids, carotenoids, steroids.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Nucleic acids. Alkaloids.</td>
<td>6</td>
<td>Electronic literature searching</td>
</tr>
<tr>
<td>14</td>
<td>Organic chemistry in the periodic system. Organic synthesis.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** number of hour (1) for introductory lecture

Compounds of the main classes are discussed according to the following aspects: structure, nomenclature, physical properties, preparation/synthesis, chemical properties, some important individual compounds (particularly in respect to the medicinal chemistry).
## PHYSICAL CHEMISTRY I.

### First Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (4 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Nuclear magnetic resonance: The technique, the chemical shift. Electron spin resonance. Mass spectroscopy.</td>
</tr>
<tr>
<td>5</td>
<td>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).</td>
</tr>
<tr>
<td>13</td>
<td>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.</td>
</tr>
</tbody>
</table>
# PHYSICAL CHEMISTRY II.

## Second Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (1 hour per week)</th>
<th>Practicals (4 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determination of freezing point depression.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Calibration of a thermometer. Determination the temperature of a phase transition.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Studying IR Spectra.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spectrophotometric investigations in the ultraviolet region.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Determination of ionization constant of indicators by spectrophotometric method.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Solubility product determination by potentiometric method.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Measurement of pH by hydrogen-electrode, measurement of redox potential.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Deadstop titration, determination of ionization constant of a weak acid.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Computer assisted conductimetric titration.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Polarography.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Studying the kinetics of the hydrolysis.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Investigation of stressed decomposition of a medicine.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Studying of the surface tension.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Supplementary lab.</td>
<td></td>
</tr>
</tbody>
</table>

# COLLOID CHEMISTRY I.

## Lecturer: Dr. Ferenc Csempesz

## Second Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (2 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What are colloids? Definitions, nomenclature, historical perspective.</td>
</tr>
<tr>
<td>2</td>
<td>Basic principles of colloid stability Intermolecular forces, interparticle forces, effect of the intervening medium. Electrostatic forces and the electrical double layer.</td>
</tr>
<tr>
<td>3</td>
<td>Steric repulsion, the effect of adsorbed or anchored layers. The total interaction potential curve.</td>
</tr>
<tr>
<td>5</td>
<td>Interfaces Surface tension, surface energy, wetting phenomena.</td>
</tr>
<tr>
<td>7</td>
<td>Rheology: viscosity, Newtonian and non-Newtonian systems, rheology of suspensions of colloidal particles.</td>
</tr>
</tbody>
</table>
## 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

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Lectures (1 hour per week)</th>
<th>Practicals (3 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Embryo development. The root apex, primary structure of roots. Root modifications Brassicaceae</td>
<td>Germination, seedlings. Plants representing fam.: Fabaceae,</td>
</tr>
<tr>
<td>3</td>
<td>Secondary growth of roots and stems.</td>
<td>Stems I. Plants representing fam.: Solanaceae, Lamiaceae</td>
</tr>
<tr>
<td>4</td>
<td>Development and anatomy of leaves. Adaptations to the environment. Shoot modifications.</td>
<td>Stems II. Plants representing fam.: Asteraceae</td>
</tr>
<tr>
<td>5</td>
<td>The movement of water in plants. Mineral nutrition. Transport of assimilates.</td>
<td></td>
</tr>
</tbody>
</table>
1. Test Work: Plants representing fam.: Cannabaceae  
Woddy stems (Gymnosperms, |
| 6     | Initiation and anatomy of flowers. Sporo-Angiosperms) and gametogenesis in angiosperms. Fruits and seed. | The fungi (introduction). I.Test  
Work on the knowledge of medicinal plants  
The Fungi I.  
The Fungi II. |
| 7     | Control of growth and development. |  
8     | Mycophyta, Bryophyta, Pteridophyta, Gymnospermaphyta |  
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Weeks  | Lectures (1 hour per week) | Practicals (3 hours per week)
---|---|---
9  | Angiospermatophyta: Magnoliidae | 2. Test Work: Fungi
   | Preparing a cleared specimen | Leaf and flower anatomy
10 | Angiospermatophyta: Hamamelididae, Caryophyllidae | Morphology and anatomy of the seed
11 | Angiospermatophyta: Rosidae 2. Test Work on the knowledge of medicinal plants. | Morphology and anatomy of the fruit.
12 | Angiospermatophyta: Dilleniidae | 3. Test Work: woody stems, leaf,
13 | Angiospermatophyta: Asteridae flower, seed, fruit. | Consultation, questioning, finishing
14 | Angiospermatophyta: Monocotyledoneae the practicals. | 

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.
- Fine mechanism of enzyme action. Three-dimensional structure of chymotrypsin, a serine protease.  
  Mechanism of acetylcholinesterase catalysis.
- 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.
  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)

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)

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.
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!
STUDY PROGRAMME

Faculty of Pharmacy
3rd year
<table>
<thead>
<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry II. Practice GYOBIBKIG2A</td>
<td>–</td>
<td>1,5</td>
<td>0</td>
<td>GYSZKSZKE2A GYOBIKE1A</td>
<td>Organic Chemistry II. Biochemistry I. signature</td>
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<tr>
<td>Biochemistry II. GYOBIKIE2A</td>
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<td>GYOBIKE1A GYNYELAT1A</td>
<td>Biochemistry I. Medical Terminology final #</td>
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<tr>
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<td>2</td>
<td>GYOBIKME1A GYNYELAT1A</td>
<td>Biochemistry I. Medical Terminology practical course grade</td>
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<tr>
<td>Physiology I. GYIKIGELE1A</td>
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<td>–</td>
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<td>Biochemistry I. Medical Terminology semi-final</td>
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<tr>
<td>Pharmaceutical Chemistry I. GYGYKGYKG1A</td>
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<td>Analytical Chemistry (quantitative) II. Organic Chemistry II. Physical Chemistry II. Medical Terminology practical course grade</td>
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<td>Pharmaceutical Technology I. GYGYIGYTG1A</td>
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<td>Organic Chemistry II. Colloid Chemistry I. Analytical Chemistry (quantitative) II. Medical Terminology practical course grade</td>
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<td>GYGENBIL2A GYNYELAT1A GYHUMANAE1A</td>
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<tr>
<td>Subjects</td>
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<td>Credit Points</td>
<td>Prerequisites</td>
<td>Examination</td>
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<td>4</td>
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<td>final #</td>
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<tr>
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<td>4</td>
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<tr>
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<td>Pharmaceutical Chemistry I. Colloid Chemistry I. Pharmaceutical Technology I.</td>
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**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!)

6. Rácz: Drug Formulation (Bp.)
7. Rácz: Pharmaceutical Technology – Part One (Bp.)
8. Rácz: Pharmaceutical Technology – Part Two (Bp.)
9. Rácz: Pharmaceutical Technology – Part Three (Bp.)

Recommended textbooks:

# PHARMACEUTICAL CHEMISTRY I.

**Director:** Dr. Péter Horváth  
**Tutor:** Prof. Dr. Krisztina Takács–Novák

## First Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (4 hours per week)</th>
<th>Practicals (5 hours per week)</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (4 hours per week)</th>
<th>Practicals (5 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proton speciation of drugs</td>
<td>Equipping, identification</td>
</tr>
<tr>
<td>2</td>
<td>Determination of protonation constants Optimization of pH-dependent processes</td>
<td>Drugs acting on the vegetative nervous system I.</td>
</tr>
<tr>
<td>3</td>
<td>Cardiac glycosides, sugars Analysis of cardiac glycosides, sugars</td>
<td>Drugs acting on the vegetative nervous system II.</td>
</tr>
<tr>
<td>4</td>
<td>Local anaesthetics</td>
<td>Local anaesthetics</td>
</tr>
<tr>
<td>5</td>
<td>Cardiovascular drugs: antiarrhythmic agents Cardiovascular drugs: antianginal agents</td>
<td>Digitalis glycosides, sugars</td>
</tr>
<tr>
<td>6</td>
<td>Cardiovascular drugs: antilipaemic agents Cardiovascular drugs: antihypertensive agents</td>
<td>Determination of protonation macroconstants</td>
</tr>
<tr>
<td>7</td>
<td>Diuretics</td>
<td>Determination of protonation microconstants</td>
</tr>
<tr>
<td>8</td>
<td>Vitamines</td>
<td>Determination of logP</td>
</tr>
<tr>
<td>9</td>
<td>Quality assurance, GLP, validation Non-steroid antiinflammatory agents</td>
<td>Diuretics</td>
</tr>
<tr>
<td>10</td>
<td>Corticosteroids Sexual hormones</td>
<td>Steroidal hormones</td>
</tr>
<tr>
<td>12</td>
<td>NMR: multiplicity, 1D NMR NMR: spin echo, 2D NMR, MRI, MRS</td>
<td>Non-steroidal antiinflammatory agents</td>
</tr>
<tr>
<td>13</td>
<td>Desinfectants Chemotherapeutic agents: sulfonamides</td>
<td>Quality assurance, GLP, validation I.</td>
</tr>
<tr>
<td>14</td>
<td>Chemotherapeutic agents: antimalarial drugs, fluoroquinolones Antidiabetics</td>
<td>Quality assurance, GLP, validation II.</td>
</tr>
</tbody>
</table>
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.
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.
Lectures
Dosage forms with coherent structure
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 by moulding.
Preparation of vaginal preparations.
Preparation of pills.
Preparation of multidose powders. Topical powders.
Preparations of veterinary 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
Tutor: Dr. Anna 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 constituens of proteins).
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 arylalkanones)
Tannins. Classification of tannins. Structures and properties of hydrolyzable and condensed tannins, biological significance. Chief tannin-containing drugs.
Pharmacological properties.
Main hydroxyanthraquinone glycoside-containing drugs.
Naphthodianthrone and diterpene quinone containing drugs. Hypericum perforatum.
Orcinols and phloroglucinols. Cannabis.
Humulus lupulus.

Practicals (4 hours per week)
Introduction, safety rules.
General methods in quality control of herbal drugs.
Herbal drugs containing carbohydrates.
(Starches, mucilages, etc.)
Plant acids and their drugs.
Vegetable oils.
Flavonoids and chief flavonoid drugs.
Anthocyanins.
Methods used in flavonoid and phenoloid chemistry.
HPLC of flavonoids.
Tannins and chief tannin drugs.
Methods used in tannin chemistry.
Laxative hydroxy-anthraquinone drugs.
Naphthodianthrone.
Methods used in hydroxyanthraquinone chemistry
Phloroglucinols.
Cannabis sativa.
Personal task.
Consultation.
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.
Metabolism of steroid hormones.

