

# Semmelweis University

Faculty of Medicine • Faculty of Dentistry • Faculty of Pharmacy  
Faculty of Health Sciences • School of Ph.D. Studies



2016 / 2017  
Budapest



C A L E N D A R

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**SEMMELWEIS UNIVERSITY**

**2 0 1 6 / 2 0 1 7**

**B u d a p e s t**

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<http://semmelweis.hu/>

LEGAL SUPERVISING  
AUTHORITY OF THE UNIVERSITY

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

Ministry of Human Resources  
1055 Budapest V., Szalay u. 10-14.  
Phone: +36-1-795-1200  
1051 Budapest V., Arany János u. 6-8.  
Phone: +36-1-795-1100  
1085 Budapest VIII., Üllői út 26.

PUBLISHER:

***Prof. Dr. Ágoston Szél***  
***Rector***



Designed and prepared for press by Semmelweis Press and Multimedia Studio  
Compiled by Olga Ványi Head of the English Secretariat  
SKD: 524  
Print and cover by Mester Press Ltd.

# Contents

Government of the University .....	6
The English Secretariat .....	6
The Schedule of the 2016/2017 academic year .....	8
<b>The Study and Examination Policy .....</b>	<b>10</b>
The Examination and Studies Regulations .....	10
Important announcement .....	10
Group Rule .....	30
Students' disciplinary and liability cases .....	31
Rectorial Circular .....	41
Information on Neptun System.....	42
The Departments of Semmelweis University (English Program) .....	45
How to reach Embassies .....	53
Academic Staff .....	54
Faculty of Medicine .....	54
Faculty of Dentistry.....	70
Faculty of Pharmacy .....	73
Division of Foreign Languages and Communication .....	75
The Central Library .....	75
Directorate for Safety Technology and Logistics .....	75
Information on language courses .....	76
Study Programs	
(The Study Programs contain the curricula, the lists of books and the tutors)	
<b>Faculty of Medicine .....</b>	<b>77</b>
Schedule of the new curriculum .....	78
Year 1 .....	78
Year 2 .....	119
Year 3 .....	145
Obligatory elective and elective subjects – schedule of the basic and pre-clinical modules .....	184
Year 4 .....	187
Year 5 .....	217
Elective subjects (basic/pre-clinical/clinical modules) – curricula .....	277
Obligatory elective and elective subjects – schedule of the clinical module.....	278
Year 6 .....	279
<b>Faculty of Dentistry .....</b>	<b>303</b>
Study Program for students started studies in the 2010/11 academic year .....	304
Study Program for students started studies in the 2011/12 academic year .....	310
Study Program for students started studies in the 2012/13 academic year .....	316
Study Program for students started studies in the 2013/2014 academic year .....	322
Study Program for students started studies in the 2014/2015 academic year .....	330
Study Program for students started studies in the 2015/2016 academic year .....	338
Year 1 .....	347
Year 2 .....	369
Elective subject, year 2 .....	384
Year 3 .....	389
Year 4 .....	417
Year 5 .....	441
Elective subjects, years 3, 4, 5 .....	457
Postgraduate courses .....	460

<b>Faculty of Pharmacy</b> .....	461
Year 1 .....	462
Year 2 .....	483
Year 3 .....	499
Year 4 .....	517
Year 5 .....	531
Evaluation of Progress .....	551
Exemptions .....	551
Diploma work.....	552
General Board Examinations.....	564
The Diploma .....	565
Cost of the Program, Refund Policy .....	567, 568
Student Services Center .....	569
Other Medical Universities in Hungary .....	569
Residence Visa, Residence Permit, Entry for a Long Stay .....	570
Reduction of tuition fee .....	572
The words of the freshmen's solemn vow, the words of oaths at the graduation ceremony.....	573
How to get a certificate of conformity with the EU .....	574
Fees, Important .....	580
Student Card .....	580
UNICard .....	581
Frequently asked questions (FAQ-s) .....	582
Student Counselling .....	588
Erasmus Program .....	589
Semmelweis Alumni.....	590
ISAS (International Student Association of Semmelweis).....	590
Students' Scientific Association (TDK).....	591
Talent Support Program .....	591
<b>Faculty of Health Sciences</b> .....	593
Brief History of the Faculty of Health Sciences .....	594
Government, Dean's Office, Staff .....	595
Information about the programs .....	596
Departments .....	602
<b>School of Ph.D. Studies</b> .....	623
History and basic information .....	624
President, Vice President .....	626
Doctorial Secretariat .....	626
Members of the Doctoral Council .....	627
Branches .....	628

# SEMMELWEIS UNIVERSITY



## GOVERNMENT SEMMELWEIS UNIVERSITY

- RECTOR: **Prof. Dr. Ágoston Szél** M. D., Ph.D., D. Sc.
- CHANCELLOR: **Dr. Károly Szász**
- VICE RECTORS: **Prof. Dr. Ferenc Bánhid**y M. D., Ph. D., D.Sc.  
General Affairs  
**Prof. Dr. Péter Hermann** D. M. D., M.Sc., Ph. D.  
Educational Affairs  
**Prof. Dr. 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:	<b>Ms. Olga Ványi B. A.</b> (459-1500/ ext 60078; english.secretariat@semmelweis-univ.hu)
Staff:	<b>Ms. Adrienn Bácskai</b> (459-1500/ ext 60072; bacsikai.adrienn@semmelweis-univ.hu)
	<b>Ms. Zsuzsa Galambos</b> (459-1500/ ext 60079; galambos.zsuzsa@semmelweis-univ.hu)
	<b>Mr. Csaba Istvánfi</b> (459-1500 / ext 60077 istvanfi.csaba@semmelweis-univ.hu)
	<b>Ms. Tímea Jurászik</b> (459-1500 / ext 60080; juraszik.timea@semmelweis-univ.hu)
	<b>Ms. Tímea Kapisinszky</b> (459-1500/ ext 60479; kapisinszky.timea@semmelweis-univ.hu) – on leave
	<b>Ms. Andrea Kevi</b> (459-1500 / ext 60081; kevi.andrea@semmelweis-univ.hu)
	<b>Ms. Éva Kiss</b> (459-1500 / ext 60089; kiss.eva@semmelweis-univ.hu)
	<b>Ms. Sarolta Kokavec</b> (459-1500 / ext 60074; kokavec.sarolta@semmelweis-univ.hu)
	<b>Ms. Zenina Korponai</b> (459-1500 / ext 60479; korponai.zenina@semmelweis-univ.hu)
	<b>Ms. Edit Kovács</b> (459-1500 / ext 60075; kovacs.edit@semmelweis-univ.hu)
	<b>Mr. Szabolcs Piller</b> (459-1500 / ext 60479; piller.szabolcs@semmelweis-univ.hu)
	<b>Ms. Márta Reményi</b> (459-1500/ ext 60076; remenyi.marta@semmelweis-univ.hu)
	<b>Ms. Orsolya Sajtos</b> (459-1500/ ext 60073; sajtos.orsolya@semmelweis-univ.hu)
<b>Ms. Petronella Szabó</b> (459-1500 / ext 60081; szabo.petra@semmelweis-univ.hu) – on leave	

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 2016/2017 ACADEMIC YEAR (Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmacy)

### Opening Ceremony

September 3, 2016

### First Semester

<b>Date of registration</b> - 1 <sup>st</sup> year	August 30, 2016
- the other years	August 29, 31- September 1-2, 2016
<b>Place of registration</b> English Secretariat	
<b>Neptun Day</b> – 1 <sup>st</sup> year	August 31, 2016
<b>Freshman's Day</b> – 1 <sup>st</sup> year	September 2, 2016
<b>First day of the semester</b>	
Faculty of Medicine (1 <sup>st</sup> – 5 <sup>th</sup> years)	September 5, 2016
Faculty of Dentistry	September 5, 2016
Faculty of Pharmacy (1 <sup>st</sup> – 4 <sup>th</sup> years)	September 5, 2016
<b>Last day of the semester</b>	
Faculty of Medicine (1 <sup>st</sup> – 5 <sup>th</sup> years)	December 9, 2016
Faculty of Dentistry	December 9, 2016
Faculty of Pharmacy (1 <sup>st</sup> – 4 <sup>th</sup> years)	December 9, 2016
5th year Pharmacy:	
Practical training	July 18, 2016 – September 16, 2016
<b>The semester lasts for</b> 5 <sup>th</sup> year Pharmacy (12 weeks)	September 19 – December 9, 2016
<b>Examination period</b>	
Faculty of Medicine (1 <sup>st</sup> – 5 <sup>th</sup> years)	December 12, 2016–January 27, 2017
Faculty of Dentistry (1 <sup>st</sup> – 5 <sup>th</sup> years)	December 12, 2016–January 20, 2017
Faculty of Pharmacy(1 <sup>st</sup> – 5 <sup>th</sup> years)	December 12, 2016–January 27, 2017

### Second Semester

<b>Date of registration</b> (1 <sup>st</sup> – 5 <sup>th</sup> years)	January 23 – 27, 2017
<b>Place of registration</b>	English Secretariat
<b>First day of the semester</b> for 1 <sup>st</sup> - 5 <sup>th</sup> years	
Medicine and Dentistry	January 30, 2017
<b>Last day of the semester</b> for 1 <sup>st</sup> - 5 <sup>th</sup> years	
Medicine and 1 <sup>st</sup> – 4 <sup>th</sup> years	May 12, 2017
Dentistry	April 28, 2017
Last day of the semester for 5 <sup>th</sup> year	
<b>Faculty of Pharmacy</b>	
<b>First day of the semester</b> (1 <sup>st</sup> – 4 <sup>th</sup> years)	January 30, 2017
<b>Last day of the semester</b> (1 <sup>st</sup> – 4 <sup>th</sup> years)	May 12, 2017
<b>First day of the semester (practice)</b>	
for 5 <sup>th</sup> year	January 25, 2017
<b>Last day of the semester (practice)</b>	
for 5 <sup>th</sup> year	May 25, 2017

**Examination period for Faculty of Medicine, Faculty of Dentistry**

1 <sup>st</sup> – 5 <sup>th</sup> year Medicine	May 15 – June 30, 2017
1 <sup>st</sup> – 4 <sup>th</sup> year Dentistry	May 15 – June 30, 2017
5 <sup>th</sup> year Dentistry	May 2 – June 9, 2017

**Faculty of Pharmacy**

1 <sup>st</sup> – 4 <sup>th</sup> year	May 15 – June 30, 2017
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**Exam held outside the academic year - EOAY Presumably August 22-30, 2017****Schedule for 6<sup>th</sup> year Medicine**

July 18, 2016 – May 5, 2017

**General Board Examination Period**

Faculty of Medicine	November 14-30, 2016 May 29 - June 20, 2017 August 21 – 31, 2017
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Faculty of Dentistry June 12 – 16, 2017

Faculty of Pharmacy June 1 - 16, 2017

Graduation Ceremony for Dentistry July 1, 2017 (Saturday)

Graduation Ceremony for Pharmacy July 1, 2017 planned (Saturday)

**Holidays**

November 1, 2017 (Tuesday)

March 15, 2017 (Wednesday)

**Spring (including Easter) holidays**

April 10 – April 17, 2017

May 1, 2017 (Monday)

**Research Students' Conference:**

February 8 – 9 – 10, 2017

No lectures or seminars for years 2–5  
on February 8 - 9**Faculty Day:**

April 26, 2017 (Wednesday)

# The Study and Examination Policy

## Faculty of Medicine, Dentistry and Pharmacy

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### Section 1

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#### *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

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#### *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

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### *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

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### *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

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### Committees and persons responsible for academic matters

## Section 7

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### *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,

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

## Section 8

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### *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

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### *Termination of student status*

Student status is terminated by dismissal if:

1. the number of credit points obtained from mandatory and alternative 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 a mandatory 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

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### *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. 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.

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## 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.

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## 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.

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## 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.

## Section 15

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### Assessment of the student's performance

## Section 16

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### *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

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### *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 materials of a subject taught over several terms, and the earliest time for taking it is when the last examination relating to the subjects of the comprehensive examination has been passed or the last relevant mid-term mark has been obtained.
  12. For subjects that are to be tested by means of examinations and the lectures of which are supplemented by seminars (practical sessions) and also for subjects where the classes consist of seminars (practical sessions) only, the head of the educational organisational unit (the lecturer of the subject) may offer a student an excellent or good mark based on their performance in the relevant teaching period. The student is not obliged to accept this offered evaluation and may request to take an examination.
  13. Students will obtain the credit if they are given a mark that is better than an unsatisfactory grade or a "fail" evaluation.
  14. No redress is available regarding the marks or evaluations given through assessment.
  15. A subject will be considered dropped if, for a subject added, the student
    - a) fails to obtain the end-of-term signature,
    - b) obtains the signature but fails to appear at the examination and does not attempt to take the examination in the examination period,
    - c) is unable to meet the examination requirements in the permitted number of retake examinations and repeated retake examinations (unsatisfactory mark) during the relevant examination period.
  16. The latest date for obtaining the credits missing because of dropping a subject is the term in which the subject is announced again, for the second time, unless the student's status is inactive.
  17. In the case of cumulative, multi-level subjects spanning multiple terms, until the end of the registration period of the given term, based on the consent of the head of the educational organisational unit, the head of the Faculty may authorise adding the next term's unit for 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

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### *Subject criteria*

1. The subject criteria specify the responsibilities of students and the relevant deadlines, for the purpose of fulfilling the subject criteria.
2. The subject criteria contain the following:
  - a) the subject syllabus,

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

## Section 19

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### *Rules of examinations and comprehensive examinations; the examination period*

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

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### *The registration and index numbers of academic achievement*

- (1) The academic achievement of students must be recorded in the markbook 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 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; the head of the dean’s office (registry office) may confirm the authenticity of the entries by signing the markbook.



- (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. 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 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

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### *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

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### *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

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### *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

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### *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.

## Section 25

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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

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### *The degree (diploma)*

#### *The degree, the certificate*

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

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

Classification on a scale of five grades:

4.51 – 5.00 distinction

3.51 – 4.50 good

2.51 – 3.50 satisfactory

2.00 – 2.50 pass

Qualification on a scale of three grades:

4.51 – 5.00 summa cum laude

3.51 – 4.50 cum laude

2.00 – 3.50 rite

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

9. Method of calculation of the classification of degrees:

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

where:

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

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

*n* = the number of required comprehensive examinations

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

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

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

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

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

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

## Section 27

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### *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

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### *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

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### *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

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### **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 1<sup>st</sup> and 2<sup>nd</sup> year students of Medicine, Dentistry and Pharmacy**

Students may apply for the §17/17 permission in Chemistry solely after the 1<sup>st</sup> semester and in Anatomy after the 1<sup>st</sup> and 3<sup>rd</sup> semester under the following conditions:

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.

**Note:** In Biophysics (after the 1<sup>st</sup> semester) and in Medical Biochemistry (after the 3<sup>rd</sup> semester) no §17/17 permission is granted.

### **GROUP RULE**

Please note, that in the 1<sup>st</sup> and 2<sup>nd</sup> 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.



# SEMMELEWEIS UNIVERSITY'S RULES OF ORGANISATION AND OPERATION

## Chapter 5

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

*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**

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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**

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**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**

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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**

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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**

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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**

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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**

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

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

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

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

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

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

## Entering the system

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

Once you enter you can choose from the following data groups at the top of the page:  
Personal data, Studies, Subjects, Exams, Finances, Information, Administration

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

- Registration
- Subject registration
- Exam registration

## Registration

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

## Subject registration (choosing subjects, choosing courses)

Choose the link “*Subject registration*” in the “*Subjects*” menu.

1. **Displaying the list of subjects:** Select the appropriate semester (e.g. 2016/17/1) 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 "Registered subjects" in the "Subjects" menu. On this page you can see the subjects you have chosen in the current registration period; you can change courses or deregister subjects here. If in any subject line you click on "Deregister subject", the system will first ask whether you really want to drop the given subject and if you answer yes, the subject will be dropped and deleted from the list of registered subjects. Naturally, this means that your registration for the courses of the deregistered subjects is also deleted and you will be informed of this. (Subject deregistration is possible during the preliminary or final subject or course registration period.)
5. **Changing courses:** If you want to change the course(s) you have chosen in a given subject, you can do this by clicking on any detail of the given subject to display the pop-up window "Subject details". Here on the "Current courses" tab in the last column of the list you have to select the course(s) required and unmark the course(s) to be dropped, then confirm the change by clicking on the „Save" button. The system will report on the change or the reasons for potential errors.

## Exam registration

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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

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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

### Simmelweis University, Faculty of Medicine

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#### 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. Szőlősi

Head of the Department: Prof. Dr. Éva Keller

**Department of Medical Biochemistry**

1094 Budapest IX., Túzoltó u. 37-47.

Phone: +36-1-4591500 / ext 60034 Dr. Léránt / 60066 Dr. Tóth / 60132 Dr. Keszler

Head of the Department: Prof. Dr. László Tretter

**Department of Medical Chemistry, Molecularbiology and Pathobiochemistry**

1094 Budapest IX., Túzoltó 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., Túzoltó u. 37-47.

Phone: 210-0306

Head of the Institute: Prof. Dr. Zoltán Benyó

**Department of Physiology**

1094 Budapest IX., Túzoltó 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: 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: 210-2930 / ext 56350 Dr. Kovács, 56115 Dr. Szántó, 56123 Dr. Salavec

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 / ext 53454 or 53456 Dr. Kiss

Head of the Department: Prof. Dr. József Tímár

**Department of Anesthesiology and Intensive Therapy**

1125 Budapest XII., Kútvölgyi út 14.

Phone: 355-6565, 325-1100; / ext 57222, 57236 Dr. Kis-Tamás

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, ext 55541 Dr. Békési

Head of the Department: 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, Dermat oncology and Venerology**

1085 Budapest VIII., Mária u. 41.

Phone: 266-0465 / ext 55776 Dr. Tóth (Med.), 55776 Dr. Hídvégi (Dent.)

Head of the Department: Dr. Miklós Sárdy

**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. 54.

Phone: 334-3186/ ext 52728 Dr. Horváth, ext 52631 Dr. Krikovszky

Head of Department: 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. Miklós Szendrői

**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 53312, 53126 Dr. Futácsi

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: 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., Üllői 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., Üllői 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., Zággrábi út 14.

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

Director: Kornélia Várszegi

## **Semmelweis University, Faculty of Dentistry**

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### **Department of Prosthodontics**

Dental Centre

1088 Budapest VIII., Szentkirályi u. 47.

Phone: 318-0011 ext 59322 Dr. 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 Dr. 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 Dr. Márton

Head (assigned) of the Department: Dr. Gábor Fábrián

### **Department of Conservative Dentistry**

Dental Centre

1088 Budapest VIII., Szentkirályi u. 47.

Phone: 318-0011 ext 59322 Dr. 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 Dr. 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 Dr. 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

50 Head and tutor of the Department: 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

**Simmelweis University, Faculty of Pharmacy**

---

**University Pharmacy, Department of Pharmacy Administration**

1092 Budapest IX., Högyes 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., Üllői út 26.  
 Phone: 317-2979 / ext 55307 Dr. Balázs  
 Head of the Institute: Dr. Szabolcs Béni

**Department of Pharmaceutics**

1092 Budapest IX., Högyes 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., Högyes 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., Högyes Endre u. 7.  
 Phone: 476-3600 / ext 53025 Dr. Tétényi  
 Head of the Institute: Prof. Dr. Péter Mátyus

**Simmelweis 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-)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**

1046 Budapest, Erkel Gyula u. 26., room 113

Phone: +(36-1)369-2694

Head of 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: Prof. Dr. Győző Láng

**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. István Gyula Zsély

**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**

1046 Budapest, Erkel Gyula u. 26.

Phone: +(36-1) 369-2694 Fax: +(36-1) 486-4962 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**

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**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

Professor Emeritus

Prof. Dr. András Csillag

Prof. Dr. Mihály Kálmán

Prof. Dr. Miklós Réthelyi

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 Kozsuresk

Dr. Dávid Lendvai

Dr. Ákos Lukáts

Dr. Viktória Vereczki

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



Senior Research Fellow	Dr. Ágota Ádám Dr. János Barna Dr. Szilvia Mezey Dr. Anna Németh
Departmental fellow	Mr. Tamás Balázs Ms. Vanda Dr. Halász Dr. Mónika Vincze
Teaching fellow	Dr. András Horváth
PhD scholarship	Dr. Csilla Barad Mr. Bulcsú Dékány Ms. Viktória Zsiros

## Institute of Biophysics and Radiation Biology

1094 Budapest IX., Tűzoltó u. 37-47.

☎: 267-6261

Head of the Department:	<b>Prof. Dr. Miklós Kellermayer</b> M.D., Ph.D., D.Sc.
Professor emeritus:	Prof. Dr. Judit Fidy
Associate professor:	Dr. Andrea Fekete, Dr. Katalin Blaskó, Dr. Gabriella Csík, 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. Nagyvárud tér 4.

☎: 210-2940, 210-2929

Head of the Department:	<b>Prof. Dr. Edit Buzás</b> 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 Kóhidai, Dr. György Nagy, Dr. Erna Pap, Dr. Éva Pállinger, 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:	<b>Prof. Dr. Péter Ferdinandy</b> 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 Tímár, 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:	<b>Prof. Dr. Éva Keller</b> M. D., Ph. D., D.Sc.
Professor emeritus:	Prof. Dr. Péter Sótorny
Associate professor:	Dr. Zoltán Szőlősi (tutor), Dr. Klára Törő
Assistant professor:	Dr. Márta 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:	<b>Prof. Dr. László Tretter</b> 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 second year medical and dentistry students) Dr. Beáta Törőcsik
Assistant lecturer:	Dr. Katalin Bartha
Research fellow:	Dr. Judit Dóczi
Assistant research fellow:	Dr. Em Ben Sorum
Pharmacist:	Dr. Erzsébet Tóth (course coordinator – pharmacy)

## Department of Medical Chemistry, Molecular Biology and Pathobiochemistry

1094 Budapest IX., Tűzoltó u. 37-47.

☎: 266-2615

Head of the Department:

Full professor:

Associate professor:

Assistant professor:

**Prof. Dr. Gábor Bánhegyi** M.D., D.Sc.

Prof. Dr. József Mandl, Prof. Dr. Anna Faragó,

Prof. Dr. Miklós Tóth, Prof. Dr. László Buday

Dr. Mária Sasvári, Dr. András Hrabák,

Dr. Ágota Vér, Dr. Nándor Müller, Dr. Miklós Csala,

Dr. Csaba Söti, Dr. Tamás Mészáros

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:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

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

Prof. Dr. Péter Sándor,

Prof. Dr. Márk Kollai, Prof. Dr. Emil Monos

Dr. András Eke, Dr. György Nádas, Dr. Tamás Ivanics

Dr. Ákos Zsembery

Dr. Kornélia Ikrényi

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:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

Tutor:

**Prof. Dr. László Hunyady** M.D, Ph.D., D.Sc.

Prof. Dr. Erzsébet Ligeti, Prof. Dr. Péter Enyedi,

Prof. Dr. Péter Várnai (course director),

Prof. Dr. Attila Mócsai, Prof. Dr. Miklós Geiszt

Prof. Dr. András Spät, Prof. Dr. Attila Fonyó

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Dr. Gábor Turu, Dr. Zoltán Jakus

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Dr. Hajnal Kovács, Dr. Enikő Lázár, Dr. Gergő Szanda,

Dr. József Tóth

Dr. András Balla

## Department of Pathophysiology

1089 Budapest, VIII. Nagyváradi tér 4.

☎: 210-2940

Head of the Department:

**Dr. Attila Tordai** M.D., Ph.D.

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. Nagyváradi tér 4.

☎: 210-2930

Homepage: [www.kozegeszsegtan.sote.hu](http://www.kozegeszsegtan.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. Nagyváradi 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. Zsuzsa Szántó (tutor), Dr. János Pilling

Assistant professor:

Dr. György Purebl, Dr. Piroska Balog, Dr. Ágnes Dósa,

Dr. Jenő Lőrincz, Dr. Márta Novák, Dr. Adrienne Stauder,

Dr. István Mucsi

Assistant lecturer:

Dr. Bernadett Babusa, Dr. László Lajtai, Dr. Gyöngyvér Salavecz

Psychologist:

Ms. Ágnes Mezei

## Institute of Medical Microbiology

1089 Budapest, VIII. Nagyváradi 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. Zsuzsanna Csukás, Dr. Zsuzsanna Bános

Assistant professor:

Dr. Orsolya Dobay (tutor for Pharmacy)

Assistant lecturer:

Dr. Csaba Maródi, Dr. Irén Budai, Dr. Katalin Kristóf

Tutor:

Dr. Ágoston Ghidán (tutor for Medicine and Dentistry)

## I. Department of Pathology and Experimental Cancer Research

1085 Budapest, VIII. Úllői út 26.

☎: 459-1500, 266-1638

Head of the Department:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. András Matolcsy** M.D., Ph.D, D.Sc.

Prof. Dr. Ilona Kovalszky, Prof. Dr. Péter Nagy,

Prof. Dr. Zoltán Sági

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

Prof. Dr. András Jeney, Prof. Dr. László Kopper

Dr. Attila Zalatnai (tutor), Dr. Judit Pápay

Dr. Ágota Szepesi, Dr. Beáta Hargitai, Dr. Botond Tímár

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. Úllői út 93.

☎: 215-7300

Head of the Department:

Full Professor:

Professor emeritus:

Scientific advisor:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. József Tímár** M.D., Ph.D., D.Sc.

Prof. Dr. Janina Kulka

Prof. Dr. Anna Kádár, Prof. Dr. Zsuzsa Schaff

Prof. Dr. Tibor Kerényi, Dr. Margit Kovács

Dr. György Illyés, Dr. Tibor Glasz, Dr. András Kiss (tutor)

Dr. Balázs Járay, Dr. Eszter Székely

Dr. Hajnalka Györfy, Dr. Magdolna Kardos, Dr. Lilla Madaras

## Department of Anesthesiology and Intensive Therapy

1125 Budapest, XII. Kútvölgyi út 4.

☎: 355-6565, 325-1100

Head of the Department:

Full Professor:

Associate professor:

Assistant professor:

Clinical specialist:

**Prof. Dr. János Gál** M.D., Ph.D., D.Sc.

Prof. Dr. István Péntes

Dr. Balázs Hauser, Dr. Csaba Hermann, Dr. Krisztina Madách

Dr. Gábor Élő, Dr. András Lox

Dr. Melinda Kis-Tamás (tutor)

## I. Department of Internal Medicine

1083 Budapest, VIII. Korányi S. utca 2/A.

☎: 459-1500

Head of the Department:

Professor emeritus:

Full professor:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. Miklós Szathmári** M. D., Ph.D., D.Sc.

Prof. Dr. Ferenc Szalay, Prof. Dr. László Gerő

Prof. Dr. János Papp, Prof. Dr. Gyula Tamás,

Prof. Dr. Péter Kempler, Prof. Dr. Judit Demeter

Dr. Margit Abonyi, Dr. István Barna, Dr. Csaba Horváth,

Dr. András Tislér, Dr. Péter Lakatos, Dr. Ádám Gy. Tabák

Dr. Gabriella Györi, Dr. István Takács, Dr. Erika Márton,

Dr. Fatima Varga, Dr. András Váradi

Dr. Péter Studinger (tutor), Dr. Zsolt Hermányi, Dr. Péter Fuszek,

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:	Dr. Péter Igaz M.D., M.Sc., Ph.D.
Professor emeritus:	Prof. Dr. Zsolt Tulassay, Prof. Dr. Edit Gláz
Full professor:	Prof. Dr. Károly Rác, Prof. Dr. Miklós Tóth Prof. Dr. Anikó Somogyi
Associate professor:	Dr. László Kónya, Dr. Györgyi Múzes, Dr. László Herszényi, Dr. Gábor Békési (tutor dent.), 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:	<b>Prof. Dr. Tamás Masszi</b> 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. Livia Jánoskúti, Dr. Judit Várkonyi András Vereckei, 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:	<b>Dr. Miklós Sárdy</b> M.D., Ph. D.
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 Prof. Dr. Ferenc Rozgonyi, Dr. Beáta Somlai, Dr. Norbert Wikonkál
Professor emeritus:	Dr. Krisztina Becker, Dr. Nóra Erős
Associate professor:	Dr. Ágnes Iringó Ottó, Dr. Györgyi Pónyai, Dr. Klaudia Preisz, Dr. Bernadett Hídvégi (tutor)
Assistant professor:	Dr. Katinka Pónyai, Dr. József Szakonyi
Assistant lecturer:	Dr. Gyula Bottlik, Dr. Judit Hársing, Dr. Klára Szalai, Dr. Ágnes Szigeti
Clinical chief doctor:	Dr. Péter Bognár, Dr. Károly Fodor, Dr. Ferenc Harnos, Dr. Zsófia Hatvani, Dr. Dorottya Kiss, Dr. Daniella Kuzmanovszki, Dr. Andrea Lukács, Dr. Pálma Silló, Dr. Béla Tóth (tutor), Dr. Veronika Tóth
Clinical doctor:	

## Department of Family Medicine

1125 Budapest, XII. Kútvolgyi út. 4.

☎: 325-1100

Head of the Department:

**Prof. Dr. László Kalabay** M.D., Ph.D.

Associate professor:

Dr. Péter Torzsa (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 Szönyi,

Dr. Balázs Szabó, Dr. Helga Kraxner, Dr. Anita Gáborján

Assistant lecturer:

Dr. Gábor Polonyi

## I. Department of Pediatrics

1083 Budapest, VIII. Bókay János u. 54.

☎: 334-3186

Head of the Department:

**Prof. Dr. Attila Szabó** M.D., Ph.D.

Full professor:

Prof. Dr. Tiavadar Tulassay, Prof. Dr. András Arató,

Prof. Dr. Tamás Machay, Prof. Dr. László Madácsy,

Prof. Dr. Tibor Verebély, Prof. Dr. Reusz György,

Prof. Dr. Antal Szabó

Professor emeritus:

Prof. Dr. Miklós Miltényi

Associate professor:

Dr. Éva Kis, Dr. András Szabó, Dr. Anna Köner

Assistant professor:

Dr. Lídia Balogh, Dr. János Bókay, Dr. Péter Sallay

Clinical chief doctor:

Dr. Zsóka Horváth (tutor)

Assistant lecturer:

Dr. Beáta Dérfalvi, Dr. Gábor Benyó, Dr. Dóra Krikovszky

## 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 Csozánzski, Dr. Gabriella Filiczki, Dr. Zoltán Jenővári,

Dr. László Jókúti, Dr. Zoltán Karádi, 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.oktatatas@gmail.com](mailto:cvc.oktatatas@gmail.com)

Head of the Department:

Professor Emeritus:

Full professor:

Associate professor:

Assistant professor:

Assistant lecturer:

Clinical fellow:

Scientific advisor:

PhD students:

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

Károlyy Lozsádi M.D., Dr. Mátyás Keltai M.D., Ph.D.

Ferenc Horkay M.D., Ph.D., D.Sc.

István Préda M.D., Ph.D.

Dr. Dávid Becker, László Gellér M.D., Ph.D. ,

Endre Zima M.D., Ph.D.

Margit György M.D.

Astrid Apor M.D., György Bárczi MD (tutor), Gábor Fülöp M.D.

Zoltán Jambrik M.D., Levente Molnár M.D., Dóra Paprika M.D.

György Szabó M.D.

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 Szelíd 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.

Miklós Tóth MD, PhD, DSc

Péter Vargha

Balázs Berta MD, Pál Maurovich Horvat MD

Valentina Kuttyifa MD, Gabriella Veress MD

## Department of Neurology

1083 Budapest, VIII. Balassa u. 6.

☎: 210-0330, 210-0337

Head of the Department:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. Dániel Bereczki** M.D., Ph.D., D.Sc.

Prof. Dr. Anita Kamondi, Prof. Dr. Mária Judit Molnár

Prof. Dr. Endre Csanda, Prof. Dr. Mátyás Papp,

Prof. Dr. Imre Szirmai

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

Dr. Róbert Debreczeni (tutor)

Dr. Sándor Ilniczky, 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,

☎: +36 1 220 6471

E-mail: [idegsebeszet@med.semmelweis-univ.hu](mailto: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](mailto: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. Miklós Szendrői** M.D., Ph.D., D.Sc.

Professor Emeritus:

Prof. Dr. Tibor Vízkelety, Prof. Dr. György Bender

Full professor:

Dr. György Szöke

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:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

Clinical senior specialist:

Clinical specialist:

Clinical doctor:

Residents:

Psychologist:

External teachers with contract  
in the English program:

**Dr. János Réthelyi**

Prof. Dr. István Bitter

Prof. Dr., Gábor Faludi

Prof. Dr. László Tringer

Dr. Brigitta Baran, Dr. Pál Czobor, Dr. János Réthelyi,

Dr. Lajos Simon, Dr. Judit Tolna,

Dr. Zsolt Unoka (tutor for the fourth year)

Dr. Gábor Csukly, Dr. Xénia Gonda

Dr. Zoltán Hidas (tutor for dentistry students)

Dr. Éva Jekkel, Dr. Beatrix Mersich,

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

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

Dr. Ádám Menus, Dr. Attila Pulay,

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

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

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

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

Dr. Judit Lazáry, Dr. Krisztina Seregi

Dr. Lívია Balogh

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

Dr. Klára Csizinszky, Dr. Bálint Hajduska-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

Gabriella Kamilla Balogh, Gergely Bíró, Tamás Halmai,

Eszter Tóth

Dr. Judit Ágnes Balázs, Dr. Gábor Gazdag

## Department of Pulmonology

1125 Budapest, XII. Diósárok u. 1/C.

☎: 355-9733

Head of the Department:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. György Losonczy** M.D., Ph.D., D.Sc.

Prof. Dr. Ildikó Horváth

Prof. Dr. Imre Hutás, Prof. Dr. Endre Vastag

Dr. Ákos Somoskövi, Dr. Márta Orosz (tutor),

Dr. Veronika Müller, Dr. Lilla Tamási, Dr. Gabriella Gálffy,

Dr. Anikó Bohács,

Dr. Zoltán Bártfai, Dr. Gábor Horváth,

Dr. Zoltán Süttő, Dr. Klára Szondy, Dr. Erika Vajda,

Dr. Katalin Várdi Visy, Dr. András Wollák, Dr. Gabriella Zsámboki

Dr. Judit Fúzy, Dr. Ildikó Géczy, Dr. Tamás Komáromi,

Dr. Csaba Máthé, Dr. Gabriella Muraközy, Dr. Andrea Nagy,

Dr. Zsuzsanna Orosz

## Department of Radiology

1082 Budapest, VIII. Úllői út 78/A.

☎: 210-0300

Head of the Department:

Full Professor:

Associate professor:

Assistant professor:

Clinical chief doctor:

Clinical doctor:

Assistant lecturer:

Senior resident:

**Prof. Dr. Viktor Bérczi** M.D., Ph.D., D.Sc.

Prof. Dr. Kálmán Hüttl

Dr. Zoltán Vígváry, Dr. Zsolt Tarján,

Dr. Magdolna Dank, Dr. Kinga Karlinger,

Dr. Ádám Mester

Dr. Zsuzsa Dömötöri, Dr. Katalin Kiss,

Dr. Géza Tóth, Dr. Klára Szalai, Dr. László Duffek,

Dr. Béla Kári, Dr. László Torgyik

Dr. Attila Kollár

Dr. Balázs Futácsi (tutor)

Dr. Erika Borbényi, Dr. Szabolcs Farkas,

Dr. Péter Magyar, Dr. Tamás Györke,

Dr. Gyöngyvér Szentmártoni, Dr. Júlia Szilvási, Dr. Éva Zergényi

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. Úllői út 78.

☎: 313-5216

Head of the Department:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. László Harsányi** M.D., Ph.D.

Prof. Dr. Tibor Tihanyi

Prof. Dr. Lajos Flautner, Prof. Dr. Katalin Darvas,

Prof. Dr. Péter Kupcsulik

Dr. Péter Kokas (tutor), Dr. István Pulay,

Dr. Mária Tarjányi, Dr. Ambrus Magyar, Dr. János Horányi

Dr. Ákos Szűcs (tutor), Dr. Krisztina Pinkola,

Dr. Marianna Borsodi, Dr. Zsolt Csapó, Dr. Péter Lukovich

Dr. Bálint Hargitai, Dr. András Nagy, Dr. Edina Nagy,

Dr. András Papp, Dr. László Regáli (tutor), Dr. Hedvig Sas

## II. Department of Surgery

1125 Budapest, XII. Kútvolgyi út 4.

☎: 325-1100/57351 Fax: 375-4291

Head of the Department:

Tutor:

**Dr. Gábor István** M.D., Ph.D.

Dr. György Ledniczky

## Department of Transplantation and Surgery

1082 Budapest, VIII. Baross u. 23.

☎: 267-6000; 459-1500/54321 Fax: 317-2166

Head of the Department:

Tutor:

**Dr. Zoltán Máthé** M.D., Ph.D.

Dr. Gábor Telkes

## I. Department of Surgery Department Section of Surgery

1096 Budapest, IX. Nagyváradi 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. Nagyváradi 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 Kóthy, 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:

Full professor:

Professor emeritus:

Associate professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. János Rigó** M.D., Ph.D.

Prof. Dr. Júlia Hajdú

Prof. Dr. Sándor Csömör, Prof. Dr. Zoltán Papp

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 Hupuczsi

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 Hruby, dr. Judit Jeager

Dr. András Újházy, Dr. Zorán Belics, Dr. Ákos Csaba,

Dr. József Gábor Joó (tutor), Dr. Barbara Köhalmi,

Dr. Norbert Sipos, Dr. Tamás Böze, Dr. Zoltán Bán,

Dr. Anikó Boda, Dr. Éva Csatlós, Dr. Zoltán Garamvölgyi,

Dr. István Karasznaí, 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 Sassi, Dr. 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. Úllői út 78/a.