Metabolism of steroid hormones.
Matabolism of arachidonic acid, eicosanoids.
Amino acid catabolism. Fate of nitrogen:
Deamination.
Elimination of ammonia: The urea cycle. Biosynthesis of nonessential amino acids.
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 different types of RNAs. Prokaryotic transcription.

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

Midtern: nucleotides and macromolecules

**COLLOID CHEMISTRY II.**

Tutor: *Dr. Ferenc Csempesz*

**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 Andreason pipette.
- 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 Högpler consistometer. Determination of the relative deformation of a polymer at various loading times.
# PHYSIOLOGY I.

## First Semester

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<th>Week</th>
<th>Lecture (5 hours per week)</th>
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<tr>
<td>5</td>
<td>Cardiac functions: Biomechanical basis of cardiac functions. Cardiac pump. Signal transduction in the cardiomyocytes.</td>
</tr>
<tr>
<td>6</td>
<td>Cardiac cycle. Electrical activity of the heart. Transmembrane potentials. Conduction in cardiac fibers, cardiac excitability, cardiac rhythmicity, electrocardiography.</td>
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<tr>
<td>8</td>
<td>Cardiovascular control mechanisms: Systemic control mechanisms. Local control mechanisms. Control of cardiac output.</td>
</tr>
<tr>
<td>12</td>
<td>Regulation of respiration: Neural and chemical control of respiration. Adaptation of cardiorespiratory system and skeletal muscle to physical exercise.</td>
</tr>
<tr>
<td>13</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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

<table>
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<th>Week</th>
<th>Lecture (5 hours per week)</th>
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<tr>
<td>1</td>
<td>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.</td>
</tr>
<tr>
<td>3</td>
<td>Regulation of acid-base balance.</td>
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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)**


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.
Arthropode-borne viruses and diseases caused by them.
Other important virus caused diseases.
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.
Colonial 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.
Morphology and cultivation of human pathogen agents. Prions. AIDS. The role of viruses in carcinogenesis.
Fungi. Medically important protozoons. 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: Biochemistry I, Biology II., Anatomy
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 midterm, exam scores will be supplemented with some bonus points.

Literature:
KUBY Immunology • W. H. Freeman and Company • New York • 2013

Other information: gsi.semmelweis.hu (The user name and password is on the course datasheet of the Neptun.)
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)
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, colloidics, 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.

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!
## STUDY PROGRAMME

### Fourth Year

The prerequisite to start 4th year is to take a Basic Hungarian Language Exam (oral).

### 7th semester

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacognosy II. Practice GYFMGGNGDE2A</td>
<td>–</td>
<td>4</td>
<td>3</td>
<td>GYFMGGNDE1A, GGYKGYKE2A</td>
<td>Pharmacognosy I. Pharmaceutical Chemistry II. practical course grade</td>
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<tr>
<td>Pharmacognosy II. GYFMGGNDE2A</td>
<td>2</td>
<td>–</td>
<td>3</td>
<td>GYFMGGNDE1A, GGYKGYKE2A</td>
<td>Pharmacognosy I. Pharmaceutical Chemistry II. final #</td>
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<tr>
<td>Pharmaceutical Chemistry III. Practice GGYKGYK3A</td>
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<td>GGYKGYKE2A, GYKIKGELE2A</td>
<td>Pharmaceutical Chemistry II. Physiology II. practical course grade</td>
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<tr>
<td>Pharmaceutical Chemistry III. GGYKGYKE3A</td>
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<td>–</td>
<td>3</td>
<td>GGYKGYKE2A, GYKIKGELE2A</td>
<td>Pharmaceutical Chemistry II. Physiology II. final #</td>
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<tr>
<td>Pharmacology and Toxicology I. Practice GGYHHATG1A</td>
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<td>Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology practical course grade</td>
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<tr>
<td>Pharmacology and Toxicology I. GGYHHATE1A</td>
<td>4</td>
<td>–</td>
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<td>GYKIKGELE2A, GGYKGYKE2A, GYMIGKME1A, GYGENIMME1A</td>
<td>Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology semi-final</td>
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<td>Pharmaceutical Technology III. Practice GGYIIGYTE3A</td>
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<td>Pharmaceutical Chemistry II. Pharmaceutical Technology II. practical course grade</td>
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<tr>
<td>Basic Medical Pathophysiology I. GGYHKKAE1A</td>
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<td>–</td>
<td>2</td>
<td>GYKIKGELE2A, GYMIGKME1A</td>
<td>Physiology II. Pharmaceutical Microbiology semi-final</td>
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<tr>
<td>Industrial Pharmaceutical Technology I. GGYIIGT2A</td>
<td>2</td>
<td>–</td>
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<td>GGYKGYKE2A, GGYIIGYTE2A</td>
<td>Pharmaceutical Chemistry II. Pharmaceutical Technology II. semi-final</td>
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</table>

**Total Credit** 31
### 8th semester

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
<th>Credit Points</th>
<th>Prerequisites</th>
<th>Examination</th>
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</thead>
<tbody>
<tr>
<td>Pharmacology and Toxicology II. Practice GGYYHHATE2A</td>
<td>–</td>
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<td>2</td>
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<td>Pharmacology and Toxicology II. GGYYHHATE2A</td>
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<td>–</td>
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<td>–</td>
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<td>Basic Medical Pathophysiology II. GGYHKKAIE2A</td>
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<td>GGYHKKAIE1A, GGYYHHATE1A</td>
<td>final #</td>
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<td>Public Health GYNEINETE1A</td>
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<td>GYKIKGELE2A, GYMIKGMIE1A</td>
<td>final #</td>
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<tr>
<td>Public Health Practice GYNEINETG1A</td>
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<td>2</td>
<td>2</td>
<td>GYKIKGELE2A, GYMIKGMIE1A</td>
<td>practical course grade</td>
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<tr>
<td>Written scientific thesis (diploma work) I. GYSZDSZDG1A</td>
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<td>Industrial Pharmaceutical Technology II. * GGYGINIPE2A</td>
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<td>semi-final</td>
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</table>

**Total Credit** 26

* The grade influences the qualification of the diploma
* Obligatory elective subject
LIST OF TEXTBOOKS (The list may change!)

5. Z.Vincze: Pharmacy Administration. Lecture notes.

Recommended textbooks:

PHARMACEUTICAL CHEMISTRY III.

Director:  **Dr. Péter Horváth**

**First Semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures (2 hours per week)</th>
<th>Practicals (4 hours per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Antibiotics I.</td>
<td>Equipping, identification</td>
</tr>
<tr>
<td>2</td>
<td>Antibiotics II.</td>
<td>Desinfectants, chemoterapeutics</td>
</tr>
<tr>
<td>3</td>
<td>Antibiotics III.</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>4</td>
<td>Analysis of drug mixtures I.</td>
<td>Identification of drug mixtures</td>
</tr>
<tr>
<td>5</td>
<td>Analysis of drug mixtures II.</td>
<td>Identification of drug mixtures</td>
</tr>
<tr>
<td>6</td>
<td>Analysis of drug mixtures III.</td>
<td>Quantitative determination of drug mixtures</td>
</tr>
<tr>
<td>7</td>
<td>Anticancer agents</td>
<td>Quantitative determination of drug mixtures</td>
</tr>
<tr>
<td>8</td>
<td>Antiviral agents</td>
<td>Quantitative determination of drug mixtures</td>
</tr>
<tr>
<td>9</td>
<td>Lipophilicity in drug research</td>
<td>Quantitative determination of drug mixtures</td>
</tr>
<tr>
<td>10</td>
<td>Rational methods of drug design I.</td>
<td>Quantitative determination of drug mixtures</td>
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<tr>
<td>11</td>
<td>Rational methods of drug design II.</td>
<td>Quantitative determination of drug mixtures</td>
</tr>
<tr>
<td>12</td>
<td>Lead compound discovery strategies I.</td>
<td></td>
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<tr>
<td>13</td>
<td>Lead compound discovery strategies II.</td>
<td></td>
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<tr>
<td>14</td>
<td>Antihistamines</td>
<td></td>
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</tbody>
</table>

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.
Pirogenicity. Endotoxins.
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 oxidation 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 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 veterinary 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 potenciometric 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)


Practicals (4 hours per week)

Essential oil containing drugs (Lamiaceae, Asteraceae, Apiaceae)

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
Antidyshyrrhythmic 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, retinoids

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, amnestic disturbances
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

<table>
<thead>
<tr>
<th>Lectures (2 hours per week)</th>
<th>Practices (2 hours per week)</th>
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<tbody>
<tr>
<td>Global situation of communicable diseases in the world and in Hungary. Life expectancy, morbidity, mortality in Hungary.</td>
<td>Classification of communicable diseases. Disinfection and sterilisation. Laboratory investigations</td>
</tr>
<tr>
<td>Infections of Gastrointestinal and Respiratory Tract.</td>
<td>Epidemiology I. (Most important rates and indices).</td>
</tr>
<tr>
<td>Haematogen infections and infections of the skin.</td>
<td>Epidemiology II. (Methods of epidemiology, calculations: standardisation, risk).</td>
</tr>
<tr>
<td>STD. AIDS/HIV. Viral hepatitis.</td>
<td>The role of the pharmacist in primary prevention of smoking, alcohol and drugs.</td>
</tr>
<tr>
<td>New, emerging diseases. Health care in case of disasters.</td>
<td>The role of the pharmacist in healthy nutrition and required physical activity.</td>
</tr>
<tr>
<td>Acute food-borne diseases.</td>
<td>Nutrition II. (Prevention of food – borne diseases)</td>
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<tr>
<td>Water hygiene.</td>
<td>Practical aspects of water hygiene.</td>
</tr>
<tr>
<td>Air-and soil hygiene.</td>
<td>Practical aspects of air hygiene.</td>
</tr>
<tr>
<td>The health care system, quality assurance.</td>
<td>Toxicology. Radiation hygiene.</td>
</tr>
<tr>
<td>Maternal, infant child and youth health care.</td>
<td>Practical aspects of maternal, infant, child and young people hygiene.</td>
</tr>
<tr>
<td>Health promotion and health education.</td>
<td>Practical aspects of health education.</td>
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</tbody>
</table>

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:

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:
### Fifth Year

#### 9th semester (12 weeks)

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Lectures</th>
<th>Practices</th>
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<th>Examination</th>
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#### 10th semester (16 weeks)

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<th>Subjects</th>
<th>Lectures</th>
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<th>Credit Points</th>
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* COMPULSORY PRACTICAL TRAINING AND PROGRAM OF THE 5TH YEAR PHARMACY STUDENTS

Passing all examinations is the prerequisite for starting the compulsory practical training. Pharmacy students are obliged to do 6 months practical training continually or in two parts (2+4 months).

Program in the 9th semester:
1. The first part of the practical training (2 months/320 hours) has to be done in a public/community Pharmacy from July 17, 2017 to September 15, 2017. Student should ask for permission if he/she would like to do the summer practice outside of Hungary, which has to be done in a public/community pharmacy and bring an acceptance letter.
2. Study Program (12 weeks) from September 25, 2017 to December 15, 2017.
3. Examination Period (6 weeks) from December 18, 2017 to February 2, 2018.

Program in the 10th semester:
4. Second part of the practical training (4 months/640 hours) has to be done in a public pharmacy and in a hospital pharmacy (4 weeks at the same place) from January 31, 2018 to May 31, 2018 in Budapest.
5. The deadline of the defence of the diploma work is March 20, 2018.

IMPORTANT:
Pharmacy graduates are entitled to bear the title of doctor. The name of the degree is Doctor of Pharmacy (dr. pharm.)

LIST OF TEXTBOOKS (The list may change!)
2. Z. Vincze: Pharmacy Administration. Lecture Administration.

Recommended textbooks:
CLINICAL PHARMACEUTICAL CARE

Faculty of Pharmacy
University Pharmacy Department o Pharmacy Administration

Director: Prof. Dr. Romána Zelkó
Tutor: Dr. Ágnes Mézsáros

5th year term 1

Lectures
1. About clinical pharmacy
2. Pharmaceutical care
3. Individual therapy with magistral preparation
5. Clinical guidelines in the treatment of hypertension
6. Special conditions influencing drug therapy
7. Clinical bio-analytical analyses
8. Therapeutic drug monitoring, Pharmaco-genetics
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-maleficience.
The principle of beneficience.
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.)
The role of the market and that of the state in the health care system.
The concept of microallocation.
The 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 physician'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?
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;
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
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
14. Organ donation from brain-dead donors: presumed consent
15. Stages of Dying
16. Active and Passive Euthanasia
17. 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: kovacsk.katalin@gmail.com

Department:
Institute of Behavioral Sciences
Department of Sociology
NET Building, 19th, 20th floor
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:
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. Micromedix, drug information
3. Publication strategies
4. Medline 1
5. Medline 2, IPA
6. Drug information, Micromedix
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
BASIC 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:
- Strategies of drug therapy. Evidence based medicine
- Pharmacotherapy of heart failure
- Pharmacotherapy of hypertension
- Pain management
- Cancer chemotherapy: colorectal and breast cancer
- Allergic disorders, therapy of dermatitis
- Drug therapy of rheumatoid arthritis, back pain and sport injuries
- Treatment of inflammatory bowel diseases
- Drug abuse
- Contraception, drug therapy during pregnancy
- Pharmacotherapy of osteoporosis
- Treatment of urology disorders (incontinence, erectile dysfunction, benign prostate hyperplasia)

Seminars:
- Chemotherapy of common respiratory and urinary tract infections
- Therapy of ischemic heart disease and myocardial infarction
- Drug therapy of venous disorders
- Treatment of peptic ulcer disease and gastroesophagal reflux disease
- Therapy of diarrhea, constipation and irritable bowel syndrome
- Therapy of common skin disorders (acne, fungal skin infections)
- Therapy of allergic rhinitis
- Treatment of bronchial asthma and chronic obstructive pulmonary disease
- Drug therapy of anxiety and sleeping disorders
- Therapy of alcohol abuse
- Treatment of nausea and vomiting
- Therapy of neurological disorders (Parkinson’s disease and schizophrenia)
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
INSTRUMENTAL PHARMACEUTICAL ANALYSIS

Institute of Pharmaceutical Chemistry

Chromatography
Thin-layer chromatography (theory and practice) 4 hours
Gas chromatography (theory and practice) 3 hours
High pressure liquid chromatography 5 hours (theory and practice)

Spectroscopy
UV and visible spectrophotometry 9 hours
Fluorimetry 3 hours
NMR spectroscopy 6 hours
Mass spectrometry 3 hours
Infrared spectroscopy 3 hours

The course is given by teachers of the Institute of Pharmaceutical Chemistry and well-known researchers of academical institutes and the pharmaceutical industry.
The subject is offered to students who are interested in the pharmaceutical analysis. It is essential in the fields of the drug control, laboratory diagnostics, phytochemistry and pharmacokinetics.
The chromatographical as well as the spectroscopical lectures built on attained basis are also dealing with the up-to-date problems and statements of the research work.
The course is started only if candidates number at least four or five.

PHYTOTHERAPY

Institute of Pharmacognosy

3. Plants and the nervous system.
4. Plants and the cardiovascular system.
5. Plants and metabolic diseases.
6. Plants and the renal system.
7. Anti-inflammatory plants.
8. Plants and the respiratory system.
9. Plants and the reproductive system.
10. Plants and the digestive system.
11. Plants and the liver and biliary system.
12. Plants and the cutaneous system.
13. Adaptogen plants.
HEALTH INFORMATICS

Institute of Digital Health Sciences

Credit: 2
Lectures
3 hours/week

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<td>4. Case study of descriptive statistics</td>
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<td>5. ANOVA models: Student’s test, one way and multiple-way ANOVA designs</td>
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<td>6. Case study of ANOVA</td>
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<td>7. Regression analysis: correlation coefficient, one and multiple variable regression models</td>
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<td>8. Case study of regression analysis</td>
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<td>10. Case study of nonparametrics models</td>
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<td>11. Logistic model</td>
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<td>12. Case study of logistic models</td>
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<td>13. Taxonomy: clusters, factorial analysis</td>
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<td>14. Final test: solution of a data processing problem</td>
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BIOORGANIC CHEMISTRY

Institute of Organic Chemistry

Organic compounds are produced by nature in inexhaustible richness. One of the basic sources of therapeutically useful compounds is the molecular storage of the pharmacy of nature. Natural products are generally environment friendly. Their chemistry is in rapid development in our days, too.

What are the most important steps of molecular evolution in the cosmos and on our Earth? What is the origin of the chirality of life? How can natural products be isolated from the sources? How can their structure be elucidated? How can the ingenious synthetic methods of nature be imitated in laboratory? How can the chirality of natural products be transferred to synthetic drug molecules? How can the complete base sequence of the human genom be determined? These are some questions of the many others, which are tried to be answered in the special collegium.

Programme

1. Isolation of natural products (e.g. iridioids, peptides).
3. Application of NMR spectroscopy for the stereostructure of organic micromolecules (e.g. alkaloids, iridioids).
4. Sequence determination of natural polymers (polypeptides, polynucleotides, e.g. the human genom).
5. The role of the isoprene unit in the construction of terpenes carotenoids and steroids.
6. Biomimetic transformation in the chemistry of iridoid compounds.
7. Chemistry of alkaloids derived from the coupling of biogenic amines (phenylethylamine and tryptamine) with secologanin.
8. Total synthesis of natural products (e.g. vitamin B12, gingkolide).
10. Total synthesis of saccharides, sassharides in total synthesis.

BIOINORGANIC CHEMISTRY

Institute of Inorganic 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 latters 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’ desease) are touched upon. Much time will be devoted to metal complexes of antitumor activity and to those that are used in the treatment of rheumathoid 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
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.

PHYSICAL ORGANIC CHEMISTRY

Institute of Organic Chemistry

The number of registered organic compounds is well over 15 million. Innumerable basic reactions contact them. How can we find an order in this jungle of compounds and cavalcade of reactions? How can the reactions be oriented? How can they be used for synthesis of drugs and many other practically important compounds (polymers, dyestuffs, etc.)? How do energy changes direct organic reactions? How can we control the factors influencing them? Organic reactions take place in the interaction of atomic and molecular orbitals. These changes are the molecular base of life, too. Is it possible to get an insight into them by simple mathematical methods?
All these questions concern physical organic chemistry, i.e. the study of organic reaction mechanism.
Programme

1. Systematics of organic reaction mechanism according to the notation system of IUPAC.
2. The basic concepts and applications of perturbational molecular orbital (PMO) method for interpretation of reaction mechanism.
3. Energetics or organic reactions.
4. Experimental methods for investigation of reaction mechanism.
5. Factors which influence the reaction (reagents, concentration, solvent, catalyst, temperature, etc.).
6. Analysis of the basic organic reaction types on selected examples.
7. Symmetry principles in organic reactions.
8. Orbital interactions as the molecular base of life processes.

COMPUTATIONAL CHEMISTRY AND QSAR METHODS

Institute of Organic Chemistry

1. Computational chemistry and molecular modeling: topics, scope and limits.
2. Quantum chemistry: basic principles and methods.
3. Molecular mechanics and dynamics.
5. Secondary interactions: molecular basis of receptor-ligand interactions.
6. QSAR methods: prediction of biological activity.
7. Applications and practice.

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

Department of Pharmaceutics
Head: Dr. István Antal

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.

PHARMACOINFORMATICS

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
<table>
<thead>
<tr>
<th>Lectures</th>
<th>References</th>
<th>Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. DATA TYPES, CLINICAL DATA-BASES, DATABASE MODELS, AND MEDICAL IMAGES</td>
<td>TERMINING, CODING AND GROUPING SYSTEMS IN HEALTH by Rudiger KLAAR, Document 416 DATABASES, SPREADSHEETS AND WORD PROCESSING IN HEALTH by Francesco PINCIROLI, Luisa PORTONI Document 401</td>
<td>2</td>
</tr>
<tr>
<td>3. THE THERAPEUTIC PROCESS AND THE MEDICAL RECORD</td>
<td>HEALTHCARE RECORD by Jos AARTS Document 407</td>
<td>2</td>
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<tr>
<td>4. HEALTH CARE INFORMATION SYSTEMS</td>
<td>OPERATIONAL USES OF HOSPITAL INFORMATION SYSTEMS by Marie-Christine JAULENT, Document 405 ARCHITECTURES IN HEALTH by Sergio TORRES, Jose TORRES Document 422</td>
<td>2</td>
</tr>
<tr>
<td>5. COMPUTER-BASED SUPPORT FOR PHARMACISTS (AN OVERVIEW)</td>
<td>EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990</td>
<td>2</td>
</tr>
<tr>
<td>6. REPRESENTING DRUG-RELATED KNOWLEDGE (classification of drugs, describing drug properties, drug informationsystems, examples</td>
<td>EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990</td>
<td>2</td>
</tr>
<tr>
<td>7. HOSPITAL PHARMACY AND DRUG-USE MONITORING SYSTEMS (informatics of public and hospital pharmacies, patient education</td>
<td>EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990</td>
<td>2</td>
</tr>
<tr>
<td>8. INFORMATION RESOURCES AND THE INTERNET, KNOWLEDGE COUPLERS EVIDENCE-BASED DRUG THERAPY (pharmacoconomics and outcome research planning therapeutic protocols)</td>
<td>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</td>
<td>2</td>
</tr>
<tr>
<td>9. INFORMATICS OF DRUG PRESCRIPTION</td>
<td>EXPERT SYSTEMS AND ARTIFICIAL INTELLIGENCE IN HEALTH by Jana ZVAROVA, Jan TALMON Document 424 COMPUTER-AIDED DIAGNOSTIC SUPPORT by Ann OOSTENDORP, Document 408</td>
<td>2</td>
</tr>
</tbody>
</table>