☎: 210-0290

Head of the Department:

Full professor:

Associate professor:

**Prof. Dr. Nándor Ács** M.D., Ph.D.

Prof. Dr. Attila Pajor, Prof. Dr. Ferenc Bánhidly

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:

Full professor:

Assistant professor:

Assistant lecturer:

**Prof. Dr. László Hangody** M.D., Ph.D., D.Sc.

Prof. Dr. András Sárváry, Prof. Dr. Tibor Mózes

Dr. Miklós Szebeny, Dr. István Baráth

Dr. Tamás Gál, Dr. Ágnes Berta (tutor)

## Department of Urology

1082 Budapest, VIII. Üllői út 78/B.

☎: 210-0330

Head of the Department:	<b>Prof. Dr. Péter Nyirády</b> 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 Szúcs, Dr. Krisztina Szabó, Dr. Lajos Joós
Assistant lecturer:	Dr. Stelios Mavrogenis, Dr. András Rusz, Dr. Attila Majoros, Dr. Péter Riesz, Dr. Erzsébet Péntes, 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:	<b>Prof. Dr. Barna Vásárhelyi</b> 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](mailto:katasztrofa@med.semmelweis-univ.hu)

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

The department was founded on July 1<sup>st</sup>, 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 1<sup>st</sup>, 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 27<sup>th</sup>, 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

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### 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 Madléná,  
Dr. Tibor Károly Fábián, Dr. Zsuzsa Szántó,  
Dr. Judit Borbély (tutor 1<sup>st</sup> year)

Assistant professor:

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

Assistant lecturer:

Dr. Péter Faluhelyi, Dr. Marianna Jáhn (tutor 4<sup>th</sup> year),  
Dr. Katalin Kalocsai, Dr. Mercédesz Linninger,  
Dr. Krisztina Mikulás (tutor 3<sup>rd</sup> year 2<sup>nd</sup> semester)

Clinical specialist:

Dr. Zsuzsanna Tóth, Dr. Pál Sajgó, Dr. Katalin Nemes  
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. Gábor Fábián** D. M. D., Ph.D.

Professor emerita:

Prof. Dr. Ildikó Tarján

Associate professor:

Dr. Katalin Gábris, Dr. Noémi Rózsa

Assistant professor:

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

Assistant lecturer:

Dr. Mária Budai, Dr. Beáta Szádeczky, Dr. Gergely Balaton,  
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:	<b>Dr. Zsuzsanna Tóth</b> 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:	<b>Prof. Dr. Gábor Varga</b> 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 – 2 <sup>nd</sup> semester)
Assistant professor:	Dr. Kristóf Kádár (tutor – 1 <sup>st</sup> 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:	<b>Prof. Dr. Csaba Dobó Nagy</b> D.M.D.
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## 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:	<b>Dr. Zsolt Németh</b> 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 Vaszilko
Clinical doctors:	Dr. József Béla Barabás, Dr. Péter Barabás, Dr. Kinga Bérczy, Dr. Gergely Csókay, Dr. Katalin Csurgay, Dr. Iván Decker, Dr. Fanni Sára Kálmán, Dr. György Komlós, Dr. Zsófia Rónaszegi-Somogyi, Dr. Tatjana Skolnyik, Dr. Ilona Szmirmova, 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 Dóri

Assistant professor:

Dr. Tibor Keglevich

## Department of General Dental Preclinical Practice

1088 Budapest, VIII. Szentkirályi u. 47.

☎: 459-1472; 459-1500/59112; 59322

Head and tutor of the Department:

**Dr. Krisztina Márton** D. M. D., Ph.D.

Clinical specialist:

Dr. Anna Dézsi (tutor 2<sup>nd</sup> year and 3<sup>rd</sup> year 1<sup>st</sup> semester)

## 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. Högyes 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

1085 Budapest, VIII. Üllői út 26.

☎: 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 (tutor)

### Department of Pharmaceutics

1092 Budapest, IX. Högyes Endre u. 7.

☎: 476-3600, (/x: 217-0914)

Head of the Department:

**Dr. István Antl** Ph.D., habil.

Full professor:

Prof. Dr. Sylvia Marton (tutor of the 5<sup>th</sup> 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 3<sup>rd</sup> 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. Högyes 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 Örfi

Assistant lecturer:

Dr. Károly Mazák, Dr. Márta Mazák-Kraszni, Ákos Rác

## Department of Pharmacodynamics

1089 Budapest, VIII. Nagyváradi tér 4.

☎: 210-2930

Head of the Department:	<b>Prof. Dr. György Bagdy</b> D. Sc.
Full professor:	Prof. Dr. Kornélia Tekes (course director, tutor)
Professor emeritus:	Prof. Dr. Tamás Török Dr. Éva Szökő (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

1092 Budapest, IX. Högyes Endre u. 7.

☎: 476-3600

Head of the Department:	<b>Prof. Dr. Péter Mátyus</b> Ph. D.
Professor emeritus:	Prof. Dr. László Szabó
Assistant professor:	Dr. Péter Tétényi (tutor), Dr. Pál Tapolcsányi
Assistant lecturer:	Olivér Éliás

## Institute of Health Informatics Development and Further Training

1094 Budapest, Ferenc tér 15. floor II.

☎: +(36-1) 210-0328; +(36-1) 488-7620 Fax: +(36-1) 210-0328; ext 51835; 57620

Head of Department:	<b>Dr. Miklós Szócska</b> Ph.D.
Full Professor:	<b>Dr. habil Elek Dinya</b> Ph.D.
Associate professor:	Dr. László Daragó Ph.D.
Assistant professor:	Dr. Dinyáné Mariann Szabó, Dr. Zoltán Ádám Tamus Ph.D., Dr. Tamás Iváncsy Ph.D.

## Centre of Physical Education and Sport Sciences

1107 Budapest, X. Zágrábi út 14.

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

Director:	<b>Kornélia Várszegi</b>
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## Sport establishments: Sports Ground and Gymnastic Hall

Budapest, X. Zágrábi út 14.

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 Göbl** 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

1046 Budapest, Erkel Gyula u. 26. I./113.

☎: +(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

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

1083 Budapest, VIII. Illés u. 15.

☎: 313-7961; ext 60601, 60579, 60594

Director:

**István Mészáros**

Supervisor:

Pál Kocsik M.Sc.

Registrar:

Zsanett Bazsó

## 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 1<sup>st</sup> year:

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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 2<sup>nd</sup> year:

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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 3<sup>rd</sup> year:

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

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

# FACULTY OF MEDICINE

## BASIC MODULE



*Faculty of Medicine*  
*1<sup>st</sup> year*

## STUDY PROGRAMME

**Important: New curriculum is to be introduced gradually starting in the 2016/2017 academic year!**

### First year

#### 1st semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFIZ325_1A	Basics of Biostatistics and Informatics	1	2	3	semi-final	–
AOKFIZ326_1A	Medical Biophysics I.	1,5	2	3	semi-final	–
AOKOBI001_1A	Medical Chemistry	3	3,5	6	semi-final#	–
	Medical Biology	2	1	3	semi-final	–
AOKMAG425_1A	Medical Sociology*	1	1	2	semi-final	–
AOKANT003_1A	Anatomy, Histology, and Embryology I.	2,5	6	8	semi-final	–
AOKLEK228_1A	Hungarian Medical Terminology I.	–	4	4	pract. mark	–
AOVLEK229_1A	Medical Terminology (Latin)	–	2	2	pract. mark	–
AOKTSI009_1A	Physical Education I.	–	1	–	signature	–
<b>Total Number of Credit Points from Obligatory Subjects</b>				<b>31</b> (in case Med. Soc. is taken in the 1st semester) or <b>29</b> (in case Med. Soc. is taken in the 2nd semester)		

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

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

# The grade influences the qualification of the Diploma.



## STUDY PROGRAMME

### First year

#### 2nd semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFIZ326_2A	Medical Biophysics II.	1,5	2	3	final	Medical Biophysics I.
AOKOBI290_1A	Medical Biochemistry I.	2	1,5	3	pract. mark	Medical Chemistry
	Molecular Cell Biology I.	2,5	4	6	semi-final	Medical Chemistry Medical Biology
AOKANT003_2A	Anatomy, Histology, and Embryology II.	3	6	9	semi-final	Anatomy, Histology, and Embryology I.
AOKOMS218_1A	First Aid	6 hours / sem.	8 hours / sem.	0	signature	–
AOKLEK228_2A	Hungarian Medical Terminology II.	–	4	2	pract. mark	Hungarian Medical Terminology I.
AOKTSI009_2A	Physical Education II.	–	1	0	signature	–
AOKNSG331_1A	Summer Nursing Practice	–	1 month / 170 hours	–	signature	–
AOKMAG425_1A	Medical Sociology*	1	1	2	semi-final	
AOVIN244_1A	Introduction to Medical Informatics (Obligatory elective subject) **	–	1	1	pract. mark	–
AOVCSA248_1A	Medical Profession (Obligatory elective subject) **	0.67	1.33	2	pract. mark	–

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

**28** (in case Med. Soc. is taken in the 2nd semester)

**26** (in case Med. Soc. is taken in the 1st semester)

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

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

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

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

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

**Recommended textbooks:**

- 1 Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S.Standring: 2015 ISBN : 9780702052309
- 2 RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
- 3 A.L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology 3rd Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885 Copyright: 2012
- 4 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 9780071780339
- 5 W.Kahle-H.Leonhardt-W.Platzer: Color Atlas and Textbook of Human Anatomy (in 3 volumes) 3rd revised ed. Thieme Inc. New York, 1986.
- 6 Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; Elsevier, 2016 , ISBN 9780723438274
- 7 Stryer: Biochemistry. 4<sup>th</sup> ed. 1995. ISBN 0-7167-2009-4
- 8 Zumdahl: Chemical Principles. 3<sup>rd</sup> ed. 1998. Houghton-Mifflin Co. Boston. ISBN 0-395-83995-5
- 9 First Aid Manual: The Authorised Manual of St. John Ambulance, St. Andrew's Ambulance Association and the British Red Cross by the British Red Cross Society published on 21/03/2011 by Dorling Kindersley Publishers Ltd ISBN 9781405362146
- 10 Cooper-Hausman: The Cell: A Molecular Approach, 5th Edition, Sinauer Associates, 2006, ISBN 0-87893-300-X
- 11 Alberts-Bray-Hopkin-Johnson-Lewis-Raff-Roberts-Walter: Essential Cell Biology, 3rd Edition Garland Science, 2009. ISBN: 978-0-8153-4129-1
- 12 Graham Scambler: Sociology as Applied to Medicine. 6th edition. 2008, Saunders Elsevier, London
- 13 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*

## LEARNING OBJECTIVES

**Aims of the lectures in anatomy:** Presentation of the important and/or complicated chapters such as introductory chapters, thorax, pelvis, hand, foot, skull, heart, chapters of the visceral organs, central nervous system, **organs of special senses, topographical anatomy.**

**Aims of the lectures in cell biology and histology:** Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic tissues (epithelial, connective, muscle and nervous). Complementing gross anatomy with a detailed presentation of the fine structure of organs, including the ultrastructural details together with the molecular background. Important chapters: basic tissues, viscera, central nervous system.

**Aims of the lectures in embryology:** Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (general embryology). Presentation of the development of the organs and functional systems parallel with the gross anatomical and histological lectures including the frequently occurring malformations.

**Aims of the practical sessions in the dissecting room:** Based on the weekly programs (see separate), students will both observe prosected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, embalmed cadaver.

Students are supervised by the lab instructors. Bones, joints, muscles and peripheral nervous system will be primarily taught in the dissecting room.

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

**Aims of the practical sessions in the histology room:** Facilitate the understanding of ground (epithelial, connective, muscle and nervous) tissues and the fine structure of the organs through the observation and interpretation of histological specimens.

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

## TOPICS OF THE LECTURES:

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

**First semester:** Gross anatomy of musculoskeletal system (i.e. bones, joints and muscles), basic cytology, basic histology, basic 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 and body cavities (thorax, abdomen, pelvis), cross sectional anatomy.

## PRACTICAL COURSE

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

**First semester:** Gross anatomy of the musculoskeletal system (i.e. bones, joints and muscles, basic cytology, basic histology, basic 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. Topographical anatomy of the ventral regions of limbs and the trunk.

**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.

**Fourth semester:** Topographical anatomy of the head, neck 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: 28 (first semester: 9; second semester: 9; third semester: 7; fourth semester: 3)

**1st year 1st semester**

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**English Language Course**

**Anatomy:** Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system, i.e. osteology, arthrology and myology, together with the vascular and nervous supply of the limbs and the trunk. Skull.

**Histology:** Microscopy of the ground (basic) tissues (epithelia, glandular tissues, connective and supporting tissues, types of muscle tissues. Histology of the corpuscular elements of the blood, cells of the red bone marrow.

**Embryology:** Basic principles of human development, introduction to the clinical embryology. General embryology, including spermatogenesis, oogenesis, fertilization, cleavage, blastulation, formation of germinal layers, body axes, molecular basis of right-left asymmetry, Hox genes, formation of the placenta, fetal membranes. Organ development including the early onset of fetal circulations. and the development of the limbs, together with the trunk and the skull. Factors inducing congenital malformations.

**Credits:** 8

**Lectures:** 2,5 hours/week

**Dissection classes:** 4 hrs/week

**Histology laboratory classes:** 2 hrs/week

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
Week 1	1. The role of anatomy, histology and embryology in the medical curriculum. Terminology 2. The cell and the cellular membrane 3. The cellular framework, microtubules, IM filaments, actin microfilaments	General introduction to practical work in the dissection room, tools and rules  Upper limb Bones	Light and electron microscopical techniques, the principles of practical histology classes
Week 2.	4. Adhesion molecules, intercellular connections, epithelial cells 5. Types of epithelia. Glandular epithelium 6. Cell nucleus, mitochondrion, peroxysome	Upper limb Bones and joints	Simple epithelia

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
<b>Week 3.</b>	7. Exocytosis, Golgi apparatus, vesicular transport, sorting 8. Endocytosis, cellular organelles. Apoptosis 9. General arthrology and myology. Joints, muscles and movements of the shoulder and the upper girdle	Upper limb Dissection of the muscles, vessels and nerves of the flexor side	Stratified epithelia
<b>Week 4.</b>	10. Muscles and actions of the elbow joint 11. Joints, muscles and actions of the wrist and the hand 12. Connective tissue cells	Upper limb Dissection of the muscles, vessels and nerves of the flexor and extensor sides	Glandular epithelium
<b>Week 5.</b>	13. Connective tissue fibres, types and formation. Extracellular matrix 14. The principles of cell division, differentiation. Cell cycle, mitosis, meiosis 15. Supporting tissues (cartilage, bone)	Upper limb Dissection of the muscles, vessels and nerves of the extensor side, dissection of joints	Connective tissue I. Cellular elements
<b>Week 6.</b>	16. Ossification, bone remodelling 17. Muscles, joints and ligaments of the vertebral column. Intervertebral. atlantooccipital and atlantoaxial joints 18. Bones, joints, construction of the pelvis. Muscles and actions of the hip joint	1. Upper limb Dissection of the muscles, vessels and nerves of the extensor side, dissection of joints  <b>2. Midterm test 1</b> Upper limb	Connective tissue II. Fibrous elements.
<b>Week 7.</b>	19. Subinguinal hiatus. Adductor and femoral canals 20. Muscles and actions of the knee joint 21. Gametes, fertilization, cleavage and blastulation	Muscles of the trunk, lower limb Dissection of joints of the lower limb	Supporting tissues
<b>Week 8.</b>	22. Muscles and joints of the foot. Architecture of the foot 23. Implantation, bilaminar embryo. Fetal membranes, umbilical cord. Structure of the placenta, placental circulation 24. Molecular basis for gastrulation. Formation, differentiation and derivatives of the germinal layers.	Lower limb Dissection of the muscles, vessels and nerves of the dorsal side	Types of ossification

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
<b>Week 9.</b>	25. Neurulation, folding of the embryo. Body axes, left-right lateralization and asymmetry. Craniocaudal, dorsoventral differentiation. Malformations 26. Blood. Corpuscular elements 27. Formation of the primary tissues. Homeobox genes, stem cells	Lower limb Dissection of the muscles, vessels and nerves of the dorsal side	Revision
<b>Week 10.</b>	28. Development of the limbs 29. Development of the vertebral column and the trunk 30. Muscle tissue	Lower limb Dissection of the muscles, vessels and nerves of the ventral side	<b>Midterm test 2:</b> Cell biology Epithelia, connective and supporting tissue. General embryology
<b>Week 11.</b>	31. Bony framework of the skull. Sphenoid and ethmoid 32. Facial skeleton. Orbit, nasal cavity 33. Temporal bone. Internal and external skull base	1. Test 3: joints, muscles, nerves and vessels of the lower and upper limbs 2. Bones of the skull	Smooth, skeletal and cardiac muscle types
<b>Week 12.</b>	34. Skull. Infratemporal and pterygopalatine fossae 35. Red bone marrow, erythropoiesis, Formation of leukocytes 36. Nervous tissue. Glial cells	Internal and external skull base	Blood, red bone marrow
<b>Week 13.</b>	37. Temporomandibular joint, muscles of mastication and facial expression 38. Muscles, fasciae and triangles of the neck 39. Clinical anatomy of the musculoskeletal system	Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa Temporomandibular joint	Peripheral nervous system
<b>Week 14.</b>	40. Clinical demonstration 41. Development of the skull, fontanelles. 42. Developmental malformations	Muscles of mastication and facial expression	Placenta, umbilical cord Revision

## 1st year 2nd semester

### English Language Course

**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 Gross anatomy class: 4 hrs/week

**Histology laboratory:** 2 hrs/week

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
<b>Week 1</b>	1. Circulatory system, composition, significance. Chambers of the heart, external features 2. Histology of the vessels 3. Structure of heart wall, myocardium, valves, anuli fibrosi Anatomical basis for heart valve malformations	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: tonsils
<b>Week 2.</b>	4. Lymph node, spleen. Structure and circulation 5. Lymphatic tissue, cellular elements. Tonsils, MALT, thymus 6. Vessels, conducting system, surface projection of the heart, pericardium. Auscultation points. Myocardial infarct.	Dissection of heart, visceral complex,	Lymphatic organs: lymph node, spleen, thymus
<b>Week 3.</b>	7. Development of the heart, malformations 8. Development of the arteries and veins; malformations. Fetal circulation 9. Gastrointestinal tract. Oral cavity, morphology and histology of the tongue and salivary glands	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of heart, visceral complex	Gastrointestinal tract: lip, tongue, including the filiform, fungiform and vallate papillae
<b>Week 4.</b>	10. Morphology, histology and development of teeth. 11. Morphology and histology of soft palate, isthmus of fauces and pharynx 12. Fine structure of the hollow and parenchymal viscera Morphology and histology of the oesophagus	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of the visceral complex	Ground teeth, tooth bud. Submandibular, sublingual glands

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
<b>Week 5.</b>	13. Morphology of the nasal cavity and paranasal sinuses Larynx, cartilages, joints, muscles connective tissue skeleton, mucous membrane. 14. Histology of the respiratory tract. Development of the lungs, Respiratory distress syndrome. 15. Morphology of the trachea and the lung. Pleura	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of the visceral complex	Respiratory system: larynx, trachea, lung
<b>Week 6.</b>	16. Thorax, respiratory actions. Structure and development of the diaphragm 17. Development of the face, and palate, congenital malformations 18. Development of the branchial apparatus, congenital malformations	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of the visceral complex	Oesophagus, cardia, fundus, pylorus of the stomach
<b>Week 7.</b>	19. Abdominal wall, rectus sheath 20. Morphology and histology of the stomach 21. Morphology and histology of the duodenum and the pancreas	<b>1 Midterm test 1</b> Heart, great vessels, development of the heart and vessels. Visceral organs of the head, neck and thorax. Morphology and development of the diaphragm. Thoracic wall <b>2.</b> Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex	Duodenum, jejunum ileum, colon, vermiform appendix
<b>Week 8.</b>	22. Morphology and histology of the jejunum and ileum 23. Morphology and histology of the large intestine and rectum. 24. Morphology of the liver and biliary system. Portal vein	Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex.	Liver, gall bladder, pancreas
<b>Easter break</b>			
<b>Week 9.</b>	25. Histology of the liver and biliary system 26. Development of the mid- and hindgut. Development of the liver and the pancreas 27. Peritoneum. Development of the serous membranes and the omental bursa. Separation of body cavities	Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex	<b>Midterm test 2</b> Vessels, heart, lymphatic organs, gastrointestinal tract



Week	Lectures	Practical sessions	
		Dissection room	Histology lab
<b>Week 10.</b>	28. Morphology and topography of the kidney. Capsules. Urinary passages, urinary bladder 29. Histology of the urinary system 30. Morphology and histology of the testicle. Spermatogenesis	Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex	Urinary system: kidney, ureter, urinary bladder
<b>Week 11.</b>	31. Morphology and histology of the epididymis, spermatic cord, seminal vesicle and prostate 32. Coats of the testicles. Inguinal canal 33. Morphology and histology of penis and male urethra. Endoscopy of the male urinary passages	Cadaver dissection Retroperitoneum, pelvic organs Dissection of the visceral complex	Male genital system: testis, epididymis, spermatic cord
<b>Week 12.</b>	34. Structure of pelvic floor, male perineum 35. Morphology and histology of the ovary and the uterine tube, oogenesis 36. Morphology and histology of the uterus, divisions and content of the broad ligament	Cadaver dissection Retroperitoneum, pelvic organs Dissection of the visceral complex	Male genital system: Seminal vesicle, prostate, penis, glans penis.
<b>Week 13.</b>	37. Morphology and histology of the vagina and the external genital organs, female perineum 38. Development and malformations of the kidney 39. Development and malformations of the urinary system	Cadaver dissection Retroperitoneum, pelvic organs Dissection of the visceral complex	Female genital system: ovary, corpus luteum, uterine tube
<b>Week 14.</b>	40. Development and malformations of the genital system. Disorders of the sexual differentiation. 41. Clinical and radiologic anatomy of the internal organs 42. Lymphatic drainage of the head&-neck, thoracic and abdominal regions Announcement the competition results	Test 3 : Abdominal wall, abdominal organs; Macroscopy of the urogenital system, pelvic and urogenital diaphragms, hernia canals	Female genital system: uterus (proliferation, secretion), vagina

## BASICS OF BIostatISTICS AND INFORMATICS

Tutor: *Dr. István Voszka*

### Week Lecture (1 hour/week)

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

### Practice (2 hours/week)

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

# MEDICAL BIOPHYSICS I.

Tutor: *Dr. István Voszka*

## First Semester

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

## MEDICAL BIOPHYSICS II.

### Second Semester

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

# MEDICAL CHEMISTRY

Department of Medical Biochemistry, Faculty of Medicine, Semmelweis University

## First Semester

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**code:** AOKOBI001\_1A

**credits:** 6

**Director of the course:**

Prof. László Tretter 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

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**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.

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

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

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

**Electrolytes**

Electrolytes, degree of dissociation and the ionization constant, their correlation. Conductance of electrolytes, specific and equivalent conductance of strong and weak electrolytes. Acid-base theories. The Arrhenius theory. Classification of acids and bases, their anhydrides. The Bronsted-Lowry concept. The Lewis concept (e.g. coordination compounds). Acid strength and the molecular structure. The ionization of water. Water product, definition of pH and pOH. The pH scale. Calculation of pH for strong electrolytes. The effect of strong acids and bases on the ionization of weak acids and bases, respectively. The effect of strong acids and bases on the salts of weak acids and bases. Buffers, calculation of pH of buffers. Buffers of polyprotic acids. Buffers of physiological importance. The carbonic acid/hydrogencarbonate buffer.

Buffer capacity. Acid-base indicators. Titration curves of strong and weak electrolytes.

The selection of indicator for titrations. The amphoteric character. Basic and acidic salts. Double salts, complexes. Geometry of complexes, chelates. Reaction of salts with water (hydrolysis).

#### *Electrochemistry*

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

#### *Thermodynamics*

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

#### *Chemical kinetics*

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

## II. Inorganic chemistry

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#### *Properties of non-metals*

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

#### *Properties of metals*

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

## III. Organic chemistry

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#### *General properties of organic compounds*

Introduction, definition of organic compounds, their composition. Homologous series, constitution, constitution isomerism. Classification according to carbon skeletons and functional groups. Characterization of bondings in organic compounds, bonding energy, distance of atoms, dipole moment. Apolar and polar character, inductive and inductomeric, mesomeric and electromeric effects. The vectorial character of dipole moment. Optical isomerism: structural principles of rotation. Chirality, chiral carbon atoms, configu-

ration, enantiomers. Principle of relative and absolute configuration. Projected formulas. Compounds with more than one chiral center: diastereomerism, mezo-forms. Separation of optical isomers.

#### **Classification of hydrocarbons based on their carbon backbone**

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

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

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

#### **Lectures and practical lessons**

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

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

**Requirements for acknowledgement of the semester**

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

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

**Midterm examinations**

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

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

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

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

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

Failed midterms might be retaken twice.

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

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

**Semifinal examination**

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

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

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

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

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

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

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



The exam is unsuccessful with

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

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

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

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

33-39 points = grade 2 (pass)

40-49 points = grade 3 (satisfactory)

50-59 points = grade 4 (good)

60-72 points = grade 5 (excellent).

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

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

### For CV and FM students

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

### Competition

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

### Exemption from the semifinal exam

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

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

### Registration and modification of examination dates:

Electronically, via the Semmelweis University Neptun System.

Retakes are not possible within 3 days following the exam.

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

**Recommended textbooks, manuscripts, handouts:****General chemistry:** Ebbing-Gammon: General Chemistry, latest edition**Organic chemistry:** Hrabák-Csermely-Bauer: Principles of Organic Chemistry (2nd edition, 2007, editor: A. Hrabák); Sasvári: Bioorganic compounds (manuscript)**Inorganic chemistry:** Tóth: Concise inorganic chemistry for Medical Students (manuscript)**Laboratory:** Hrabák: Selected Collection of Chemical Calculations and Biochemical Exercises (2007); Hrabák: Laboratory Manual - Medical Chemistry and Biochemistry (third edition, 2007)

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

**TOPIC LIST AND IMPORTANT TERMS**

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**GENERAL CHEMISTRY TOPICS (1 – 37)****Note: Chapter numbers correspond to the 9th edition of D.D. Ebbing – S. D. Gammon: General Chemistry (2009)****Important terms are written in italics.****ATOMIC STRUCTURE**

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

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

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

**ELECTRON CONFIGURATION OF ELEMENTS**

(Ebbing: Chapter 8. Electron configurations and periodicity)

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

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

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

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

**IONIC AND COVALENT BONDING**

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

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

Cation, anion, lattice energy, ionic radius.

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

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

**INTERMOLECULAR FORCING**

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

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

### CHEMICAL EQUILIBRIA

(Ebbing: Chapter 14: Chemical equilibrium)

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

### CONCENTRATIONS OF ACIDS AND BASES

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

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

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

### ACID-BASE CONCEPTS

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

9. Acid base theories: The Arrhenius concept. Self ionization of water, the pH and pOH of a solution. The pH scale. Calculation of pH for strong acids and bases.
10. Titration curves of strong electrolytes. Relative strength of acids and bases. Acidic strength and the molecular structure of hydrides and oxoacids.
11. Acid-base equilibria: pH of weak acids and bases. Degree of ionization and the ionization constants ( $K_a$  and  $K_b$ ). Definition of  $pK_a$  and  $pK_b$ . Acid base theories: Bronsted-Lowry concept. Conjugated acids and bases. Lewis concept of acids and bases.
12. Common ion effect: The Henderson-Hasselbalch equation. pH dependence of acid/base equilibria. Acid-base indicators
13. Buffers. Principle of maintaining a constant pH (examples). Buffer capacity. Comparison of acid and base capacity. Titration curves of monoprotic and polyprotic (phosphoric and carbonic acid) weak acids.
14. Buffers of physiological importance. Buffer effect of the phosphate group. The carbonic acid / hydrogen carbonate buffer. The pH-bicarbonate diagram. Effect of stabilization of carbon dioxide and bicarbonate concentration on the buffer capacity. Total acidity of the urine. Respiratory acidosis. (Lecture)
15. Acid-base properties of salt solutions (hydrolysis). Anion-hydrolysis (example: acetate) and cation-hydrolysis (example: ammonium ion). pH of acidic salts (examples:  $\text{NaHSO}_4$ ,  $\text{NaHCO}_3$ ,  $\text{NaH}_2\text{PO}_4$  and  $\text{NaHPO}_4$ ).  
Acid (Arrhenius theory), base (Arrhenius theory), self ionization of water, ion-product constant for water (water product,  $K_w$ ), pH, pOH, the pH scale; acid-base titration curve, equivalence point.  
Acid (Bronsted-Lowry theory), base (Bronsted-Lowry theory), conjugate acid-base pair, Lewis-acid, Lewis base.  
Acid ionization (dissociation) constant, base ionization (dissociation) constant, degree of ionization.  
– common ion effect, buffer, Henderson-Hasselbalch equation  
– acid-base indicators, buffer capacity (acid capacity and base capacity)  
Skills: Drawing the titration curves of strong and weak (monoprotic and polyprotic) acids/ bases

(Lecture): Intracellular and extracellular buffer systems of the body, average charge of phosphoric acid at various pH, components of the bicarbonate buffer in the blood, role of the ventilation in pH stabilization, role of the red blood cells in pH stabilization, role of the kidney in pH stabilization, 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)

- Solubility of salts. The solubility product. Saturated solutions, solubility. Conditions for precipitation. Examples of well soluble and mainly water insoluble compounds.
- Complex ions. Lewis theory and complex formation. Central ions and ligands, coordination number. Geometry and isomerism of complexes. IUPAC nomenclature of complexes. Principles of valence shell and crystal field theory.
- Unidentate, bidentate, ambidentate and polydentate ligands in complexes. Chelate complexes, complexometric titration. EDTA and biological complexes (heme, vitamin B<sub>12</sub>, calmodulin, EF hand). Elimination of heavy metal ions from the body.

Solubility, solubility product constant ( $K_{sp}$ ), ion product ( $Q$ ), conditions for precipitation

Complex salts, double salts, ligands, central ions, coordination number of complexes, unidentate-, bidentate-, ambidentate- and multidentate ligands (examples), chelate complexes (examples), Lewis acid-base theory, geometric isomerism, chiral isomerism, crystal field theory, high and low spin complex; structure of EDTA, biological complexes of iron and calcium, EF hand protein motif

### SOLUTIONS

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

- Solutions. Solute, solvent. Solubility. The solution process. Solubility of iodine in organic solvents and in water. Lugol solution. Solution of ionic crystals (NaCl) and crystals of polar substances (glucose) in water. Hydrated ions.
- Enthalpy of solution of solids and gases. Lattice energy and enthalpy of hydration. Enthalpy of solvation. Role of the change of entropy in the solution process. Effects of temperature and pressure on solubility of solids and gases. Henry's law. Bunsen (absorption) coefficient. Calculation of molar concentration of dissolved gases.
- Vapor pressure of solutions. Raoult's law. Ideal and "real" solutions, vapor pressure depression of solutions of nonvolatile solutes. Mole fraction and molality. Vapor pressure depression of dilute solutions of nonvolatile solutes.
- Solutions of gas in gas. Partial pressure. Composition of air. ppm as concentration unit. Decompression sickness. Artificial air.
- 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.
- The phenomenon of osmosis. Osmotic pressure, dependence on temperature, solute concentration and ionic dissociation. Isotonic, hypertonic and hypotonic solutions. Determination of molecular mass or concentration by measuring osmotic pressure. Biological and medical significance of osmosis.

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

**THERMODYNAMICS**

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

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

**REACTION KINETICS**

(Ebbing: Chapter 13: Rates of reaction)

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

**ELECTROCHEMISTRY**

(Ebbing: Chapter 19: Electrochemistry; Lectures)

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

*equation, concentration cell, hydrogen electrode, glass electrode, non-polarizable electrodes, calomel electrode, silver electrode; specific and equivalent conductance; Daniell element; non-polarizable electrode*

## **INORGANIC CHEMISTRY TOPICS (1 – 14)**

### **Important terms are written in italics.**

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

**ORGANIC CHEMISTRY TOPICS (1 – 22)**

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

**Important terms are written in italics.**

**COVALENT BONDING IN ORGANIC COMPOUNDS**

(Chapter 2)

1. The central role of carbon atoms in organic chemistry. Chemical bonds. Hybridization of atomic orbitals, the hybrid states of carbon, resonance and delocalization in organic compounds.  
*sp, sp<sup>2</sup>, sp<sup>3</sup> hybridization, promotion of carbon, aromatic compound, antiaromatic compounds, benzenoid compound*

**DIPOLE MOMENTUM AND GENERAL ACID-BASE PROPERTIES OF ORGANIC COMPOUNDS**

(Chapter 3)

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

**THE STERIC STRUCTURE OF ORGANIC MOLECULES. ISOMERISM AND TERMINOLOGY.**

(Chapter 4)

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

**CLASSIFICATION OF ORGANIC COMPOUNDS**

(Chapter 5)

8. Classification of organic compounds according to the main functional groups
9. Reaction types and reaction mechanisms in organic chemistry.  
*S<sub>N</sub>1 reaction, S<sub>N</sub>2 reaction, functional group, homologous series, homolytic bond breaking, heterolytic bond breaking, nucleophile reactant, electrophile reactant, electrophilic, nucleophilic, radical reactions, addition, substitution, elimination, Markownikow rule, 1-1 example for fundamental reaction types in organic chemistry (e.g. nucleophile addition), rearrangement reactions, regioselective reaction*

**MAJOR FUNCTIONAL GROUPS AND THEIR REACTIONS**

(Chapter 6)

10. Structure and reactions of alkanes: nomenclature, conformational analysis, radical reactions.
  11. Structure and reactions of alkenes and alkynes: nomenclature, sigma and pi bonds, the triple bond, the cis-trans and the Z/E nomenclature of isomers. Electrophilic addition type of reactions. Hydrohalogenation. Markownikow's rule. Dienes, conjugation and resonance. Electrophilic addition of 1,3-butadiene.
  12. Structure, synthesis and typical reactions of alkyl halides. Nucleophilic substitutions: the  $S_{N1}$  and  $S_{N2}$  reactions.
  13. Structure and reactions of homoaromatic compounds. Benzene and polycyclic compounds. Resonance stabilization in aromatic compounds and the Huckel's rule.
  14. Mechanism of electrophilic substitution of aromatic compounds. Effect of substituents of the aromatic ring on the reaction rate and product formation in further electrophilic substitution type of reactions.
  15. Classification, structure, physical and chemical properties and reactions of organic hydroxyl compounds (alcohols, enols, phenols). Formation of ethers and esters.
  16. Classification and nomenclature of ethers (epoxides, hemiacetals, acetals). Electronic structure of open-chain and cyclic ethers; physical properties, miscibility, chemical reactivity: coordinative bonding, basicity, Zeisel test, nucleophilic attack of epoxydes, peroxyethers.
  17. Structure, nomenclature, chemical-physical properties, biological role and characteristic reactions of carbonyl compounds (aldehydes, ketones). Important nucleophilic addition reactions (addition of simple inorganic molecules; dimerisation, polymerisation, aldole formation, acetal formation, formation of ketimines, oximes, hydrazones, Schiff's bases).
  18. The electronic structure of the carboxylate anion, the most important mono-, di- and tricarboxylic acids. Condensation type reactions of organic acids: ester- and anhydride-formation, lactones. Decarboxylation of organic acids. The decarboxylated products of amino-, hydroxy- and keto acids.
  19. Halogen-, hydroxy-, oxo- and amino derivatives of carboxylic acids.
  20. Organic thio-compounds. Thioalcohols, thioethers, sulfenic and sulfonic acids.
  21. Amino- and imino-derivatives of hydrocarbons: their formation, classification and base character. The principal reactions of organic amines: acylation, reaction with  $HNO_2$ , deamination, transamination.
  22. The most important representatives of organic amines in living organisms. The amine derivatives of carbonic acid: carbamoyl-P, urea, guanidine, creatine, barbiturate.
- Alkane, alkene, alkyne, Huckel's rule, olefin, paraffin, alcohols, enols, phenols, bond order, alkoxy, aryloxy, tautomer,  $\alpha$ -unsaturated alcohol, ether formation, ester formation, dehydration, epoxide, hemiacetal, acetal, Zeisel test, peroxyethers, thiol, thioether, disulfide, sulfide, sulfoxide, sulfone, sulfonate, carbonyl group, aldehyde, ketone, quinone,  $\beta$ -unsaturated carbonyl compounds, amphoterism, desmotropism, protective groups, dimerization, paraformaldehyde, glycosides, furanose, pyranose, Schiff-base, hydrazine, oxime, strong and mild oxidation of oxo-compounds; Tollens test; Fehling test, Cannizzaro reaction*
- ester, anhydride, amide, halogenide, azide, aminoacid, fatty acid, carboxylate, dimerization of carboxylic acids, nucleophilic acylation, alpha substitution, driving forces of esterification, cyclic esters, soaps, transesterification, transamination, polyesters*
- nitroso, nitro, oxime, amine, imine, amide, nitrile, isonitrile, cyanate, isocyanate, imide, hydrazine, hydrazide, azo, electron distribution within the most important functional groups: acid-base properties (primary, secondary... amines), conjugation effect, amphoterism of imidazole, structure of the amide bond, restricted rotation and isomerism, tautomerism of nucleotide bases, Schiff-base formation, isocyanate formation*



**TOPICS FOR THE LAB EXAM (1 – 19)**

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

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

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

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

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

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

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

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

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

*Organic acids:* formic acid, acetic acid, propionic acid, butyric acid, valeric acid, caproic acid, oxalic acid, malonic acid, succinic acid, glutaric acid, maleic acid, fumaric acid, lactic acid,  $\beta$ -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, phenoether, 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 Kővecses Mrs Márta Stroe Mrs Kinga Pelczer

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

## MEDICAL BIOCHEMISTRY I.

**Department of Medical Biochemistry, Faculty of Medicine, Semmelweis University**

### **Second (Spring) Semester**

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**Neptun code:** AOKOB1001\_1A

**Credits:** 3

**Director of the course:**

Prof. László Tretter M.D., Ph. D., D. Sc.