Total: 20

**PRACTICES:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>10 hours</th>
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<tbody>
<tr>
<td>1. Informatics of high throughput screening (METABOL·EXPERT)</td>
<td>2</td>
</tr>
<tr>
<td>2. Drug information systems (Micromedex and Internet resources) Resources of evidence based medicine (Cochrane library)</td>
<td>2</td>
</tr>
<tr>
<td>3. Analysis of dose response data in pharmacology (PROBIT analysis) Evaluation of clinical trial data (analysis of variance)</td>
<td>2</td>
</tr>
<tr>
<td>4. An antibiotic advisor UTI</td>
<td>2</td>
</tr>
<tr>
<td>5. A drug-dosage planning assistant USC PACK</td>
<td>2</td>
</tr>
</tbody>
</table>

Total: 10
CLINICAL PHYSIOLOGY LABORATORY MEASUREMENTS

GYKIKKFVE1A

Elective course for pharmacy students in the 4th and 5th years
The purposes of the course 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:

1. Theoretical introduction to the bases of measurement techniques (lecture)
2. Introduction to the uses of instruments and data acquisition software applied during the course (laboratory practice)
3. Scientific and diagnostic measurement techniques for studying the electrophysiology of motor nerves, neuromuscular transmission and skeletal muscle (lecture)
4. 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. (laboratory practice)
5. Electrophysiology of the heart, cardiac arrhythmias. Regulation of arterial blood pressure under physiological and pathophysiological conditions. The characteristics of the pulse wave propagation (lecture)
6. Measurement of pulse wave velocity. Recording and analysis of a 12-lead ECG. Demonstration of pathological ECG recordings. (laboratory practice)
7. Mechanical properties of the respiratory system under physiological conditions and in respiratory diseases. Adaptation of the cardiorespiratory system to physical exercise (lecture)
8. Spirometry. Studying the circulatory and respiratory adaptation responses during physical exercise (laboratory practice)
9. Regulation of carbohydrate metabolism and its disorders (lecture)
10. Oral glucose tolerance test, determination of HbA1c level, analysis of normal and pathologic glucose tolerance curves (laboratory practice)
11. Reflexes of the somatic nervous system. Function of the vestibular system. Regulation of body position under physiological conditions and in neural disorders (lecture)
12. Neurological examination techniques: examination of motor reflexes and vestibular function, EOG (laboratory practice)
13. Lab retake.
14. Consultation, practice for the practical exam

Prerequisite: Successful completion of Physiology II course and Physiology final exam. Students who meet the following criteria will receive 2 credit points: attendance of at least 6 lab practices and 5 theoretical classes; successful semifinal exam (including a practical part). Summaries of the lecture material and laboratory manuals will be electronically provided by the institute.
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.
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:

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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, infringement 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

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<tr>
<td>C: Dr. Santiago Ramon Y Cajal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pléh Csaba 3.</td>
</tr>
</tbody>
</table>

Dr. Magyar Kálmán
<table>
<thead>
<tr>
<th>3. The addiction model of eating disorders</th>
<th>Kodály Zoltán 3.</th>
<th>C: Koessler János</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: Pruzsinszky József</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Family therapy in eating disorders</td>
<td>Pálinkás József (TDK)</td>
<td>Toró Tibor 1.</td>
</tr>
<tr>
<td>C: Wigner Jenő</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C: Réthelyi Miklós</td>
<td></td>
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- 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 electronic 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 occurent 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:
... 
...

The outside and inside covers of the diploma work should follow the next patterns:

**Outside cover:**

DIPLOMA WORK

(The NAME OF THE STUDENT)

Budapest
year
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 fullfill 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 (e.g.: less than 50000 characters) or have not been submitted until the deadline can be corrected, completed or resubmitted after an appropriate time (e.g.: 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.
Disclaimer Statement

Undersigned……………………………………… (1.) time of birth……………………… Neptun code………………
fourth year student of group no. ……at Semmelweis University, Faculty of Dentistry hereby volun-
tarily resign of the elaboration of the thesis-topic in favour of ……………………………………time 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 "Lea-
vying 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

Classification 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 2017/2018 academic year

<table>
<thead>
<tr>
<th>Medicine</th>
<th>USD 9,100 / semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentistry</td>
<td>USD 9,100 / semester</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>USD 6,000 / semester</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Medicine</th>
<th>USD 9,320</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(USD 9,100 tuition fee + USD 220 registration fee</td>
</tr>
<tr>
<td></td>
<td>registration fee is payable once during the studies)</td>
</tr>
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</tr>
<tr>
<td>Pharmacy</td>
<td>USD 6,220</td>
</tr>
<tr>
<td></td>
<td>(USD 6,000 tuition fee + USD 220 registration fee</td>
</tr>
<tr>
<td></td>
<td>registration fee is payable once during the studies)</td>
</tr>
</tbody>
</table>

Before February 1

<table>
<thead>
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<th>Medicine</th>
<th>USD 9,100</th>
</tr>
</thead>
<tbody>
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<td>USD 9,100</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>USD 6,000</td>
</tr>
</tbody>
</table>

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 that this fee is subject to change!

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 200 (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:**

- **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.

- **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.
**STUDENT SERVICE CENTER**

YES – Your Education Service Co.
Address: H-1241 Budapest, P.O. Box 179.
E-mail: info@sth.hu
application@sth.hu
Phone: (+36-30) 312-4663

**OTHER MEDICAL UNIVERSITIES IN HUNGARY**

**University of Szeged, Hungary**
H-6720 Szeged, Dugonics square 13.
Phone: (+36-62) 544-000
Fax: (+36-62) 546-371
Foreign Students’ Secretariat
Head: Andrea Lehocki-Balog
office.fs@med.u-szeged.hu
Tel.: + 36 62 545-458

**University of Pécs, Medical School**
H-7624 Pécs, Szigeti út 12., HUNGARY
**General Medicine in English**
**Dentistry in English**
**Pharmacy**
Klára SOMODI (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

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 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.)*
- a revenue stamp of HUF 1,000 (okmánybélyeg), which can be obtained at a post 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”):

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>8:30 am to 1:00 pm</td>
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<tr>
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</tr>
<tr>
<td>Friday</td>
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</tr>
</tbody>
</table>

E-mail: bpkir5@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32, #230 from KELETI – you have to get off at the bus stop named ‘Szegedi út’.

602
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
• 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
• revenue stamp for 18 000 Forints (okmánybélyeg from the Post Office)
• proof of funds to cover your expenses
• certification of valid medical insurance coverage in Hungary
• school certificate 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 – Student Day
Thursday 8:30 am to 1:00 pm
Friday 8:30 am to 12:00
E-mail: bpkir5@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32, #230 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 extension period you are applying for (about 15 months)
- residence permit application form
- address registration form (*lakcímbjelentő*) 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
- revenue stamp for 10.000 Forints (*okmánybélyeg* from the Post Office)
- proof of funds to cover your expenses
- school certificate from the secretariat of your college / university
- certification of valid medical insurance coverage in Hungary (you can get it from your school/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 – Student Day
- Thursday 8:30 am to 1:00 pm
- Friday 8:30 am to 12:00
- E-mail: bpkir5@bah.b-m.hu (It is possible to book an appointment in advance.)

How to get there: Take buses #20E, #30, #30A #32, #230 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 #3 (“3. 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”):**

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**E-mail:** bpkir5@bah.b-m.hu (It is possible to book an appointment in advance.)

**How to get there:** Take buses #20E, #30, #30A #32, #230 from KELETI – you have to get off at the bus stop named ‘Szegedi út’.
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 form for coming to Hungary for Study Purposes
- 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
- proof of payment of the tuition fee* 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.

REDUCTION OF TUITION FEE

1. Students may apply for a reduction after completing the first semester of the first academic year if their semester weighted average results were above 4.51. From the third semester the reduction is granted under an extra condition: from the end of the second semester, all their semester weighted average results have to be continuously above 4.51, including the weighted average of the second semester. The reduction is 10% of the tuition fee with average results above 4.51 and 15% with average result of 5.00.

Students may apply for a reduction after completing each semester on condition they meet the above requirements, and in case they have completed all the obligatory semester subjects, and gained minimum 20 credits in each semester.

No reduction is given in case of exemption from one or more subjects (except from PE).

No reduction is given during retaken semesters on account of subjects already completed.

Students eligible for the tuition fee reduction pay with 10-15% reduced tuition fee in the next semester.

Application deadlines: September 15th – first semester
February 15th – second semester

2. Students taking just one normal, exempted “FM” or one exam course “CV” in a semester pay 50% of their semester tuition fee. (Note: The permission can be granted upon the student’s written request that has to be handed in at the English Secretariat before starting the semester!)

3. Tuition fee for the 6th year:
a. In case the student completes more than the compulsory 3 weeks of clinical rotations at Semmelweis University, he/she has to pay 100% of the tuition fee valid in that academic year.
b. In case the student completes the 2 weeks compulsory Pediatrics rotation and 1 week Transfusion course at Semmelweis University and completes the remaining of the rotations abroad, he/she has to pay 80% of the tuition fee valid in the academic year. The relevant acceptance letters should be handed in latest until December 15, 2016. Otherwise the student is not entitled for the reduction! Please write a letter of request addressed to the Academic Program Director when applying for the 20% reduction!

4. Students working as teaching assistants (TA-s) may apply for a reduction – USD 300/ semester in their tuition fee for the semester that follows the teaching assistance course. The following criteria will be taken into account when deciding whether a student is entitled to tuition fee refund for their Teaching Assistance (TA) work:

Your weighted average from the previous school year (indicated as 'Average’ in your Neptun account and ‘Weighted average’ on your transcript!! See definition at FAQ-s.) must be at least 3.51

You must have received either an ‘Excellent’ (5) or ‘Good’ (4) as the final result for the subject relating to the TA course you take.

The departments that hold TA courses will provide the English Secretariat with a list of those students who successfully complete the course. If the completion of the course has been officially considered and accepted by the English Secretariat and the student has met the above requirements, then they may be given the reduction in the next semester’s tuition fee (they can pay $300 less.) Tuition fee reduction is not automatic! Taking the TA course does not negate the student’s responsibility to make the scheduled tuition fee payment in full by the appropriate deadline. Students are only entitled to receive their refund after they have been officially notified in writing by the English Secretariat.

requests in any of the above matters will be accepted after graduation!

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."


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


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 office 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

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):
– 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 OKLEVLÉ, BIZONYÍTVÁNY KÜLFÖLDÖN TÖRTÉNŐ ELISMERTETÉSÉHEZ
SZÜKSÉGES HATÓSÁGI BIZONYÍTVÁNY KIADÁSA IRÁNTI KÉRELEM

Alulírott ................................................................. (név) kérem, hogy oklevél/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, szülésnő 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, szülésnő 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!):

– Útlevél/személyi igazolvány fénymásolata
– Lakcímkártya fénymásolata
– Bizonyítvány/oklevél fénymásolata
– Igazgatási szolgáltatási díj meg fizetését igazoló csekkszelvény/átutalási bizonylat
– Eredeti hatósági erkölcsei 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 kérés, megjegyzés:

Alulírott nyilatkozom, hogy a kérelemben feltüntetett adatok a valóságnak megfelelnek és
személyes adataim kezeléséhez hozzájárulok.

Kelt: ....................................................................................................................

Az oklevél, bizonyítvány külföldön történő elismertetéséhez szükséges hatósági bizonyítvány
kiadása iránti kérelem
# EXTRA CURRICULAR FEES

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>First retake of a semi-final or final examination&lt;br&gt;second and third retakes</td>
<td>free&lt;br&gt;2,000 HUF / 3,000 HUF (students of dentistry)</td>
</tr>
<tr>
<td>2</td>
<td>Uncertified absence from the exam – Examination and Studies Regulations §19/5.</td>
<td>4,000 HUF (students of medicine)</td>
</tr>
<tr>
<td>3</td>
<td>Retake of the General Board Examination (each part of the GBE)</td>
<td>8,000 HUF</td>
</tr>
<tr>
<td>4</td>
<td>Default charges:&lt;br&gt; a) delay of registration (when the tuition fee is paid)&lt;br&gt;– read more details about the registration requirements under the next title “Important”</td>
<td>5,000 HUF&lt;br&gt;5% of all-time minimum wage in Hungary</td>
</tr>
<tr>
<td></td>
<td>b) failing to hand in the diploma work on time&lt;br&gt;– two weeks postponement&lt;br&gt;– every plus week</td>
<td>3,000 HUF&lt;br&gt;2,000 HUF/week</td>
</tr>
<tr>
<td>5</td>
<td>Failing to report any change in data registered in the Neptun System</td>
<td>5% of all-time minimum wage in Hungary</td>
</tr>
<tr>
<td>6</td>
<td>Copy of the diploma (per number of copies and languages)</td>
<td>4,000 HUF/each</td>
</tr>
<tr>
<td>7</td>
<td>Copy of the lecture book (index)</td>
<td>6,000 HUF</td>
</tr>
<tr>
<td>8</td>
<td>Official transcript&lt;br&gt;2,000 HUF/each (the old type: 500 HUF/page)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Failing to keep any deadlines:</td>
<td>5% of all-time minimum wage in Hungary</td>
</tr>
</tbody>
</table>

## IMPORTANT

### Registration requirements

Please note that the date of registration for the first semester is between **4 - 8 September, 2017** and for the second semester is between **29 January - 2 February, 2018**. 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.

### Late payment

Please keep it in mind that either failing to pay your tuition fee or having incomplete payment regardless the amount until the given deadline, you will have to pay a **default charge**: **USD 100 within 1 week after the deadline, USD 200 within 1 month after the deadline and USD 500 afterwards, but latest until the beginning of the examination period.** The late payment fee must be paid together with the tuition fee to the same bank account. Failing to fulfill the above conditions the student’s legal relationship will be intermitted, the student will not be allowed to continue his/her studies and sit for the exams in the given semester. He/She can register again only in the next academic year.

### Late registration

If due to some reason, you cannot register until 8 September, 2017 and 2 February, 2018, but you have already paid your tuition fee, you will have to pay **HUF 5,000 for late registration**.

**Non-receipt of a statement or lack of written notification of the tuition fee debt does not negate the student’s responsibility to make scheduled payments/to pay by the published deadline.**

**All costs listed are subject to change!**
EXTRA CURRICULAR FEES
AFTER GRADUATION

1. Diploma duplicates (copies) 4,000 HUF/each
2. Diploma supplement
   first copy free
   second or more (in form of transcripts) for students graduating
   from Medicine 3,500 HUF
   second or more (in form of transcripts) for students graduating
   from Dentistry and Pharmacy 3,000 HUF
3. Postal charges
   postal order available at the secretariat

All costs listed are subject to change

STUDENT CARD

How to order a new student card

1. To obtain a new student card, you must first have an official photo taken and provide your official signature at „Központi Okmányiroda” (Central Document Office) Address: 13th District, 110 – 112 Visegrádi utca.
   You must take your residence permit and passport with you to the Központi Okmányiroda.
2. There you will be given a NEK (Nemzeti Egységes Kártyarendszer) datasheet. This form has a 16-character identification number in the upper right corner.
3. Log on to your Neptun site, go to ‘Administration’ and click on ‘Student Card request’ in the drop-down list.
   * A smiley:) will warn you not to add the hyphens when typing in your 16 character NEK identifier into yellow text box!
3/a. Click on the grey tab ‘Add new’ and type your 16 character NEK identifier into the blank called ‘NEK azonosító’
3/b. then choose ‘Demand type’. Check that your permanent (home) address is correct and shows up in the ‘Street, number’ text box. Please note that you will also need your temporary (Hungarian) address written in the Neptun. This will serve for your temporary, A4-format student card you will receive at the English Secretariat.

The plastic card takes about 6-8 weeks to be produced after being ordered from the English Secretariat. You will need to use the temporary, A4-format certificate until you receive your official card. Please note that the temporary certificate is valid only for 2 month, after which time it must be renewed.
**FREQUENTLY ASKED QUESTIONS - FAQ-s**

- **What are the Foreign Students’ Secretariat’s office hours?**
  
  Where: EOK (Basic Medical Science Center) 37-47 Túzoltó 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.


- **Where do I get the information and forms necessary for my studies?**
  

- **How do I get my class schedule for the next term?**
  
  [http://ora.semmelweis.hu/tervezet/](http://ora.semmelweis.hu/tervezet/)

- **How do I get my class schedule for the current term?**
  
  [http://ora.semmelweis.hu/aktualis/](http://ora.semmelweis.hu/aktualis/)

- **How do I get my class schedule for the previous term?**
  
  [http://ora.semmelweis.hu/regi/](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?**

- **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?**
  All continuing students will remain on the same fee rate as when they first enrolled in the program. Students who take a semester off keep their original tuition fee. Transfer students pay the highest tuition fee in force in the actual academic year.

- **If I haven’t paid my tuition fee by the due date will I be charged a late fee?**
  Yes. In order to avoid any late fees, your balance must be fully covered. The amount of the late fee is indicated in the Calendar.

- **What are the consequences of not paying the tuition fee?**
  Students who have not paid their tuition in full by the published deadline will have their exam registrations put on hold. Students will not be allowed to register for exams until their tuition and fees are paid; there will be no exceptions.

- **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 no later than the above dates. Students will not be allowed to register for exams until their tuition and fees are paid; there will be no exceptions.

- **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.

- **Do I qualify for a tuition reduction? How do I know if I am eligible for receiving a refund?**
  Students whose average reaches a certain level are eligible for a tuition reduction under the following conditions:

  Students may apply for a reduction after completing the first semester of the first academic year if their semester weighted average results were 4.51. From the third semester the reduction is granted under an extra condition, if, from the end of the second semester, all their semester weighted average results were continuously above 4.51. The reduction is 10% with average results above 4.51 and 15% with average result of 5.00.

  Students may apply for a reduction after completing each semester on condition they meet the above requirements, and in case they have completed all the obligatory semester subjects, and gained minimum 20 credits in each semester.

  No reduction is given in case of exemption from one or more subjects (except from PE).

  No reduction is given during retaken semesters on account of subjects already completed.

  Students eligible for the tuition fee reduction pay with 10–15% reduced tuition fee in the next semester.

  Application deadlines:  September 15th – first semester
  February 15th – second semester

  **Note:** the weighted average is calculated.

  For further reductions please see under title *Reduction of Tuition Fee*.

- **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.

  $\sum: 27 + 12 + 20 + 15 + 24 + 15 + 10 = 123$

  Number of credits earned in the semester: 30

  Weighted average from the first semester: $123/30 = 4.1$
• **What is the difference between weighted average and cumulative weighted average?**
The weighted average and cumulative weighted average are based on grades given for each course taken and the number of credit hours specified for those courses over the specified period of time (one term for weighted average; more or all terms for cumulative weighted average). The difference between the two is that *weighted average* is calculated for one semester of the year and *cumulative weighted average* is based on two or more semesters of the individual.

• **What if I can’t attend an exam or class at the time scheduled?**
Students are required by university regulations to present written justification stating the reasons of their absence. Upon returning to school after an absence, students should report to the department’s office and present a doctor’s note, if their absence was caused by medical reasons. Excuses not provided within 3 days after the missed exam or class will result in the absence being marked as an unexcused absence.

It should be noted that the student will be recorded absent even if s/he is absent for a valid reason such as sickness. In the case of absence with a valid reason, an official document that proves the reason of absence should be provided. The department has the right to reject any document of questionable credibility. If you are sick and cannot take the exam or class, you should telephone your tutor immediately and leave a message for the department office even if this is not the first day of your absence.

• **Do I have to pay a fine if in case of my absence from an exam remains uncertified?**
Yes. Please see „Extra curricular fees” in the Calendar

• **How do I pay my missed exam fees online?**
Go to Finances/ Payment
Transcribe item
Payment titles: Service
Service type: Missed exam fee (HUF 4,000)
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 (HUF 2,000)
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. Please see „Extra curricular fees” in the Calendar

• **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/](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 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.
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
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, Ülloi út 26. Room 202

Contact Information

Ms. Katalin F. Tóth
ERASMUS Institutional Coordinator
Tel: (+36 1) 459-1500, ext. 55827
Fax: (+36 1) 459-1588
Email: erasmus@semmelweis-univ.hu

Ms. Márta Honvéd
Coordinator Assistant
Tel: (+36 1) 459-1500, ext. 55828
Fax: (+36 1) 459-1588
Email: erasmus@semmelweis-univ.hu

SEMMELWEIS ALUMNI

http://alumni.semmelweis.hu/eng/semmelweis-alumni

Mission Statement

Semmelweis Alumni’s mission is to help build long-lasting and mutually beneficial relationships between the University and its current students, alumni, faculty and researchers.