End semester requirement: practice mark

#### **Description of the curriculum**

The principal aim of the course is to provide an insight into the structure and function of biologically important molecules including amino acids, carbohydrates, lipids and nucleotides as well as proteins, enzymes and nucleic acids. This module is a prerequisite to the understanding of the intermediary metabolism of the cell that is introduced by the module of bioenergetics and mitochondrial ATP production. The cell biology unit describes the principles of organization of cells as well as the function of subcellular organelles. The molecular biology module aims at highlighting the storage and expression of genetic information throughout replication, transcription and translation as well as our current understanding of the regulation of gene expression, followed by an up-to-date summary of currently used methods in molecular biotechnology.

**Module I. Biologically important molecules and macromolecules****I/1. Amino acids, peptides, proteins**

Amino acids. Amino acids as electrolytes. Structure and chirality of amino acids. Reactions of amino acids. Proteins. The peptide bond. Structure levels in proteins. Primary structure of proteins. Steric structure of globular proteins. Conformation of proteins. Purification of proteins. Structural characteristics of fibrous proteins. Collagen. Myoglobin and hemoglobin.

**I/2. Enzymology**

Enzymes. Enzymes as biocatalysts, enzyme activity. Isozymes. Coenzymes. Enzyme kinetics: the Michaelis-Menten model. Mechanism of action of some important enzymes (serine proteases). Reversible and irreversible inhibition of enzymes; competitive, non-competitive and uncompetitive inhibitors. Regulation of enzyme activity. Allosteric enzymes.

**I/3. Carbohydrates, lipids, nucleotides**

Structure and function of essential building blocks of living cells.

**Module II. Bioenergetics and mitochondrial ATP production**

Group transfer potential. Bonding types of high group transfer potential. Principle and examples of coupled reactions in the metabolism. The phosphoryl transfer. Role of high energy phosphates in the intermediary metabolism. Synthesis of ATP by substrate level phosphorylation.

Mitochondrial membranes and their permeability. Mitochondrial transporter systems. The respiratory chain: components, organization, function, inhibitors. Respiratory control, P/O ratio, uncoupling of oxidative phosphorylation. Mitochondrial ATPase. ( $F_0F_1$ -ATP-ase): structure, function, inhibitors. Mechanism of oxidative phosphorylation. Chemiosmotic hypothesis.

**Module III. Cell Biology**

Compartmentation in eukaryotic cells. Membrane structure. Intracellular membranes. Cell nucleus. Movement of cellular organelles. Cytoskeleton, microfilaments, microtubuli, actomyosin. Mechanism of vesicular transport. Metabolism and transport, the principle of metabolom. Metabolic profile of various organelles (endoplasmic retikulum, peroxisomes, lysosomes, mitochondria).

**Module IV. Molecular Biology****IV/1. DNA, RNA and protein synthesis (storage and expression of genetic information)**

Nucleic acids – structure and function. Bases, nucleosides, nucleotides, DNA structure, DNA denaturation, hybridization. DNA replication. Replication in prokaryotes, leading and lagging strand. Okazaki fragments. DNA-dependent DNA polymerases. DNA ligase. Telomerase. topoisomerases. Replication in eukaryotes. Structure of eukaryotic chromosomes. Mitochondrial DNA. Nucleosome structure. DNA repair. Types of DNA damage; mutations, frameshift, nonsense mutations, mismatch repair. Coordination of repair and replication. Transcription in prokaryotes. Structure of RNA; t-RNA, r-RNA, m-RNA, differences between the prokaryotic and eucaryotic genomes. Transcription complexes, initiation, elongation, termination in prokaryotes. Transcription in eucaryotes, RNA polymerases, promoters, enhancers, silencers. Processing of mRNA, mechanism of splicing. Alternative splicing, mRNA editing. The genetic code. Activation of tRNA. Mechanism of translation, initiation, elongation, termination. Antibiotics. Posttranslational modification of proteins. Protein folding, sorting, quality control and transport into intracellular compartments. Ubiquitination and intracellular proteolysis.

**IV/2. Regulation of gene expression**

Regulation of gene expression in prokaryotes. The operon model. Positive and negative regulation in the lac operon. Regulation of gene expression in eukaryotes at the transcriptional level. Role of chromatine structure; covalent and non-covalent chromatin modifying activities and DNA methylation (epigenetics). Post-transcriptional regulation in eukaryotes. Regulation of mRNA stability; microRNAs. Translational regulation.

**IV/3. The eukaryotic cell cycle and its regulation**

Cell cycle in eukaryotes. Cyclins and cyclin dependent protein kinases. Proteases in the cell cycle. Regulation of G0/G1, G1/S and G2/M transitions. Integration of DNA repair into the cell cycle.

**Module V. Methods in molecular biology and gene technology**

Principles of recombinant DNA technology: molecular cloning, restriction endonucleases. Genomic and cDNA libraries. Blotting techniques (Southern, Northern, Western) and their utilization. DNA microarrays. PCR and its application in molecular biology. Recombinant vectors (reporter and expression vectors); synthesis of recombinant proteins. Transgenic, knock-out and knock-in animals in medical research. Human gene therapy. The Human Genome Project and its results: organization and polymorphic nature of the human genome; implications for human traits and diseases. Genotyping methods (PCR-RFLP, PCR-ASA). Application of bioinformatics in biological and medical research.

**Requirements**

1. Participation in the laboratory practicals, consultations and seminars is obligatory; students have to sign the attendance sheets at the end of every lesson. In case of more than three absences from the practical lessons for any reason, the semester will not be acknowledged and the student is not 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 his/her own teacher. The schedule of practical lessons, consultations and seminars can be downloaded from the official homepage of the Institute.
2. Both midterm examinations have to be passed before the commencement of the examination period (see next paragraph).

**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 at most 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, 3 and 5 (at most 6) are added to the scores of midterm I and those obtained in weeks 8 – 11 (at most 8) to midterm II, respectively. Importantly, these bonus points not only improve your midterm grades but might help you pass the midterm, too.

**Midterm examinations**

Two midterm written examinations will be held during the semester (in weeks 6 and 13 of the semester, respectively), during laboratory practical lessons.

Midterm tests consist of open questions that might include structures of bioorganic compounds as well as calculations with regard to pH of amino acid solutions, enzyme purification and enzyme kinetics.

The material of midterm I covers the subject of lectures and seminars of the first 5 weeks (corresponding chapters from the topic list: Amino acids, peptides, proteins and enzymes: 1-18; Carbohydrates: 1-6; Bioenergetics and mitochondrial energy production: 1-4).

Midterm II is based on the lectures and seminars of weeks 6-12 (corresponding chapters from the topic list: Nucleotides and nucleic acids: 1-8; Cell Biology: 1-11; Molecular Biology: 1-35). Midterm tests will be evaluated and graded by lab teachers (0, 2, 3, 4 or 5 scores).

It is compulsory to pass BOTH midterm exams, that is, to acquire at least 2 scores from each of them, as a prerequisite to acknowledgement of the semester (obtaining a signature). These 'midterm' or 'bonus' points are added to the scores achieved at the semifinal exam (see below).

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

Failed midterms might be retaken twice.

**The first retake** is written; it should be performed in week 7 (retake of midterm I) and week 13 or 14 (retake of midterm II), supervised by the student's own lab teacher.

Students having failed the first retake might sit for the second retake in the last week of the semester.

**The second retake** is an oral exam conducted by a two-member examination committee. Students having failed the first retake of both midterms I and II will be examined in the material of both midterms at the same time.

**Textbooks, manuscripts, handouts:**

**Harper's Illustrated Biochemistry (30th edition)**

**Sasvári:** Bioorganic compounds (manuscript)

**Hrabák:** Selected Collection of Chemical Calculations (manuscript)

Medical Chemistry and Biochemistry Laboratory Manual (manuscript)

**Powerpoint files of lectures – [www.biochemistry.sote.hu](http://www.biochemistry.sote.hu), English, For students, Biochemistry I, authorized pages**

(username and password can be obtained from lab teachers)

**Students' own lecture notes**

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 1<sup>st</sup> floor, Department of Medical Chemistry, Molecular Biology and Pathobiochemistry, „D” passage.**

**Exemption:** Students who have certificates of their previous studies at other Universities in Chemistry and/or Biochemistry may apply for exemptions 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.
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 semester without attending lectures and laboratory programs. This exam is based on the question list of the semifinal or final examination, and can be obtained from the tutor of the course. After a successful exam students are exempted from the semifinal or final exam at the end of the semester, 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 semester. The exemption is valid only for one semester unless the student successfully completes the final exam for both semesters' material.
3. Partial exemption (i.e. only from laboratory programs or lectures) is not permitted.

# 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

**Description of the curriculum**

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

**Textbooks**

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

## MEDICAL PROFESSION

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

### Second Semester

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**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:** 30<sup>th</sup> January

**Precondition:** Only for students in the 1<sup>st</sup> year.

## MEDICAL SOCIOLOGY

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

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**Credit:** 2

Responsible person and Institute for the course: *Dr. Zsuzsa Szántó*; Institute of Behavioural Sciences

**Lecturers:** Dr. Zsuzsa Szántó  
 Dr. Katalin Kovács  
 Dr. Bea Dávid  
 Dr. Fruzsina Albert

**Goals of the subject:**

To introduce to the students the social distribution of health and illness, the causes and consequences of health status inequalities, the role of psychosocial factors in health care, the social phenomena occurring in healing, the social situation of medicine, and the social embeddedness of the health care system.

**Syllabus of the subject:**

Week	Class type	Themes
1	Lecture	Introduction. Changing patterns of disease
2	Lecture	Health and illness behaviour.
3	Lecture	Social inequalities in health and mortality.
4	Seminar	Health and illness behaviour.
5	Seminar	Social inequalities in health and mortality.
6	Lecture	Health professions
7	Seminar	Health professions
8	Lecture	National variations of health care
9	Lecture	Health care and health policy
10	Lecture	Midterm examination
11	Seminar	Chronic illness and disability
12	Seminar	Ageing and care of the elderly
13	Seminar	Gender aspects of health
14	Seminar	Doctor-patient relationship

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

**Course requirements, methods of monitoring:**

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

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

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

**Textbook:**

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



# INTRODUCTION TO MEDICAL INFORMATICS

Institute of Digital Health Sciences

**Credit:** 1

Practice: 14 hours/semester

## OPTIONAL courses:

### 1. SCIENTIFIC COMMUNICATION COURSE

	The course gives an introduction to the paper based and oral publications and presentations. The students find a medical problem (a topic) to work out during the course The grade is given by the publication and the presentation, made by the student.
1.	Studying scientific publications via electronic library of the university. Studying and comparing the structure and format, that is the restrictions determined by of several editorials. Searching papers as basics for a medical study (syndromes, diagnoses, therapy).
2.	Structure of a scientific publication. The importance and meaning of the sections of the paper.
3.	Structure of an oral presentation and slides. Studying papers as publications and slides, as presentations.
4.	Making an article on a medical study by special formal constraints and restrictions.
5.	Making a presentation on the same theme.

### 2. DATABASES COURSE

1.	<i>Database theory:</i> Introduction to database theory (the application, logical, and physical models, basic concepts and objects). Planning a relational database (patient appointment scheduling (PAS) database example). Database in practice: managing tables, basic queries (database: PAS; tables: calendar, patient, physician)
2.	<i>Database powered websites (theory):</i> The LAMP model, Web2.0 features Online technologies: Basic concepts of HTML, CSS, PHP, SQL servers
3.	<i>Web technologies in practice:</i> Creation of a simple web application (using basic HTML and PHP as an example to HTTP data transfers)
4.	<i>EM project portal:</i> Web Application design - php based application for search (query) the PAS database existing on SQL server (MySQL).
5.	<i>EM project portal:</i> User Interface design of online User Interfaces for patients, administrators and physicians.

### 3. BIOMEDICAL SIGNAL PROCESSING COURSE

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

### 4. PRESENTATIONS IN THE WEB 2.0 SPHERE

1.	Introduction: How to make a good presentation? – technical and non-technical skills, best practices
2.	The “traditional” way – using MS PowerPoint (4 h.)
3.	Presentations in the Web 2.0 sphere: using online tools (Google Docs, Slideshare, Prezi) (4 h.)
4.	Exam: Individual work. (2 h.)

# FIRST AID

Tutor: *Dr. Hajnalka Mészáros*

## Topics

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

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

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

Mode of certifying absences: oral – referring to practices

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

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

# TERMINOLOGY OF MEDICINE (1st semester)

## Responsible organisational unit:

Faculty of Health Sciences, Division of Foreign Languages and Communication

## Programme director:

Zöldi Kovács Katalin PhD, Head of the Division

## 2 lessons per week, 2 credits

**Assessment:** 3 written tests

## Role of subject in fulfilling the aim of training:

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

## Brief description of subject:

The main aim of the subject is:

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

## Course content of practical lessons:

1. Grammar:

*Nouns:* the 5 Declensions

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

*Prepositions* (in anatomical, clinical and pharmaceutical phrases)

*Numerals:* Usage on prescriptions.

2. Texts containing:

- a) anatomical names;
- b) clinical and patho-anatomical diagnoses;
- c) prescriptions

3. Vocabulary

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

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

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

## Basics of Foreign Language (module 1.)

### Magyar orvosi szaknyelv 1.

#### Responsible organisational unit:

Faculty of Health Sciences, Division of Foreign Languages and Communication

#### Programme director:

Zöldi Kovács Katalin PhD, Head of the Division

4 lessons per week, 4 credits,

**Assessment:** end-term written and oral exam

#### Role of subject in fulfilling the aim of training:

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

#### Brief description of subject:

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

#### Course content of practical lessons:

Lesson 1-2:	The alphabet
Lesson 3-4:	Greetings
Lesson 5-6:	Where are you from?
Lesson 7-8:	Introducing people
Lesson 9-10:	Numbers-phone numbers
Lesson 11-12:	What time is it?
Lesson 13-14:	Practising telling the time
Lesson 15-16:	Days
Lesson 17-18:	When do you study?
Lesson 19-20:	What is it? - food
Lesson 21-22:	Consolidation
Lesson 23-24:	Test 1 + situations
Lesson 25-26:	What is the food like? - adjectives
Lesson 27-28:	What do you think of English tea?- giving opinions
Lesson 29-30:	I would like a tea
Lesson 31-32:	Shopping for food
Lesson 33-34:	Ordering food- in a café
Lesson 35-36:	Rooms in the flat
Lesson 37-38:	Furniture in the rooms
Lesson 39-40:	Where are the furniture?
Lesson 41-42:	As a guest
Lesson 11-12:	At a party
Lesson 43-44:	Where can I find the library?
Lesson 45-46:	When shall we meet?
Lesson 47-48:	Asking for information, setting programs
Lesson 49-50:	Places in the city

Lesson 51-52:	Consolidation
Lesson 53-54:	Test 2 + situations and communication practice
Lesson 55-56:	Assessment

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

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

## Basics of Foreign Language (module 2.)

Magyar orvosi szaknyelv 2.

**Responsible organisational unit:**

Faculty of Health Sciences, Division of Foreign Languages and Communication

**Programme director:**

Zöldi Kovács Katalin PhD, Head of the Division

4 lessons per week, 2 credits,

**Assessment:** midterm (written) and endterm (written and oral) tests

**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

**Brief description of subject:**

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

**Course content of practical lessons:**

- Lesson 1-4: Forming questions
- Lesson 5-6: Plural forms
- Lesson 7-8: What do you like doing in your free time?
- Lesson 9-10: I would like to.....
- Lesson 11-12: Communication skills
- Lesson 13-14: A date – what do you like?
- Lesson 15-16: I like dancing, swimming etc.
- Lesson 17-18: I can ride a bike, drive etc.
- Lesson 19-20: Communication practice
- Lesson 21-22: Can I help you? In a clothes shop
- Lesson 23-24: Can I give you something else?
- Lesson 25-26: Communication practice
- Lesson 27-28: Consolidation
- Lesson 29-30: Test 1 + situations
- Lesson 31-32: I have a headache – at the doctor
- Lesson 33-34: At the chemist's
- Lesson 35-36: Communication practice – at the doctor, at the chemist's

- Lesson 37-38: My family, family members
- Lesson 39-40: Family relations
- Lesson 41-44: Communication practice- introducing your family
- Lesson 45-48: My boss' wife – social relations
- Lesson 49-50: Consolidation
- Lesson 51-54: Test 2 – situations, communication practice
- Lesson 55-56: Assessment

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

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

## COMPULSORY SUMMER PRACTICE

Nursing Course - 1 month, 170 hours

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

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

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

### Week 1

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

### Week 2

(practicing the things learnt in the previous week)

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

**Week 3**

(practicing the things learnt in the previous two weeks)

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

**Week 4**

(practicing the things learnt in the previous 3 weeks)

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

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

## NOTE



# BASIC MODULE



*Faculty of Medicine  
2<sup>nd</sup> year*

## STUDY PROGRAMME

### Second Year

#### 3<sup>rd</sup> semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKANT003_3A	Anatomy, Cell, Histology and Embryology III.	3	4	7	semi-final	Anatomy, Cell, Histology and Embryology II., Medical Biochemistry, Molecular and Cell Biology I.
AOKELT226_1A	Medical Physiology I.	6	5	11	semi-final	Anatomy, Cell, Histology and Embryology II, Medical Biochemistry, Molecular and Cell Biology I., Medical Biophysics II.
AOKOBI290_2A	Medical Biochemistry, Molecular and Cell Biology II.	3	3	6	semi-final	Medical Biochemistry, Molecular and Cell Biology I.
AOKLEK228_3A	Hungarian Medical Terminology III.	–	4	2	pract. mark	Hungarian Medical Terminology II.
AOKTSI009_3A	Physical Education III.	–	1	–	signature	–
<b>Total Number of Credit Points from Compulsory Subjects</b>				<b>26</b>		
<b>Obligatory elective subjects</b>						
AOVCSA249_1A	Introduction to Clinical Medicine	–	2	2	pract. mark	Medical Profession
<b>4 credit points from obligatory elective/elective subjects</b> must be collected in each semester. See the detailed list of obligatory electives and electives after the 3 <sup>rd</sup> year curriculum						
<b>Total Number of Credit Points from Obligatory elective / Elective Subjects</b>				<b>4</b>		

## Second Year

### 4<sup>th</sup> semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKANT003_4A	Anatomy, Cell, Histology and Embryology IV.	1	2	3	final#	Anatomy, Cell, Histology and Embryology III.
AOKELT226_2A	Medical Physiology II.	6	5	11	final#	Medical Physiology I.
AOKOBI290_3A	Medical Biochemistry, Molecular and Cell Biology III.	3	3	6	final#	Medical Biochemistry, Molecular and Cell Biology II.
AOKLEK228_4A	Hungarian Medical Terminology IV.	–	4	2	pract. mark	Hungarian Medical Terminology III.
AOKTSI009_4A	Physical Education IV.	–	1	0	signature	–
AOKNSG331_1A	Compulsory Nursing Practice (in summer, either after the 1st year or the 2nd year)	–	170 hours workload	–	signature	–
<b>Total Number of Credit Points from Compulsory Subjects</b>				<b>22</b>		

**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 3<sup>rd</sup> year curriculum

\*The grade influences the qualification of the Diploma

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

- 1 Harper's Illustrated Biochemistry, 30th edition, Lange, ISBN-10: 0071825347
- 2 Berne-Levy-Koeppen-Stanton: Physiology, 6th updated edition, Mosby. ISBN-10: 032307362X
- 3 Cockerham, William C.: Medical Sociology. Prentice Hall, Upper Saddle River, 2006.
- 4 Marthy A. & Véggh Á. Egészségére! Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.

**Recommended textbooks:**

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

# ANATOMY, CELL, HISTOLOGY AND EMBRYOLOGY III.

Department of Anatomy, Histology & Embryology

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

## Third Semester

**Lectures:** 3 hours per week

**Laboratory:** 4 hours per week

Week	Lecture	Dissection room	Histology lab
1.	<p>1. <b>Introduction to the study of the nervous system Meninges, hemispheres, the lateral ventricles</b></p> <p>2. <b>Gross anatomy of the diencephalon, the III. ventricle</b></p> <p>3. <b>Gross anatomy of the brainstem and the cerebellum The IV. ventricle</b></p>	<p>Divisions of the brain, meninges, arteries and veins of the brain, surface structures of the hemispheres, basis cerebri.</p> <p>Specimen demonstration: dura mater, sinuses</p>	–
2.	<p>4. <b>Blood supply to the brain, CSF circulation</b></p> <p>5. <i>Differentiation of the neural tube, development of the spinal cord. Neural crest</i></p> <p>6. <i>Differentiation of the brain vesicles</i></p>	<p>Lateral ventricles, third ventricle</p> <p>Brain stem, fourth ventricle, cerebellum</p>	–
3.	<p>7. <b>Gross anatomy of the spinal cord, spinal segment Dermatomes</b></p> <p>8. Neuronal architecture of the spinal cord: proprioceptive and nociceptive (withdrawal) reflex arcs.</p> <p>9. Neuronal architecture of the spinal cord: autonomic reflex arc. Spinal pathways</p>	<p>Cross sections of the brain. Specimen demonstration: spinal cord together with the membranes</p>	–
4.	<p>10. <b>Introduction to cranial nerves. Classification of sensory, motor and autonomic nuclei</b></p> <p>11. Microscopy of the brainstem: tracts and nuclei of the medulla oblongata</p> <p>12. Microscopy of the brainstem: tracts and nuclei of the pons and midbrain. Reflex arc of mastication</p>	<p>Fine structure of spinal cord. Revision</p> <p><b>Test I: Anatomy and development of the brain and the spinal cord</b></p>	–
5.	<p>13. Microscopy of the diencephalon</p> <p>14. Cells of the CNS: neurones (axon, dendrite, synapses)</p> <p>15. Cells of the CNS: glia cells</p>	<p>Dissection of the dorsal regions</p> <p>Skull, intracranial space</p> <p>Microscopy of the CNS</p>	<b>Nervous system I.</b> Peripheral nerve, motor end plate, spinal cord, brainstem
6.	<p>16. Microscopy of the cerebral cortex</p> <p>17. Sensory systems</p> <p>18. Microscopy of the cerebellum, pathways</p>	<p>Dissection of the dorsal regions</p> <p>Spinal cord</p> <p>Microscopy of the CNS</p>	<b>Nervous system II.</b> Cerebellar and cerebral cortices Pineal body
7.	<p>19. Structure and connections of the basal ganglia</p> <p>Motor pathways</p> <p>20. <b>Trigeminal nerve, ophthalmic division</b></p> <p>21. <b>Trigeminal nerve, maxillary division</b></p>	<p>Dissection of the dorsal regions</p> <p>Microscopy of the CNS</p>	–

Week	Lecture	Dissection room	Histology lab
8.	22. <b>Trigeminal nerve, mandibular divisions, reflex arc of mastication, neuroanatomy of pain</b> 23. <b>Facial and glossopharyngeal nerves</b> 24. <b>Vagus, accessory and hypoglossal nerves</b>	Dissection of the dorsal regions. <b>Test II: Microscopy of the central nervous system, cranial nerves</b>	–
9.	25. The hypothalamo-hypophysial system. The pituitary gland 26. Endocrine organs: pineal body, thyroid, parathyroid, adrenal glands 27. Patient demonstration	Dissection of dorsal regions. Demonstration of head and neck regions.	–
10.	28. <b>Fibrous and vascular coats of the eyeball.</b> 29. <b>Lens, chambers of the eye, vitreous body, accommodation</b> 30. Inner coat of the eyeball, retina	Dissection of dorsal regions.	<b>Endocrine organs</b> Pituitary, thyroid, parathyroid, suprarenal glands, Endocrine cells in the testicle, ovary, corpus luteum and pancreas
11.	31. Optic nerve, visual pathway, visual cortex 32. <b>External muscles and movements of the eye</b> 33. <b>Protective and lacrimal apparatus of the eye. Development of the eye</b>	Dissection of dorsal regions. <b>Test III: Topographical anatomy of the limbs, spinal nerves, intracranial topography</b>	–
12.	34. <b>External ear, auditory tube, tympanic cavity, tympanic membrane, auditory ossicles</b> 35. <b>Bony and membranous labyrinth</b> 36. <b>Spiral organ of Corti. Development of the auditory and vestibular system</b>	Organs of special senses Dissection of the eye	<b>Organs of special senses I.</b> Eyeball, retina, lacrimal gland
13.	37. Auditory pathway, auditory cortex 38. <b>Vestibular system</b> 39. <b>Olfactory and gustatory systems</b>	Organs of special senses	<b>Organs of special senses II.</b> Organ of Corti, palm skin, hairy skin, mammary gland.
14.	40. Limbic system 41. Parasympathetic and sympathetic nervous systems 42. <b>Skin and appendages. Mammary gland</b>	Organs of special senses	–

# ANATOMY, CELL, HISTOLOGY AND EMBRYOLOGY IV.

## Fourth Semester

**Lectures:** 1 hours per week

**Laboratory:** 2 hours per week

Week	Lecture	Dissection room
1.	The topographical and sectional anatomy of the head, <b>clinical relevances</b>	Dissection of ventral and head&neck regions
2.	The topographical anatomy of the neurocranium, <b>clinical relevances</b>	Dissection of ventral and head&neck regions
3.	The topographical anatomy of the viscerocranium, <b>clinical relevances</b>	Dissection of ventral and head&neck regions. Body cavities
4.	The topographical anatomy of the neck, <b>clinical relevances</b>	Dissection of ventral and head&neck regions. Body cavities
5.	The sectional anatomy of the neck	Dissection of ventral and head&neck regions. Body cavities
6.	The topographical anatomy of the thorax	Dissection of ventral and head&neck regions. Body cavities
7.	The sectional anatomy of the thorax	<b>1. Midterm: Topographical anatomy and the viscera of the head and neck .</b>
8.	<b>The functional and clinical anatomy of the thorax</b>	Dissection of ventral regions. Body cavities
	<b>Easter break</b>	
9.	The topographical anatomy of the abdomen <b>clinical relevances.</b>	Dissection of ventral regions. Body cavities and the pelvis
10.	The sectional anatomy of the abdomen	Dissection of ventral regions. Body cavities and the pelvis
11.	The topographical anatomy of the upper limbs	<b>2. Midterm: Topographical anatomy of the ventral regions of limbs, the thorax and the abdomen, body cavities .</b>
12. <i>Competition 1st round</i>	The topographical anatomy of the lower limbs, gait mechanism	Dissection of the pelvis and the perineum
13. <i>Competition 2nd round</i>	The topographical and sectional anatomy of the female pelvis and perineum, <b>clinical relevances</b>	Brain. Presentation of prosected specimens of the final examination
14.	The topographical and sectional anatomy of the male pelvis and perineum <i>Announcement of the competition results</i>	Brain dissection. Presentation of the placenta and the fetus

# ANATOMY, CELL, HISTOLOGY AND EMBRYOLOGY III – IV.

## Third Semester

### Department of Anatomy, Histology & Embryology English Language Course

**Subject:** Anatomy, cell, histology and embryology of the **central and the peripheral nervous system**. Blood supply and innervation of the trunk and limbs. Histology and development of the **endocrine organs**. Anatomy, histology and embryology of the **sensory organs**. Visual pathway, pathway of the pupillary light reflex. Auditory and vestibular pathway. Gustatory apparatus. Olfactory apparatus.

**Credits:** 7

**Lecture:** 3 hours/week

**Laboratory:** 4 hours/week (4 hrs/week anatomy, or 2 hrs anatomy and 2 hrs histology)

### Detailed weekly curriculum

LECTURE	LAB	
Topic	Anatomy	Histology
<b>Week 1</b>		
Nervous system - Introduction. Interneuronal synapses, chemical neurotransmission. Morphological base of the neurophysiological processes. Peripheral sensory receptors and peripheral effector nerve endings. Reflex arch.	Spinal cord, its blood supply. Meninges, sinuses, cisternae. Base of the epidural anesthesia. Cistern puncture. Brain: meninges of the brain, cranial nerves, blood supply of the brain.	
<b>Week 2</b>		
Structural organization of the spinal cord. Gray and white matter. Rexed zones. Kahler's rule. Spinal reflexes. Brain stem and diencephalon. III. ventricle.	Dissection of the nuchal region and back. Surface of the brain. Median-sagittal section of the brain. Corpus callosum.	
<b>Week 3</b>		
Functional units and histology of the cerebral cortex. Brodmann's areas. Dorsomedial and ventrolateral afferent pathways. Somatotopy. Somatosensory cortex Thalamus.	In situ dissection of the spinal cord, intervertebral ganglia, plexuses. Lateral ventricle, III. ventricle. Brain stem, cerebellum, IV. ventricle. Cerebellar tonsils. Anatomical base of the inclusion	
<b>Week 4</b>		
Motor unit, lower and upper motor neuron, somatomotor cortex. Corticospinal (pyramidal) tract. Basal ganglia. Clinical anatomy of the motor pathways. Histology of the cerebellar cortex. Neural connection of the cerebellum. Anatomical bases of the cerebellar syndromes.	Flechsig's section. Frontal sections of the brain. Lumbal puncture. In situ dissection of the brain I.: meninges. Checking the efficiency of the cistern puncture.	



LECTURE	LAB	
	Topic	Anatomy
<b>Week 5</b>		
Reticular formation and its connections. Autonomic nervous system and its clinical anatomy. Cranial nerves: classification, functions, nuclei of them.	Review. <b>Midterm test</b> (written)	
<b>Week 6</b>		
Cranial nerves/1: III, IV, V, VI, XI, XII Cranial nerves/2: VII, IX, X Gustatory and olfactory apparatus and pathways	In situ dissection of the brain II.: lateral ventricle, III. and IV ventricles. Brain stem. Trigeminal ganglion, cavernous sinus.	Peripheral nerve, nerve endings, muscle spindle
<b>Week 7</b>		
Limbic system Eye, fibrous and vascular capsules of the eye. Refractory media of the eye. Development of the eye. Malformation of the eye development.	Base of the skull. Demonstration of the cranial nerves (outcoming from the brain and their peripheral pathways)	Spinal cord, spinal and autonomic ganglia
<b>Week 8</b>		
Structure of the retina. Morphology of the colour vision. Visual pathway, pupillary reflex, accommodation. Symptoms of injuries. Outer eye muscles. Anatomical base of the three dimensional vision. Morphological base of strabismus.	Dissection of the orbit and eye. Secretion, drainage and absorption of the vitreous humor.	Cerebral cortex, cerebellum, hippocampus. Substantia nigra. Choroid plexus
<b>Week 9</b>		
Auditory apparatus: outer and middle ear. Inner ear. Organ of Corti. Auditory and vestibular pathways. Development of the auditory and vestibular apparatuses. Clinical anatomy of the auditory and vestibular systems.	Dissection of the orbit. Outer muscles of the eye and their innervation.	Eye, optic nerve, eye lids, lacrimal gland
<b>Week 10</b>		
Hypothalamus, hypothalamo-hypophyseal system. Physiological and pathological relevances of the system Histology of the hypophysis and portal circulation. Adrenal gland, thyroid and parathyroid gland, pineal gland. Clinical aspects of the neuroendocrine system.	Outer and middle ear. In situ dissection of the middle ear. Physiology of the auditory tube. Ossicles. Inner ear.	Auricle. Auditory and vestibular organ.

LECTURE	LAB	
	Topic	Anatomy
<b>Week 11</b>		
Microscopical anatomy (sections) of the brain stem. Development of the nervous system I.: Early stage of development, differentiation of the neural tube. Development of the nervous system II.: Histogenesis, craniocaudal and dorsoventral differentiation. Malformations.	Review.	Review of the microscopical anatomy of the brain.
<b>Week 12</b>		
Development of the nervous system III. Development of the spinal cord, brain, brain stem and cerebellum. Development of the nervous system IV.: development of the telencephalon, basal ganglia, choroid plexus. Liquor circulation. Hydrocephalus. Development of the nervous system V.: neural crest and its derivatives.	<b>Midterm (oral)</b>	Review of the microscopical anatomy of the brain.
<b>Week 13</b>		
Injuries of the spinal cord pathways. Brown-Sequard syndrome. CT and MRI of the brain. Tumors, vascular attacks, vascular malformations of the brain. Actual questions of the neuroscience and neuroanatomy.	Cross sections of the head and neck. In situ dissection and review of the nerves and vessels of the head and neck.	Endocrine organs II.: thyroid and parathyroid glands, adrenal gland and pancreas.
<b>Week 14</b>		
Clinical neuroanatomy. Chemical neuroanatomy. Research activity of the Institute.	Plexuses. Review of the nervous system.	Review.

**Important note:** If the result of the 2nd midterm in the 3rd semester is not valid (the mark is 1), we provide a retake chance to improve this mark. If the retake mark is also 1, the student can not get the signature to validate the semester.

## Fourth Semester

### Department of Anatomy, Histology & Embryology

#### English Language Course

**Subject:** Regional anatomy of the head, neck, trunk, and body cavities. Gross anatomy of the pharynx, larynx, and peritoneum. Section anatomy.

**Credits:** 3

**Lecture:** 1 hour/week

**Laboratory:** 2 hours anatomy or 1 hour anatomy plus 1 hour histology

#### Detailed weekly curriculum

LECTURE Topic	LAB	
	Anatomy	Histology
<b>Week 1</b>		
Regional and sectional anatomy of the upper limb.	Dorsal regions of the head, neck, chest wall and limbs. Cross section of the arm and forearm. Bones and joints of the upper limb. Topography of radial nerve injury. Dorsal veins of the hand.	
<b>Week 2</b>		
Regional and sectional anatomy of the lower limb.	Dorsal regions of the head, neck, chest wall and limbs. Cross section of the thigh and leg. Bones and joints of the lower limb. Medial and lateral malleolar regions. Anastomoses between deep and superficial veins. Topography of cistern puncture.	
<b>Week 3</b>		
Vertebral column and its function.	Dorsal regions of the head, neck, chest wall and limbs. Cross section of the neck.	
<b>Week 4</b>		
Calvaria, face, mimetic muscles - blood supply and innervation.	Ventral regions of the head, neck, limb. Cranial nerves related to these regions. Subclavian artery, external carotid artery and their branches. Subclavian vein, internal jugular vein and their tributaries.	
<b>Week 5</b>		
Orbit and pterygopalatine fossa.	Ventral regions of the neck, limbs. Surface projection of thoracic viscera. Thoracic cavity <i>in situ</i> . Pleura, pericardium, cardiac valves. Topography of thoracocentesis and cardiac puncture.	
<b>Week 6</b>		
Floor of the oral cavity, topography of the salivary glands.	Ventral regions of the neck, head and limbs. Topography of the stellate ganglion. Mediastinum. Surface projection of abdominal viscera. Abdominal cavity <i>in situ</i> .	
<b>Week 7</b>		
Topography of the neck.	Ventral regions of the head, neck, limbs. Lung, Blood vessels of the heart.	

LECTURE	LAB	
Topic	Anatomy	Histology
<b>Week 8</b>		
Gross anatomy of the mammary gland and armpit.	Ventral regions of the head, neck, limbs. Posterior mediastinum. Retroperitoneum. Uropoietic system.	
<b>Week 9</b>		
Mediastinum.	Abdominal aorta. Lumbar plexus. Retroperitoneum. Ventral regions of the head, neck, limbs. External and internal male reproductive organs.	
<b>Week 10</b>		
Posterior abdominal wall, retroperitoneum.	External and internal female reproductive organs. Perineum.	
<b>Week 11</b>		
Pelvis, female perineum.	External genitalia, perineum. Pelvis, internal iliac artery, sacral plexus.	
<b>Week 12</b>		
Topography and CT of the abdomen.	Topography of the rectum. Pelvis, perineum.	
<b>Week 13</b>		
Clinical anatomy. Laparoscopy, and laparoscopic surgery.	Brain, spinal cord. Review of dissected regions.	
<b>Week 14</b>		
Clinical anatomy. Endoscopy (rectoscopy, colonoscopy)	Review.	

# MEDICAL PHYSIOLOGY

## Department of Physiology

**Subject code: AOKELT226\_1A, AOKELT226\_2A**

**Credit Points: 11 (I. semester) + 11 (II. semester)**

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

Course Director: Dr. Péter Várnai, Full Professor

Tutor: Dr. András Balla

**Year: 2016/2017**

### 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

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

## Second semester

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

### Practices, 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. 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 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.