Membership

To become a member of Semmelweis Alumni, you need to complete a registration form. Registration is free of charge and memberships remain valid indefinitely.
You may become a member if you meet any of the following criteria:

- You are currently a student at Semmelweis University and have successfully completed at least four semesters;
- You are a former student of Semmelweis University or one of its legal predecessors and successfully completed at least four semesters;
- You are currently a faculty member or researcher at Semmelweis University
- You were formerly a faculty member or researcher at Semmelweis University

**ISAS – INTERNATIONAL STUDENT ASSOCIATION OF SEMMELWEIS**

[http://isas.hu/](http://isas.hu/)

ISAS 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 called ISAS Review which is full of information for the students and also from students
5. and many more…

ISAS 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)


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.lista_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.
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 dozens of staff members have the opportunity to take part in 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 in a daily basis and we accept several groups of students from different countries in 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

Address: H-1088 Budapest, 17 Vas Street

Phone: +(36-1)486-5910
Fax: +(36-1)486-5913
E-mail: student@se-etk.hu
Home Page: http://etk.semmelweis.hu/english

Dean  Prof. Zoltán Zsolt Nagy, Ph.D., Habil., D.Sc.
Vice Deans  István Vingender, Ph.D. – Academic Affairs
Prof. János Rigó, M.D., Ph.D., D.Sc. – Clinical Affairs
Gabriella Dörnyei, Ph.D. – Scientific Affairs

Director of the English Language Programmes  István Vingender, Ph.D.

Dean’s Office

Ms. Marianna Kakuk  – Head of Dean’s Office
Phone: +(36-1)486-5912 e-mail: kakuk.m@se-etk.hu

Mr. Benedek Horváth  – Secretary
Phone: +(36-1)486-5911 e-mail: horvath.benedek@se-etk.hu

Ms. Virginia Berger  – Coordinator of International Affairs
Phone: +(36-1)486-5917 e-mail: berger.virginia@se-etk.hu

Ms. Ágnes Szabó  – Coordinator of Short, Intensive Training Programs
Phone: +(36-1)486-5845 e-mail: agnes.szabo@se-etk.hu

Foreign Students’ Secretariat

Mr. Árpád Leel-Őssy  – Coordinator
Phone: +(36-1)486-5905 e-mail: leel.ossy.arpad@se-etk.hu
Fax: +(36-1)486-5913 room: 129

Ms. Éva Sütő  – Erasmus Coordinator
Phone: +(36-1)486-5909 e-mail: suto.eva@se-etk.hu
Fax: +(36-1)486-5913 room: 129

Mr. Mátyás Magyaros  – Administrator
Phone: +(36-1)486-5909 e-mail: magyaros.matyas@se-etk.hu
Fax: +(36-1)486-5913 room: 129
Information about the B.Sc. and M.Sc. programmes

Training system

Hungary, as a member of the European Union, belongs to the unified European Higher Education Area, which in principal follows the multi-cycle (bachelor, master and doctorate) training system. In this system it is much easier for students, lecturers and researchers to travel and build international relations, moreover, as citizens of the European Union they can continue their studies and plan their future as employees or entrepreneurs in any of the member states. These opportunities open up a wider field for non-European citizens studying in Hungary as well, since the possibilities of internal mobility inside the unified Europe are based on the training channels and close relationships between countries, in the labour market and among institutions.

PROGRAMMES OF THE FACULTY

I. Bachelor of Science (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 BSc Programme**

Graduates are able to approach professionally and safely patients or victims in prehospital emergency care (oxyology), able to perform triage, on an individual basis and 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. They 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, English)

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.
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 cooperation 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
Intensive Nursing
Emergency Nursing
Geriatric Nursing
Community Nursing
Perioperative 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.
Teacher of Health Sciences and Health Care Msc Training 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

- Intercultural Nursing (English)
- Addictology Consulting (Hungarian)
- Wellness Management (Hungarian)
- Acute Patient Care (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)

Programmes planned to be launched

BSc programme
Nursing and Patient Care BSc Programme
Specialized programme: Voice, Speech and Swallowing Therapist (Hungarian)
DEPARTMENTS

INSTITUTE OF APPLIED HEALTH SCIENCES

Department of Nursing

Address
H-1088 Budapest, Vas u. 17., room 152
Phone: +(36-1)486-5936
E-mail: apolas@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Professor Zoltán Balogh, RN, PT, M.Sc., Ph.D.

Contact person
Mrs. Veronika Rajki Ph.D
Phone: +(36-1)486-5836 e-mail: rajki.veronika@se-etk.hu

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 is 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 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 currency 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

Address
H-1088 Budapest, Vas u. 17., room 144
Mailing address: H-1085 Budapest, Úllói út 26.
Phone: +(36-1)486-4890
Fax: +(36-1)486-4891
E-mail: szuleszeti.tanszek@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Professor János Rigó, M.D., Ph.D., D.Sc.

Contact person
Dr. Eszter Borján Ph.D.
Phone: +(36-1)486-4893 e-mail: borjan.e@se-etk.hu

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

Address
H-1088 Budapest, Vas u. 17., room 305
Phone:  +36-1)486-5980
Fax.:  +36-1)486-5981
E-mail.:  fizioterapia@se-etk.hu
Website:  etk.semmelweis.hu

Head of Department
Professor Dr. Horváth Mónika, Ph.D.

Contact person
Ms. Zsuzsanna Gerencsér
Phone:  +36-1)486-5984  e-mail: gerencserzs@se-etk.hu

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 for consists of 240 credits, which corresponds to the requirements of a Bachelor’s degree. The Department also offers the 3-semesters 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 1th 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 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:
- treatment options of TMJ dysfunctions with physiotherapy
- the biomechanical characteristics of standing stability and balance retention, 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 D3 method.

Division of Physical Education

Contact person:
Head: Gábor Soós
Phone: +(36-1)486-5850 e-mail: testnev@se-etk.hu

The Division of Physical Education teaches the 4-semesters 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

Address
H-1088 Budapest, Vas u. 17., room 39
Phone: +(36-1)486-4820
Fax: +(36-1)486-4830
E-mail: dietetika@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Professor Dr. Katalin Tátrai-Németh, Ph.D.

Contact person
Dr. Erzsébet Pálfi
Phone: +(36-1)486-4826 email: palfie@se-etk.hu

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 dieticians 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 dietetitians. 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 “PORGROW” 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 ensur-
ing 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 Dieticians (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 Dietoterapic Interventions
- Innovation in public catering
- Disease Specific Nutrition Therapy and Communication Method
- Examination of nutrition and nutritional status of 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 Dieticians, 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

Address
H-1088 Budapest, Vas u. 17., room 148
Phone:  +(36-1)486-5840,
Fax:  +(36-1)486-5841
E-mail:  oxiologia@se-ETK.hu
Web: etk.semmelweis.hu

Head of Department:
Associate Professor Dr. Péter Kanizsai, Ph.D., DEAA

Contact person:
Associate Professors
Dr. Péter Kanizsai
Phone: +(36-1)486-5842  e-mail: kanizsai.peter@se-ETK.hu
Dr. István Hornyák
Phone: +(36-1)486-5842  e-mail: hornyaki@se-ETK.hu

Background
Oxyology – the science of rapid intervention as described by the famous Hungarian physician Aurel Gabor is a specialty that is 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.

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.

We have started a multi-centre research programme on biomarkers involving Hungarian, Slovenian and German centres.

The Department manages its tasks with four full-time members and a number of highly qualified consulting teachers. Practical teaching is organized in 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 opening soon and caring for the population of approximately 800,000.
- 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.
- We offer a possibility of doctoral training for nurses, paramedics and physicians possessing a university degree.
• Students can join the School of PhD Studies offering participation and thesis work on “Point-of-care technologies in emergency medical care”.
• An MSc training programme targeting the intrahospital emergency care is to start soon, most likely in 2018, resulting in the qualification of advanced practice nurses (APN), those capable health care professionals who work in the emergency departments under the supervision of the lead physician.
• We have launched a monthly meeting named OxyNox for trainee and graduate paramedics. This event is held in the Vas utca building where a well-known representative of prehospital care is invited as guest speaker followed by case discussions from everyday practice.
• The Paramedic Day is organised each May where students demonstrate their practical skills during a competition and it is also a great time to get together and spend some happy hours with no stress.

Research
PhD research topics:
• Point of Care technologies in emergency medical care

Students’ Scientific Association research topics:
• Acute Coronary Syndrome
• First aid training
• Pain relief
• Airway management
• Rescue direction
• Position and activities of paramedics in the Emergency Department
• Care of the polytrauma patients
• Shock management
• Mental aspects of rescue/emergency work
• Complex cardipulmonary 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

Address
H-1088 Budapest, Vas u. 17., room 245
Phone: +(36-1)486-4840
Fax: +(36-1)486-4845
Email: csaladgondozas@se-etk.hu
Website: etk.semmelweis.hu

Head of Department:
Associate Professor Dr. Somogyvári Zsolt

Contact person:
Professor László Szabó, M.D., Ph.D., med. habil.
Phone: +(36-1)486-4840 e-mail: szabo.laszlo@se-etk.hu

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

Address
H-1088 Budapest, Vas u. 17., room 126
Phone: +(36-1)486-4870
Fax: +(36-1)486-4861
E-mail: epidemiologia@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Professor Dr. István Barcs, CSc.

Contact person
Professor Dr. István Barcs, CSc.
Phone: +(36-1)486-4862 e-mail: barcsi@se-etk.hu

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

**Department of Clinical Studies**

**Address**
H-1088 Budapest, Vas u. 17., room F/9  
Mailing address: H-1085 Budapest, Úllói út 26.

Phone: +(36-1)486-5970  
Fax: +(36-1)486-4860  
E-mail: gadok@se-etk.hu  
Website: egtud.klinikai@se-etk.hu

**Head of Department**
Professor Dr. Klára Gadó, Ph.D., M.D.

**Contact person**
Professor Dr. Klára Gadó, Ph.D., M.D.  
Phone: +(36-1)486-5970  
e-mail: gadok@se-etk.hu

**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

Address
H- 1088 Budapest, Vas u. 17., room 20
Mailing address: H-1085 Budapest, Úllói út 26.
Phone: +(36-1)486-5855
Fax: +(36-1)486-5858
E-mail: szemeszeti.tanszek@se-etk.hu
Web: etk.semmelweis.hu

Head of Department
Associate Professor Dr. Illés Kovács M.D., Ph.D.