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). 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 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:**

**Textbook:** Berne-Levy-Koeppen-Stanton: Physiology (6th edition).

**Practice book:** Practices in Medical Physiology (Edited by: Péter Enyedi and Péter Várnai, 2010)



# Medical biochemistry, molecular and cell biology II

Teaching Secretary: *Dr. István Léránt*

## Fall Semester

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

## Laboratory program and seminars – Fall Semester

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

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

Student Affairs Secretary    Mr Zsolt Ozsváth  
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Lab coordinator                Dr Katalin Bartha  
+36-1-4591500#60032

Lab staff                         Mrs Éva Vallinger  
Mrs Ildikó Mártonffy

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

# Medical biochemistry, molecular and cell biology III

Teaching Secretary: **Dr. István Léránt**

## Spring Semester

Lecture topics	
Week 1	$Na^+ / K^+$ ATP-ase. The permeability of cell membranes, P-type ATP-ase. Structure of $Na^+ / K^+$ ATP-ase. $Na^+ / K^+$ -ATP-ase isoforms. Regulation. Secondary active transports. Na-H exchange
Week 2	Chemical neurotransmission. Cholinergic neurotransmission. Biosynthesis of acetylcholine, receptors, acetylcholine esterase. Molecular mechanism of exocytosis
Week 3	Noradrenergic neurotransmission. Biosynthesis and metabolism of norepinephrine. Synaptic uptake. Molecular mechanisms of adrenergic, dopaminergic and serotonergic neurotransmission
Week 4	GABAergic neurotransmission. NO: Regulatory role of NO. Nitric oxide synthase. Guanylate cyclase. Molecular effects of nitric oxide
Week 5	Glutamatergic neurotransmission. General properties of ion channels. General properties of ion channels. Methods for studying ion channels.
Week 6	Structure of the $K^+$ channels. Methods for studying ion channels. The molecular mechanism of gating and permeation. <i>Haemostasis</i> : Pathobiochemistry of atherothrombosis and atherosclerosis. The role of cholesterol in the formation of atherosclerotic plaques. LDL oxidation and scavenger receptors. Risk factors of atherosclerosis related to cholesterol homeostasis (diabetes, hypertriglyceridemia). Biochemical background for prevention of atherosclerosis (Plant oils and alcohol consumption, exercise).
Week 7	Initiation of blood coagulation – Protein C and thrombomodulin. Termination of blood coagulation: inhibitors (antithrombin – heparin, hirudin, TFPI). Alternative pathway of blood coagulation: Factor XII. Fibrinolysis. Degradation of fibrin (D and E fragments): fibrinolytic enzymes (plasmin, elastase). Fibrin substrates, D-dimers. Activation of plasminogen: Glu-plasminogen (native), conformational and proteolytical modifications. Plasminogen activators (tPA and cofactors, uPA, streptokinase) Inhibitors of fibrinolytic enzymes, $\alpha_2$ -plasmin inhibitor, plasminogen activator inhibitor-1 (PAI-1). Regulation of plasminogen activation and fibrinolysis, TAFI. Functions of PMN and fibrinolysis.
Week 8	Adhesion molecules. Cadherines, selectins, IgSF cellular molecules. Integrins. Platelets. Structure and function (adhesion, vWF and aggregation, fibrinogen) Activation, triggers (thrombin, collagen, PAF). Secondary activators (ADP, $TXA_2$ ). Receptors (thrombin receptor). Activation, inhibitors. $PGI_2$ and $TXA_2$ , platelet activation. The endothelium. Structure and haemostatic role. Procoagulant components. von Willebrand Factor (vWF). Anticoagulant components. NO, Endothelin, PAR1, ACE, MMP-9. Angiogenesis. Angiogenin and angiostatin. Thrombophylia. Anticoagulant therapy: Vitamin K antagonists, INR. Heparin. Hirudin. Aspirin and platelets. Plasminogen activators. Acute myocardial infarcts. Stroke.
Week 9	<i>Biotransformation</i> : reactions of the first and second phase, biological significance, clinical aspects. Reactions and significance of cytochrome P450 isoenzymes. Conjugation of xenobiotics and of endogenous substrates.
Week 10	Mechanisms of signal transduction processes mediated by cAMP. Formation, degradation of cAMP, PKA, cAMP and regulation of gene expression. Signal transduction processes mediated by intracellular receptors: steroid, thyroid, retinoid receptors.
Week 11	Therapeutic targeting of signal transduction pathways. Calcium signalling
Week 12	<i>The role of thyroid hormones</i>
Week 13	<i>Biosynthesis of steroid hormones in the adrenal cortex</i> . Effects of mineralocorticoids and glucocorticoids, regulation of their biosynthesis. Signal transduction of steroid hormone receptors, genomic and non-genomic actions of steroid hormones. Congenital adrenal hyperplasias.
Week 14	<i>Biosynthesis of sexual hormones</i> . Cyclic changes in the ovaries, the cooperation of granulosa and theca interna cells. Placental progesterone and estradiol synthesis. <i>Eicosanoids</i> : prostaglandins, thromboxanes and leukotrienes. The cyclooxygenase and the lipoxygenase pathways. Effects of eicosanoids on: platelet aggregation, gastric mucosal protection, myometrial contractility, inflammation.

## Laboratory program and seminars – Fall Semester

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

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Office of student affairs - 1.508 room, 1<sup>st</sup> floor, 'C' passage

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

1. They have to present their certificates regarding the courses to the responsible tutor of the course during the first two weeks of the semester. (Dr. István Léránt Department of Medical Biochemistry)
2. Exemptions are given only after a "checking" exam during the first month of the semester. At this exam one of the lecturers will check whether the student's knowledge is sufficient to complete the semesters without attending lectures and laboratory programs. This exam is based

on the question list of the final examination, and can be obtained from the tutor of the course. After a successful exam students are exempted from the final exam at the end of spring semester of the second academic year, including attending both lectures and laboratory programs. If students fail they must attend both lectures and laboratory programs and they have to sit for the semifinal or final exam at the end of the semesters.

3. Partial exemption is not permitted.

### List of textbooks

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

## 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](mailto:ptorzsa@gmail.com)

**Application date:** 1<sup>st</sup> September

**Precondition:** Only for students in the 2<sup>nd</sup> 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)

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



## Basics of Foreign Language (module 4.)

Magyar orvosi szaknyelv 4.

**Responsible organisational unit:**

Faculty of Health Sciences, Division of Foreign Languages and Communication

**Programme director:**

Zöldi Kovács Katalin PhD, Head of the Division

**4 lessons per week, 2 credits,**

**Assessment:** midterm (written) and endterm (written and oral) tests

**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective professional communication in the language they use during their field practice. With the help of this course they become able to communicate with the patients in the Hungarian hospitals.

**Brief description of subject:**

The fourth module is dedicated to learning basic medical vocabulary. Students acquire the skills needed in taking family, social, and medical history in internal medicine. They also learn how to address the patient during an examination and give advice for the treatment.

**Course content of practical lessons:**

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

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

Marthy Annamária – Végh Ágnes. *Egészségére! - Magyar orvosi szaknyelv*. Semmelweis Egyetem Egészségtudományi Kar, 2010.

## NOTE

# PRE-CLINICAL MODULE



*Faculty of Medicine*  
*3<sup>rd</sup> year*

## STUDY PROGRAMME

### Third year

#### 5<sup>th</sup> semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKKOR021_1A	Pathophysiology and Clinical Lab. Diagnostics I.	1,5	3	4	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKMIK022_1A	Medical Microbiology I.	1,5	2,5	4	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKPTK023_1A <sup>1</sup> AOKPAT024_1A <sup>2</sup>	Pathology I.	3	4	7	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKGEN025_1A	Immunology	2	2	4	semi-final#	Medical Biochemistry, Molecular and Cell Biology III.
AOKBL1306_1A <sup>3</sup> AOKBL3307_1A <sup>4</sup>	Internal Medicine - Prope- deutics	2	5	7	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II., Medical Biochemistry, Molecular and Cell Biology III.
AOKBVI026_1A	Medical Aspects of Disaster Preparedness and Response I.	1x2/semester	–	0	signature	
AOKLEK228_5A	Hungarian Medical Termi- nology V.	–	4	2	final	Hungarian Medical Terminology IV.
<b>Total Number of Credit Points from Compulsory Subjects:</b>				<b>28</b>		

**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 3<sup>rd</sup> year curriculum

<sup>1</sup> 1st Department of Pathology

<sup>2</sup> 2nd Department of Pathology

<sup>3</sup> 1st Department of Internal Medicine

<sup>4</sup> 3rd Department of Internal Medicine

<sup>#</sup> The grade influences the qualification of the Diploma.

### Third year

#### 6<sup>th</sup> semester

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKKOR021_2A	Pathophysiology and Clinical Lab. Diagnostics II.	1,5	2,5	4	final#	Pathophysiology and Clinical Lab. Diagnostics I., Immunology
AOKMIK022_2A	Medical Microbiology II.	1,5	2	3	final#	Medical Microbiology I., Immunology
AOKPTK023_2A <sup>1</sup> AOKPAT024_2A <sup>2</sup>	Pathology II.	3	4	7	final#	Pathology I.
AOKBL1027_1A <sup>3</sup> AOKBL3029_1A <sup>4</sup>	Internal Medicine I.	1,5	3	5	semi-final	Internal Medicine – Propedeutics, Pathophysiology and Clinical Lab. Diagnostics II. *, Pathology II. *
AOKMAG031_1A	Behavioral Sciences II. (Medical Psychology)	1	2,5	3	final	Behavioral Sciences I. Medical Sociology, (Medical Communication)
AOKBVI026_2A	Medical Aspects of Disaster Preparedness and Response II.	1x2/semester	–	0	signature	
AOKKMI020_1A	Basic Surgical Techniques	0,5	1,5	2	semi-final	Anatomy, Cell, Histology, and Embryology IV., Medical Physiology II.
AOKFIZ036_1A	Medical Imaging	12/semester	16/semester	2	semi-final	Medical Biophysics, Anatomy, Cell, Histology, and Embryology IV.
AOKGEN030_1A	Genetics and Genomics	2	2	4	semi-final#	Medical Biochemistry, Molecular and Cell Biology III.
AOKNSG332_1A	Internal Medicine Practice (in summer)	–	170 hours workload	–	signature	–
<b>Total Number of Credit Points from Compulsory Subjects:</b>				<b>30</b>		

**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 3<sup>rd</sup> year curriculum**

<sup>1</sup>1st Department of Pathology

<sup>2</sup>2nd Department of Pathology

<sup>3</sup>1st Department of Internal Medicine

<sup>4</sup>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!)

- 1 Cecil's Essentials of Medicine. Ed. Andreoli, Carpenter, etc. 5<sup>th</sup> ed. W.B. Saunders, 2001. ISBN 0-7216-8179-4
- 2 Bickley, L.S.-Hoekelman R.A: Bates' Guide to Physical Examination and History Taking. 7<sup>th</sup> ed. J.B. Lippincott Williams & Wilkins, 1998. ISBN 0-7817-1655-1
- 3 Current Medical Diagnosis and Treatment. Tierney, McPhee, Papadakis, Appleton and Lange McGraw-Hill 2002. ISBN 0-07-136466-8
- 4 Marshall: Illustrated Textbook of Clinical Chemistry. Mosby. 2<sup>nd</sup> ed. Gower Med. 1992
- 5 F.Heckner et al.: Practical Microscopic Hematology. 4<sup>th</sup> ed. 1993. Williams and Wilkins Trade Clidh. ISBN: 0-8121-1711-5
- 6 Peter E.S.-Freund-Meredith B.McGuire:Healts, Illness, and the Social Body. (A Critical Sociology. Prentice Hall. Upper Saddle River, New Jersey.
- 7 Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141
- 8 Behavior & Medicine, 4<sup>th</sup> Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.
- 9 Murray, Rosenthal, Kobayashi, Pfaller: Medical Microbiology. 4<sup>th</sup> ed. 2002. Mosby Inc. ISBN 0-323-01213-2
- 10 Robbins: Basic Pathology, 2008. V. Kumar, A. K. Abbas, N. Fausto, R. Mitchell Saunders; 8 edition
- 11 Szende B, Suba Zs.: Introduction to Histopathology. Bp. Medicina, 1999.
- 12 Katzung: Basic and Clinical Pharmacology. Lange 10<sup>th</sup> ed, 2007
- 13 Falus A. Immunology, Semmelweis PH, 2001.
- 14 Medical Genetics and Genomics (e-book)

**Recommended textbooks:**

- 1 Harrison's Principles of Internal Medicine. Companion Handbook. 12/1997 14<sup>th</sup> ed. 096009. Ed. by Anthony Fauci, E.Braunwald, K.J. Isselbacher et al. Paper Text ISBN 0-07-021530-8 LCCN:97-042634
- 2 Harrison's Principles of Internal Medicine. 15<sup>th</sup> ed. McGraw Hill Inc. 2001. ISBN 0-07007272-8 (Combo) 0-07-007273-6 (Vol.1.), 0-07-007274-4 (Vol.2.), 0-07913686-9 (Set)
- 3 Cecil Textbook of Medicine. Ed. Goldmann, L. Bennett, J.C. 21<sup>st</sup> ed. W.B.Saunders 2000. ISBN 0-7216-7995-1 Vol.1-2. ISBN 0-7216-7996-X (Single Vol.)
- 4 Concise Oxford Textbook of Medicine. Ed.Ledingham, Warrell. Oxford University Press, Oxford, 2000. ISBN 0192628704
- 5 The Merck Manual. 16<sup>th</sup> ed. Merck Research Laboratories, 1996.
- 6 William J. Marshall, Stephen K.Bangert: Clinical Chemistry. 5<sup>th</sup> ed. Elsevier Health Sciences 2004. ISBN: 0723433283.
- 7 Stephen J. McPhee, William F. Ganong: Pathophysiology of Disease: An Introduction to Clinical Medicine, 5<sup>th</sup> ed. McGraw-Hill.2006. ISBN 10: 0-07-144159-X
- 8 H. Themi, H. Diem, T. Haferlach: Color Atlas of Hematology 2<sup>nd</sup> ed. Georg Thieme Verlag 2004. ISBN: 9783136731024
- 9 Kathryn L. McCance, Sue E. Huether: Pathophysiology: The Biologic Basis for Disease in Adults And Children 5<sup>th</sup> ed. Mosby Inc 2005 ISBN-10: 0323036236
- 10 N. Goldschlager et al.: Principles of Clinical Electrocardiography. 3<sup>rd</sup> ed. 1989. Appleton and Lange ISBN: 0-8385-7951-5.
- 11 Mahta, Atul B. Hoffbrand, A. Victor: Haematology at a Glance 2<sup>nd</sup> ed. Blackwell Publishing 2005. ISBN: 1405126663
- 12 Carl A. Burtis: Tietz Textbook of Clinical Chemistry. W.B. Saunders 3<sup>rd</sup> 1999 ISBN 0721656102
- 13 Carl A. Burtis: Tietz Fundamentals of Clinical Chemistry. W.B. Saunders 5<sup>th</sup> 2001 ISBN 0721686346
- 14 Davis et al.: Clinical Laboratory Science. (Strategies for Practice.) 1988. Lippincott-Raven Clidh Text. ISBN: 0-397-50860-3
- 15 E.Rubin-J.L. Farber: Pathology (J.B. Lippincott 1994). – 3<sup>rd</sup> edition (1999)
- 16 Nemes Z.: Atlas of Histopathology (TEMPUS edition, Debrecen 1998)
- 17 C.P.L. Wheater, H.G. Burkitt, Stevens J.S. Lowe: Basic Histopathology, a Colour Atlas and Text. (Churchill Livingstone; 4Rev Ed edition, 2002)
- 18 Zalatai 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
- 21 Alan Stoudemire: Human Behaviour: An Introduction for Medical Students. Lippincott Company, 1994. 2<sup>nd</sup> ed. ISBN 0-397-51337-2.
- 22 Kopp M. - Skrabski Á.: Behavioural Sciences Applied in a Changing Society, Corvina, 1996.
- 23 Fadem B: Behavioural Science., Lippincott Williams & Wilkins, 5<sup>th</sup> ed., 2008.
- 24 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6<sup>th</sup> ed., New York, Wiley, 2008.

# PATHOPHYSIOLOGY AND CLINICAL LABORATORY DIAGNOSTICS

## I-II.

### Department of Pathophysiology

Director: *Dr. Attila Tordai*

Tutor: *Dr. Miklós Molnár*

### 5<sup>th</sup> semester

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

**6<sup>th</sup> semester**

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



# MEDICAL MICROBIOLOGY I.

## Institute of Medical Microbiology

Program Director: **Dr. Dóra Szabó**

Tutor: **Dr. Ágoston Ghidán**

## First Semester

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

## First Semester

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

# MEDICAL MICROBIOLOGY II.

## Second Semester

Week	Lectures (1,5 hours per week)
1.	Medical Mycology
2.	Medical Parasitology – 1
3.	Medical Parasitology – 2
4.	Medical Parasitology – 3
5.	General Virology
6.	• DNA viruses – 1
7.	• DNA viruses – 2
8.	• RNA viruses – 1
9.	• RNA viruses – 2
10.	• RNA viruses – 3
11.	Hepatitis viruses
12.	Retroviruses. AIDS. Viral oncogenesis
13.	• Slow viruses and Prions. Control of viral diseases. Antiviral chemotherapy
14.	• Iatrogenic and Nosokomial infections

Week	Practicals (2 hours per week)
1.	Medical Mycology
2.	Medical Parasitology – 1
3.	Medical Parasitology – 2
4.	Medical Parasitology – 3
5.	Midterm exam I. General Virology
6.	DNA viruses
7.	RNA viruses
8.	Midterm exam II.
9.	Clinical Bacteriological Diagnosis – 1: Skin, wound and eye infections
10.	• Clinical Bacteriological Diagnosis – 2: Respiratory tract infections
11.	• Clinical Bacteriological Diagnosis – 3: Infections of the uro-genital tract. Abdominal and Enteral infections. Sexually transmitted diseases
12.	• Clinical Bacteriological Diagnosis – 4: Bacteraemia, sepsis, endocarditis, meningitis
13.	Summary and review
14.	Practical exam

# PATHOLOGY I.

## 1st Dept. of Pathology and Experimental

Cancer Research

Tutor: **Dr. Gergely Rácz**

## First Semester

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**Lectures** (14 weeks): (all lectures for the whole class are held at the 2nd Dept. of Pathology).

**Autopsy and histology practice** (14 weeks) absence: more than 3 absences invalidate semester. Missing any half (either histology or autopsy) of the practice is considered an absence.

### Lectures (3 hours per week)

1. Introduction
2. Cell injury
3. Cell injury
4. Inflammation
5. Inflammation
6. Wound healing, regeneration and fibrosis
7. Immunopathology
8. Neoplasia
9. Neoplasia
10. Neoplasia
11. Genetic diseases
12. Haemodynamic disorders
13. Haemodynamic disorders

### Histopathology practices

- Autopsy demonstration
- Nutmeg liver H&E (1)
- Cardiac fibrosis in liver H&E(7)
- Pulmonary edema H&E (2)
- Haemosiderin in alveolar macrophages H&E (8)
- Thromboembolism H&E (3)
- Hemorrhagic infarction of the lung H&E (4)
- Anemic infarction of the kidney H&E(5)
- Emollition of the brain H&E (6)
- Fatty degeneration of the liver H&E (12)
- Phlegmone H&E(13)
- Cerebral abscess H&E(14)
- Fibrinous pericarditis H&E (15)
- Pseudomembranous colitis (16)
- Actinomycosis H&E (98)
- Candidiasis PAS (17)
- Aspergillosis (slide demonstration)
- Acute appendicitis H&E(66)
- Oxyuris in appendix H&E(67)
- Chronic polypous sinusitis H&E (18)
- Chronic abscess (9)
- Granulation tissue H8LE (19)
- Foreign-body granuloma H&E (20)
- Metaplasia (slide demonstration)
- Dysplasia of the cervical epithelium (CIN) H&E(24)
- In-situ carcinoma of the cervix H&E (25)
- Invasive squamous cell carcinoma of the cervix H&E (26)
- Squamous cell papilloma H&E (23)
- Squamous cell carcinoma of the larynx H&E (10)
- Tubulovillous adenoma of the colon H&E (30)
- Adenocarcinoma of the colon H&E(31)
- Metastasis in lymph node H&E (36)
- Metastatic carcinoma in the lung (slide demonstration)
- Leiomyoma H&E (37)
- Leiomyosarcoma (slide demonstration)
- Lipoma H&E (11)
- Liposarcoma (slide demonstration)
- Malignant fibrous histiocytoma H&E (38)
- Immunohistochemistry (slide demonstration)

- |   |  |
|---|--|
| 14. Environmental and nutritional pathology | Atherosclerosis of the aorta H&E (45)<br>Benign nephrosclerosis H&E(46)<br>Coronary-sclerosis H&E(47)<br>Polyarteriitis nodosa H&E (48)<br>Giant cell arteriitis H&E (49)<br>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)<br>Myocardial infarction, old H&E (43)<br>Myocarditis H&E(44)<br>Endocarditis H&E(96)  |
| 17. Heart                                   | IRDS H&E (50)  |
| 18. Heart                                   | Lobar pneumonia H&E(51)<br>Bronchopneumonia H&E (52)<br>Pneumoconiosis H&E (54)<br>Pleurafibrosis H&E (97)   |
| 19. Respiratory system                      | Miliary tuberculosis in lung H&E (55)  |
| 20. Respiratory system                      | Tuberculous lymphadenitis H&E (56)<br>Sarcoidosis H&E (57)<br>Oat cell carcinoma of the lung H&E (58)<br>Mesothelioma H&E (59)<br>Nasopharyngeal carcinoma (slide demonstration)   |
| 21. Respiratory system                      | Mixed tumor of the parotid gland H&E(32)<br>Warthin-tumor (slide demonstration)<br>Mucoepidermoid carcinoma (slide demonstration)<br>Adenoid cystic carcinoma (slide demonstration)<br>Chronic peptic ulcer H&E (60)<br>Chronic gastritis H&E (61), Giemsa (62)<br>Signet ring cell carcinoma of the stomach H&E(63), PAS (64)<br>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)<br>Carcinoid H&E (53)<br>Peritoneal carcinosis H&E (99)   |
| 25. Gastrointestinal tract                  | Organ demonstration  |
| 26. Gastrointestinal tract                  |  |
| 27. Gastrointestinal tract                  |  |
| 28. Pancreas                                |  |

## PATHOLOGY II.

### Second Semester

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**Lectures** (3 hours per week)

- 29. Liver and biliary system
- 30. Liver and biliary system
- 31. Liver and biliary system
  
- 32. Kidney
  
- 33. Kidney
  
- 34. Urinary tract
  
- 35. Male genital syste
  
- 36. Gynecologic pathology
- 37. Gynecologic pathology
  
- 38. Neonatology
- 39. Breast
  
- 40. Blood and lymphoid organs
- 41. Blood and lymphoid organs
  
- 42. Blood and lymphoid organs
- 43. Blood and lymphoid organs
  
- 44. Endocrinology

**Histopathology** practices

- Alcoholic hepatitis H&E(70)
- Chronic hepatitis H&E (71)
- Liver cirrhosis H&E(72)
- Hepatocellular carcinoma H&E (73)
- Cavenous haemangioma of liver H&E (35)
- Chronic cholecystitis H&E(74)
  
- Chronic pancreatitis H&E(75)
- Acute hemorrhagic necrotising pancreatitis H&E(76)
- Pancreatic pseudocyst (slide demonstration)
- Adenocarcinoma of pancreas H&E (77)
- Islet cell tumor of pancreas (slide demonstration)
- Diabetic nodular glomerulosclerosis (Kimmelstiel-Wilson) H&E (78)
- Glomerulonephritis H&E (79)
- End stage kidney H&E (80)
- Acute rejection in transplanted kidney H&E (22)
- Acute pyelonephritis H&E (81)
- Chronic pyelonephritis H&E (82)
- Renal cell carcinoma H&E (83)
- Normal adrenal cortex (slide demonstration)
- Wilm's tumor H&E(84)
- Transitional cell carcinoma H&E (28)
- Nodular hyperplasia of the prostate H&E(85)
- Adenocarcinoma of prostate H&E(87)
- Seminoma H&E (88)
- Embryonal carcinoma (slide demonstration)
- Teratoma H&E(89)
- Placenta retention H&E (90)
- Extrauterine gravidity H&E (91)
- Arias-Stella phenomenon (slide demonstration)
- Hydatiform mole H&E (92)
- Choriocarcinoma H&E (93)
- Endometrial hyperplasia H&E (94)
- Endometriosis (slide demonstration)
- Endometrium carcinoma H&E (95)
- Chronic cervicitis H&E (123)
- HPV infection in cervix H&E (124)
- In situ hybridisation (slide demonstration)
- Condyloma acuminatum (slide demonstration)
- Follicular cyst of the ovary H&E (125)
- Mucinous cystadenoma of the ovary H&E(29)
- Mucinous cystadenocarcinoma (slide demonstration)
- Borderline serous papillary cystadenoma of the ovary H&E (126)
- Serous papillary cystadenocarcinoma of the ovary (slide demo)
- Granulosa cell tumor (slide demonstration)
- Fibrocystic disease of the breast H&E(101)

45. Endocrinology  
 Peri- and intracanalicular fibroadenoma of the breast H&E (33)  
 Phylloid tumor (slide demonstration)  
 Intraductal carcinoma H&E (102)  
 Invasive ductal carcinoma H&E(103)  
 Invasive lobular carcinoma H&E (104)  
 FNAB of the breast (cytol. smear demonstration)
46. Skin  
 47. Skin  
 Normal bone marrow H&E (127)  
 Leukemic bone marrow H&E(128)  
 Leukemic infiltration of parenchymal organs (slide demonstration)  
 Multiple myeloma H&E (106)  
 Amyloidosis Congo (21)
48. Head and neck  
 Non Hodgkin lymphoma (low grade) H&E (107)  
 Non Hodgkin lymphoma (high grade) H&E (108)  
 Follicular lymphoma (slide demonstration)  
 Tonsillar lymphoma (slide demonstration)  
 MALT lymphoma (slide demonstration)  
 Hodgkin lymphoma H&E (109)  
 Hodgkin lymphoma histologic types (slide demonstration)
49. Bones and joints  
 50. Bones and joints  
 Colloid goiter H&E(110)  
 Graves disease H&E (111)  
 Follicular adenoma of the thyroid gland H&E(112)  
 Follicular carcinoma (slide demonstration)  
 Papillary carcinoma of the thyroid gland H&E (113)  
 Medullary carcinoma (slide demonstration)  
 Adrenal cortical adenoma H&E(105)  
 Parathyroid adenoma (slide demonstration)
51. Bones and joints  
 Osteosarcoma H&E (114)  
 Rhabdomyosarcoma H&E (115)  
 Rheumatoid arthritis H&E (116)  
 Autoimmun diseases (slide demonstration)
52. Eye  
 Basocellular carcinoma H&E (27)  
 Verruca vulgaris H&E (100)  
 Naevus pigmentosus H&E (39)  
 Malignant melanoma H&E (40)  
 Metastatic melanoma (slide demonstration)  
 Bowen's disease (slide demonstration)  
 Capillary haemangioma of the skin H&E (34)
53. Skeletal muscle  
 54. Nervous system  
 55. Nervous system  
 Purulent meningitis H&E(117)  
 Encephalitis H&E (118)  
 Meningeoma H&E (119)  
 Glioblastoma multiforme H&E(120)  
 Schwannoma H&E (121)  
 Neuroblastoma H&E (122)  
 Ganglioneuroblastoma (slide demonstration)  
 Paraganglioma (slide demonstration)
56. Nervous system  
 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.**

## **2<sup>nd</sup> Department of Pathology**

2016-2017

Head of Department: **Prof. Dr. József Tímár**

Tutor: **Dr. András Kiss**

## **Index**

Lectures

List of textbooks

Histopathology practices - slides for the histopathology exam and slide demonstrations

General information - Lectures, practices, competition

Examinations: Semifinal

Examinations - Final

Schedule

Schedule for the academic year

## **Lectures**

### **1<sup>st</sup> Semester – 2016**

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**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**

Basic notions in hemodynamics. Hemorrhage, active and passive hyperemia. Disorders of water and electrolytes. Edema. Thrombosis, embolism. Infarction. Shock

#### **Inflammation I.**

Definition. Symptoms. Vascular permeability.

Inflammatory mediators and their origin. Cellular recruitment. Acute inflammation. Systemic manifestations of inflammation. Inflammation of avascular tissues. Wound healing, regeneration and repair: Classification of cells and tissues according to their regenerative capability.

Extracellular matrix. Regeneration, repair.

#### **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.**

Single-gene abnormalities. Autosomal dominant and recessive inheritance, sex-linked disorders. Lysosomal storage diseases.

Genetic and developmental disorders. Gene pathology II.

Chromosomal abnormalities. Morphogenic disorders, malformations, multifactorial inheritance. Prenatal diagnosis. Familial diseases and symptoms.

#### **Neoplasia I.**

Causes of neoplasia. Epidemiology.

Chemical, physical and biological carcinogenesis. Tumor prevention.



**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.**

Classification of tumors. Histologic types of tumors. Characteristics of benign and malignant tumors. Premalignant lesions. Paraneoplasia.

**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, Cytodiagnosics. The morphologic and technical basis of aspiration cytology. Aim and clinicopathological 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.**

Structure of vessels. Atherosclerosis. Aneurysms. Hypertensive vascular disease. Inflammatory disorders of blood vessels.

Microvascular disease. Diseases of veins and lymphatic vessels.

Tumors of vessels.

**Cardiovascular Pathology II.** Endocarditis, myocarditis, pericarditis. Rheumatic heart disease. Ischemic heart disease.

**Cardiovascular Pathology III.**

Congenital heart diseases. Cardiomyopathies. Heart failure. Systemic diseases involving the heart. Cardiac tumors.

**Head and neck**

Oral cavity, lips, tongue, teeth, salivary gland. Nose and sinuses, nasopharynx. Ear. of the esophagus. Developmental disorders, diverticulio, esophagitis, tumors of the esophagus. Larynx and trachea. (Developmental abnormalities, Infections/Inflammation, Trauma, Tumors).

**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.**

Development of lung cancer. Neoplasia (primary cancer of the lung, metastasis, benign tumors). Etiology, genetic abnormalities. Diseases of the pleura.

**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.**

Colon (congenital disorders, infections, diverticular disease, inflammation, Crohn-disease, ulcerative colitis, vascular diseases, neoplasms, other disorders). Appendix. Peritonitis.

### **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.

## **2<sup>nd</sup> Semester – 2017**

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### **Liver and biliary system I.**

Anatomy of the liver, function. Bilirubin-metabolism and jaundice. Hepatic failure. Hepatorenal syndrome. Viral hepatitis. Chronic hepatitis. Cirrhosis. Portal hypertension. Non-viral hepatitis.

### **Liver and biliary system II.**

Alcoholic liver disease, toxic liver injury. Hemochromatosis. Vascular disorders. Neoplasms.

### **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**

The hypothalamus-hypophysis system. Pathology of the pituitary gland. The thyroid gland: hypo- and hyperfunction, inflammations, tumors. Pathology of the parathyroid gland. Hypo- and hyperfunction and other diseases of the adrenal cortex. Tumors of the adrenal gland. Pineal gland. Ectopic hormone production. Pathology of the thyroid gland.

#### **Kidney Pathology I.**

Anatomy. Clinical syndromes. Glomerula diseases. Renal disease and systemic disorders. Congenital abnormalities. Inflammatory and non-inflammatory lesions.

#### **Kidney Pathology II.**

Tubulointerstitial diseases. Hydronephrosis. Lithiasis.

#### **Kidney Pathology III.**

Tumors of the kidney. Kidney transplantation.

**Uro pathology**

Congenital abnormalities of the urinary tract. Inflammations. Urinary bladder (malformations, inflammations, tumors). Urethra

**Male genital system**

Diseases of the epididymis, testis, prostate, penis and scrotum.

**Gynecologic pathology I**

Precancerous lesions of the cervix. Cervix carcinoma. Endometrial hyperplasias. Benign and malignant tumors of the endometrium.

**Gynecologic pathology II.**

Inflammations of the vulva, vagina and uterus. Tumors of the vulva, vagina and uterus. Pathology of the fallopian tubes. Normal menstrual cycle. Bleeding abnormalities. Pathology of pregnancy. Ovarial diseases.

**Neonatology**

Premature birth and its complications. Intrauterine infections and their consequences. Twin pregnancy. Diseases of the perinatal period. Sudden infant death.

**Breast I**

Symptoms and diagnosis of breast diseases.

Malformations. Benign symptomatic lesions (inflammations, fibrocystic disease, epithelial dysplasia and its significance, benign tumors)

**Breast II**

Malignant tumors - epidemiology, risk factors.

Histologic types of breast carcinoma. Prognostic factors in breast cancer

Non-epithelial breast malignancies

Screening: non-palpable breast lesions

The male breast.

**Blood and lymphoid organs I.**

Hemopoetic system. Normal function (bone marrow, lymph nodes, spleen). Morphology and immunologic evaluation. Disorders of platelets and coagulation. Anemias, polycythemia. Neutrophilia. Proliferative disorders of mast cells. Monocytosis. Sinus histiocytosis. Benign disorders of lymphoid cells.

**Blood and lymphoid organs II.**

Acute myeloproliferative syndromes (acute leukaemias). Chronic myeloproliferative syndromes (CML, myelofibrosis, thrombocytemia). Acute and chronic lymphocytic leukaemias. Disorders of the spleen.

**Blood and lymphoid organs III.**

Lymphomas (Hodgkin, non-Hodgkin). Metastatic tumors in bone marrow and lymph nodes. Clinicopathological case demonstrations.

**Nervous system I.**

Trauma, vascular and circulatory disorders. CSF dynamics. Encephalomyelitis, meningitis. Congenital malformations. Metabolic storage.

**Nervous system II.**

Demyelinating diseases. Neurodegenerative diseases. Pathology of the eye and ear. Metabolic diseases

**Dean's Day****Nervous system III.**

Neoplasms (neuroectodermal, mesenchymal, embryonic, ectopic tissue, metastasis). Peripheral nervous system (neuropathies, inflammations, trauma, tumors). Skeletal muscle and soft tissue tumors

Muscular dystrophies, myopathies, diseases of neuromuscular junction, fatty tumors, fibrous tumors, fibrohistiocytic tumors, tumors of skeletal muscles.

**Immunopathology I.** Constituents of the immune system

Hypersensitive reactions. Allergy. Transplantation.

Immunodeficiency. AIDS. Infections of immunodeficient individuals.

### **Immunopathology II. - Autoimmune diseases.**

Etiology. Monosystemic diseases (e.g. chr. Atrophic gastritis, myasthenia gravis Basedow dis., Hashimoto thyroiditis, 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.

Diseases of the epidermis and dermo-epidermal junction. Diseases of the dermis: vessels, connective tissue, panniculus. Tumors of the skin. Manifestations of systemic diseases of the skin.

### **List of textbooks**

- 1 Kumar, Abbas, DeLancey, Malone Robbins and Cotran: Pathologic Basis of Disease (Elsevier Saunders, Eights Edition, 2010), ISBN: 978-1-4160-3121-5
- 2 Kumar-Abbas-Fausto Robbins and Cotran: Pathologic Basis of Disease (Elsevier Saunders, 2005), ISBN: 0-8089-2302-1
- 3 Szende B., Suba Zs Introduction to Histopathology (Medicina, 1999)  
**WEB:** [www.4dpathology.hu](http://www.4dpathology.hu)

### **Recommended literature**

- 1 E.Rubin-J.L.Farber: Pathology (J.B.Lippincott 1994). 3rd edition (1999)
- 2 Nemes Z. Atlas of Histopathology (TEMPUS edition, Debrecen 1998)
- 3 CP. L. Wheater, H.G, Burkitt, a Stevens J.S. Lowe.: Basic Histopathology a Colour Atlas and Text. (Churchill Livingstone; 4Rev Ed edition, 2002)  
**WEB:** [www.path2.sote.hu](http://www.path2.sote.hu)

**General Informations:** [www.path2.sote.hu](http://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](mailto: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.*

*(carcinogenesis in cervix)*

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

Leiomyosarcoma

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*

**11. practice**

*Histology of lung diseases II.  
Tumors of the lung*

**12. practice**

*Histology of gastrointestinal tract diseases I.  
Upper GI tract*

**13. practice**

*Histology of gastrointestinal tract diseases II.  
Non-tumorous bowel diseases*

**14. practice**

IRDS

Bronchopneumonia  
Miliary tuberculosis in lung  
Sarcoidosis (Boeck's disease)

Small cell carcinoma of the lung  
Squamous cell carcinoma of the lung  
Adenocarcinoma of the lung  
Mesothelioma  
Lung metastasis

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

Villous atrophy in small intestine – Celiac disease  
Ulcerative colitis  
Crohn's disease  
Pseudomembranous colitis

**ORGAN DEMONSTRATION**

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**2<sup>nd</sup> 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 thyroiditis  
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  
Embryonal carcinoma of the testis

**20. practice**

*Histology of gynecological diseases I.  
Uterus*

Extrauterine (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 2<sup>nd</sup> 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 Immunohistochemistry 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 absolution (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 1<sup>st</sup> 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 11<sup>th</sup> and 13<sup>th</sup> 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.

- The exam for EM begins at 8.30 a.m.** sharp at the **II<sup>nd</sup> 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.
- 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.
- Registration** The internet based sign up system (NEPTUN) regarding pathology has been established for the 3<sup>rd</sup> 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.
- 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.
- 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 worse 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/tele-examination 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<sup>nd</sup> 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<sup>nd</sup> 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. They 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 answer 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 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.

**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 slide) 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 worse 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 5 grade.**

**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

1<sup>st</sup> Dept. of Internal Medicine Tutor: **Dr. Péter Studinger**

2<sup>nd</sup> Dept. of Internal Medicine Tutor: **Dr. Krisztina Hagymási**

3<sup>rd</sup> Dept. of Internal Medicine Tutor: **Dr. Katalin Keltai**

In 2016/17 Internal Medicine Propedeutics and Internal Medicine I. are taught by the 3<sup>rd</sup> Department!

### First Semester

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**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

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**Course:** Internal Medicine

**Type:** compulsory

**Total weeks:** lecture 14, seminar 0, practical 14

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

**Form of tuition:** lecture, bedside practice

**Mode of assessment:** theoretical exam (semi-final)

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

Acquisition of knowledge of medical toxicology.

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

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

# IMMUNOLOGY

## Department of Genetics, Cell and Immunobiology

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

Tutor: **Dr. Marianna Csilla Holub**

**Subject code:** AOKGEN025\_1A

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

**Credits:** 4

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

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 Nagyvárud Square, Operating training center, 1089 Budapest, Nagyvárud sq. 4.

Lecturer: **Professor Dr. György Wéber**

Tutor: **Dr. Györgyi Szabó**

**Credit: 2**

## Second Semester

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**Prerequisites:** Pathology and Histopathology II., Surgery I.

The aim of the subject is to practice the basic surgical techniques, to present hygienic approach, which attainments are indispensable for clinical doctors working in manual field of medicine. This subject provide basics about special behavior in the operating theatre, preparation of the patient and surgical team before operation, surgical tools and instruments, wound management, laparoscopic instruments and techniques.

Recommended for students interesting in manual fields of medicine.

**Practices** are held on every second week (7x135 minutes).

1. The operating room.
2. Knoting and suturing on in vitro models.
3. Knoting and suturing on in vivo models.
4. Operations on small animals I.
5. Operations on small animals II.
6. Basics of the video-endoscopic techniques.
7. Practices on pelvitrainers.

**Attendance** is obligatory on every practice. Because of limited capacity of operating theatre, absence cannot be repeated by joining another group. One missed practice can be repeated on 14th week of the semester.

**Absence** should be certified with medical or other official certificate. Absence from practices is not to exceed 25%.

**Requirement:** Practical exam (5 degree evaluation).

**Textbook:** Basic surgical techniques (textbook and video)



## BEHAVIORAL SCIENCES II.

### (Medical Psychology)

General Medicine, 3<sup>rd</sup> year Medical Students  
 Institute of Behavioral Sciences  
 Head of the Department: **Prof. Dr. József Kovács**  
 Tutor: **Dr. Gyöngyvér Salavecz**

**Credit: 3**

**2016/2017**

### 2<sup>nd</sup> Semester

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#### Lectures:

1. Brain and behaviour (Bódizs R.)
2. Learning theory and human behaviour (Purebl Gy.)
3. Psychodynamic formulation of human behaviour (Stauder A.)
4. Stress and illness, behavioural interventions (Stauder A.)
5. Altered states of consciousness in medical practice (Suhai G.)
6. Substance misuse and surrounding areas in medical practice (Lajtai L.)
7. Psychosomatic disorders (Túry F.)