Contact person
Ms. Kata Réz e-mail: kata_rez@se-etk.hu Phone: +(36-1)486-5858
Ms. Beáta Tapasztó, M.D. e-mail: tapaszto.beata@se-etk.hu

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

Address
H-1088 Budapest, Vas u. 17., room 348
Phone: +(36-1)486-5960
Fax: +(36-1)486-5961
E-mail: kepalkoto@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Associate Professor Attila Doros M.D., Ph.D.

Contact person
Associate Professor Attila Doros M.D., Ph.D.
36-(1)486-4916 e-mail: doros.attila@se-etk.hu

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 “Information 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

Address
H-1088 Budapest, Vas u. 17., room 343/A
Phone: +(36-1)486-4921
Fax: +(36-1)486-4912
E-mail: pszichologia@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Associate Professor Mária Hoyer, Ph.D.

Contact person
Ms. Mária Hoyer
Phone: +(36-1)486-4921 e-mail: hoyerm@se-etk.hu

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:

- **Basic of psychology** – theoretical course including general psychology, developmental psychology, theories of personality.
- Communication and self-development – We use structured exercises to develop skills in the following field: 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 dysfunction; and improvement of the health care system and the formulation of health policy. Health psychologists’ fields of work: Behavioral risk factors/"pathogens" (possibilities of intervention for correction of risk behavior) Behavioral health preservation / behavioral „immunogenic”. Making research of what are the views, opinions, attributions 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
The main profile of the Division of Applied Pedagogy 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

Address
H-1088 Budapest, Vas u. 17., room 325
Phone: +(36-1)486-4919
Fax: +(36-1)486-4912
E-mail: addiktologia@se-etk.hu
Web: etk.semmelweis.hu

Head of Department
Professor József Rácz, M.D., Ph.D., DSc.

Contact person
Mr. Máté Kapitány-Fövény Ph.D.
Phone: +(36-1)486-5990 e-mail: kapitany.foveny@se-etk.hu

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**

**Address**

H-1088 Budapest, Vas u. 17., room 345  

Phone: +(36-1)486-4940  
Fax: +(36-1)486-4942  
Email: morfologia@se-etk.hu  
Website: etk.semmelweis.hu

**Head of Department**

Professor Dr. Gabriella Dörnyei, Ph.D.

**Contact person**

Dr. Judit Kiss, Ph.D.  
Phone: +(36-1)486-4945  e-mail: kissj@se-etk.hu

**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
- Current issues of radiobiology
- The genetic basis of muscle disorders
- Trends in modern biotechnology
- Functions of hormone receptors: scientific research and clinical practice, health and disease
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
- Spiritual resources and healing (The effect of hypnosis as an adjunctive treatment of intermediate and high risk breast cancer patients on survival, immune functions and quality of life)
- Stem cells: prospects and challenges
- Investigation of serum biomarkers for prediction of late side effect of ionizing radiation
- Determination of potential targets for intervention in radiation-induced cardiovascular disease
- HER-2 oncogen amplification, chromosome 17 and DNA ploidy status in synovial sarcoma
- Signal transduction pathways in maternal-fetal interactions in normal and complicated pregnancies
- A possible model of venous varicosity in rats
- Role of angiotensin II in vascular remodeling
- 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

Department of Social Sciences

Address
H-1088 Budapest, Vas u. 17., room 332
Phone: +(36-1)486-4910
Fax: +(36-1)486-4912
E-mail: tarstud@se-etk.hu
Website: etk.semmelweis.hu

Head of Department
Associate Professor Judit Helga Feith, Ph.D.

Contact person
Associate Professor Judit Helga Feith, Ph.D.
Phone: +(36-1)486-4910 email: h.feith@se-etk.hu

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. 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 New Medicine, Development and Financing, Central European Studies, Kaleidoscope – Journal of History of Culture, Science and Medicine.

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, Management of Health Care Organizations, Social Norms in Health Care, Medical Profession and Ethos, 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 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). According to the plans of the Department, from September of 2017 the full time English language programme will start, as well. 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 four ‘Professional Days on Teaching and Research Methodologies’ so far. Most of our staff has experiences in teaching in abroad, which has broadened our perspectives and made us more conscious about the approaches we apply. Many of us have participated as teachers, tutors in ERASMUS intensive programs in numerous foreign universities and we ourselves had coordinated an IP titled: Interdisciplinary Training on Social Inclusion in three different countries.

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 been organized the 5th Professional Day and Conference on Patient Rights. The aim of the conference was to examine the current ethical and legal issues arising
in the everyday practice of health care with the involvement of wide circle of scientific and professional audience. The highlighted topics of the conference were 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 2016 the Department gave place for the 2nd 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 will be held in 2017 with the title of ‘Harmful/Protective Society’, within the frames of the 15th ‘Days of Behavioural Sciences’. 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, Learn-Teach-Know (TANTUdSZ).

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**

**Address**
H-1088 Budapest, Vas u. 17., room 130
Phone: +(36-1)486-4960
E-mail: lektorat@se-etk.hu
Website: etk.semmelweis.hu

**Head of Division**
Katalin Zöldi Kovács, Ph.D.

**Contact person**
Ms. Alexandra Bakó
Phone: +(36-1)-486-4962 email: bako.alexandra@se-etk.hu
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 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 online 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.
History and basic information

A decade ago *The Act of Higher Education, 1993*, charged universities with preparing students for their academic degree as well as awarding them doctoral (Ph.D.) degrees. This decision galvanized the scientific communities and schools of doctoral studies were founded one after the other in all Hungarian universities.

At that time professor Péter Sótonyi laid down the basic foundations of the SOTE Doctoral School. His successor, Professor László Kopper carefully structuring the study programs, reorganized it, creating and amending detailed regulations and working out new rules of the institution. The next chairman, professor Ágoston Szél has continued these efforts to build a well-organized institution devoted for education and training of graduate students in several fields of medicine, biology and health sciences. The School Ph.D.Studies of Semmelweis University is currently one of our most successful divisions with around hundred students obtaining Ph.D. diplomas every year. The School of Ph.D. Studies is in fact a “virtual” organisation of the university, in importance comparable to that of a Faculty. The virtuality of this “Faculty” is due to the fact that teachers and tutors are all employees or co-workers of the five regulal Faculties, they perform their scientific activities in different laboratories and institutes of this (and other) university. However, with their collaboration and organization they create new research centres that function like spiritual “melting pots”. The concentration and focus of this scientific potential has a great impact on the young candidates' research work. The motivation of the students is multiplied by the presence and interaction of experienced tutors.

The basic unit of this complex teaching-learning team is one student - one tutor. Together they enjoy a high level of freedom and autonomy in running their research, that is within the limits set by the Rules and Regulations.

The first doctoral programs in 1993 were formed sporadically around the greatest personalities of the university. Each program was comprised of five to ten subprograms, the majority of which consisted of various topics or themes. It was the leader of the program who was responsible for the advance of each tutor and student. The number of the study programs was already around 25 when the Ministry of Education decided to restructure the doctoral training. A small number of branches of science were nominated and now all programs must be grouped under the umbrella of larger organizations called Doctoral Schools (the Hungarian abbreviation is TDI). The programs have retained their independence, however, the councils of the doctoral schools became the real administrative centres of the doctoral training.

Currently the School of Ph.D. Studies at Semmelweis University has seven Doctoral Schools. Basic Medicine, Clinical Medicine, Pharmaceutical Sciences, Mental Health Sciences, Neurosciences, Molecular Medicine and Pathological Sciences. Each School comprises of 2 to 16 study programs, the total number of which is above 40 (see detailed information on programs and Doctoral Schools).

By involving the greatest authorities from within, as well as from outside the university, the School of Ph.D. Studies has from the beginning been able to preserve the quality and prestige of the degree.

The largest faculty, the Faculty of Medicine is represented in almost all Doctoral Schools, the Faculty of Dentistry has its own study program, the Faculty of Pharmacyis represented by individual Doctoral Schools. The Faculty of Health Care as a Higher Education Institute of college level does not issue doctoral diplomas degrees, its teachers however are taking part in the study programs organized by the other faculties.

The activity of the School of Ph.D. is divided into two parts:
Part I: educational phase - program courses and research activity
Part II: qualification phase - examination, writing and defending dissertations
Although the educational and qualification phases can be continuous, each contains features that provide greater flexibility in obtaining a degree. Basically, anybody holding a university diploma degree (not necessarily a medical one) can join either Phase I or II.
The aim of Phase I is to train students to become scientists by providing them courses. Credit points can be accumulated upon completion of a course. The selected scientific topic will become the core of the thesis. A qualified tutor supervises each student.

Phase II provides an opportunity to evaluate the results of the experiments and to publish them in acknowledged scientific journals. Obviously, this is, or can be an on-going activity in Phase I as well. The student is required to pass a comprehensive examination and to write and defend a dissertation. Phase II follows Phase I, but one may join Phase II without completing Phase I, providing the necessary prerequisites have been fulfilled. However, if one joins the School of Ph.D. Studies directly in Phase II it is necessary to be accepted by a consultant within a program.

The School of Ph.D. Studies offers three forms of education:

- Full-time for scholarship holders (scholarship obtained from state, agency, foundation etc.) entering Phase I as students
- Part-time students, entering Phase I as students
- Individual studies, entering Phase II as candidates

Both full-time and part-time students must meet the same requirements. The main difference between those with and without scholarship is that the latter have jobs and are combining studies and work. Individuals who join only Phase II will not be students with record-book and student identity card, but they will be candidates for the doctoral degree.

The total number of candidates at present is about 500.

Certain costs of education, scientific training and official procedures are covered for students and candidates. Most of the fees are equal to or close to what is ordinarily paid by undergraduate students.

The actual decision-making body of the School of Ph.D. Studies is the Doctoral Council. Its work is supported by the Education Committee and Quality Assurance Committee. The former is responsible for organizing the study courses and all matters related to the training. The latter evaluates topic accreditation applications, dissertations prior to submitting them to opponents. Recently another Committee has been established to run disciplinary procedures.