#### Seminars:

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

#### Department:

Institute of Behavioral Sciences  
 Department of Psychology  
 NET Building, 20th floor  
 1089. Budapest, Nagyvárad tér 4.  
 Tel: 210-2953  
 Secretary: NET Building, 20th floor, Room – 2005. tel: 2102930/ 56114.

**Course Leader:** Dr. László Lajtai  
NET 20<sup>th</sup> floor, room 2011  
Tel: 210-2930/ 56403, e-mail: lajtai.laszlo@med.semmelweis-univ.hu  
Further information: www.behsci.sote.hu

**Seminar Teachers:**

Dr. György Purebl	purgyor@net.sote.hu
Dr. László Harmat	laszloharmat@yahoo.com
Dr. András Szentkirályi	aszentkiralyi@gmail.com
Gyöngyvér Salavecz	salgyon@net.sote.hu
Anikó Hazag	anikoha@gmail.com
Judit Pap	juditpap@gmail.com
Éva Pollák	evipoll@yahoo.com

**Participation and making up for absences:**

Participation list will be recorded at the end of every lecture and every seminar. To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (The maximum number of absences permitted: one absence from the lectures and two absences from the seminars.) Content of the lectures may appear in the exams.

**Certifying absence from lesson:**

Medical certificate

**Semester requirements:**

To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (The maximum number of absences permitted: one absence from the lectures and two absences from the seminars.) One absence can be overlooked by the teacher if the student writes an essay. The topic of the essay must be discussed with the seminar leader in advance.

**Type of exam:**

Final

**Exam requirement:**

Classroom activity and paper presented in the group.

**Sign up for exam:** Through the NEPTUN system.

**Method of sign up:** Through the NEPTUN system.

**Certifying absence from exam:**

A telephone or email message to the seminar leader.

**Sign up for exam:** Through the NEPTUN system.

**Course Textbook:**

1 **Behavior & Medicine**, 4<sup>th</sup> Edition, Danny Wedding, Hogrefe & Huber publishers, Seattle, 2006.

**Recommended text books:**

- 1 Kopp M. - Skrabski Á.: Behavioural Sciences Applied in a Changing Society, Corvina, 1996.
- 2 Fadem B: Behavioural Science., Lippincott Williams & Wilkins, 5<sup>th</sup> ed., 2008.
- 3 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6<sup>th</sup> ed., New York, Wiley, 2008.

## 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 discussable themes were selected by the lecturers of the Department of Physiology, and are given to the students every week. The necessary subject-matter of instruction will be published on the home page of the Department of Physiology. Use of data bases in the Central Library of the University (e.g. PubMed) is required.

## MEDICAL IMAGING METHODS

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

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

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

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

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

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

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

# MEDICAL ASPECTS OF DISASTER PREPAREDNESS AND RESPONSE I-II.

**Directorate for Safety Technology**  
**Department for Disaster Management and Education**

Supervisor: **Pál Kocsik**

Lecturer: **Csaba Csendes**

**Type of Course: indispensable**

Code: AOKBVI026\_1A, 2A

Credit value: 0

## First and Second Semester

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### **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:**

**5<sup>th</sup> 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.

**6<sup>th</sup> 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 1<sup>st</sup> 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**

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1. Intracellular transport mechanisms
2. Endoplasmic reticulum. Vesicular transport
3. Secretion and Golgi
4. Endocytosis. Endosomal – lysosomal system
5. Nuclear envelope and nuclear lamina. Nuclear pores and gated transport
6. Functions and malfunctions of some nuclear components
7. rRNA synthesis. Telomerase
8. Endosymbiotic cell organelles. Mitochondrion
9. Peroxisome
10. Cytoskeleton. Microtubules
11. Microfilaments and intermediate filaments
12. Cell – cell and cell –ECM adhesion and junction
13. Regulation of cell cycle I
14. Cell aging and death

**Important notes:** No possibility to make up of absences.  
There are no mid-term exams.  
Attendance of 75% of lectures is necessary for the end-term signature.  
Requirement: practice grade based on the result of the written or oral exam.  
(depending on the number of students).

**Core text:**

Alberts et al. Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546

Lecture presentations are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

## GENETICS AND GENOMICS

### Department of Genetics, Cell- and Immunobiology

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

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

Subject code: **AOKGEN030\_1A**

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

Credit:4

#### Lectures (2 hours per week):

1. Introduction to human genetics, the human genome
2. 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)**

Marthy Annamária – Végh Ágnes. *Egészségére! – Magyar orvosi szaknyelv*. Semmelweis Egyetem Egészségtudományi Kar, 2010.



# COMPULSORY SUMMER PRACTICE

## Internal Medicine - 1 month, 170 hours

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

Students who do not submit the certificate of completion on time will have their registration placed on hold until the proof of completion is received by the English Secretariat. Certificates can be downloaded at [http://www.semmelweis-english-program.org/index.php?option=com\\_content&task=view&id=79&Itemid=101](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 3<sup>rd</sup> year student without any pharmacology training*

*Practice of the most important medical interventions.*

*Dosage of medicines. (Methods)*

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

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

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

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

*Cognition of the patient documentation and independent documenting.*

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

*Practising the so-called small laboratory tests.*

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

*Participation in the meetings of the institution.*

*On-call service.*

**OBLIGATORY ELECTIVE AND ELECTIVE SUBJECTS – SCHEDULE OF THE BASIC AND PRE-CLINICAL MODULES (1st, 2nd & 3rd year) – Find detailed curricula after the 5th year**
**OBLIGATORY ELECTIVE SUBJECTS**

1st semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVNEI263_1A	History of Medicine	2	–	2	pract. mark	–
AOVANT457_1A	Developmental Biology I.	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology II.
AOVKPK088_1A	Library Informatics	2	–	3	pract. mark	–
AOVKIK099_1A	Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.
AOVGEN083_1A	Basic Cell Biology	2	–	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
AOVDEM156E1A	Teaching assistance (Demonstrator)	1	–	1	pract. mark	Only 2 <sup>nd</sup> 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
AOVDEM215E1A	Teaching assistance II. (Demonstrator)*	1	–	1	pract. mark	–
AOVTDK158E1A	Work within the union of research students (TDK munka)	1	–	1	pract. mark	–
AOVTDK164E1A*						
AOVCSA249_1A	Introduction to Clinical Medicine	2	–	2	pract. mark	Medical Profession
AOVCSA248_1A	Medical Profession	0,67	1,33	2	pract. mark	–
AOVCSA248_1A	Mathematical and Physical Basis of Medical Biophysics 14 hours lecture in the first four weeks of the semester		–	1		
2nd semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVNEI263_1A	History of Medicine	2	–	2	pract. mark	–
AOVANT458_1A	Clinical anatomy – propedeutics	2	–	2	pract. mark	Anatomy, Cell, Histology and Embryology III.
AOVANT457_2A	Developmental Biology II.	2	–	3	pract. mark	Developmental Biology I.
AOVKIK102_1A	Clinical cardiovascular physiology	2	–	2	pract. mark	Medical Physiology II.
AOVINP244_1A	Introduction to Medical Informatics	–	1	1	pract. mark	Medical Profession
AOVKPK088_1A	Library Informatics	2	–	3	pract. mark	–
AOVDEM156F1A	Teaching assistance (Demonstrator)	1	–	1	pract. mark	Only 2 <sup>nd</sup> 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
AOVDEM215F1A	Teaching assistance II. (Demonstrator)*	1	–	1	pract. mark	–
AOVTDK158F1A	Work within the union of research students (TDK munka)	1	–	1	pract. mark	–
AOVTDK164F1A*						

\* 2nd TDK research and/or demonstrator activity

## ELECTIVE SUBJECTS

1st semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOSMAG392_1A	Art of Learning	2	-	2	pract. mark	-
AOSMAG318_1A	Social media in medicine	2	-	2	pract. mark	-
AOSGEN134_1A	Introduction to Epigenetics	2	-	2	pract. mark	Immunology
AOSMMS174_1A	Traditional Chinese Medicine	2	-	2	pract. mark	basic module
AOSMAG336_1A	Culture in Medicine, Culture of Medicine	2	-	2	pract. mark	-
AOVGEN083_1A	Basic Cell Biology	2	-	3	pract. mark	Anatomy, Cell, Histology and Embryology I.
AOSKIK151_1A	Cardiorespiratorical and neurophysical measuring techniques	2	-	2	pract. mark	Medical Physiology II.
AOSMAG139_1A	Jewish Medical Ethics I.	2	-	2	pract. mark	-
AOSNEI246_1A	History of Medical Professionalism	2,5	-	2	pract. mark	-
AOSFRM394_1A	Introduction to Pharmacological Research	2	-	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I.
AOVOVM093_1A	Basics of Medical Chemistry	2	-	3	pract. mark	-
	Pathobiochemistry	2	-	2	pract. mark	

2nd semester						
Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOSMAG392_1A	Art of Learning	2	-	2	pract. mark	-
AOSLEK340_1A	Clinical Hungarian	-	4	2	pract. mark	Hungarian Medical Terminology V.
AOSGRI374_1A	Disruptive Technologies in Medicine	2	-	1	pract. mark	-
AOSMAG318_1A	Social media in medicine	2	-	2	pract. mark	-
AOSMMS174_1A	Traditional Chinese Medicine	2	-	2	pract. mark	basic module
AOSMAG336_1A	Culture in Medicine, Culture of Medicine	2	-	2	pract. mark	-
AOVELT101_1A	Problem based medical physiology	2,5	-	4	pract. mark	Medical Physiology II.
AOVKIK102_1A	Clinical cardiovascular physiology	2	-	2	pract. mark	Medical Physiology II.
AOSNEI246_1A	History of Medical Professionalism	2,5	-	2	pract. mark	-
AOSGEN142_1A	Sexual genetics	2	-	2	pract. mark	Anatomy, Cell, Histology and Embryology II. Biochemistry, Molecular and Cell Biology I.
AOSMAG139_2A	Jewish Medical Ethics II.	2	-	2	pract. mark	-
AOSGEN176_1A	Chemotaxis – Its significance in biology and clinical sciences	2	-	2	pract. mark	Medical Chemistry
AOSFRM394_1A	Introduction to Pharmacological Research	2	-	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I.

## NOTE

# CLINICAL MODULE



*Faculty of Medicine*  
*4<sup>th</sup> year*

## STUDY PROGRAMME

### Fourth Year

7th semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFRM034_1A	Pharmacology and Pharmacotherapy I.	2.5	2.5	5	semi-final	Medical Physiology II. Medical Biochemistry and Molecular Cell Biology III. Pathophysiology and Clin. Lab. Diagn. II.
AOKNEI335_1A	Public Health and Preventive Medicine I.	1	2.5	4	semi-final	Pathology II., Medical Microbiology II. Pathophysiology and Clin. Lab. Diagn. II.
AOKBL3029_2A <sup>3</sup> AOKBL1027_2A <sup>1/2</sup>	Internal Medicine II.	1.5	3	4	semi-final	Internal Medicine I., Immunology Pathophysiology and Clin. Lab. Diagn. II.
AOKSB1343_1A	Surgery I.	2	1	3	semi-final	Pathology II., Basic Surgical Techniques Pathophysiology and Clin. Lab. Diagn. II.
AOKKAR292_3A	Internal Medicine III. - Cardiology	1	2	3	semi-final	Internal Medicine II. *, Medical Microbiology II. Pharmacology and Pharmacotherapy I. *
AOKFUL042_1A	Otorhinolaryngology (either)	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques, Surgery I. *
AOKBOR043_1A	Dermatology (or)	1.5	2.5	4	semi-final #	Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I. Pharmacology and Pharmacotherapy I. *
AOKPUL047_1A	Pulmonology (either in the 1st or in the 2nd semester)	1	2	3	semi-final	Pathology II. Internal medicine - propedeutics
AOKPSI050_1A	Psychoterapy in medical practice	1	1	2	semi-final	Medical Psychology Medical Communication Internal medicine - propedeutics
AOKSZB044_1A	Oral Surgery and Dentistry	1	1	2	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques, Surgery I. *
AOKRAD049_1A	Radiology	2	2	4	semi-final #	Medical Imaging Anatomy, Cell, Histology and Embryology IV. Pathology II.
AOKHKT026_3A	The Medical Fundamentals of Disaster Resolution III.	1x2 /semester	-	0	signature	criteria requirement
Total Number of Credit Points from Compulsory Subjects				<b>37, 34, 33, 31 or 30</b>		
<b>4 credit points from obligatory elective/elective subjects</b> 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						
<b>Total Number of Credit Points from Obligatory elective / Elective Subjects</b>				<b>4</b>		

**Fourth Year**
**8th semester**

Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKFRM034_2A	Pharmacology and Pharmacotherapy II.	2.5	2.5	5	final #	Pharmacology and Pharmacotherapy I. Medical Microbiology II. Internal medicine - propedeutics
AOKNEI335_2A	Public Health and Preventive Medicine II.	1	2.5	4	final #	Public Health and Preventive Medicine I.
AOKSB1343_2A	Surgery II.	2	2	4	semi-final	Surgery I. Pharmacology and Pharmacotherapy I.
AOKLMI033_1A	Laboratory Medicine	1.5	-	2	semi-final	-
AOKORT048_1A	Orthopaedics	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Pathology II., Surgery I.
AOKMAG045_1A	Bioethics – Medical Ethics	2	0	2	semi-final	Medical Psychology
AOKFUL042_1A	Otorhinolaryngology (either)	1	2	3	semi-final #	Anatomy, Cell, Histology and Embryology IV. Basic Surgical Techniques Surgery I. *
AOKBOR043_1A	Dermatology (or)	1.5	2.5	4	semi-final #	Pathophysiology and Clin. Lab. Diagn. II. Internal Medicine I. Pharmacology and Pharmacotherapy I. *
AOKPUL047_1A	Pulmonology (either in the 1st or in the 2nd semester)	1	2	3	semi-final	Pathology II. Internal medicine - propedeutics
AOKHKT026_4A	The Medical Fundamentals of Disaster Resolution IV.	1x2 /semester	-	0	signature	criteria requirement
AOKNSG333_1A	Summer surgery practice	-	1 month/ 170 hours	-	signature	Surgery II. *
<b>Total Number of Credit Points from Compulsory Subjects</b>				<b>30, 27, 26, 24 or 23</b>		
<b>4 credit points from obligatory elective/elective subjects</b> 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.						
<b>Total Number of Credit Points from Obligatory elective / Elective Subjects</b>				<b>4</b>		

<sup>1</sup> 1st Department of Internal Medicine

<sup>2</sup> 2nd Department of Internal Medicine

<sup>3</sup> 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!)

- 1 Cecil's Essentials of Medicine. Ed. Andreoli, Carpenter, Griggs. Loscalzo.W.B. Saunders. 5<sup>th</sup> ed. 2001. ISBN 0-7216-8179-4
- 2 Adler: ABC of AIDS. 1993. 3<sup>rd</sup> ed. ISBN 727907611. BMJ
- 3 Adler: ABC of Sexually Transmitted Diseases. 3<sup>rd</sup> ed. 1995. ISBN 72790261X. BMJ
- 4 Becker,W.- Naumann,H.- Pfaltz R.: Ear, Nose and Throat Diseases. Thieme. Stuttgart, New-York, 1994. ISBN 0-86577-536-2 or 3-13-671202-3
- 5 Répássy,G.: Otolaryngology. Eger, Radó Ny. 2000.
- 6 Katzung: Basic and Clinical Pharmacology, Lange 10<sup>th</sup> ed, 2007
- 7 Churchill's pocketbook of cardiology. Grubb, NR-Newby,D.E. Edinburgh 2006.
- 8 Richard B. Gunderman: Essential Radiology: Clinical Presentation, Pathophysiology, Imaging, 2nd ed, Thieme Medical , 2006. ISBN 1588900827, 9781588900821
- 9 The New Public Health: An Introduction for the 21<sup>st</sup> Century. By:T.Tulchinsky, E.A. Varavikova. 2000. ISBN 03350-5 Note: The list of the textbooks in Public Health, please find after its syllabus!
- 10 Adams,J.C-Hamblen,D.L.:Outline of Orthopaedics. 12<sup>th</sup> ed. Churchill Livingstone, Edinburgh, 1995. ISBN 0443 05149 6
- 11 Horst Cotta: Orthopaedics. Georg Thieme Verl. New York, 1980. ISBN 3-13590001-0
- 12 Bourne,Brewis: Lecture Notes on Respiratory Disease. Blackwell. 5<sup>th</sup> ed. 1998. ISBN 0-632-04968-5
- 13 Sabiston Essentials of Surgery. Saunders. 1994. ISBN 0-7216-3492-3.
- 14 Davis-Christopher : Textbook of Surgery rövidített változata!
- 15 Szabó Gy.: Oral and Maxillofacial Surgery. Bp. Semmelweis Kiadó, 2001.
- 16 Szende B.-Suba Zs.: Introduction to Histopathology. Bp. Medicina. 1999.
- 17 Koesner, K.R.: Manual of Minor Oral Surgery for the General Dentist. Blackwell Munksgaard, 2006.
- 18 Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

**Recommended textbooks:**

- 1 Cecil Textbook of Medicine. 21<sup>th</sup> ed. W.B. Saunders, 2000. Vol.1-2.
- 2 Lynn S. Bickley: Bates' Guide to Physical examination and history taking
- 3 Tulassay Z. (Ed): A belgyógyászat alapjai (I-II.)
- 4 Internet links for Internal Medicine
- 5 Current Medical Diagnosis and Treatment. (Ed.)Tierney,McPhee,Papadakis. Appleton & Lange, McGraw-Hill 2002. ISBN 0-07-136466-8
- 6 Harrison's Principles of Internal Medicine. 15<sup>th</sup> ed. McGraw-Hill Inc. 2001.
- 7 Concise Oxford Textbook of Medicine. Ed. Ledingham, Warrell. Oxford University Press, Oxford, 2000.
- 8 Davis-Foster-Gamelli: Essentials of Clinical Surgery. Mosby Year Book
- 9 Davis-Christopher (ed.): Sabiston): Textbook of Surgery. The biological basis of modern surgical practice. Saunders Company.
- 10 Duckworth,T.: Orthopaedics and Fractures. 3<sup>rd</sup> ed. Blackwell Science, 1995.
- 11 Szécsény-Berentey: Sebészet. Bp. Medicina.
- 12 Gaál: Sebészet. Bp. Medicina.
- 13 Littmann: Sebészeti műtéttan. Bp. Medicina.
- 14 Fitzpatrick's Dermatology in General Medicine Editor: Freedberg, Irwin M.; Eisen, Arthur Z.; Wolff, Klaus; Austen, K. Frank; Goldsmith, Lowell A.; Katz, Stephen I. Publisher: McGraw-Hill Edition: 6th Edition ISBN: 0-07-138076-0, 0-07-138066-3, 0-07-138067-1
- 15 full-text online access:  
<http://gateway.ut.ovid.com/gw1/ovidweb.cgi?New+Database=Single|0&S=IDNJHKIDNGILP00>
- 16 Shimizu's Textbook of Dermatology – accessible online also
- 17 Clinical Dermatology Editor: Rona M.MacKie 5<sup>th</sup> Edition Oxford Core Texts, 2003 ISBN13: 9780198525806ISBN10: 019852580X Paperback or the latest edition
- 18 Dermatology Editor: Otto Braun-Falco, Gerd Plewig, Helmut H. Wolff, Walter Burgdorf Publisher: Springer Verlag; 3 edition (November 2009)
- 19 Peterson: Contemporary Oral and Maxillofacial Surgery. Mosby, 2003.
- 20 Peterson: Principles of Oral and Maxillofacial Surgery. Decker, 2004.
- 21 Robinson, Howe: Tooth Extraction. A Practical Guide. Oxford, 2000.
- 22 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. SOTE, Bp. 1992.
- 23 W. E. Erkonen, W. L. Smith: Radiology 101: the basics and fundamentals of imaging, 2nd ed, Lippincott Williams & Wilkins, 2004. ISBN 0781751985, 9780781751988
- 24 R. A. Novelline: Squire's fundamentals of radiology, 6th ed, Harvard University Press, 2004. ISBN 0674012798, 9780674012790



# PHARMACOLOGY AND PHARMACOTHERAPY I – II.

Tutor: *Dr. Pál Riba*

## First and Second Semester

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**First Semester:** Lectures (2,5 hours) Practices (2,5 hours)

**Second Semester:** Lectures (2,5 hours) Practices (2,5 hours)

**Code:** AOKFRM034\_1,2\_A

**Total credits for the 2 semesters:** 10

**Course Director:** *Prof. Dr. Péter Ferdinandy*

### Pharmacology and Pharmacotherapy (two semesters)

#### Topic of Pharmacology and Pharmacotherapy I (Year 4, 2016/2017, first semester):

Introduction into the Pharmacology (history of pharmacology, pharmacogenomics, general principles of toxicology). General Principles of Pharmacodynamics (drug receptors, signaling mechanisms and drug action, pharmacodynamic principles, dose-response curves and quantal dose-effect curves, therapeutical index, tolerance).

Pharmacokinetics (drug absorption, distribution, elimination). Clinical pharmacokinetic principles Development and Regulation of Drugs (clinical trials: phase I. II. III. IV.). EvidenceBased Medicine (ethic disciplines, role of placebo in clinical trials). Pharmacovigilance (reports on adverse events and reactions). Biologic Drugs. Orphan Drugs. Generic products, biosimilar products. Drug formulas. Prescription writing.

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

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

Pharmacology of Adrenergic Transmission (sympathomimetic drugs). Pharmacotherapy of COPD.

Drugs Used in Bronchial Asthma. Antitussive Drugs. Expectorants. Pharmacotherapy of Asthma.

Pharmacology of Adrenergic Transmission (sympatholytics drugs). Antipsychotics.

Sedative-hypnotic and Anxiolytic Drugs.

Antidepressant and Mood-stabilizing Agents. Antiseizure Drugs.

Treatment Strategy of Psychiatric/Neurological Disorders. Pharmacological Management of Neurodegenerative Disorders. Nootropic Drugs. Centrally Acting Skeletal Muscle Relaxants (spasmolytics).

Antiviral Agents. Pharmacotherapy of Viral Infection

Pharmacotherapy of Bacterial Infections. Cell Wall- and Membrane Active Antibiotics.

Pharmacotherapy of Bacterial Infections. Antibiotics Inhibiting the Protein- and Nucleic Acid Synthesis. Miscellaneous Other Antibiotics.

Antifungal and Antiprotozoal Agents. Disinfectants. Antiseptics.

#### Topic of Pharmacology and Pharmacotherapy II (Year 4, 2016/2017, second semester):

Drugs Used in Disorder of Coagulation. Agents Used in Cardiac Arrhythmias

Drugs Used in Angina Pectoris. Antihyperlipidemic Agents. Diuretics and antidiuretics..

Drugs Used in heart failure. Antihypertensive Agents.

Treatment Strategy of Cardiac Failure. Treatments Strategy of Ischemic Heart Disease. Drugs Used in Peripheral Vascular Diseases. Agents Used in Anemias.

Pancreatic Hormones and Antidiabetic Drugs. Hypothalamic and Pituitary Hormones. Adrenocorticosteroids and Adrenocortical Antagonists. Thyroid and Antithyroid Drugs. The Gonadal Hormones and Inhibitors.

Treatment Strategy of Hypertension. Metabolic Syndrome. Treatment Strategy of DM Type II. Basic Pharmacology of Inflammation and Fever. Non-opioid Analgesics. Non-steroid Anti-inflammatory Drugs. Drugs Used in Gout. Agents that Affect Bone Mineral Homeostasis. Treatment Strategy of Osteoporosis. Basic Pharmacology of Opioid Analgesics. Drug Abuse. Drugs Acting on Smooth Muscle. Agents Affecting the Function of Uterus. Drugs Used for Treatment of Migraine. Treatment Strategy of Pain. Hormonal Contraception. Agents Acting via the Opioid Receptors. Additional Treatment of Pain. Immunopharmacology (immunosuppressive and immunomodulatory agents). Treatment Strategy of Rheumatoid arthritis. Pharmacology of Nutrition (vitamins, appetite enhancers, agents improving digestion, prokinetic drugs). Laxatives and Antidiarrheal Drugs. Drugs Affecting the Liver and the Biliary Function. Pharmacology of the Gastrointestinal System (agents for treatment of peptic ulcer, gastroesophageal reflux disease and IBD). Emetics and Antiemetics. Cancer Chemotherapy (basic pharmacology of cancer chemotherapeutic drugs, treatment strategy). General and Detailed Toxicology. Pharmacokinetic Differences and Variations in Drug Responsiveness according to Age or State of Health. Factors Affecting the Drug-body Interaction. Drug Treatment in Pregnancy. Pharmacological Treatment in Critical Care.

**Maximum number of absences is 25 percent of the practices in the semester**

**Absence justification:** Medical certificate is accepted.

There are no obligatory midterms, but optional midterms are organized.

**Semester requirements:** The number of absences should not be more than 25 percent of the practices in the semester.

Successful exam from the topic of the preceding pharmacological course.

**Way of giving grades:**

**Written test:** scores.

**Semi-final** exam. Oral; consists of two questions

**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 types:**

1st semester. Semi-final, oral

2nd semester. Final exam which consists of three parts. **1.** Preceding exam from toxicology. **2.** Written test from clinical pharmacology. **3.** Oral exam.

**Sign up for the exam:** Registration has to be done through the NEPTUN system for the days set by the department until the number of limit.

**How to modify the exam date:** Through the NEPTUN system, as it allows.

**Justifying the exam absence:** Medical certificate is accepted.

**Textbook:** Basic and Clinical Pharmacology (Eds. B. G. Katzung, S.B. Masters, A. J. Trevor), LANGE medical book, 12th edition

# PUBLIC HEALTH AND PREVENTIVE MEDICINE I.

**Institute:** Department of Public Health

**Location:** NET building, 1089 Budapest, Nagyvárad tér 4., 13<sup>th</sup>, 14<sup>th</sup>, 19<sup>th</sup> and 21<sup>st</sup> floors.

NET 13<sup>th</sup> 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

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**Lectures** (1 contact hour, 45 min):

Introduction, history of public health

Concepts and levels of prevention.

Health determinants. Health status of the Hungarian population.

Epidemiology of smoking and related diseases

Epidemiology of alcohol and illegal drug consumption

Epidemiology of cardiovascular diseases

Epidemiology of cancer

Basics of health policy, public health programs.

The structure and financing of healthcare.

Quality assurance in healthcare.

Basic concepts of health promotion

Mother-, infant and youth health.

Public health aspects of handicapped people. Gerohygiene

Mental hygiene, suicide

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

Basics of demography, standardization

Epidemiology I: Basic concepts, basic measures. Overview of statistical knowledge

Epidemiology II: Risk and cause. Epidemiological analysis

Epidemiology III: Screening. Clinical epidemiology. Evaluation of epidemiological analyses.

Epidemiology IV: Midterm. Critical reading

Smoking prevention and cessation programs.

Alcohol and illegal drug prevention programs

Prevention of cardiovascular diseases and cancer. Screening methods.

Evaluation of public health programs

Health care planning, quality assurance.

Different levels of health promotion. Health plan.

Mother and youth hygiene.

Field trip

Consultation

## Second Semester

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### **Lectures** (1 contact hour, 45 min):

General epidemiology of communicable diseases: Epidemics and the primary and secondary factors of the epidemic process

Infection control: Nosocomial infections. Antibiotic-resistance.

Environmental medicine: ecological basics, air pollution, smog

Environmental medicine: water, the water cycle of Earth, water supply, water management

Environmental medicine: Ionizing radiation, types, effects and limits

Environmental medicine: Chemical safety, basics of toxicology, risk assessment

Environmental medicine: Housing and settlement hygiene

Occupational medicine: The basics of occupational medicine, occupational diseases, exposition

Occupational medicine: Physical agents

Occupational medicine: Chemical agents

Occupational medicine: Ergonomics. Stress at the workplace.

Nutrition: Evaluating the nutritional status

Nutrition: Diet-related diseases

Nutrition: Food safety

### **Seminars** (2,5 contact hour, 113 min):

Communicable diseases I.: Basic concepts of communicable diseases. Classification of communicable diseases, international statistics

Communicable diseases II.: Vaccination. Sterilization, disinfection

Communicable diseases III.: Airborne and enteral diseases

Communicable diseases IV.: Haematogenic-lymphogenic and animal derived diseases

Communicable diseases V.: STD

Basic concepts of toxicology

Toxicology of certain chemicals.

Impact of environmental factors on health

Occupational diseases I.: The definition of occupational diseases. Policy, financing, supervision Notification.

Occupational diseases II.: Biological occupational agents, occupational diseases in healthcare. Accidents.

Occupational diseases III.: Physical and chemical occupational agents.

Nutrition I.: Assessment of nutritional status, nutritional fact charts

Nutrition II.: Diet planning. Food intoxication / infection.

Field trip

## INTERNAL MEDICINE II.

1<sup>st</sup> Dept. of Internal Medicine Tutor: **Dr. Péter Studinger**

2<sup>nd</sup> Dept. of Internal Medicine Tutor: **Dr. Krisztina Hagymási**

3<sup>rd</sup> Dept. of Internal Medicine Tutor: **Dr. Katalin Keltai**

In 2016/17 Internal Medicine II. is taught by the 1<sup>st</sup> and 2<sup>nd</sup> Department!

### First Semester

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**Type:** compulsory

**Total weeks:** lecture 14, seminar 0, practical 14

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

**Form of tuition:** lecture, bedside practice

**Mode of assessment:** theoretical exam (semi final)

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

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

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

## INTERNAL MEDICINE III. – CARDIOLOGY

**Heart Center Department of Cardiology**

Tutor: **Dr. György Bárczi**

### First Semester

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**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.  
atherosclerosis  
Invasive/non invasive tests  
Stable coronary artery disease

4. Ischaemic heart disease II.  
Acute coronary syndrome
5. "Cardiology Day"  
Live demonstrations, interactive lectures, resuscitation practice, etc.
6. Heart failure  
Cardiomyopathies
7. Arrhythmias I.  
Supraventricular arrhythmias
8. Arrhythmias II.  
Ventricular arrhythmias  
Syncope, sudden cardiac death
9. Acquired valve diseases
10. Congenital heart diseases in children and in adults
11. Cardiac Surgery  
Indications and recommendations
12. Infective heart diseases, cardiac tumours
13. Primary and secondary prevention
14. Interactive case presentations

### **Practices**

(ward rounds, 2 hours per week)

1. Bedside practice – ECG
2. Bedside practice – heart failure, echocardiography
3. Bedside practice – valvular heart diseases
4. Coronary care unit – intraaortic balloon pump
5. Coronary care unit – invasive haemodynamics
6. Coronary care unit – cardiogenic shock
7. Out patient care – ischemic heart diseases
8. Out patient care – arrhythmias
9. Common practice – invasive cardiology
10. Common practice – non-invasive cardiology
11. Common practice – electrophysiology
12. Common practice – pediatric cardiology
13. Common practice – cardiac surgery
14. Practical exam

**Students are strongly recommended to visit regularly our website where updated informations are available: <http://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

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### **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.

## **SURGERY II.**

### **Second Semester**

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**Lectures** (2 hours per week)

Appendicitis

Acute abdomen

The oesophagus and diaphragm

The stomach, duodenum and small intestine

The large intestine and the ano-rectal region

The ileus

The liver

The cholelithiasis and biliary surgery

Pancreas I. - Acute pancreatitis

Pancreas II. (Chronic Pancreatitis. Tumours)

The artificial nutrition - Enteral, parenteral

The acute gastrointestinal bleeding

Catastrophic surgery. - Surgery of tropical diseases

Pediatric Surgery

Consultation - Questions-answers

**Site of lectures: (előadások helye): lecture hall**

**PRACTICALS: all in wards** (2 hours per week)



# OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

Tutor: *Dr. Beáta Bencsik*

## First Semester – half class

## Second Semester – half class

### Lecture (1 hour per week)

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

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

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

Types of hearing losses, etiology. Audiological diagnostic methods.

Surgical management of hearing losses. Otosclerosis. Cochlear implant.

Physiology and lesions of the vestibular system.

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

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

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

Clinical anatomy, physiology and diseases of the pharynx.

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

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

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.

Foreign bodies. Medial and lateral neck masses.

### Practice (2 hours per week)

Clinical examinations.

Diagnostical methods of the ear.

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

Routine audiology. Uning fork practice.

Operating theatre. Video.

Examination of the vestibular system. ENG. CCPG.

Evaluation of different otological cases.

Anterior and posterior rhinoscopy. Clinical management of the epistaxis.

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

Advanced examination of the pharynx. Directoscopy, fiberoscopy.

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

Direct and Indirect of the voice. Laryngoscopy. Videostroboscopy.

Emergency management of suffocation.

Operating theatre. Video. Voice prostheses.

Oesophagoscopy, bronchoscopy.

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

# ORAL SURGERY AND DENTISTRY

Tutor: **Dr. Zsolt Németh**

## First Semester

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

Introduction to Oral and Maxillofacial Surgery.

Benign tumors of the maxillofacial region

Haemangiomas of the maxillofacial region. Salivary glands

Malignant tumors of the maxillofacial region

Maxillofacial traumatology

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

Periodontal diseases. Oral medicine

Infections of dental origin

Minor oral surgery Dentoalveolar surgery

Dental reconstructions. Prosthodontics

Biomaterials in the maxillofacial surgery

Developmental anomalies of the maxillofacial region

Den to-maxillofacial radiology

Computer tomography (CT) in the maxillofacial surgery

Pediatric dentistry and orthodontics

Cariology and endodontics

Consultation

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

# DERMATOLOGY

## Department of Dermatology-Venerology and Dermatoooncology

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

Tutor: **Dr. Béla Tóth**

**Credits: 4**

**First Semester – half class**

**Second Semester – half class**

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

### **Objectives of the course:**

Morphology, structure, physiology and general pathology of the skin. Bacterial, viral and other infections of the skin. Sexually transmitted diseases (STD). Dermatoallergology. Dermatoimmunopathology. Basics of the skin immune system (SIS). Bullous skin disorders. Psoriasis. Skin symptoms of autoimmune diseases. Skin symptoms of vascular diseases. Oncodermatology. Skin symptoms of internal diseases. Basic principles of general and topical dermatological treatment.

The goal of the training:

- 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

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### **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 antytrypsin 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

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### Lectures

Subject of Orthopedic Education. Organization.

Orthopedic care in Hungary. Possibilities of prophylaxis.

Inflammatory diseases in orthopaedics.

Anatomy and biomechanics of the spine. Mai posture.

Scheuermann's disease. Vertebra plana, Calve.

Scoliosis. Theories concerning the etiology of various kinds of scoliosis.

Pathological, clinical and radiological symptoms and appearance. Symptomatology and therapy of the functional scoliosis. Symptoms and therapy of scoliosis with recognized etiology (congenital, paralytic, rachitic).

Degenerative diseases of the spine. Etiology of low back pain, clinical symptoms, therapy. Low back of disc origin. Significance of the intervertebral discs under normal and pathological conditions. Symptomatology of the ischias syndrome and its therapy.

Spondylolysis and spondylolisthesis. Lumbalization and Sacralization.

Deformities and diseases of the neck and the upper extremity.

Congenital torticollis, Klippel-Feil deformity. Cervical rib. Sprengel deformity.

Obstetricalisparalysis. Recurrent dislocation of the shoulder. Cervicobrachial syndrome.

Periarthritis of the shoulder. Dupuytren contracture. Kienböck disease. Tennis elbow.

Madelung deformity. Sudeck dystrophy of the upper extremity.

Osteoarthritis of the hip. Etiology, pathology, clinical and radiological symptoms.

Methods of conservative and operative Treatment.

Diseases of the child's hip. Legg-Perthes-Calve disease. Slipped capital femoral epiphysis. Acute and chronic arthritis of the hip.

Congenital dislocation of the hip. Anatomy and development of the hip joint. Concept of dysplasia. Subluxation and luxation. Pathology. Early and late clinical and X-ray signs. Early and late conservative therapy. Various methods of operative treatment. Palliative operation.

Diseases of the knee. Recurrent dislocation of the patella.

Osteochondritis of the tibial tubercle (Osgood-Schlatter disease). Osteochondrosis of the tibia. Varus, valgus and hyperextension deformity. Osteoarthritis.

Chondromalacia of the patella. Meniscus lesions.

Diseases of the foot. Congenital clubfoot. Tarsal synostosis. Hallux valgus. Aseptic necrosis of the bones of the foot. Osteoarthritis of the joints of the foot. Flatfoot.

Neuromuscular diseases. Classification and treatment. Infantile cerebral palsy.

Disturbances of the development of the vertebral body and neural arch. Muscular defects. Progressive muscular dystrophy and other diseases of the muscles.

Primary tumors of bones and their classification. Benign bone tumors. Osteoid osteoma. Semimalignant and malignant tumors (giant cell tumor, chondroma, osteosarcoma, chondrosarcoma, multiple myeloma, Ewing sarcoma). Main pathologic features.. '

Bone disorders. Osteoporosis, osteomalacia, osteogenesis imperfecta, Paget disease.

Developmental anomalies. Congenital anomalies of the extremities.

### Consultation.

## **Practices**

Instruction of correct behaviour in the Hospital and during practicals. Introduction to the Hospital. Therapeutic aims of Orthopedics. Methods of the clinical practicals.

Methodology of learning Orthopedics.

Diagnostic and therapeutic methods of Orthopedics. Anamnesis. Inspection, palpation, examination of motions.

Basics of radiological examination of the musculoskeletal system. Normal Roentgen anatomy of the bones and joints. Form and function. Methods of examination of limb shortening and alterations of the forms. Contracture. Limping.

Fixation, relief of weight bearing, plaster splints, plaster bandages. Examination of patients. Examination of the diseases and deformities of the spine, malposture (Calves deformity, spondylarthrosis).

Preparation of plaster splints, bandages. Examination of patients with lumbago, ischias syndrome, spondylolysis, spondylolisthesis. Demonstration of Roentgenograms.

Examination of scoliotic patients. Preparation of plaster and other corsets.

Examination of patients. Tuberculous spondylitis. Demonstration of Roentgenograms.

Preparation of plaster beds.

Examination of patients with congenital dislocation of the hip. Early and late symptoms of this disease. Demonstration of Roentgenograms.

Examination of patients with congenital dislocation of the hip. Demonstration of the means and methods of therapy and their application.

Examination of patients with juvenile osteochondritis of the hip. Epiphyseolysis.

Infantile coxa vara. Demonstration of Roentgenograms and methods of treatment.

Preparation of hip spica.

Examination of patients with osteoarthritis of the hip. Examination of contractures of the hip. Demonstration of Roentgenograms.

Examination of patients with recurrent dislocation of the patella, Osteoarthritis, tuberculous arthritis of the knee. Punction of the knee joint. Methods of fixation of this joint, preparation of plaster bandage.

Examination of patients with diseases and deformations of the neck, upper extremity.

Torticollis, cervicobrachial syndrome, periarthrits of the shoulder, tuberculosis of the shoulder joint. Demonstration of Roentgenograms. Application of the methods of hand and arm fixation.

Examination of patients with congenital clubfoot and flatfoot. Therapy. Application of the methods of foot and lower leg fixation.

Demonstration of the methods of gymnastics and physiotherapy.

# RADIOLOGY

## Dept. of Radiology

www.radi.sote.hu

Tutor: *Dr. Balázs Futácsi*

## First Semester

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

**Code:** AOKRAD049\_1A

**Credits:** 4

**Course Director:** *Dr. Viktor Bérczi*

### Course topics (order of lectures could change)

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

### Practices

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

### Semester requirements

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

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

Appreciated work on practices (assessment by teacher)

# 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

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### 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 4<sup>th</sup> year medical students Academic year 2016/2017

The participation in the tuition is obligatory.

The digital slides are available for the students via our website ([www.labmed.usn.hu](http://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.**



**Exam**

**The exam is a written test.**

**The material for examination is based on the lectures. The questions are prepared by lectures.**

**The exam consists of 50 questions. The students have 60 minutes for writing test.**

**The test questions include simple choice (one correct answer out of 4 or 5 options).**

**Test results of exam are available within one day.**

**Evaluation:**

**0- 60% = 1 (Failed)**

**61- 70% = 2**

**71- 80% = 3**

**81- 90% = 4**

**91-100% = 5**

**Exam dates: You will be notified about the dates offered by the Department before the exam period and they will be finalized at the Staff-Student meeting.**

**Taking examination before the exam period is not allowed.**

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

**Diagnostic profile of the Department**

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

**Research at the Department**

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

**Useful and update information about the Institute and the subject of Laboratory Medicine can be found at home page: [Semmelweis.hu/laboratorium](http://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

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 medical ethics.

The principle of respect for autonomy.

The principle of non-maleficence.

The principle of beneficence.

The principle of justice.

Arguments against „principlism“.

##### 4. week

The concept of health and disease.

Naturalistic definitions of health.

The medical model of defining health.

Normativist definitions of health.

**5. week**

Informed consent.  
 Simple consent and paternalism in medicine.  
 The emergence of the doctrine of informed consent.  
 Standards for information disclosure for patients.  
 When is informed consent not necessary?  
 Standards of competence and incompetence.  
 The right to refuse medical treatment.  
 Some psychological and communicational aspects of informed consent.

**6. week**

Information disclosure to terminally ill patients. Telling the truth to patients.  
 The history of information disclosure to terminally ill patients.  
 Pros and cons for lying to terminally ill patients.  
 The weaknesses of the arguments in favour of lying.  
 The dying process according to E. Kübler-Ross.  
 How to communicate the bad news to terminally ill patients.  
 The physician's relationship with the relatives of the deceased patient.

**7. week**

Justice in Health Care I. Ethical questions of macroallocation.  
 Higher and lower level macroallocational problems.  
 The role of personal responsibility in maintaining health.  
 The principles and practice of rationing in contemporary health care systems. (Soft and hard rationing.)  
 Medical ethics and medical economics. Ethical questions of cost-benefit and cost effectiveness analysis. The QALY.  
 The problem of right to health care. (The libertarian, the liberal and the socialist views about the right to health care.)  
 The role of the market and that of the state in the health care system.  
 Ethical problems of financing health care. (Fee-for-service, capitation, fixed salary, DRG-system, etc.)  
 Setting health care priorities in Oregon.  
 Attempts to define a just health care system.

**8. week**

Ethical questions of reproductive medicine.  
 Abortion.  
 Artificial insemination from donor.  
 In vitro fertilization, surrogate motherhood.  
 Ethical questions of genetic counseling.  
 Ethical questions of embryo experimentation.

**9. week**

Justice in Health Care II. Ethical questions of microallocation. Moral dilemmas in the allocation of scarce medical resources.  
 The concept of microallocation.  
 Ethical analysis of various selection criteria. (Medical benefit, psychological ability, supportive environment, social value criterion, resources required criterion, age, ability to pay, random selection, personal responsibility for the illness, etc.)

**10. week**

Ethical questions of animal experimentation.  
History of the thinking about the moral status of animals.  
The philosophical significance of the Darwinian conception of nature.  
The views of Peter Singer: antispeciesism.  
The views of Tom Regan: animal rights.  
Ethical questions of experimentation on animals on the basis of a moderate animal protectionist's view.  
Critical anthropomorphism.  
Alternatives to animal experimentation.

**11. week**

Euthanasia and the withholding of life-sustaining treatment  
Definitions.  
The sanctity of life versus the quality of life doctrine.  
Is there any difference between active and passive euthanasia?  
The practice of active euthanasia in the Netherlands. The 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**

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

**13. week**

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

**14. week**

The rights of patients.  
The role of patient's rights in the transformation of the paternalistic physician-patient relationship.  
Moral versus legal rights.  
A list of basic rights of patients.  
Mechanisms to ensure the realizations of patient's rights. (Patient's rights advocates, ombudsman, hospital ethics committees, institutional review boards, arbitration, etc.)

**Course Faculty:**

Prof. József Kovács, MD, PhD, (Head of the Department), 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  
 Jenő Lorincz, MD, JD e-mail: lorjen@net.sote.hu

**Department:**

Institute of Behavioral Sciences  
 Department of Bioethics  
 NET Building, 19th, 20th floor  
 1089. Budapest, Nagyvárad tér 4.  
 Tel: 210-2953  
 Secretary: NET Building, 20th floor, Room-2005

**List of questions**

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

**Textbook:**

Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

**Important:**

To participate on at least 75% of the total number of lessons is a prerequisite of getting the signature. Doctor's certificate is required to justify absence from the lessons and the exam.

**Exam type:** semi-final

**Sign up for the exam:** through the Neptun system.

# PSYCHOTHERAPY IN MEDICAL PRACTICE

Tutor: *Dr. György Purebl, Dr. Zsolt Unoka*

## Requirements for the signature at the end of the semester:

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%.

**The semi-final exam in Psychotherapy in medical practice** is an oral examination. The examination grade comprises the average of the grades for two oral examination questions (from a list of topics taken from both the e-learning and textbook material).

## Second Semester

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### Lectures

The role of psychotherapy in medical practice

The psychotherapeutic process, indications of psychotherapy

Basic techniques of the psychotherapeutic treatment, mechanism of change, basic competencies

The psychotherapy of anxiety

The psychotherapy of depression

The psychotherapy of sleeping disorders

The psychotherapy of somatization

The psychotherapeutic techniques in the supporting of patients living with chronic diseases

Crisis intervention; Recognizing suicidal inclination and its psychotherapeutic treatment in practice

The psychotherapy of sexual disorders

Psychotherapy of difficult patients of various personality types

The psychotherapy of alcohol and drug abuse

The semi-final exam in **Psychotherapy in medical practice** is a written test of 50 items which comprises multiple choice, true and false and case recognition question types.

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 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**

**Term: 2016/2017**

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

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

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

## Subject Syllabus (weekly basis, in order):

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

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

## Course attendance requirements and resolving absence:

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

## Certification of absence from lectures or the exam:

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

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

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

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

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

**Method of grading:** signature

**Exam type:** none

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

**Application for examination:** none

**Modification of examination application:** none

**Method of certifying absence from examination:** none

**List of literature for the course:** In process of appearance

## ELECTIVE SUBJECTS

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

## COMPULSORY SUMMER PRACTICE

### General Surgery - 1 month, 170 hours

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

[http://www.semmelweis-english-program.org/index.php?option=com\\_content&task=view&id=79&Itemid=101](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, decurusus, etc.), referring to the Head of Department in the visits.

Writing final report at the patient's leave.

Practicing the technique of cupping.

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

Compilation of infusion and wiring of infusion under supervision.

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

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

Practice of bladder cathetering under supervision.

Practice of elastic bandageing.

Making and evaluating oversensitive tests under supervision.

Cognition and practice of applying test paper.

Applying and practicing oscillometry.

Picking stitches and chips.

Curing infected gashes, changing bandage under supervision.

Lend a helping hand in chest tapping and stomach tapping.

Participation in endoscopic and radiological examinations, if possible.

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

Participation in defining surgical indications.

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

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

24 hour-on-call service once a week.

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

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

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

Participation in autopsy, and in clinical pathologic meeting.

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

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

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

Treatment of infected gash.

Examination of anthrax, abscess, phlegmone, 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.

## NOTE

# CLINICAL MODULE



*Faculty of Medicine  
5<sup>th</sup> year*

## STUDY PROGRAMME

### Fifth Year

9 <sup>th</sup> semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKBL3029_4A <sup>3</sup> AOKBL1027_4A <sup>4</sup>	Internal Medicine IV.	1	3	4	semi-final	Internal Medicine III. - Cardiology, Pharmacology and Pharmacotherapy II. Radiology
AOKSB1343_3A	Surgery III.	1	1	2	semi-final	Surgery II.
AOKNO1388_1A	Obstetrics and Gynaecology I.	2	1 week/ sem	4	semi-final	Pathology II., Pathophysiology and Clinical Lab. Diagnostics II., Surgery II.
AOKGY1054_1A <sup>1</sup> AOKGY2055_1A <sup>2</sup>	Pediatrics I.	2	3	5	pract. mark	Pathology II. Pharmacology and Pharmacotherapy II. Internal Medicine III. - Cardiology
AOKPSI057_1A	Psychiatry I.	1,5	2	3	semi-final	Pharmacology and Pharmacotherapy II. Neurology I. *
AOKNEU056_1A	Neurology I.	2	1,5	3	pract. mark	Anatomy, Histology and Embriology IV. Pathology II. Internal Medicine III. - Cardiology
AOKIGS399_1A	Forensic Medicine I.	1	1,5	2	semi-final	Anatomy H. E. IV., Genetics and Genomics, Pathology II.
AOKANE427_1A	Intensive Therapy and Anaesthesiology	1,5	1,3	2	semi-final	Surgery II., Pharmacology and Phar- macotherapy II., Internal Medicine III. (Cardiology)
AOKURO060_1A	Urology	1	2	3	semi-final	Surgery II. Radiology
<b>Total Number of Credit Points</b>				<b>28</b>		

<sup>1</sup> 1<sup>st</sup> Department of Pediatrics

<sup>2</sup> 2<sup>nd</sup> Department of Pediatrics

<sup>3</sup> 3<sup>rd</sup> Department of Internal Medicine

<sup>4</sup> 1<sup>st</sup> and 2<sup>nd</sup> Department of Internal Medicine

## Fifth Year

10 <sup>th</sup> semester						
Subject code	Compulsory Subjects	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOKBL3029_5A <sup>3</sup> AOKBL1027_5A <sup>4</sup>	Internal Medicine V.	1	3	5	semi-final	Internal Medicine IV. Neurology II. * Forensic Medicine *
AOKNO1388_2A	Obstetrics and Gynaecology II.	2	–	2	pract. mark	Obstetrics and Gynaecology I.
AOKGY1054_2A <sup>1</sup> AOKGY2055_2A <sup>2</sup>	Pediatrics II.	2	3	5	semi-final	Pediatrics I.
AOKPSI057_2A	Psychiatry II.	1,5	2	4	pract. mark	Psychiatry I.
AOKNEU056_2A	Neurology II.	2	1,5	4	semi-final	Neurology I.
AOKIGS399_2A	Forensic Medicine II.	1	2	3	semi-final	Forensic Medicine I.
AOKANE426_1A	Oxyology – Emergency Medicine	1,5	1,1	1	semi-final	Internal Medicine III. - Cardiology Surgery II.
AOKTRA063_1A	Traumatology	1,5	2	3	semi-final	Anatomy, Cell, Histology and Embriology IV. Radiology SurgeryII.
AOKCSA061_1A	Family Medicine	1	–	1	semi-final	Internal Medicine III. – Cardiology Public Health and Preventive Medicine II.
AOKSZE065_1A	Ophthalmology	2	2	4	semi-final	Anatomy, Cell, Histology and Embriology IV., Internal Medicine III. – Cardiology, Surgery II.
<b>Total Number of Credit Points</b>				<b>32</b>		

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

1 1<sup>st</sup> Department of Pediatrics

2 2<sup>nd</sup> Department of Pediatrics

3 3<sup>rd</sup> Department of Internal Medicine

4 1<sup>st</sup> and 2nd Department of Internal Medicine

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

- 1 W.E. Hathaway-W.W. Hay (ed.): Current Pediatric Diagnosis and Treatment. 13<sup>th</sup> ed. Lange Medical Book. ISBN 08358-1442-1, ISSN 0093-8556.
- 2 Lecture Notes of Forensic Medicine Ed. by Péter Sótónyi, Éva Keller, Semmelweis Publisher, 2008.
- 3 Knight's Forensic Pathology. 3<sup>rd</sup> ed. 2004. Arnold.
- 4 Kaplan & Sadock's Synopsis of Psychiatry. Tenth ed. Eds: B.J. Sadock, V.A. Sadock, Lippincott Williams, 2007
- 5 N.C. Andreasen-D.W. Black: Introductory textbook of Psychiatry. American Psychiatric Press, Washington.
- 6 Lang, G.K.:Ophthalmology. A Pocket Textbook Atlas. Thieme Flexibook. Stuttgart, 2000. ISBN 3-13-126161-7
- 7 Hacker N.F-Moore J.G-Gambone J.C.:Essentials of Obstetrics and Gynecology. 4<sup>th</sup> ed. W.B. Saunders Co. ISBN 0-721601790 Paperback
- 8 Peitzman B.A,Rhodes M, Schwab C.W, Yealy M.Y, Fabian C.T: The Trauma Manual: Trauma and Acute Care Surgery, Third edition, Publisher: Wolters Kluwer / Lippincott Williams & Wilkins
- 9 Smith's General Urology. E.A.Tanagho, J.W.McAninch (ed.) Appleton & Lange. 15<sup>th</sup> ed. McGraw-Hill Professional Publ. 2000. ISBN 0-83-858607-4
- 10 P. Nyirády, I. Romics (ed.): Textbook of Urology, Semmelweis Publisher, Budapest, 2009.
- 11 Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients.
- 12 Adams: Principles of Neurology. McGraw-Hill
- 13 Lindsay,Bone,Callender:Neurology and Neurosurgery Illustrated. Churchill Livingstone
- 14 Marini J.J.-Wheeler A.P.: Critical Care Medicine – The Essentials. Williams and Wilkins. Baltimore, 2<sup>nd</sup> ed. 1997. ISBN 0-683-05555-0

**Recommended textbooks:**

- 1 T.E.OH: Intensive Care Manual.
- 2 Basic Ophthalmology for Medical Students and Primary Care Residents. Ed.by: C.A.Bradford. 1999. 7th ed.
- 3 David Hull-Derek I. Johnson:Essential Paediatrics. 3rd ed.Churchill Livingstone, 1994. ISBN 0-443-04782-0
- 4 Silver, Kempe Bryn and Fulginiti's Handbook of Pediatrics. Appleton and Lange. ISSN 0440-192
- 5 Mccleod's: Clinical Examination. J.Munro. CRW Edards Churchill Livingstone Ed.
- 6 Papp Z.: Obstetric Genetics. Bp. Akadémiai K. 1990. ISBN 963-05-5689-8
- 7 Papp Z.: Atlas of Fetal Diagnosis. Elsevier, London, 1992. ISBN 0-444-98675-8
- 8 Knight B.: Simpson's Forensic Medicine. E.Arnold Co. London. 1991.
- 9 Marsden, Fowler: Clinical Neurology. Raven Press
- 10 Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
- 11 Gilroy: Basic Neurology. Pergamon Press
- 12 Weiner- Lewitt: Neurology of House Officer. Williams and Wilkins
- 13 Bannister: Brain an Bannister's Clinical Neurology. Oxford University Press
- 14 Mumenthaler: Neurology. Georg Thieme Verlag.
- 15 Manual of Emergency Medicine. 5<sup>th</sup> ed. Jon L.Jenkins, G.R.Braen. 2004. Lippincott Williams and Wilkins. Prod.Nr. 479531-1019
- 16 Rakel,R.E: Essentials of Family Practice. W.B.Saunders Co. 1998.
- 17 Taylor,R.B.: Fundamentals of Family Medicine. Springer, 1996.

**IMPORTANT: Practical part of the clinical subjects will be held in block system in the 5<sup>th</sup> year! Information will be given by the departments in the beginning of the 2015/2016 academic year.**

**IMPORTANT: Practical part of the clinical subjects is held in block system in the 5<sup>th</sup> year!  
Information will be given by the departments in the beginning of the 2016/2017 academic year.**

## INTERNAL MEDICINE IV.

1<sup>st</sup> Dept. of Internal Medicine Tutor: **Dr. Péter Studinger**

2<sup>nd</sup> Dept. of Internal Medicine Tutor: **Dr. Krisztina Hagymási**

3<sup>rd</sup> Dept. of Internal Medicine Tutor: **Dr. Katalin Keltai**

In 2016/17 Internal Medicine IV. and V. are taught by the 3<sup>rd</sup> Department!

### First Semester

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**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.

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

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

# INTERNAL MEDICINE V.

## Second Semester

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

**Syllabus:** Regulation of the haemopoiesis. Iron deficiency anaemia, anaemia of the chronic disorders, megaloblastic anaemias. Disorders of the iron utilisation. Aplastic anaemia. Haemolytic anaemias. Disorders of the haemoglobin synthesis. Cytopenic states. Myelodysplasia syndroma. Acute leukaemias. Chronic myeloproliferative diseases (CML, myelofibrosis, polycythaemia rubra vera (PV), essential thrombocytosis (ET). Lymphomas (M. Hodgkin, NHL). Plasmacell dyscrasias (multiple myeloma, Waldenström macroglobulinaemia, Heavy chain diseases, amyloidosis). Congenital and acquired disorders of the haemostasis.

Fever of unknown origin (FUO). Nosocomial infections. Viral infections: human herpes virus infections. Acute upper airways viral infections. Pneumonia. Infective endocarditis. Septic shock. Influenza. Neurotop viral infections. Systemic viral infections. Systemic mycotic diseases (candidiasis, aspergillosis). Helminthiasis. Protozoon caused diseases: amoebiasis, giardiasis, malaria, leishmaniasis, pneumocystosis, toxoplasmosis, trypanosomiasis). The principles of antibiotic therapy.



## SURGERY III.

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

### First Semester

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**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  
 Cardiac 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.**

## OBSTETRICS AND GYNECOLOGY I.

### 1st Dept. of Obstetrics and Gynecology

Tutor: **Dr. Gyula Richárd Nagy**

### First Semester

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**Lectures** (2 hours/week) held at the 1<sup>st</sup> Department

Introduction. General information. The menstrual cycle. Conception. Normal pregnancy. Normal labor and delivery. Obstetrical examinations. Changes in maternal anatomy and physiology during pregnancy. Prenatal care. Symptoms and signs of pregnancy. Spontaneous abortion. Ectopic pregnancy. Basic knowledge of ultrasonography. Maternal diseases complicating pregnancy. Gestational diabetes. Abnormalities of pregnancy. Abnormalities of labor and delivery. Monitoring of the fetus. Hypertensive disorders in pregnancy. Premature delivery. Intrauterine growth retardation (IUGR). Neonatology. Twin pregnancy. Operative delivery. Normal and abnormal puerperium. Major issues in current obstetrics.

## OBSTETRICS AND GYNECOLOGY II.

### Second Semester

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**Lectures** (2 hours/week)

Gynecological endocrinology. Menstrual disorders. Inflammatory diseases in obstetrics and gynecology. Sterility, infertility. Assisted reproduction. Cervical cancer. Cervical Cancer. Tumors of the ovary. Tumors of the vulva, vagina and corpus uteri. Principles of cancer therapy. Endometriosis. Polycystic ovary syndrome (PCOS). Genetic Counseling. Prenatal genetic diagnosis. Fetal anomalies. Dysmorphology. Perimenopausa. Genital prolapse. Urogynecology. Vital statistics. Medical legal problems in obstetrics and gynecology. Occasionally the topics are interchangeable. Practical education will be in groups of ten students. They spend a week in the Department rotating between major divisions and special outpatient clinics. They will take part in the night duties twice during the week.

# PEDIATRICS I.

1st Dept. Tutor: **Dr. Dóra Krikovszky**

2nd Dept. Tutor: **Dr. Péter Hauser**

## LECTURES IN PAEDIATRICS FOR 5th GRADE MEDICAL STUDENTS

### First Semester

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Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 54. I. floor  
II. Department of Pediatrics, Budapest IX, Tűzoltó u. 7-9.

#### **Subject**

The care of newborns and preterm babies.  
Fever of infants and children. Congenital malformations  
Introduction to paediatrics. Newborn physiology  
Nutrition of infants. The care of the healthy baby  
Presenting symptoms. Methods of paediatric diagnosis  
Inborn errors of metabolism  
Diseases of the respiratory tract  
Renal diseases in childhood  
Psychomotor development of the child.  
Mental retardation  
Fluid and electrolyte disturbances.  
Care of the child with diarrhea  
Malnutrition. Chronic malabsorption disorders  
Intrauterine infections. Anaemia. Infant mortality.  
SIDS  
Seizures during infancy and childhood.  
Status epilepticus  
Congenital heart diseases  
Disturbances of the lipid metabolism

# PEDIATRICS I.

### First Semester

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#### **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.**

### **Second Semester**

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Location: I. Department of Pediatrics, Budapest VIII, Bokay J. u. 54. I. floor  
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**

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#### ***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.

# PSYCHIATRY I – II.

Tutor: *Dr. Imola Seres*

## First Semester

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### 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

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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

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### 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

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### 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

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#### **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

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### *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**

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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**

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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

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#### UROLOGY

Head of Department: *Prof. Dr. Péter Nyirády*

Tutor: *Dr. András Horváth*

### Second Semester

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**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

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**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

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### 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

- a) Preparation
- b) Induction of Anesthesia
- c) Maintenance of the patient airway
- d) Intraoperative fluid management
- e) Maintenance of the Anesthesia
- f) Termination of the Anesthesia, recovery
- g) Anesthetic complications

Regional anesthetic techniques

Pain relief

- a) Acute pain (including postoperative pain)
- b) Chronic pain

Postoperative complications

### **Emergency and critical care**

Primary and advanced cardiopulmonary life support

Techniques and procedures of critical care

- a) Techniques of airway maintenance
- b) Techniques of intravenous access
- c) Evaluation of the fluid, ionic and acid/base balance
- d) Principles of fluid management
- e) Transfusion, blood products
- f) Principles of enteral and parenteral nutrition

### **Lectures and Practice**

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

### **Lectures and Practice**

Diseases requiring intensive therapy

- a) Respiratory failure
  - acute (including ARDS and asthmatic attack)
  - chronic
- b) 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

Curriculum Year: 2016/2017.

## First Semester

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

### Syllabus (weekly schedule):

#### 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 (thoracic, 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 orthoses and splints. Consultation of typical and the more frequent trauma cases, radiologic diagnostics, as well as videos in the operative theater are also part of the curriculum. 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 or 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-semester test and quiz topics, dates, absences and retaking of these tests:**

There will be no tests or quizzes during the semester. During practices, the lecture material will be discussed, disputed questions can be settled.

### **Criteria for the signature at the end of the semester:**

Attendance of 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**

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#### **Lectures:**

Introduction. History of ophthalmology.

Ophthalmology in medicine.

Functions of the eye. Optics.

The conjunctiva. Ocular surface diseases. The "red eye".

Diseases of the eyelids.

The lacrimal system - function and diseases.

The cornea – keratitis, degenerations, dystrophies.

Keratoplasty. Refractive surgery.

Diseases of the sclera.

The crystalline lens. Aetiology of cataract.

Management of infantile and adult cataract.

The orbit. Signs and symptoms of orbital diseases. Thyroid ophthalmopathy Infections.

Lacrimal gland diseases.

The uvea and its diseases.

Glaucoma. Clinical diagnosis. Classification. Treatment.

Disturbances of ocular circulation.

"Medical", retina (vascular diseases, macular disorders) and "surgical" retina (retinal detachment).

Ocular manifestations of systemic diseases. The vitreous and its disorders.

Pediatric ophthalmology. Strabismus, amblyopia.

Diseases of the optic nerve and optic pathways.

Neuro-ophthalmology. Normal and abnormal eye movements.  
 Pupillary reactions.  
 Tumours of the eye.  
 Modern diagnostic and imaging techniques in ophthalmology.  
 Trauma of the eye and adnexa.  
 The role of the general practitioner in the management of eye diseases.  
 Multiple choice questions. Diagnostics (slides).  
 Demonstration material: slides, handouts, videotapes, case studies.

**Practice:**

Anatomy of the eye and adnexa. Dissection of a pig's eye.  
 General notions on the examination of an eye patient.  
 The normal ophthalmological status.  
 Functions of the eye. Determination of visual acuity (distant, near). Refractive errors of the eye. Retinoscopy.  
 Correction of visual refractive errors. Prescription of glasses. Javal-Schiötz ophthalmometer.  
 Corneal topography. Contact lenses. Photorefractive keratectomy.  
 Visual field, colour vision, examination of dark adaptation, critical flicker fusion frequency. Tonometry.  
 External examination of the eye (diffuse light, focal illumination, slit lamp), exposing the palpebral fissure, eversion of the eyelids. Differential diagnosis of the red eye.  
 Ophthalmoscopy I.  
 Red reflex. Direct and indirect ophthalmoscopy. Examination of the pupil.  
 Ophthalmoscopy II.  
 Fluorescein angiography. Scanning laser ophthalmoscopy.  
 Surgical management of cataract. Ultrasound biometry. Planning of the refractive power of IOL.  
 One - day surgery.  
 The glaucoma patient, screening and follow-up. Antiglaucomatous interventions.  
 Surgery of the vitreous body.  
 Ophthalmoscopy III. Pediatric ophthalmology. The examination of concomitant squint and its treatment. Binocular vision. Differential diagnosis of paralytic strabismus.  
 Ultrasonographic examination. Diseases of the retina and vitreous body, intraocular tumors, retinopathy of prematurity. Demonstration of the ultrasound diagnostics of the aforementioned diseases.  
 Ophthalmoscopy IV. Ward round, examination of patients.  
 Electrophysiology of vision (ERG, EOG, VEP).  
 Emergency in ophthalmology. (Sudden and progressive loss of vision)  
 First aid in ophthalmology. Forms of patching, treatment of eye injuries.  
 Ophthalmological tasks of the family's physician. The most common eye complaints and disorders.  
 Ward round, examination of patients.  
 Consultation.

## NEUROLOGY I – II.

### General information

Tutor: Dr. Róbert Debreczeni

Tel.: 210-0330, Fax: 210-1368

### Office hours at the Department of Neurology:

Monday 13,00-14,00                      Friday 10,00-12,00

**Responsible Secretary:**              Andrea Kovács (Andi)

**Exams:** At the end of the first semester tutors conduct a practical examination.

At the end of the second semester the semi-final exam consists of a practical (testing the neurological examination skills at the bedside) and a written theoretical part. Passing the practical exam is the prerequisite of taking the written exam. The written exam includes simple and multiple choice questions, 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 5<sup>th</sup> year:

1. Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients. 2. Adams: Principles of Neurology. McGraw-Hill
3. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

### Other suggested books:

1. Marsden, Fowler: Clinical Neurology. Raven Press
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
3. Gilroy: Basic Neurology. Pergamon Press
4. Weiner- Lewitt: Neurology of House Officer. Williams and Wilkins
5. Bannister: Brain an Bannister's Clinical Neurology. Oxford University Press
6. Mumenthaler: Neurology. Georg Thieme Verlag.

## 1st Semester

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### **Week**              **Lecture title**

1. Basic principles of neurological diagnosis. The anamnesis. The connection between symptoms, localization and causes of neurological diseases.
2. Patient examination I. Cranial Nerves (part 1).
3. Patient examination III. Motor system (part 1)
4. Patient examination IV. Motor system (part 2)
5. Patient examination II. Cranial Nerves (part 2)
6. Patient examination V. The sensory system
7. The cortex
8. The spinal cord. The peripheral nervous system.
9. The brainstem. The thalamus.
10. The cerebellum
11. Disturbed consciousness. Neurological emergency.
12. Inflammatory disorders, AIDS.
13. Tumors of the nervous system
14. Neuroradiology (CT, MRI, angiography)



**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.
4. Motor functions of cranial nerves. Bulbar, pseudobulbar and suprabulbar paresis.
5. Examination of the I. and II. Cranial nerve. The visual fields.
6. Examination of the III., IV., VI. Cranial nerves. The eye movements. The rystalli reflexes. Gaze disorders.
7. The V cranial nerve.
8. The facial nerve palsy.
9. The nystagmus. Dizziness and vertigo. The vestibular system.
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

**2nd 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. Encephalopathies
12. Genetic abnormalities in neurologic disorders
13. Written semifinal exam
14. Questions and answers.

**Week Practice**

1. Diagnostic procedures I.: EEG, evoked potentials, EMG, Doppler, CSF
2. Diagnostic procedures II.: Neuroradiology, X-ray, CT, MRI, etc.
3. Movement disorders. Symptoms of Parkinson's disease.
4. Hyperkinesia and dystonia.
5. Hypnoid and non-hypnoid unconsciousness. The Glasgow coma scale.
6. Metabolic encephalopathies.
7. Memory dysfunction, dementia.
8. The cognitive functions
9. Emergency in Neurology.
10. Examination of muscle disorders.
11. Examination of polyneuropathies.
12. Differential diagnosis of headaches.
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
4. Pupillary reflex arcs. Disturbances of pupillary reflexes.
5. Trigeminal nerve
6. Facial nerve
7. The vestibular system
8. Hearing
9. Glossopharyngeal, vagus, accessory and hypoglossal nerves
10. Organization of motor control
11. Sensory systems
12. Gross anatomy of the hemispheres
13. Basal ganglia and the thalamus
14. The limbic system
15. The cerebellum
16. Blood supply of the hemispheres. Cerebral metabolism
17. Blood supply of the brainstem, cerebellum and the spinal cord
18. The cerebrospinal fluid

### II. Basic Neurology

1. Classification of reflexes (stretch, superficial, abnormal and primitive reflexes)
2. Characteristics of upper and lower motoneuron lesion
3. Paresis syndromes according to the site of lesion
4. Symptoms of spinal cord damage
5. Medulla oblongata (bulbar) syndromes caused by circulatory disorders
6. Pontine syndromes caused by circulatory disorders
7. Mesencephalic syndromes caused by circulatory disorders
8. Muscle tone control
9. Nystagmus
10. Vertigo and dizziness; peripheral and central vestibular syndromes
11. Symptoms of cerebellar lesions
12. Symptoms of frontal lobe damage
13. Symptoms of temporal and occipital lobe damage
14. Symptoms of parietal lobe damage
15. Symptoms of occipital lobe damage
16. Thalamic syndromes
17. Clinical examination and types of aphasia
18. Structural basis and types of unconsciousness
19. Physical examination of the unconscious patient
20. Increased intracranial pressure, brain herniations, hydrocephalus
21. Hyperkinesia
22. Gait disturbances
23. Bladder and bowel dysfunction
24. Symptoms of intervertebral disc herniation
25. Lesions of the peripheral nerves of the upper extremity. Tunnel syndromes on the upper limb.
26. Lesions of the peripheral nerves of the lower extremity.

**III. Neurological Disorders**

1. Classification of ischaemic cerebrovascular disorders
2. Intracranial bleedings, subarachnoideal hemorrhage
3. Symptomatology of Parkinson's disease
4. Classification of headaches. Trigeminal neuralgia
5. Focal epilepsies
6. Generalized epilepsies
7. Meningitis. Examination of the CSF in inflammatory neurological diseases
8. Encephalitis
9. Diagnosis of polyneuropathies
10. Emergency in neurology
11. Traumatic CNS diseases
12. Diagnosis of dementia
13. Multiple sclerosis: signs and diagnosis
14. Intracranial tumors
15. Spinal tumors
16. Disorders of the nervous system due to alcoholism
17. Myasthenia gravis
18. Guillain-Barre syndrome
19. Encephalopathies
20. The motor neuron diseases
21. Muscular dystrophies

**EMERGENCY MEDICINE – OXIOLOGY****Dept. of Anesthesiology and Intensive Therapy**

Division of Emergency Medicine and Oxyology

Tutor: **Dr. Peter Vass****2nd semester****Compulsory subject: Emergency Medicine and Oxyology (EMO)– program and topics****1 credit**

Lectures	Remarks
Pictures and sounds from the 20th century – birth of a new phylosophy of patient care. How do we err? Importance of communication in acute medicine	Historical perspectives, approach and emphasis. SBAR principles. Patient pathways.
Pain syndromes. As long as it hurts you know that you are alive.	Headache, chest and abdominal pain, backpain. The basics of pain management.
Environmental accidents.	Electrocution, drowning, near-drowning, heat exhaustion, heat stroke, hypothermia. What to do on the scene and in the ED.
Group of symptoms in emergency	Dyspnoe, vertigo, syncope, nausea and vomiting, diarrhoea, weakness. Allergic reactions.
Prehospital emergency services as integral parts of emergency care.	First aid, primary emergency systems, levels of rescue, connection of ambulance with hospital care.

Lectures	Remarks
Perfuse it or lose it.	Things you've missed from pathophys but will surprise you in acute situations.
Emergency cardiac care. From the sliding door to the PCI.	Syncope, heart failure, ACS.
Acute neurological deficit. Time is brain.	Stroke, altered mental states, convulsions.
Paediatric emergencies. The same but downsized?	The most frequent emergency situations in kids. Special view of paediatric emergency care.
The severely injured patient. The future: Die Hard 6.	Trauma, burns, compartment syndromes. Integration, teamwork, damage control.
Massive bleeding. The dynamic approach of coagulopathies.	How to deal with bleeding patients?
Toxicology. Alle Ding sind Gift-any stuff is a poison. Two steps above earth.	Toxidromes. Aspecific and specific care. Substances of abuse.
Fever, infections, sepsis. „Blood poisoning“ in the 20th century.	Severe heat imbalance, the emergency aspects of sepsis.

### Types of practices in Emergency Medicine - Oxyology:

**OMV: Emergency Medicine Basic practice (2x45 min)** The basic rules of treatment of a critically ill patient during simulation. Basic airway skills during simulation. Oxygen therapy workshop. IV access or alternative ways in critically ill patient during simulation. Basic monitoring techniques in treatment of emergency patient during simulation.

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

**PBL-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. Team member 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. Planning and management of diagnostic for emergency patient. PoCT. Planning of treatment of emergency patient. Communication with help of SBAR.

## FAMILY MEDICINE

**Tutor:** Péter Torzsa MD Tel: 355-8530, e-mail: ptorzsa@gmail.com

**Lectures**

**Exam:** Test exam

**Credit value: 1 credit point**

**Minimum/maximum group size: 55/210**

**Key elements of these seminars include:**

- The structure and functioning of the Hungarian Primary Health Care System. Activity of the general practitioners.
- The ranges of normality as they will assist in recognizing and anticipating deviations from normal and the earliest manifestations of disease
- Quick diagnoses. Applying the best available evidence in investigations and 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

**2016/2017.**

**Held in both semesters.**

Lectures: 2 hours/week

**Credits: 2**

Exam type: multiple choice test

Participation: min. 70% is obligatory

Obligatory elective subject for medical students already trained in microbiology, pharmacology and basic clinical subjects.

The subject gives an overview on the basic principles and practice of antimicrobial therapy. The antibiotics represent one of the most important classes of drugs that are prescribed practically in all branches of clinical medicine. It seems easy to use them and that is why we abuse them. Discussing the most important clinical features of the frequent infections, the subject shows the optimal approach to patients with infectious diseases and antimicrobial treatment.

The first two lessons discuss the specific features of antimicrobial therapy, the basic principles of empiric treatment and the pharmacokinetic/pharmacodynamic concept that substantiates the application of antimicrobials in 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:

1. E. Ludwig: Antibiotic therapy, Medintel, Budapest, 2003.
2. A. Szalka, L. Tímár, E. Ludwig, Zs. Mészner: Infectology, Medicina, Budapest, 2005.
3. Reese and Betts: A practical approach to infectious diseases. Lippincott Williams and Wilkins 2003.
4. Material of the lectures online availability

## 2016-2017. – Lectures

Basic principles of antimicrobial therapy. Microbiological diagnosis, as the basis of antimicrobial therapy. The concept of "drug of choice"

Diagnosis of infectious diseases: clinical relevance of the various diagnostic tests

Optimisation of antimicrobial therapy. The pk/pd approach, correlation of dosage and clinical efficacy.

Infectious diseases with exanthemas

Upper respiratory tract infections (common cold, acute and chronic rhinosinusitis, acute otitis, tonsillitis, pharyngitis). Epidemiology, the influence of age. Theoretical considerations and practice.

Community acquired pneumonia. Epidemiology, the difficulties of etiological diagnosis. The impact of emerging bacterial resistance on the clinical efficacy of antibiotics. The modern approach and practice based on it

The nosocomial infections. Nosocomial pneumonia, difficulties of etiological diagnosis. Antimicrobial treatment. Iv catheter-associated infections.