Dr. József Timár
President of the Doctoral Council
President of the Doctoral Council

Dr. József Timár  
II. Department of Pathology  
1091 Budapest IX., Úllői út 93.  
Phone: 215-7300 /53400  
E-mail: jtimar@gmail.com

Vice President of the Doctoral Council

Dr. János Rigó  
1st Dept. of Obstetrics and Gynaecology  
H-1088 Budapest, Baross u. 27.  
Tel: +(36-1) 266-0473/54216  
E-mail: rigo.janos@med.semmelweis-univ.hu

President of the Doctoral Student’s Union

dr Szilárd Szanyi  
E-mail: dhok@phd.semmelweis-univ.hu

Doctoral Secretariat

Phone: (36-1) 266-2343, (36-1) 266-7483  
Fax: (36-1) 317-4888  
Krisztina Tölgyesi-Lovász Head  
(36-1) 459-1500/55373  
Hilda Marton Educational assistant  
(36-1) 459-1500/55242  
Anita Marosfalvi Financial assistant  
(36-1) 459-1500/55162  
Zsuzsa Kalmár Educational Assistant  
(36-1) 459-1500/55287  
Dorottya Komlósy Educational Assistant  
(36-1) 459-1500/55387  
Office hours:  
Monday: Closed  
Tuesday, Thursday, Friday: 8.30 a.m. - 12.00 a.m.  
Wednesday: 13.00 p.m. - 16.00 p.m.
Members of the Doctoral Council

Dr. János Timár  
President

Dr. János Rigó  
Vice-President

Dr. György Bagdy  
Vice-Rector for Scientific Affairs

Dr. László Rosivall  
Ph.D. School of Basic Medicine

Dr. Tivadar Tulassay  
Ph.D. School of Clinical Medicine

Dr. Béla Noszál  
Ph.D. School of Pharmaceutical Sciences

Dr. István Bitter  
Ph.D. School of Mental Health Sciences

Dr. Bereczki Dánel  
János Szentágothai Doctoral School of Neurosciences

Dr. József Mandl  
Ph.D. School of Molecular Medicine

Dr. Ilona Kovalszky  
Ph.D. School of Pathological Sciences

Dr. György Losonczy  
Representative of Faculty of Medicine

Dr. Gábor Varga  
Representative of Faculty of Dentistry

Dr. Kálmán Magyar  
Representative of Faculty of Pharmacy

Dr. Péter Gaál  
Representative of Faculty of Health and Public Services

Dr. Gyula Domján  
Representative of Faculty of Health Sciences

Dr. Zoltán Benyó  
President of the Educational Board

Dr. János Rigó  
President of the Quality Control and Evaluation Board

Dr. István Nagy  
President of the Committee of Disciplinary Procedures  
(János Szentágothai Doctoral School of Neurosciences)

Dr. Iván Forgács  
Faculty of Health Sciences

Dr. Péter Tamás Sótonyi  
Szent István University, Faculty of Veterinary Science

Dr. Péter Szolgay  
Pázmány Péter

Dr. László Kopper  
1st Dept. of Pathology and Experimental Cancer Research

Dr. Emil Monos  
Institute of Human Physiology and Clinical Experimental Research

Dr. Szilárd Szanyi  
President of the Doctoral Students' Union

Permanent Committees of the Doctoral Council

Educational Board

President: Dr. Zoltán Benyó
Institute of Human Physiology and Clinical Experimental Research
H-1094 Budapest, Tűzoltó u. 37–47.
Tel: +(36-1) 2010-03-06
E-mail: benyo.zoltan@med.semmelweis-univ.hu

Quality Control and Evaluation Board

President: Dr. János Rigó
1st Dept. of Obstetrics and Gynaecology
H-1088 Budapest, Baross u. 27.
Tel: +(36-1) 266-0473/54216
E-mail: rigo.janos@med.semmelweis-univ.hu
Committee of International Affairs

President: Dr. László Rosivall
Dept. of Pathophysiology
H-1089 Budapest, Nagyvárad tér 4.
Tel: +(361) 210-2956/6121
E-mail: rosivall.laszlo@med.semmelweis-univ.hu

Committee of Disciplinary Procedures

President: Dr. István Antal
E-mail: antal.istvan@pharma.semmelweis-univ.hu

University School of Ph. D. Studies

President: Prof. József Tímár MD, PhD, DSc

BRANCHES:

I. BASIC MEDICINE

Chairman: Prof. László Rosivall MD, PhD, DSc
E-mail: rosivall.laszlo@med.semmelweis-univ.hu

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<td>Cardiovascular Disorders: Physiology and Clinic of Ischaemic Circulatory Diseases</td>
<td>Prof. Béla Merkely MD, PhD, DSc</td>
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<td>Prof. Zoltán Prohászka MD, PhD, DSc</td>
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<td>The Mechanisms of Normal and Pathologic</td>
<td>Prof. Zoltán Benyó MD, PhD, DSc</td>
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<td>Functions of the Circulatory System</td>
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<td>Physiology and Pathophysiology of the Regulation of Fluids and Electrolyte Homeostasis</td>
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II. CLINICAL MEDICINE

Chairman: Prof. Tivadar. Tulassay MD, PhD, DSc
E-mail: tulassay.tivadar@med.semmelweis-univ.hu

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<th>Programs</th>
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<td>Prof. Tamás Masszi MD, PhD, DSc</td>
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<td>Dental Research</td>
<td>Prof. Gábor Varga MD, PhD, DSc</td>
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<td>Fetal and Neonatal Medicine</td>
<td>Prof. Zoltán Papp MD, PhD, DSc</td>
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<td>Gastroenterology</td>
<td>Prof. Zsolt Tulassay MD, PhD, DSc</td>
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<td>Ophthalmology</td>
<td>Prof. Ildikó Süveges MD, PhD, DSc</td>
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<td>Examination of etiopatológical and genetic factors of diabetes mellitus and liver diseases and there complications</td>
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<td>Physiology and Pathology of the Musculoskeletal System</td>
<td>Prof. Miklós Szendröi MD, PhD, DSc</td>
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<td>Prof. Tivadar Tulassay MD, PhD, DSc</td>
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<td>Urology</td>
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<td>Clinical and Experimental Research in Angiology</td>
<td>Prof. György Acsády MD, PhD, DSc</td>
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<td>Dermatology and Venereology</td>
<td>Prof. Sarolta Kárpáti MD, PhD, DSc</td>
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<td>Molecular Genetics, Pathomechanism and Clinical Aspects of Metabolic Disorders</td>
<td>Prof. Péter Lakatos MD, PhD, DSc</td>
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<td>Clinical application of basic science results</td>
<td>Prof. Barna Vásárhelyi MD, PhD, DSc</td>
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<td>Reproductive medicine</td>
<td>Prof. János Rigó MD, PhD, DSc</td>
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<td>Otorhinolaryngology, foniatry</td>
<td>Dr. László Tamás, MD, PhD</td>
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III. PHARMACEUTICAL SCIENCES

Chairwoman: Prof. Béla Noszál MSc, PhD, DSc
E-mail: noszal.bela@pharma.semmelweis-univ.hu

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<td>Experimental and Clinical Pharmacology</td>
<td>Prof. Kálmán Magyar MD, PhD, DSc</td>
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<td>Modern Trends in Pharmaceutical Scientific Research</td>
<td>Dr. István Antal MSc, PhD</td>
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IV. MENTAL HEALTH SCIENCES

Chairman: Prof. István Bitter MD, PhD, DSc
E-mail: bitter.istvan@med.semmelweis-univ.hu

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<td>Clinical Psychology and Psychiatry</td>
<td>Prof. László Tringer MD, PhD, CSc</td>
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<tr>
<td>Behavioral Sciences</td>
<td>Prof. József Kovács MD, CSc, DSc</td>
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<tr>
<td>Sociological and mental health approaches to resources for individuals and communities</td>
<td>Dr. Beáta Dávid (Pethesné) PhD</td>
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V. NEUROSCIENCES

Chairman: Prof. Dániel Bereczki MD, PhD, DSc
E-mail: bereczki.daniel@med.semmelweis-univ.hu

<table>
<thead>
<tr>
<th>Programs</th>
<th>Co-ordinators</th>
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<tbody>
<tr>
<td>Neuromorphology and Cell Biology</td>
<td>Prof. Miklós Palkovits MD, PhD, DSc</td>
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<tr>
<td>Neuroendocrinology</td>
<td>Prof. Zsolt Liposits MD, PhD, DSc</td>
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<tr>
<td>Functional Neurosciences</td>
<td>Prof. E. Szilveszter Vizi MD, PhD, DSc</td>
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<tr>
<td>Clinical Neurosciences</td>
<td>Prof. Zoltán Nagy MD, PhD, DSc</td>
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<tr>
<td>Clinical Neurological Research</td>
<td>Prof. Imre Szirmai MD, PhD, DSc</td>
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<tr>
<td>Biological Psychiatry</td>
<td>Prof. Gábor Faludi MD, PhD, DSc</td>
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VI. MOLECULAR MEDICINE

Chairman: Prof. József Mandl MD, PhD, DSc
E-mail: mandl.jozsef@med.semmelweis-univ.hu

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<tr>
<th>Programs</th>
<th>Co-ordinators</th>
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<tbody>
<tr>
<td>Basis of Human Molecular Genetics and Gene Diagnostics</td>
<td>Prof. András Falus MD, PhD, DSc</td>
</tr>
<tr>
<td>Cellular and Molecular Physiology</td>
<td>Prof. Erzsébet Ligeti MD, PhD, DSc</td>
</tr>
<tr>
<td>Embryology, Theoretical, Experimental and Clinical Developmental Biology</td>
<td>Prof. Ágoston Szél MD, PhD, DSc</td>
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<tr>
<td>Immunology</td>
<td>Prof. Gyula Poór MD, PhD, DSc</td>
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<tr>
<td>Pathobiochemistry</td>
<td>Prof. József Mandl MD, PhD, DSc</td>
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</table>
### VII. PATHOLOGICAL SCIENCES

Chairman: **Prof. Ilona Kovalszky** MD, PhD, DSc  
E-mail: kovalszky.ilona@med.semmelweis-univ.hu

<table>
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<tr>
<th>Programs</th>
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<tbody>
<tr>
<td>Alterations of Cells, Fibres and Extracellular and Diagnostic Pathomorphological Studies Matrix in the Course of Heart and Vascular Diseases and in Certain Tumours Experimental and Diagnostic Pathomorphological Studies</td>
<td>Prof. Zsuzsanna Schaff MD, PhD, DSc</td>
</tr>
<tr>
<td>Experimental Oncology</td>
<td>Prof. László Kopper MD, PhD, DSc</td>
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<tr>
<td>Public Health Science</td>
<td>Prof. Péter Sótonyi MD, PhD, DSc</td>
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<tr>
<td>Study of the Immunobiological Effects of Micro-organisms and of their Components at Molecular and Cellular Level and in the Microorganisms</td>
<td>Prof. Károly Nagy MSc, PhD</td>
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<tr>
<td>Health Sciences</td>
<td>Prof. Gyula Domján MD, MSc, PhD</td>
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