Intraabdominal infections (primary and secondary peritonitis, cholecystitis). Urinary tract infections. Central nervous system infections. Meningitis, etiological diagnosis, antimicrobial treatment.

Infections of the immunocompromised hosts. Diagnosis, and the principles of treatment. Invasive fungal infections. Colonisation and infection. Treatment of *Candida* and *aspergillus* infections.

Tropical diseases. HIV and AIDS.

The modern concept of sepsis. The basis of antimicrobial therapy. Indication of antibiotic combinations. The toxic shock syndrome.

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

### Recommended textbooks:

1. **Ludwig E.** (szerk): Antibiotikum terápia 2003 Medintel, Budapest, 2003.
2. Szalka A., Tímár L., **Ludwig E.**, Mészner Zs. (Szerk.): Infektológia. Medicina, Budapest, 2005.
3. Reese and Betts: A practical approach to infectious diseases. Lippincott Williams and Wilkins 2003.
4. Figures of the lectures are available electronically

# BASICS OF MEDICAL CHEMISTRY

## Department of Medical Chemistry, Molecularbiology and Pathobiochemistry

Lecturer: *Dr. Gábor Bánhegyi*

Lectures: compulsory

**Credit: 1**

Topics:

- 1: Basics of atomic and molecular structure, periodic table, bondings.
- 2: Chemical equations, stoichiometry, reaction types. Acids, bases, salts. Solutions. Concentrations.
- 3: Laws of diluted solutions. Electrolytes, ionization of electrolytes. Conductivity. Acid-base theories.
- 4: Chemical equilibria. Le Chatelier principle, law of mass action. Equilibria in aqueous solutions, principle of pH. Buffers. Carbon dioxide/hydrocarbonate buffer.
- 5: Consultation: preparation for the 1<sup>st</sup> midterm. Focused on calculations: ionization, pH, buffer, solubility product.
- 6: Chemical thermodynamics. Principles of enthalpy, entropy, free enthalpy. Hess' law. Basics of reaction kinetics. Activation energy and catalysis.
- 7: Electrochemistry. Oxidation and reduction, redox systems in the living cells.
- 8: A short summary of inorganic chemistry. Metals and non-metals. Complexes.
- 9: Calculations in electrochemistry and thermochemistry.
10. Basics of organic chemistry, hybrid states of carbon, organic reaction types. Isomerism, structural isomerism. IUPAC nomenclature.
11. Stereochemistry. Geometric and chiral isomerism, nomenclature. Prochirality.
12. The most important groups of organic compounds. Aliphatic and aromatic skeletons, their reactions. Repetitions of their structures. Consultation before the 2<sup>nd</sup> midterm – focused on organic chemistry.
13. The most important groups of organic compounds according their functional groups, their reactions. Repetitions of their structures.
- 14: Closing test. 30 multiple choice questions and 10 structures

Exam: closing test. 30 multiple choice questions and 10 structures

Note: Material of the lectures is available on the website of the Department.

Max. 3 absences are allowed.

## VALUE OF ULTRASONOGRAPHY IN THE CLINICAL DIAGNOSTICS

(Lecturer: **Dr. Ágnes Szebeni** M.D., D. Sc.)

1. a) Basic physics of medical ultrasound  
b) Demonstration of the ultrasound laboratory; technique of ultrasound scanning.
2. a) Sonography of the liver, the spleen, the gallbladder and the bile ducts.  
b) Patient demonstrations and training
3. a) Sonography of the pancreas and the pancreas and the lymph nodes.  
b) Patient demonstrations and training
4. a) Invasive sonography (US guided biopsies and punctions, endosonography, intraoperative sonography).  
b) Videodemonstrations.
5. a) Urogenital sonography.  
b) Patient demonstrations and training
6. a) Small part scanning.  
b) Patient demonstrations and training
7. a) Vascular sonography  
b) Patient demonstrations and training

## INTRODUCTORY LECTURES OF TRADITIONAL CHINESE MEDICINE

### The topics:

1. Chinese way of thinking about medicine – Introductory lecture
2. Basic principles in Chinese anatomy and physiology (Yin-yang, Chi, meridian, points, cun, etc.) – 1 lecture
3. The twelve meridians and their points (locations and indications) – 6 lectures
4. The rules of the point selections – 2 lectures
5. The five- element theory, future trends in research and in the clinical use – 1 lecture

## LIBRARY INFORMATICS - MEDICAL LITERATURE RESEARCH

Lecturer: **Dr. Lívia Vasas** PhD. – Central Library

Institute: Semmelweis University Central Library, 1088 Budapest, Mikszáth Kálmán tér 5, 1<sup>st</sup> floor

Duration: One semester, 30x45 minutes (10x3 lessons)

### SUGGESTED SEMESTER 1-10.

#### Exam-form Credit-value

Minimum/maximum group-size

The aim of the subject:

Thematic:

#### Practical mark 3 credit-points

8/30

Teaching students how to search in medical literature sources  
Medical e-catalogues, e-books, e-libraries, databases  
(PubMed/Web of Science/Scopus/Ovid Medline, EBM, PsycINFO,  
IPA, Primal Pictures -3D Anatomy Atlas/ProQuest Dissertations  
and Theses), Scientific Web Scientometry (IF, Citation)



Assistant lecturer:	Anna Berhidi, Edit Csajbók
Student records officer:	Zsuzsa Margittai: Tel.: 459-1500/60503
Application deadline:	August 29 – September 2, 2016
Precondition	There isn't.

- 1. Introduction, technical details introduction of Central Library's Homepage: [www.lib.sote.hu](http://www.lib.sote.hu) and its facilities**

Literary research  
Introduction: homepage of central library  
Training: researching, keywords  
– Basic computer knowledge for literature search
- 2. PubMed database**

The meaning of PubMed  
Introduction of PubMed  
National Library Medicine-Medline and thesaurus  
Entrez databases  
MESH and PubMed Searching
- 3. Periodicals, Scientometry: Impact factor (JCR)**

– Training: Browser and matching searching, archive and the newest editions  
– Characterization of periodicals/reviews/journals, ISSN, DOI  
Electronical edition (Science Direct, Springer, LWW, Biomed Central, InterScience, Nature Publishing Group)  
**Impact factor (JCR)**  
Fundamentals of science  
ISI- JCR Science Edition and Social Science Edition, IF:  
**calculating Impact factor** and its role by measuring scientific publications  
List of Journals with IF: **Journal Citation Report** and its editions.  
**Searching an exact data in JCR**, handling data: sorting and filtering journals
- 4. Searching International Library/Book/Periodical catalogues**

Hungarian electronical catalogues  
Semmelweis Univ. Central Library (Budapest) <http://www.lib.sote.hu>  
National Library of Medicine (Bethesda, USA)  
<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=nlmcatalog>  
Deutsche Zentralbibliothek für Medizin (Germany) <http://www.zbmed.de>  
Karolinska Institute (Sweden) <http://search.kib.ki.se/miks/bin/2/>  
Worldcat <http://www.worldcat.org/>  
Amazon [www.amazon.com](http://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

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The fundamentals of classical genetics  
 Polygenic inheritance, multifactorial determination  
 General cytogenetics  
 Basic principles of embryology and teratology  
 Clinical molecular genetics  
 Amniotic fluid cell culture for cytogenetic analysis  
 Alphafetoprotein (AFP)  
 Genetic amniocentesis  
 Pathology of multiple pregnancy  
 Genetic counseling  
 General aspects of decision making regarding the fate of pregnancy  
 Elements of phenotype analysis  
 Embryopathology and fetal pathology  
 Sphingolipidoses  
 Mucopolysaccharidoses and mucopolipidoses  
 Disorders of carbohydrate metabolism  
 Diseases of amino acid metabolism  
 Haemophilia and other bleeding disorders. Congenital immunodeficiencies. Congenital hypothyroidism. Cystic fibrosis  
 Hereditary muscular and neurological diseases  
 Congenital disturbances of ossification  
 Neural tube defects (NTDs). Hydrocephalus. Other craniospinal malformations  
 Thoracic and abdominal malformations  
 Cystic kidney disease. Obstructive uropathies  
 Down syndrome. Further autosomal trisomies  
 Duplication and deficiency (deletion) syndromes  
 Fragile X mental retardation syndrome (MartinBell syndrome)  
 Disturbances of sex differentiation.  
 Intrauterine bacterial infections. Congenital rubella syndrome. Further viral and chlamydial infections. Congenital toxoplasmosis  
 Prenatal screening for fetal malformations and trisomies

# ANAESTHESIA AND INTENSIVE THERAPY

Dept. of Anesthesiology and Intensive Therapy

## First Semester

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### 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. Tamás Machay**

## Second Semester

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Physiology of the Fetus and Newborn. Transition to Extrauterin Life.  
Maternal and Fetal Problems in Neonatology. Prenatal Care.  
Delivery Room Management of Newborns. Resuscitation. Infant Transport.  
Respiratory Disorders of Newborns.  
Ventilation of the Neonate.  
Cardiac Diseases of Newborns.  
Surgical Diseases of Newborns.  
Metabolic Problems of Newborns.  
Neonatal Hyperbilirubinaemia. Anaemia. Polycythaemia. Blood Products Used in the Newborns.  
Parhophysiology of Body Fluids. Fluid and Electrolyte Management.  
Neonatal Neurology.  
Infections of the Newborns. Prevention and Treatment.  
Neonatal Pharmacology. Surfactant replacement.  
Neonatal Radiology.  
Follow up of High-risk Newborns.

# CLINICAL ENDOCRINOLOGY

## 2nd Department of Internal Medicine

Course Director: **Prof. Dr. Károly Rácz**

### Second Semester

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#### 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

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**Purpose of the subject:** In the practice of surgery is very important the early detection of emergency cases. For this reason the collaboration with the representatives of other medical professions is indispensable. The goal of our lectures is to present the appropriate procedures of physical examination, laboratory and radiological findings in order to recognize the correct diagnosis; to know what is necessary, **what is possible and what is enough** to do in a case of surgical emergency; when to ask for a consultation for adequate therapy.

The inborn errors, injuries, inflammations and tumors of the organs are also presented. In order to make the lectures more interesting we are going to review the relevant episodes in history of medicine and final arts.

#### Main topics:

- Introduction, life threatening disorders in surgery, emergency in gastrointestinal surgery, acut abdomen.
- Gastric, duodenal, small bowel emergencies.
- Peritonitis acuta.
- Abdominal trauma.
- Surgery of the wound, infections, anaerob infections in surgery (MRSA, Furnier, tetanus, anaerob)
- Small bowel obstruction, large bowel obstruction.

- Esophageal emergencies.
- Biliary emergencies.
- Complications of peptic ulcer.
- Gastrointestinal bleeding.
- Pancreatitis acuta.
- Pancreatitis chronica.
- Appendicitis, diverticulitis, sigmoiditis, typhlitis.
- Surgical 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

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Topics of interest in the field of hematology, state of the art of various hematological and hemato-oncologic diseases

2 hours per week

#### **Main topics:**

1. Place and significance of hematology. Normal blood production, basics of hematologic diagnosis.
2. Classification of anemias, diagnosis.
3. Myelodysplastic syndromes.
4. Diagnosis and treatment of acute leukemias.
5. Acute leukemias of the childhood.
6. Classification and treatment of lymphomas I.
7. Classification and treatment of lymphomas II.
8. Clinical picture and diagnosis of hemorrhagic diatheses.  
Prophylaxis and treatment of venous thrombosis.
9. Gastroenterological complications of hematological diseases.
10. Dermatologic manifestations of hematological diseases and hematological symptoms of dermatologic diseases.
11. Immunocytopenias.
12. Hematological emergencies.
13. Stemcell transplantation.
14. Infectious complications of hematological diseases

# HISTORY OF MEDICINE

## Institute of Public Health

Lecturer: **Dr. Judit Forrai**

The history of medical science, considered as a part of the general history of civilization. The study of the history of medicine helps us to describe and understand how people in different times and cultures experienced and dealt with these fundamentals of human existence. This knowledge can inform debate about the present and the future, and help to bring medicine and science to a wide audience. All human societies have medical beliefs that provide explanations for birth, death, and disease. Many cultures in ancient times treated illnesses with magic and herbal remedies. Ancient Egyptians thought that their gods healed them. The ancient Greeks pursued medicine as a science. Hippocrates, the most famous physician of the time (c. 400 B.C.), believed that diseases had natural causes, not supernatural ones. By the Middle Ages, Europe was hit with a terrible epidemic that killed millions of people called the plague, or Black Death. The Renaissance marked a new period of interest in art and science throughout Europe. Despite new medical discoveries, many doctors still practiced old ways. Most sick people could not afford to see a trained physician. Instead, they consulted midwives who assisted with childbirths and made herbal remedies to treat illnesses. Minor surgeries were not done in the hospital but at the local barbershop. Medical research and training improved in the 18th century but there were still no cures for diseases like smallpox, a disease that killed millions of people over thousands of years. Middle Eastern doctors gave people mild doses of the smallpox to combat the disease. The portrayal of the history of medicine becomes more difficult in the 19th century. Discoveries multiply, and the number of eminent doctors is so great that the history is apt to become a series of biographies. Nevertheless, it is possible to discern the leading trends in modern medical thought. In the beginning of 20th century the research and technology have expanded medical knowledge and improved medical practices like surgery. Today, doctors are able to perform less invasive surgical procedures. The science of medicine has progressed dramatically in just the last 50 years. Career opportunities in health care have also expanded. There is a need for more skilled medical professionals, not only in hospitals, but in dentist and doctors' offices, research labs, rehabilitation centres, mental health clinics, nursing homes and even schools.

## Topics/week

1. Introduction. What is Medicine? Methods and sources of Medical History. The birth of paleomedicine (bones teeth, mummies). Prehistoric medicine. Far East.
2. Far East Medicine. Chinese civilization, Japan, India.
3. Medicine of ancient civilizations, rivers valley's culture: Mesopotamia, Egypt, and the medicine knowledge. Medicine - in the Bible time - Heritage of the empirical knowledge. Practitioners. Theories of diseases.
4. Greco-Roman Medicine. Homeric medicine. Asclepius, Hippocrates. Corpus Hippocraticum- the concept and doctrine of his theories about the nature and diseases (the four humors). The Oath. Hygiene and health education. Post-Hippocratic schools – the golden heritage in the school of Alexandria. The roman physicians, diseases. Advance of public health. Water supply and sanitation, climate, soil and health, diseases, endemics. The workers' health, provision of medical care. (Celsus, Galenus)
5. Medieval medicine. Byzantine Healers, Arabian Hakims, Monks, Crusaders and medieval „doctors.“ The Arabian medicine: chemistry, pharmacy, hospitals. Razes, Avicenna, Abulcasis. The medieval Monasteries (Monte Cassino). The growth of European cities, sanitary problems of urban life. The first religious medical school in Salerno. Medieval Universities, medical humanists, and Christian caritas.
6. Medicine in the Renaissance. The Arts and the humanism. The new mentality of medicine: Paracelsus. The revolution of anatomy: Vesalius and his contemporaries. The first step toward the

- specialization. Botany and mineralogy. The printing of book's role in medicine. Foundation of the administration of Public Health. Epidemic diseases: communicable and non-communicable diseases. Theories, therapies, and medical care, hospital. Quarantine.
7. Experimenters, Teachers and Theoreticians in the Sixteenth and Seventeenth Centuries. Body as machine -old schools: iatrochemical, iatrophysical theories. New schools: animism, tonus, vitalism, stimulation, homeopathy. The circulation of the blood. Harvey's methodology Malpighi. Microscopy. Birth of modern clinical medicine: Sydenham. Boerhaave and his pupils.
  8. Industrialism in the Eighteenth Century. Clinical medicine- schools of clinical (French, English, German, and Habsburg). The first Vienna School: van Swieten. surgery (Hunter, Valsalva), pathology (Morgagni, Bichat). Public health and hygiene. Occupational health, prison reform, general health (death rate, statistics), Ramazzini, Frank. Smallpox. Infant mortality. Nursing, dispensaries and hospitals, development of obstetrics. Sanitary conditions – filthy towns.
  9. Clinical medicine in the second half of the nineteenth Century. Bacteriology a new science in medicine. Revolution, concepts and theories under the microscope. New discoveries Pasteur, Koch. Social revolution, industrialism, public health. National and international movements and health reforms, and medical care. Period of great epidemics. International health organization. The Red Cross.
  10. Development of surgery and gynaecology. The man-midwife (Smellie, Hunter), History of anaesthesia. General and local possibilities. Wells, Morton, Simpson, Jackson). Asepsis and antisepsis. Early efforts to develop aseptic techniques. Semmelweis, Lister. Progress in surgery, Billroth. Cholecystostomy, appendectomies.
  11. Emergence of specialism. Logical outgrowth of locality pathology, new instruments. Initially the medical professions: Paediatrics, Psychotherapy, Ophthalmology, Otolaryngology, Rhinology and Laryngologist, Dentistry, Neurology and Psychiatry, Dermatology and Venerology.
  12. From the black death to the AIDS. The history of epidemics. The theories and therapies. Tropical medicine. The development of epidemics, the bacteriology and immunology. The new medications. Ehrlich and the chemotherapy, sulphonamides, antibiotics. Virology. Salk and Sabin. New diseases and screenings methods.
  13. Consultation

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

**Exam requirement:** written test

**Textbook:**

Chrestomathy on the History of Medicine. Ed. Dr. Forrai J., Dr. Ballér P., Budapest, 1992. SOTE



# CLINICAL CARDIOVASCULAR PHYSIOLOGY

## AOKKIKCAR\_1A

*Elective course for medical students in the 3rd, 4th and 5th years.*

The purposes of the course are:

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. Biomechanical background of normal and pathological cardiovascular functions.
2. Hemodynamics of cerebral aneurisms
3. Recent results in control of cerebral blood supply, physiological and clinical aspects
4. Clinical physiology of the microcirculation
5. Age related changes in the vascular system, role of sexual hormones
6. Coronary circulation, possibilities of pharmaco-physiological interventions
7. Pathophysiology of chronic venous insufficiency
8. Role of endothelial mechanisms in clinical symptoms
9. Duplex ultrasonic investigation of large vessel function: measurement of vessel wall elasticity, Doppler-indexes, study of veins
10. Ultrasonic investigation of the human heart: theoretical background; 2D-, M-, Doppler-mode, color Doppler imaging, echocardiography; diagnostics of valve insufficiency and coronary diseases

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.

Further information is available on this web page: [www.elet2.sote.hu](http://www.elet2.sote.hu)

## CARDIORESPIRATORIC AND NEUROPHYSIOLOGICAL MEASURING METHODS

*Elective course for medical students in the 3-6th years*

Course director: *Dr. Habil. László Dézsi*, Private Professor of Physiology, Semmelweis University

Invited lecturers:

*Prof. Emer. Emil Monos*, Professor of Physiology, Semmelweis University

*Dr. Iván Fűzes*, Dipl. Electrical Engineer, Teacher of Physiology, Semmelweis University

*Prof. Ákos Jobbágy*, Professor of Electrical Engineering, Budapest University of Technology and Economics

*Dr. Zsolt Farkas*, Chief Physician (Children's Hospital of Heim Pál)

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.

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](mailto:dezsi.laszlo@richter.hu); phone: 06-1-431-4823; phone/fax: 06-72-536-019). The application of min. 5 students is required. Further information: [www.humanelettan.usn.hu](http://www.humanelettan.usn.hu)

Detailed Program:

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

# MEDICINAL, EPIDEMIOLOGICAL, AND SOCIAL ASPECTS OF DRUG ABUSE

Department of Pharmacology and Pharmacotherapy

Course director: *Prof. Dr. Susanna Fürst*

## Second semester

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**Credit: 2**

**Topics:**

**Introduction, general concepts.** Non-medical use of drugs. Drugs of abuse. Classification of scheduled drugs under WHO control. Vulnerability. Tolerance, physical and psychological dependence. Molecular basis of drug addiction.

**Opioids.** Pharmacological action of opioid agonists and antagonists. Opioid receptors, endogenous ligands. Characteristics of opioid dependence.

**Psychomotor stimulants.** Pharmacological action of amphetamine, its derivatives (methamphetamine, MDMA-“Ecstasy”, etc.) and cocaine. Role of the dopaminergic transmission in the drug abuse.

**Hallucinogens. Ethanol.** Pharmacological action of hallucinogens, (LSD, mescaline, phencyclidine, etc.). Role of the serotonergic transmission in hallucination. Characteristics of ethanol dependence.

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

**Sedative-hypnotics.** Pharmacological action of benzodiazepines, barbiturates, other sedative-hypnotics. Characteristics of prescription drug dependence. Polydrug-abuse.

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

**Pharmacological treatment.** Traditional medicinal treatment and new methods. Medical treatment of withdrawal symptoms, replacement therapy. Treatment of overdose. Prevention of relapse.

**Psychotherapy.** Individual and group therapy. The problems of long-term rehabilitation. Counseling.

**Drug abuse and society.** Legal issues. Statutory rules and regulations. Human rights.

**Role of public and civil 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.

**Prevention and harm-reduction.** Primary, secondary and tertiary prevention. Demand-reduction and harm-reduction. Early recognition. Rehabilitation, social reintegration.

**Psychosocial questions of drug abuse.** Psychosocial aspects. Self-destructive attitudes. Psychological and social background. Role, task and possibilities of the medical doctor.

**Absence: Maximum number of absences is 25 percent of the lectures in the semester**

**Absence justification: Medical certificate is accepted**

**There is no midterm**

**Requirement: Participation at the lectures**

**Evaluation: On the base of the scores of the written test**

**Exam: written test**

**The written test is on the last lecture, registration has to be done through the NEPTUN system**

**How to modify the exam date: Personal discussion for another appointment**

**Exam absence justification: Medical certificate is accepted**

## **BASICS OF FAMILY MEDICINE**

2016/2017

### **Department of Family Medicine**

Director: **Prof. Dr. László Kalabay**

Location: *Kútvölgyi Hospital, first floor, library*

### **Family medicine as a speciality**

#### **Past and present of family medicine in Hungary**

#### **Daily routine of family doctor**

Dr. Kalabay László

#### **Doctor-patient relationship in family practices. Communication skills**

Dr. Torzsa Péter

#### **Emergency care in family practice**

Dr. Szabó János

#### **Cardiology and prevention in family practice**

Dr. Simon Judit

#### **Diabetes mellitus in family practice**

#### **Optimal treatment of diabetes mellitus**

Dr. Dani Vilmos

#### **Prevention program in family practice**

#### **Optimal treatment of hypertension**

Dr. Torzsa Péter

#### **Primary care in cities**

Dr. Torzsa Péter

#### **Primary care in the countryside**

Dr. Szabó János

#### **Care of gipsy patients**

Dr. Horváth Péter

#### **Medical ethics and law**

Dr. Vajer Péter

#### **Continuing home care**

#### **Rehabilitation**

#### **Terminal illnesses**

#### **Summary**

Prof. Dr. László Kalabay

Dr. Péter Torzsa

# HISTORY OF THE MEDICAL PROFESSIONALISM

Lecturer: **Dr. Péter Balázs**

**Class Sessions:** Medical professionalism as an ethical norm is an ancient behavioural pattern and theoretical construction alike based on sacral calling. Consequently, roots of the modern professional mythology may be traced back to the late Neolithic age, but the whole framework was systematized as soon as in the old Egyptian and Mesopotamian culture. Since the Hippocratic age, the medicine of craftsmen was based on teachings of natural sciences and the Middle Age supported the medicine with mythology of sciences, but only the Enlightenment provided the social environment for a de-sacralized professionalism, nevertheless it followed exactly the ancient religious patterns.

General part of the topic is concerning the onset of professionalism while discussing different manifestations and transitions related to ideologies, socio-economic circumstances and scientific teachings from the Neolithic age down to the latest market economies. Specific part demonstrates milestones and historic ages, which were decisive in this proceeding: Old Egypt, Mesopotamia, old age Judaism, early and consolidated Christianity, impact of Islam on Europe, Reformation of the Roman Catholic church, Enlightenment, the Communist ideology and the social market economy.

## Attendance at lectures, options for additional lectures:

Basic requirement: attendance at 8 sessions. In case of justified non-attendance of more students at a specific session, additional lecture is available.

## Justification for non-attendance at lectures

Up to 2 sessions no need for justification, in case of more than 3 sessions missed no confirming of the course.

## Justification for non-attendance at the exam

Only certificates of administrative authorities.

## Control of knowledge acquired within the time-frame of sessions

No control during the session period

## Requirements for confirming the session attendance

Having attended less than 8 sessions no confirming of the course. Additional sessions, if organized, are parts of the 10 session contingent.

## Preliminary and final marks

Type of marks: five degree evaluation (1-5). Preliminary mark on the written work, which becomes a final mark automatically except additional questions answered (see below).

## Type of exam

Base of exam: homework written about the history of medical professionalism sent by e-mail to the lecturer (deadline: 7 days before the exam, 5-6 A4-pages, margins, fonts, space agreed at the first session) Type of exam: each student will get several questions based on his/her own homework to determine the final mark.

## Entering for examination

Student Administration System (NEPTUN)

## Modification of data entered for examination

When registered in NEPTUN only after consulting the lecturer

## Justification for non-attendance at the exam

Only certificates of administrative authorities.

## Note on readings

Handout of Power Point presentations at the beginning of each relevant session.

# HEALTH INFORMATICS

## Institute of Digital Health Sciences

**Credit:** 2

**Lecture:** 2 hours/week

### Themes

1. Classification and Coding Systems
2. ICD-10 Coding System
3. Electronic patient's Record
4. Electronic patient's Record
5. DRG System
6. Hospital Information Systems
7. WEB 2.0
8. WEB 2.0 Solutions in Health Care
9. Introduction to Health Databases
10. Oncology Database
11. Evaluation of Country data. Presentation
12. Evaluation of Aggregated data
13. Principles of Documentation Making
14. Documentation of Breast cancer: case study  
Self work: Stomach Cancer Documentation (data collection, evaluating, presentation, documentation) Deadline: half semester. Sending: via Internet

# JEWISH MEDICAL ETHICS I - II.

## Institute of Behavioral Sciences

Director: **Prof. Dr. Ferenc Túry**

Course Director: **Rabbi Baruch Oberlander**

**Credit: 4 credits** (2 credits for each semester; I and II)

Attendance at 75% of lectures is compulsory. Missed lectures cannot be made up for. In case of missing more than 25% of lectures (3 lectures) a note from a healthcare professional is required.

Semester grade requirement: A written report (paper) based on list of topics and recommended reading material.

Successful completion of semester I is the prerequisite of signing up for semester II.

**Obligatory:** Handouts given during lectures

**Recommended:** Dr. Avraham Steinberg (Translated by Dr. Fred Rosner): *Encyclopedia of Jewish Medical Ethics*, Feldheim Publishers, Jerusalem-New York, 1988, ISBN: 1-58330-592-0

Fred Rosner: *Pioneers in Jewish Medical Ethics*, Jason Aronson, New Jersey, 1997

Fred Rosner: *Medicine in the Bible and the Talmud: Selections from Classical Jewish Sources*, Ktav Publishing House, New York 1977

Rabbi Moshe Tendler-Fred Rosner: *Practical Medical Halachah*, Association of Orthodox Jewish Scientists, New Jersey 1990

David J. Bleich: *Judaism and Healing: Halakhic Perspectives*, Ktav Publishing House, New York 1981

Faitelev Levin: *Halacha, medical science, and technology: Perspectives on contemporary Halacha issues*, Maznaim Publishing Corporation, New York-Jerusalem, 1987

Fred Rosner: *Medicine and Jewish Law II*, Jason Aronson, New Jersey, 1993

### Semester I.

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- 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.

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- 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

## SLEEP MEDICINE

### Institute of Behavioral Sciences

Lecturer: **Prof. Dr. Ferenc Túry**

Course Director: **Dr. Márta Novák Ph.D.**

#### Credit: 2

1. Introduction to sleep medicine
2. Physiology of sleep and alertness
3. Electrophysiology
4. Cardiovascular and respiratory functions in sleep
5. Significance and classification of sleep –wake disorders
6. Assessment and diagnosis of sleep-wake disorders
7. Insomnias
8. Circadian rhythm disorders
9. Parasomnias
10. Sleep-related breathing disorders: sleep apnea
11. Sleep-related movement disorders: restless legs syndrome and periodic limb movements in sleep
12. Pediatric sleep medicine
13. Sleep in special populations: aging and gender issues
14. Visit to the Sleep laboratory. Exam / evaluation

**Recommended textbooks:**

1. Kryger MH, Roth T, Dement WC (eds): Principles and Practice of Sleep Medicine. 4<sup>th</sup> ed. Elsevier, 2007
2. Sheldon S, Kryger M: Principles and Practice of Pediatric Sleep Medicine. Elsevier, 2005

**Important:**

To participate on at least 75% of the total number of lessons is a prerequisite of getting the signature. One absence from the lectures (two lesson hours) is the maximum number permitted. The student can make up for the absence by preparing a study in a subject given by the teacher.

Semester requirement: test

Exam type: practice mark

Sign up for the exam: through the Neptun system.

Certifying absence from the exam: written certificate and request

## CLINICAL ONCOLOGY

– elective for students in the 4<sup>th</sup> and 5<sup>th</sup> year

Course Director: **Prof. Dr. Zsolt Tulassay**

**2 hours/week, 2 credits**

2<sup>nd</sup> Department of Internal Medicine

Basic principles of clinical application of chemotherapy, principles of immunotherapy and endocrine therapy.

Cancer prevention: tobacco dependence and its treatment, chemoprevention, role of surgery in cancer prevention.

Cancer screening: principles, gastrointestinal, gynecologic, breast, lung.

Specialized techniques in cancer management: vascular access, interventional radiology, RFA photodynamic therapy, molecular imaging and functional imaging of cancer.

Cancer of head and neck: molecular epidemiology, treatment and rehabilitation.

Cancer of the lung: molecular biology, NSCLC, SCLC.

Cancer of esophagus and stomach: stage directed multimodality treatment.

Pancreatic cancer: clinical presentation, evaluation, treatment of resectable and advanced diseases.

Cancer of the liver: etiology, screening populations, clinical management, systemic therapy, regional therapy, radiotherapy.

Colorectal cancer: molecular biology, screening, staging and prognosis, stage dependent treatment of colon cancer, combined modality treatment of rectal cancer.

Kidney cancer: molecular biology of cancer, histologic types, localized and metastatic kidney cancer.

Cancer of the breast: molecular biology, risk factors, diagnosis, prognostic and predictive factors, multimodality primary adjuvant treatment.

Cancer of unknown primary site: histologic types of CUPS, management of CUPS.

Immunosuppression related malignancies: AIDS, transplantation, chemotherapy.

The lecturers of the elective are the oncologists of Semmelweis University.



# ORGAN TRANSPLANTATION

## First Semester

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**Department:** Faculty of Medicine, Department of Transplantation and Surgery

**Time:** 14x90 minutes

**For semesters:** 7, 9

**Type of exam:** written

**Credits:** 2

Minimum/maximum number of students: 20/140

### Course thematics:

1. Introduction - History, Terminology, Organ Donation
2. Pediatric Kidney Transplantation
3. Histocompatibility, Immunologic Aspects and Immunosuppression
4. Kidney Transplantation Indication, Operation, Results, Complications
5. Liver Transplantation
6. Pediatric Liver Transplantation, Hepatocyte Transplantation
7. Follow-up of the Transplant Patient
8. Small Bowel and Multiorgan Transplantation
9. Pancreas and Islet Cell Transplantation
10. Lung Transplantation
11. Heart Transplantation
12. Radiological Aspects of Transplantation
13. Ethics of Transplantation - Case reports
14. Terminal Examination

Sign up: through the Neptun system

Deadline of sign up: September 1

# INFLAMMATION BIOLOGY

**Department of Genetics, Cell and Immunobiology**

Course director: **A. Kristóf Fülöp**, PhD

Prerequisite subject: Immunology

**Credits:** 2

## Second Semester

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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

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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](http://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

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Lectures (2 hours per week):

1. Timeline of epigenetics; levels of epigenetic changes; targets of epigenetics
2. DNA methylation; de novo and maintenance methylation; Dnmt interactions
3. Histone modifications; histone code; histone modifying enzymes
4. Polycomb and trithorax complexes; Methylated DNA binding proteins
5. Transposons, and non-coding RNAs in epigenetic regulation; RNAi
6. Genome imprinting; skewed X inactivation their connection to DNA methylation
7. Epigenetic changes during early development and gametogenesis; Epigenetic consequences of cloning and ART
8. Transgenerational epigenetics; epigenetics of endocrine disruptors; maternal behaviour and its epigenetic consequences
9. Paramutation, transvection and mitotic bookmarking
10. Role of epigenetics in carcinogenesis; epigenetic therapy in cancer
11. Epigenetics in aging and autoimmunity
12. Epigenetic changes in diseases of the central nervous system
13. Methods used for the detection and analysis of epigenetic alterations.

#### Important notes:

Only for third and upper year students. There are no midterm exams. Attendance of 75% of lectures is necessary for the end-term signature. Exam: Written or oral exam (depending on the number of students).

No possibility to make up of absences.

*Core texts:* CSHL Epigenetics textbook 2006. Downloadable from [http://www-nmr.cabm.rutgers.edu/academics/biochem694/reading/Allisetal\\_2006.pdf](http://www-nmr.cabm.rutgers.edu/academics/biochem694/reading/Allisetal_2006.pdf)

Lecture presentations and additional texts are available on the homepage: [www.dgci.sote.hu](http://www.dgci.sote.hu)

**Homepage:** <http://gsi.semmelweis.hu>

# CHEMOTAXIS – its significance in biology and clinical sciences

**Department of Genetics, Cell and Immunobiology**

Course director: *Dr. László Köhidai*

**Credits: 2**

## Second Semester

Lectures (2 hours per week):

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

### Important notes:

Prerequisite: Medical Chemistry.

Max. allowed absences: 3. Attendance of 75% of lectures is necessary for the end-term signature.

One individual oral presentation (not for grade) is compulsory.

Exam: oral for practice mark

Possibility to make up of absences from the material on the website:

[www.chemotaxis.usn.hu](http://www.chemotaxis.usn.hu) and [www.dgci.sote.hu](http://www.dgci.sote.hu)

**Homepage:** <http://gsi.semmelweis.hu>

# INFANT ASSESSMENT

## 1<sup>st</sup> Department of Pediatrics

Lecturer: *Dr. C. F. Zachariah Boukydis*

## Second Semester

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### Credits: 2

Lectures (2 hours per week):

### Teaching goals:

1. To teach methods of neurobehavioral assessment of full-term and at-risk (premature, drug-exposed; birth asphyxiated) infants.
2. To teach methods of using the neurobehavioral as a context for communicating with parents and caregivers.
3. To teach methods of evaluating fetal neurobehavior.

### Themes (itemized list for each week):

- Week 1 Introduction to the Course: Readings and practicum experience  
History and Philosophy of Neurological and Behavioral Assessment of Infants  
Research and Clinical Uses of Neurobehavioral Assessment of Infants
- Week 2 Basic Issues in the Neurobehavioral Assessment of Infants  
Overview of Three Neonatal Neurobehavioral Assessments:  
NICU Network Neurobehavioral Scale [NNS]  
Neonatal Behavioral Assessment Scale (NBAS)  
Assessment of Preterm Infant Behavior (APIB)
- Week 3 Observation of Infant Neurobehavior
1. Observation Framework
  2. Guidelines for Documenting Observations of Infant Neurobehavior
  3. The 4 A's of Infancy
- Week 4 Observation of At-Risk Infant Neurobehavior
1. Observations and Clinical Documentation
  2. Clinical Screens (Neonatal Abstinence Scale)
  3. Developmental Screens (Denver 2 Scales of Infant Development)
- Week 5 NICU Network Neurobehavioral Scale:  
Overview of the Assessment
1. Reflexes
  2. Behavioral Items
  3. Stress Abstinence Scale  
Demonstration with Healthy Full-Term Infant
- Week 6 NICU Network Neurobehavioral Scale: Part 2  
Issues in Scoring the Assessment  
Demonstration with Healthy Preterm Infant
- Week 7 NICU Network Neurobehavioral Scale: Part 3  
Neurodevelopmental Research  
Clinical Applications
- Week 8 Neurobehavioral Assessment of At-Risk Infants  
Review of Research on Early Neurobehavior and Outcome  
Preterm Infants  
Birth Asphyxiated Infants

- Week 9 Neurobehavioral Assessment of At-Risk Substance Exposed Infants  
Review of Research on Early Neurobehavior and Outcome  
Substance-Exposed Infants  
Alcohol Exposed Infants  
Videotape of Assessment with Cocaine/Alcohol Exposed Infant
- Week 10 Clinical Applications of Neurobehavioral Assessment  
Screening and Referral  
Early Intervention Services  
Primary Pediatric Care
- Week 11 Clinical Applications of Neurobehavioral Assessment  
Screening and Referral for Early Regulatory Issues
- Week 12 Developing Clinical Services to Integrate Neurobehavioral Assessment and Consultation  
NICU Discharge Programs  
Boarder Baby Programs  
Consultation to Drug Treatment Programs/ Mothers' Homes
- Week 13 Use of Neurobehavioral Assessment to Consult with Parents and Caregivers of At-Risk Infants  
Philosophy and Methods of Consultation  
Videotapes of Consultations with Parents of Preterm and Substance-Exposed Infants
- Week 14 Prenatal Neurobehavioral Assessment  
Overview of the Fetal Neurobehavioral Assessment Scale (FENS)  
Continuities / Discontinuities Between Fetal and Neonatal Neurobehavior  
Use of Prenatal Ultrasound Screens to Observe Fetal Neurobehavior and Development  
Ultrasound Consultation (based on Observing Fetal Neurobehavior) with Mothers, Fathers and Families.

**Requirements of attendences on courses, options of redoing missed courses:**

Students must attend at least 11 of the 14 classes. If the student is not able to attend a class for reasons of illness, the student must provide a written letter from their doctor. Students are not allowed to miss more than three classes for illness reasons. If a student misses a class, there is no other opportunity to make up the course attendance.

**Method of proving the absences (courses):**

If you are absent from a class for illness reasons, you must provide a signed letter from your doctor.

**Numbers, themes, timing, redoing of midterm examinations and demonstrations:**

Following the seventh week, a 3 page reflection paper is due. The instructions for writing the paper will be give during the early weeks of the course. The paper will be graded. Failure to turn in the reflection paper will constitute a failing grade in the assignment. A student who does not turn in the reflection paper will be required to have a meeting with the course instructor or assistant instructor.

**Requirements of signing the index books (acknowledgement of the semester, including the realization of individual tasks):**

Students must: (1.) attend at least 11 of the 14 classes; (2.) complete the mid-term reflection paper; (3.) participate in class discussions; and (4.) complete the final reflection paper in order for the professor, Dr. Boukydis, to sign their index books.

**Method of evaluation:**

The final grade for the course will involve: 1. Satisfactory attendance; 2. Active participation in class discussion; 3. Passing grade in the mid-term reflection paper; and 4. Passing grade in the final reflection paper. The grades will be defined on the 3-scale evaluation system.

**Type of examination:**

There will be no final examination in this course. Students have to hand in a final reflection paper on the last day; 14th (class).

**List of suggested or obligatory readings, literature:**

1. NICU Network Neurobehavioral Scale (NNNS). Lester, B. M. and Tronick, E.Z. (2004). The neonatal network neurobehavioral scale. *Pediatrics*, (113).
2. Essentials About Consultation in the Perinatal Period; Observing Infants and Sharing Observations with Parents; Use of Neurobehavioral Assessments as a Context for Consulting with Parents and in Prevention/Intervention; and Consults with Parents and Caregivers of At-Risk Infants: Prematurity and Substance-Exposure (Chapters 1-4) In CFZ Boukydis Consulting with Parents and Infants in the Perinatal Period: Baltimore, MD USA Brookes Publishing Co.
3. Assessment of Preterm Infant Behavior (APIB). Als, H., Lester, B.M., Tronick, E.Z. and Brazelton, T. B. (1982) Toward a research instrument for the assessment of preterm infants' behavior. In. H.E. Fitzgerald et al (Eds.) *Theory and research in behavioral pediatrics*, Vol.1, (pp.85-132) New York, Plenum.
4. Neonatal Behavioral Assessment Scale (NBAS). Brazelton, T.B. and Nugent, J. K. (1995). *The neonatal behavioral assessment scale*. London: MacKeith Press.
5. Neurological Assessment of the Preterm Infant (NAPI) [Korner, A.F. and Thoman, V. A. (1990) *Neurobehavioral assessment of the preterm infant*. New York: The Psychological Corporation.
6. Dubowitz, L. and Dubowitz, V. (1981). *The neurological assessment of the preterm and fullterm infant*. Clinics in Developmental Medicine: No.79. Philadelphia: Lippincott, Williams & Wilkins.

## 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

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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?
- 270 Week 10: Education online: medical resources
-



- Week 11: Podcasts and medical videos  
The era of new media
- Week 12: A new way of collaboration: Google Docs
- Week 13: Dangers of social media  
Describing topics requested by the students
- Week 14: Future: is there a web 3.0?  
The results of the surveys

### **Participation and making up for absences:**

A signature will be given with the prerequisite of participation (minimum 75% of the lectures and seminars). It is possible to make up for an absence by participating in another seminar group the same week. One absence can be overlooked by the teacher if the student writes an essay. The topic of the essay must be discussed with the seminar leader in advance.

### **Justification of the absence in the lectures and examinations:**

Participation list will be recorded at the end of every lecture/seminar. In case of absence medical certificate has to be presented within three workdays to the course leader.

### **Checks during the semester (reports, written checks) :**

One written exam on week 12. It can be made up during the semester.

### **Requirements for the signature at the end of the semester:**

Regular participation on the lectures and seminars, filling in two surveys online (week 2 and 12). One written exam (week 12)

### **Method of the calculation of marks:**

- Written exam: 60 points
- Two surveys: 30 points
- Work during classes: 10 points

### **Categories:**

- 5: 85-100 points
- 4: 75-84 points
- 3: 65-74 points
- 2: 50-64 points
- 1: 50 points

**Requirements for the exam:** fulfilment of the requirements of the semester

**Application for the exam:** Through the Neptun system.

**Changing the application for the exam:** Through the Neptun system.

**Justification of the absence from the exam:** Medical certificate has to be presented within three workdays to the course leader.

### **Course and recommended text books:**

Pilling János (szerk.) (2011): Medical communication, Medicina Könyvkiadó, Budapest.

<http://www.med20course.com>

<http://www.sciencerooll.com>

# CULTURE IN MEDICINE, CULTURE OF MEDICINE – Popular Themes of Current Clinically Applied Medical Anthropology

**Institute of Behavioral Sciences**

**Course Director: Prof. Dr. Ferenc Túry**

**Lecturer: Dr. László Lajtai**

**Credit: 2**

## Second Semester

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### Weekly topics of the seminars:

1. „We have never been modern?“ – An initiation to critical approaches to evidence base in medicine – How to respond? - / - Discussion of the semester: Requirements and timescale.
2. Alternatives 1: Narratives and explanatory models – Confusions and the lay perspective
3. Alternatives 2: Complementary medicine – Competition at our doorstep
4. Alternatives 3: Healing and folk medicine – Wisdom or beliefs?
5. Alternatives 4: Biomedicine for anthropology, or the twist of perspectives
6. Challenges 1: Migrants, refugees and minorities
7. Challenges 2: Reproduction, sex, age, death and other trends in „western“ medicalization
8. Challenges 3: Nutrition and taboos - biopower and social body
9. Challenges 4: Placebo, pharmaceuticals and the rule of pharmaceutical industry
10. Challenges 5: Public medicine, private medicine and the reproduction of inequities
11. Favourite themes 1: Alcohol, drug, and AIDS at crossroads of culture and law
12. Favourite themes 2: Shrinks and madness – CBS and the mirage of the normal
13. Fieldworks: Discussion 1.
14. Fieldworks: Discussion 2.  
Recapitulation, feedback and evaluation.

# ART OF LEARNING

Institute of Behavioral Sciences

Course Director: *Prof. Dr. Ferenc Túry*

Lecturer: *Dr. János Kollár*

## First and Second Semester

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The program focuses on five fields of study:

- 1 **Keys of Originality** – Teaching simple methods for improving creativity. Such methods can be a part of the everyday practice. By improving creativity, people can regain their capability of open mind thinking and thus understand the world on a higher level.
- 2 **Learning methods** - Such methods that can help to make the process of learning as enjoyable and easy as possible. They can help to organize the structure of memory, improve recall and give an aid to find associations in between different learning materials.
- 3 **Lecturing** - Teaching basic rules of lectures and presentations (how to grab the attention of the audience, how to avoid the usual “pitfalls”, how to overcome “stage fright” etc.) and acquiring knowledge about the latest presentation softwares (including Prezi, Leonar3Do etc.).
- 4 **Analysis of the Social Media and Relaxation** – Using RSS (Really Simple Syndication) for collecting information regarding any topics for eg. for writing scientific papers, wise application of searching systems available on the internet and discovering sites important for teaching and learning. Learning the basics of relaxation.
- 5 **Exam** – The participants present their own presentations in front of the group while getting feed-backs from each-other and the leader of the course.  
There is no prerequisite for the course. It consist of 5 meetings 4 university hours per each. At the end of the course the participants take an exam.

**1st meeting: Keys of Originality** – Teaching simple methods for improving creativity. Such methods can be a part of the everyday practice. By improving creativity, people can regain their capability of open mind thinking and thus understand the world on a higher level.

Some key elements:

- Creativity in the light of transactional psychology (possibilities for enhancing the “creative child” living inside of us)
- Creative problem solving (10 exercises for creativity improvement. Everybody has an opportunity for choosing the best ones for herself/himself.)
- Everyday methods for creativity improvement (20-25 games and exercises in small groups and large group)

**2nd meeting: Learning methods** - Such methods that can help to make the process of learning as enjoyable and easy as possible. They can help to organize the structure of memory, improve recall and give an aid to find associations in between different learning materials.

Some key elements:

- Neurologic base of learning, the role and function of Short Term Memory and Long Term Memory (short lecture)
- Connection in between emotions and learning (presentation and exercise)
- Acquiring individually shaped mnemotechnic methods (PQRST method, Mind Mapping, Locus Method, Storybuilding, ABC method, learning numbers, learning names etc. – introduction into the application of the methods, individual and small group exercises)
- Basic methods of neurolinguistic programming (NLP) (anchoring, reframing, VAKOG method)

- Creation of brainwave synergy and its role in learning (the application of Natura Sound Therapy software and its advantages in learning)
- Time management in learning (how to use time of learning more effectively making the period of learning much shorter)
- Biological background of learning (breathing, nutrition, yoga exercises)

**3rd meeting: Lecturing** – Teaching basic rules of lectures and presentations (how to grab the attention of the audience, how to avoid the usual “pitfalls”, how to overcome “stage fright” etc.) and acquiring knowledge about the latest presentation softwares (including Prezi, Leonar3Do etc.).

Some key elements:

- Basic differences in between a lecture and a presentation
- Making an 8 minute long presentation as perfect as possible on a conference (basic rules of creating and holding presentations)
- Overcoming nervousness while holding a lecture or presentation
- The latest softwares applied presenting your material.
- Making 3D presentations

Making your own presentation about a given topic – exercise (searching for material, collecting the presentation, keeping the rules of presentation, evaluation)

**4th meeting: Analysis of the Social Media and Relaxation** – Using RSS (Really Simple Syndication) for collecting information regarding any topics for eg. for writing scientific papers, wise application of searching systems available on the internet and discovering sites important for teaching and learning and learning the basics of relaxation.

Some key elements:

- How to find relevant material on the World Wide Web? (Search engines, searching methods)
- Searching for illustration materials (pictures, videos, other materials) for your presentation or lecture (introducing Slideshare, Scholar, Digg, Knol etc.)
- Web 2.0 and Web 3.0 and the exploitation of their possibilities (thematic and semantic search)
- Free internet sources of lectures and teaching/learning materials
- Organizing virtual conferences in cyberspace (Second Life, Conference Alert etc.)

**5th meeting: Exam** – The participants present their own presentations in front of the group while getting feed-backs from each-other and the leader of the course.

## 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

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### 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://sciencereport.com/2013/10/30/whitepaper/>

## INTRODUCTION TO PHARMACOLOGICAL RESEARCH

### Department of Pharmacology and Pharmacotherapy

Supervisors: **Dr. Péter Ferdinandy**

**Dr. Tibor Zelles**

## Healthcare management

Course Leader: Dr. habil. Éva Belicza Ph.D.

Prerequisite: Internal Medicine I.

Credit: 2

Lecture: 2 hours / week

Subject code: AOVEMK444\_1A

### Thematics:

- |            |   |
|------------|---|
| 1st week:  | Introduction: the role of management in healthcare, basics  |
| 2nd week:  | Healthcare economics I.                                     |
| 3rd week:  | Healthcare economics II.                                    |
| 4th week:  | Healthcare financing  |
| 5th week:  | Healthcare system models and their international comparison |
| 6th week:  | Organisational management                                   |
| 7th week:  | Organisational behavior                                     |
| 8th week:  | Human resource management in healthcare                     |
| 9th week:  | Change management in healthcare                             |
| 10th week: | Patient safety in practice                                  |
| 11th week: | Quality management and development in healthcare            |
| 12th week: | Health politics   |
| 13th week: | Project and time management                                 |
| 14th week: | Summary   |

## MATHEMATICAL AND PHYSICAL BASIS OF MEDICAL BIOPHYSICS

Lecturer: **Dr. Miklós Kellermayer**

Credit: 1

14 hours lecture in the first four weeks of the semester.

### Thematics:

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

The presence in at least 75 % of the lessons is obligatory.

The grade is based on the result of test written on the 5th week. This test should be written by all students irrespective of taking this elective subject. The result of test is expected to be at least satisfactory (2) as a condition for signature in Medical biophysics 1. The elective subject helps in the preparation for this test.

Evaluation: practical grade based on the result of test written on the 5th week.

Textbook: Lecture notes on the homepage of the department.

High school physics textbooks.

## CLINICAL HUNGARIAN from the second semester of the 3<sup>rd</sup> year

### Division of Foreign Languages and Communication – Faculty of Health Sciences

1046 Budapest, Erkel Gyula u. 26.

Phone: +(36-1) 486-4960 Fax: +(36-1) 486-4962 Bakó

Head of the Division: **Katalin Zöldi Kovács Ph.D.**

## OBLIGATORY ELECTIVE AND ELECTIVE SUBJECTS – SCHEDULE OF THE CLINICAL MODULE

### OBLIGATORY ELECTIVE SUBJECTS

Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVANE104_1A	Anesthesiology and Intensive Therapy	2	–	2	pract. mark	Surgery II.
AOVFRM252_1A	Medicinal, Epidemiological, and Social Aspects of Drug Abuse	2	–	2	pract. mark	Pre-clinical module
AOVPAT126_2A	Clinicopathology II.	2	–	3	pract. mark	Pathology final
AOVBL2112_1A	Clinical Endocrinology	2	–	2	pract. mark	Basic module
AOVCVT411_1A	Clinical Hematology	2	–	2	pract. mark	Pre-clinical module
AOVKLM157C1A	Clinical practice	–	1	1	pract. mark	Pre-clinical module
AOVBL2150_1A	Clinical Oncology	2	–	2	pract. mark	Internal Medicine II.
AOVIN108_1A	Health Informatics	2	–	2	pract. mark	Pre-clinical module
AOVGY1120_1A	Neonatology	2	–	2	pract. mark	Pre-clinical module
AOVKIK102_1A	Clinical cardiovascular physiology	2	–	2	pract. mark	Pre-clinical module
AOVKIK099_1A	Clinical Physiology of Respiration and Respiratory Diseases	2	–	2	pract. mark	Medical Physiology II.

## ELECTIVE SUBJECTS

Subject Code	Subject	Lectures	Practicals	Credit Points	Examination	Prerequisite
AOVSIF105_1A	Antibiotic therapy & infectology	2	–	2	pract. mark	Pre-clinical module Pharmacology and Pharmacotherapy II.
AOSKIK151_1A	Cardiorespiratorical and neurophysical measuring techniques	2	–	2	pract. mark	Medical Physiology II.
AOSMAG318_1A	Social media in medicine	2	–	2	pract. mark	Medical Communication
AOVSB2129_1A	Emergency Surgery	2	–	2	pract. mark	Surgery I.
AOVG1283_1A	Neurobehavioral assessment of infants	2	–	2	pract. mark	Pre-clinical module
AOVIDS279_1A	Neurosurgery	2	–	2	pract. mark	Neurology
AOSMAG155_1A	Sleep Medicine	2	–	2	pract. mark	Pathophysiology and Clin. Lab. Diagnostics II.
AOSMMS174_1A	Traditional Chinese Medicine	2	–	2	pract. mark	For 3rd year students and up
AOSGEN134_1A	Introduction to Epigenetics	2	–	2	semi-final	Immunology
AOSLEK340_1A	Clinical Hungarian	–	4	2	pract. mark	Hungarian Medical Terminology V.
AOSGEN135_1A	Inflammation Biology	2	–	2	pract. mark	Immunology
AOSFRM394_1A	Introduction to Pharmacological Research	2	–	2	pract. mark	Medical Biochemistry, Molecular and Cell Biology I.
AOVEMK444_1A	Healthcare Management	2	–	2	pract. mark	Internal Medicine I.





*Faculty of Medicine  
6<sup>th</sup> year*

## COMPULSORY INTERNSHIPS AND RESPONSIBLE DEPARTMENTS

### **Internal Medicine**

#### **1<sup>st</sup> 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**

#### **2<sup>nd</sup> Department of Internal Medicine**

Budapest, Szentkirály u. 46. Phone: 266-0926 ext. 55599, 55524

Head of the Department: **Prof. Dr. Károly Rácz**

Tutor: **Dr. Krisztina Hagymási**

#### **3<sup>rd</sup> Department of Internal Medicine**

1125 Budapest, XII. Kútvölgyi út 4. 12. Phone: 355-1122

Head of the Department: **Prof. Dr. István Karádi**

Tutor: **Dr. Katalin Keltai**

(In 2016/17 Internal Medicine belongs to the 1<sup>st</sup> and 2<sup>nd</sup> Department!)

### **Infectology**

#### **2<sup>nd</sup> 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**

#### **1<sup>st</sup> Department of Surgery**

Budapest VIII., Üllői út. 78. Phone: 313-5216 / ext. 52167

Head of the Department: **Dr. László Harsányi**

Tutor: **Dr. Péter Kokas, Dr. Ákos Szűcs**

#### **2<sup>nd</sup> 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 Sóttonyi M.D., Ph.D.**

280 Tutor: **Dr. Péter Banga**

## **Pediatrics**

### **1<sup>st</sup> Department of Pediatrics**

Budapest VIII., Bókay J. u. 53. Phone: **3142-858**

Head of the Department: **Dr. Attila Szabó**

Tutor: **Dr. Erzsébet Horváth**

### **2<sup>nd</sup> 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)

Education coordinator: **Anna Gaál** (gaal.anna@med.semmelweis-univ.hu)

## **Obstetrics and Gynecology**

### **1<sup>st</sup> 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: **Dr. Attila Tordai**

## STUDY PROGRAM

Subject code	Internship	Required number of weeks	Credits	Examination	Prerequisite	
AOKBL1067_SA	Internal Medicine	9	9	final #		
AOKBL2068_SA						Internal medicine VI.
AOKBL3069_SA						Basic Imaging,
AOKSZL070_SA	1 week Infectology		–	signature	Bioethics – Medical ethics	
AOKCSA154_SA	1 week Family medicine		–	signature		
AOKSB1071_SA	Surgery	9	9	final #	Surgery III.	
AOKTRA075_SA	2 weeks Traumatology		–		Traumatology	
AOKSBE066_SA	1 week Vascular surgery		–			
AOKGY1076_SA	Pediatrics	8	8	final #		
AOKGY2077_SA						Pediatrics II.
AOKSZL078_SA					1 week Infectology	–
AOKNO1081_SA	Obstetrics and Gynecology	5	5	final #	Obstetrics and Gynecology II., Urology, Pediatrics II.	
AOKNEU080_SA	Neurology	4	4	final #	Neurology II.	
AOKPSI079_SA	Psychiatry	4	4	final #	Psychiatry II.	
AOKANG216_SA	Transfusion Course	1	–	signature	–	
AOKOMS153_SA	Prehospital Emergency Medicine	2	–	signature	Oxiology - Emergency Medicine	
<b>Total:</b>		<b>42</b>	<b>39</b>			
AOKSZD217_SA	Thesis work		20			

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](http://www.sote.hu/intezetek/oktatas/?inst_id=145&page_id=480)

Certificates can be downloaded at

[http://www.semmelweis-english-program.org/index.php?option=com\\_content&task=view&id=79&Itemid=101](http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101)

### 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

**Curriculum year:** 2016-2017

**Registration:** NEPTUN system

**Program:** a detailed program plan will be announced about locations and tutors of daily practice in time

Group size: Our institution can only accept a limited number of students (14 persons) at a time. In order to keep the program interactive and to avoid overcrowding at patients' departments we cannot accept your request to register above this quota. If the scheduled practice weeks do not match your plans you can: 1. Switch registration with a fellow student. 2. Collect at least 5 more persons having the same problem and apply to the English Secretariat to schedule an additional week for Infectology rotation. Our Division will do its best to fulfill these requests; however it cannot be granted that rotations will be organized at any desired time.

**Overview**

Knowledge on infectious diseases has been among the most ancient parts of medical practice and science. Epidemics, isolation of patients with communicable diseases, vaccinations and anti-infective therapy had a significant impact not only on the progress in healthcare but also on history and socio-cultural development of mankind. Although infectology is often considered being of marginal importance within internal medicine, it should be noted that an increasing number of diseases and conditions seem to have an infectious background. In addition, around a third of chapters within major medical textbooks deal with infectious diseases.

Currently development of infectology has two important directions that are complementary to each other. The traditional one will target classical and emerging infections often of global scope, like influenza, gastrointestinal infections, hepatitis or malaria etc. A newer branch of infectology is focusing on infections related to modern medicine, like nosocomial outbreaks caused by multiresistant organisms or infections occurring in immunocompromised hosts. Prophylaxis and therapy of infections as well as knowledge on antibiotic therapy is of significant importance in both fields.

**Program details**

During the infectology rotation you will be welcome to

- take part in rounds at Departments of Infectious Disease
- participate in round table discussions on current topics in infectology
- discuss real life cases especially in the immunocompromised host setting
- being updated on basic diagnostic and therapeutic approaches in stem cell transplant patients
- have an overview on developments in HIV/AIDS therapy.

Sessions are designed to be as interactive as possible, so you are encouraged to actively take part in discussions and feel free asking questions from tutors at all times.

Completion of rotation and signature: Registered students must attend all courses to receive their signature. We can only accept hospital discharge papers for verification of absences. The absence must be substituted at a later time period, assigned by the tutor. In the case of further absences, the practice cannot be accepted. Excuses like having been unable to locate the venue of practice are not acceptable. Students arriving later than 10 minutes past the scheduled start of the sessions will not be accepted to take part in the program.

**SURGERY**

Acting as a HO or SHO under strict supervision, including administration and practical skills.

Admitting of patients with full physical examination, including breast and PR examinations.

Theoretical planning for examinations and treatments for the examined patients.

Continuous observation and registration of the patient's condition with administration.

Writing of discharge reports.

Performing different injections (iv, im, sc), insertion of venflons, phlebotomies. To determine blood group, performing of transfusions under strict supervision. Completion of administration.

Insertion of NG tubes.

Catheterization (urethral and suprapubic).

Removal of clips and stitches.

Changing of dressings.

Assistance at abdominal and thoracic wash-outs or punctures.

Taking part in consultations with other specialists.

Theoretical decisions about operations. Consenting.

Taking part in operations, scrubbing in, stitching.

Being on duty for 24 hours once a week.  
 Examination and treating of emergency patients.  
 Taking part in anesthesiological preparation of patients.  
 Observation of premedications.  
 Assistance at several anesthesiological procedures, including spinal, peridural and GA.  
 Assistance at intubations. If possible, independent intubation.  
 Measurement of CVP.  
 Assistance at jugular and subclavian venal punctures.  
 Suction of the throat and trachea.  
 Observation of ITU work.

HO	house officer
SHO	senior house officer
PR	per rectum
NG	nasogastric
GA	general anesthetic
CVP	central venous pressure
ITU	intensive therapy unit

Observation of postoperative treatment.  
 Observation of resuscitation and reanimation.  
 Observation of autopsies of the ward.  
 Being present at every medical discussion of the ward.  
 Observation of outpatient work.  
 Assistance in outpatient work including assistance at day surgical operations.  
 Changing of dressings of outpatients.  
 Treatment of infected wounds.  
 Assistance at i.v. anesthesia.  
 Performing and assisting at local anesthesia.  
 Observation and assistance at ultrasound, endoscopies and X-ray examinations.  
 As interns, students take part in the daily rounds and report on the patients examined by them or treated in their section. Interns examine the patients under the supervision of the ward chief or ward surgeon. Interns are required to be personally involved in the examinations and the evaluation of the findings.

***Involvement in the preparation of the documentation of the patients.***

***Involvement in the preoperative preparations as well as in the postoperative care and treatments.***

Take part in the operations as second assistants.  
 Take part in on-call duty without numerical limitations. During on-call (night) duty, interns should-under the supervision of the ward chief or authorized surgeon – be involved in solving all problems caused by either acute or chronic diseases.  
 Interns are required to take part in all consultations organized for them.

***Interns will be eligible for the final examination if the above conditions have all been met and their academic achievements during their internship proved.***

## TRAUMATOLOGY

**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

Curriculum Year: 2016/2017.

### **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](http://www.semmelweis-english-program.org/index.php?option=com_content&task=view&id=79&Itemid=101) under the link: Approved Health Institutes for 6th year Rotations).**

1. Daily attendance of morning conference. After becoming acquainted with the introduced cases, students will have the opportunity to examine the hospitalized patients and familiarize themselves with patient's documentation.
2. Assisting or observing in the operative theater, depending on the operative program.
3. Students shall participate in patient admission, examination, follow and help in the evaluation of the diagnostic examinations, and take part in the acute treatment of traumatized patients during on duty shifts.
4. Participating in grand rounds, patient presentation, and following up on referrals.
5. Consultation with attending tutor of actual clinical cases, planning the treatment and the course of patient follow up.
6. Taking part in patient follow up examinations. Examining the range of motion, function, evaluating x-rays and CT scans. Identification and treatment of complications

### **Detailed syllabus:**

1. First Aid
2. Evaluation of the mental-stage/orientation with the Glasgow-score
3. Evaluating and management of external wounds
4. Termination of bleeding



5. Transportation of trauma patient
6. Transient fixating bandage of traumatic part of body
7. Preparation of the surgical area
8. Surgical scrub-in and clothing
9. Infiltrational anaesthesia
10. Incision and drainage
11. Management of infected, necrotic wound
12. Closure
13. Stitch removal
14. Applying pressure-bandage
15. Reuniting closed fractures
16. Fracture stabilization
17. Reduction of dislocation
18. Transient fixation of broken extremities
19. Insertion of Foley's catheter in men
20. Insertion of Foley's catheter in women
21. Venous-cannulating
22. Pain management
23. Assisting surgical procedures

#### **Attendance criteria and absences:**

The complete attendance of the two week practice as well as the completion of the syllabus signed by the tutor is mandatory. The syllabus must be handed in at the Traumatology Department upon completion of the practice with the certificate (if practice is spent abroad) and student index. During the course of the two weeks, 6 hour work days are mandatory 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 6<sup>th</sup> 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 traumatology 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 6<sup>th</sup> 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 Janyai 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, 6<sup>th</sup> 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.***

## OBSTETRICS AND GYNECOLOGY

### ***Essential Requirements in Obstetrics***

- Prenatal care (anamnesis, lab tests, screening during pregnancy, obstetrical examinations, Leopold's manoeuvres)
- Cardiotocography (NST, OCT)
- Ultrasonography (evaluation)
- Abnormal pregnancy (diagnosis and therapy), intercurrent diseases (diabetes, heart diseases, renal diseases). Preeclamptic toxemia, hypertension, twins, hemorrhages, abortions
- Normal labor
  - fetal and maternal monitoring, management of the stages of labor (examinations during labor)
- Abnormal labor
  - breech delivery, transverse lie (diagnosis)
- Obstetric operations (assistance at labor and delivery)
- Obstetric operations (vacuum extraction, forceps, cesarean section, episiotomy)
- Postnatal care
  - Evaluation of the premature, dysmature and eutrophic newborns
  - Fundamentals of neonatal management
- Essential Requirements in Gynecology
- Gynecologic anamnesis
- Gynecologic examinations (to be carried out)
  - vaginal examination
  - colposcopy – cytology (basic knowledge, how to take a PAP smear)
  - examination of the breast
- Gynecologic operations (assistance)
  - bartholin abscess, cyst
  - D and C
  - abdominal hysterectomy
  - vaginal hysterectomy
  - colporrhaphy
- Postoperative management (basic knowledge)

- Outpatient clinics (to take part in the office work of outpatient clinics for gynecology, genetic counseling, adolescent gynecology, menopause, endocrinology, etc.)
- Bleeding disorders
- Cervical, corporal, ovarian, vulvar cancer (etiology, screening, diagnosis, therapy)
- Inflammation of the genital tract (PID)
- Urinary incontinence
- Contraception

## NEUROLOGY

### General information

Tutor: **Dr. Róbert Debreczeni**

Tel.: 210-0330, Fax: 210-1368

### Office hours at the Department of Neurology:

Monday 13,00-14,00      Friday 10,00-12,00

**Responsible Secretary:** Andrea Kovács (Andi)

**Rotation periods:** set by the English Secretariat, but for individual changes one might apply at the Department of Neurology. To ease the scheduling of other 6th year practices the Department shall organize "early rotations" right after taking the 5th year semifinal exam.

Neurology rotation is 4 weeks long (when at Semmelweis University 3 weeks clinical practice+1 week preparation for the exam). Students receive their schedule and assignments on the first day of practice. During the training students must write one neurological case report. It is also obligatory to spend one day at our Outpatient Clinic and to take part in one 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 neurology patients
2. Adams: Principles of Neurology. McGraw-Hill
3. Lindsay, Bone, Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone

### Other suggested books:

1. Marsden, Fowler: Clinical Neurology. Raven Press
2. Duus: Topical Diagnosis in Neurology. Thieme Medical Publishers
3. Gilroy: Basic Neurology. Pergamon Press
4. Weiner- Lewitt: Neurology of House Officer. Williams and Wilkins
5. Bannister: Brain an Bannister's Clinical Neurology. Oxford University Press
6. Mumenthaler: Neurology. Georg Thieme Verlag.

**6<sup>th</sup> 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 neuritis, Meniere's disease, brainstem TIA with vertigo, acoustic neuroma.
- XI. Disorders of higher cognitive functions
- A. Define and assess: dementia, delirium, amnesia, confabulation, hallucination.
  - B. Define normal-pressure hydrocephalus.
  - C. Define the anatomical basis for aphasia and dysarthria.
  - D. Differentiate the aphasias on the basis of ability to produce speech, comprehension, naming, repetition.
- XII. Disorders of altered consciousness
- A. Define hypnoid and non-hypnoid unconsciousness.
  - B. The anatomic basis of consciousness.
  - C. Assess the comatose patient, evaluation and treatment.
  - D. Localize the following: decorticate and decerebrate rigidity, conjugately deviated eyes, pathologic respiration, pinpoint pupils, anisocoria, intact versus absent oculocephalic response, intact versus disconjugate ice water calorics.
  - E. Diagnosis and management of increased intracranial pressure (ICP).
  - F. Symptoms of uncal and other herniations.

- XIII. Headaches and facial pain
  - A. Clinical features of migraine, cluster headache, tension headache, trigeminal neuralgia, "organic" headache.
  - B. Treatment for common headaches.
- XIV. Brain tumors
  - A. Clinical presentation and diagnosis of primary brain tumors.
  - B. Metastatic tumors to the brain in adults.
- XV. Infections
  - A. Bacterial meningitis, viral meningitis, encephalitis including herpes simplex, chronic meningitis, brain abscess. Neurosyphilis. Lyme disease.
  - B. HIV and the nervous system.
- XVI. Spinal cord disorders
  - A. Neurological symptoms caused by compression, transection and hemisection of the spinal cord.
  - B. Autonomic deficits caused by spinal cord lesion.
  - C. Clinical presentation of vitamin B12 deficiency.
- XVII. Peripheral nervous system disorders
  - A. Clinical syndromes of neuropathy, neuromuscular junction disorders, myopathy.
  - B. Describe: radicular pain, radiculopathy, mononeuropathy, meralgia paresthetica, mononeuropathy multiplex, polyneuropathy, paresthesia, fasciculation.
  - C. Clinical findings in root lesions at C5, L4, L5, S1.
  - D. Herniated nucleus pulposus.
  - E. The tunnel syndromes.
  - F. The acute inflammatory demyelinating polyneuropathy (Guillain-Barre synd.)
  - G. The motoneuron disease.
  - H. The myasthenia gravis.
  - I. Duchenne muscular dystrophy, myotonic dystrophy, polymyositis.
- XVIII. Alcohol related disorders
  - A. Wernicke-Korsakoff syndrome, dementia.
  - B. Delirium tremens, alcohol withdrawal seizure.
  - C. Cerebellar degeneration, peripheral polyneuropathy.



## Neurology Examination Question List for 6<sup>th</sup> year Students

### 1<sup>st</sup> series *Priority questions*

1. Brainstem reflexes
2. The facial nerve
3. Differential diagnosis of vertigo and dizziness
4. Localisation of paresis syndromes
5. Symptomes 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
11. Clinical manifestation of increased intracranial pressure. Herniations.
12. Traumatic intracranial bleedings
13. Trauma of the spine and spinal cord
14. Clinical syndromes of impaired circulation of the internal carotid artery
15. Clinical syndromes of impaired circulation of the vertebro-basilar system
16. Emergency in cerebrovascular disorders
17. Diagnostic procedures in cerebrovascular disorders.
18. Disturbance of cerebral venous circulation.
19. Intracerebral bleedings.
20. Diagnosis, treatment and prognosis of subarachnoid hemorrhage
21. Status epilepticus
22. Meningitis, encephalitis
23. Multiple sclerosis
24. Signs of brain tumors
25. Signs of tumors of the spine and spinal space
26. Brain edema
27. Diagnostic criteria of dementia
28. Diagnosis of Parkinson's disease
29. Wernicke-Korsakow syndrome
30. Guillain-Barre syndrome
31. Disturbance of micturition and defecation
32. Myasthenia gravis

### 2<sup>nd</sup> series

1. Neurological causes of impaired visual acuity. Visual field defects.
2. Ocular movement and gaze disorders
3. Disorders of the vestibular system.
4. Syndromes of lower cranial nerve dysfunctions.
5. Syndromes of pons and mesencephalon lesions
6. The muscle tone control
7. Neuroanatomical basis of sensory disturbances
8. Functional systems of cerebellum. Signs of cerebellar disorders.
9. Gait disorders
10. Symptoms of frontal lobe damage
11. Symptoms of temporal lobe damage
12. The limbic system
13. Symptoms of parietal lobe damage
14. Symptoms of occipital lobe damage
15. Classification of aphasia
16. Agnosia, apraxia, alexia, agraphia

17. The basal ganglia
18. Disorders of the thalamus
19. Localisation of memory disturbances
20. Imaging techniques (angiography, CT, MR, PET, SPECT )
21. Investigation of cerebral circulation
22. EEG in the diagnostic workup
23. EMG, nerve conduction studies, transcranial magnetic stimulation and evoked potentials (BAEP, VEP, SSEP)
24. The lumbar puncture and the examination of cerebrospinal fluid
25. The cerebral circulation, and its regulation
26. Classification of cerebrovascular disorders
27. TIA
28. Causes of cerebral ischaemia in young adults
29. Treatment and prevention of cerebral ischemia
30. Classification of epilepsy
31. Diagnostic workup of epilepsy
32. Differential diagnosis of syncope and other types of disturbed consciousness
33. Treatment of epilepsy

**3<sup>rd</sup> series**

1. Neurological disorders caused by viral infections
2. Neurological disorders caused by Herpes virus
3. Prion-diseases, slow virus infections
4. Neurological consequences of AIDS
5. Clinical types and treatment of multiple sclerosis
6. Hystopathological classification of brain tumors
7. Metastatic tumors of the brain
8. Paraneoplasias of the nervous system (PML, neuropathies, cerebellar deg., Lambert-Eaton sy.)
9. Disorders associated with parkinsonian syndrome
10. Treatment of Parkinson's disease
11. Hyperkinetic movement disorders
12. Hyperkinesias
13. Classification of encephalopathies
14. Primary degenerative dementias
15. Multiple system atrophy
16. Disturbed cerebrospinal fluid circulation (hydrocephalus)
17. Syndrome of brachial plexus damage
18. Syndrome of radial, ulnar and median nerve damage
19. Syndrome of lumbosacral plexus damage
20. Etiology of polyneuropathies
21. Neuropathies in diabetes mellitus
22. Inherited neuropathies (Charcot-Marie, Dejerine-Sottas)
23. Low back pain, and cervical disk disease
24. Malformation of the spine and spinal cord
25. Symptoms of the disorder of spinal cord
26. Motoneuron diseases
27. Muscular dystrophies
28. Muscle disorders
29. Primary headache syndromes
30. The neuralgias
31. The physiological sleep and the sleep disorders
32. Genetic disorders in neurology (Huntington chorea, fragile X, dystrophia myotonica)

# PSYCHIATRY

## Department of Psychiatry and Psychotherapy

Tutor: *Dr. Erika Szily*

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

The goals of the psychiatric practices (4 weeks)

The goal of our Clinic is to teach medical students about the most important signs and symptoms of the most common diseases as psychiatric disorders have a relatively high prevalence in the population. Considering the high prevalence and the last but not least economic consequences, psychiatric disorders can be a burden for every society. Every medical student must be familiar with the high prevalence of depressive and anxiety disorders. Hungary was once one of the leading countries among those with high suicide rates; therefore, we require them to get acquainted with important details of the main causes and therapeutic possibilities of suicide, as well. As many psychiatric disorders can mask somatic diseases, medical students have to learn about the differentiation of these conditions.

In the 5th year students must base their knowledge on lectures and materials of practice where they have an opportunity to talk to a psychiatric patient, so they can learn how to detect the most important signs and symptoms of diseases. During the 6th year, they need to explore patients and write a case report according to the sample that is available on the website of our Clinic. Before the oral exam they have to discuss this case report with the responsible tutor who will give a mark for it. Students are not allowed to take their final exam without a marked case report. We have a certificate form on our website containing all the details students must bring from the hospital where they have completed their rotation.

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

Objectives/target abilities:

- The ability how to obtain a complete and reliable history
- The method of asking about specific psychiatric symptoms or how to evaluate the information provided by the patients including:
  - orientation and attention
  - affect
  - thought disorder
  - memory
  - psycho-motor abilities
  - perception
  - motivation, intellect and personality
- The ability of noticing states of potential psychiatric emergency
- The ability to recognize specific symptoms that can refer to any hidden psychiatric problem which is not told by the patients
- The ability of summarizing all the gained information in a detailed case report
- The ability of establishing a tentative diagnosis and to know what kind of tests (either laboratory or psychological or neuro-radiological, etc) are needed for the correct diagnosis
- Being aware of the most important effects and side/adverse effects of drugs used in psychiatry
- To learn that the practitioner must always consider the possible existence of psychiatric disorders even when there are a lot of somatic symptoms, since they can also appear as a result of psychiatric diseases

We have 5 wards with different profiles in our Clinic. Students must join these wards according to their schedule made by our training coordinator. Everybody has a tutor within the ward he or she is scheduled to. The tutor presents the specific profile of that particular ward, but they also have the opportunity to go and see other wards, too. They spend a day at the out-patient department of our Clinic, which is very useful because there are many patient examinations referred from other departments of Semmelweis University. Thus, they can gain insight into the most important psychiatric features of internal medicine, neurology, surgery etc. Students must join for one all-night-duty and they have to participate in the emergency treatment performed during this period.

Under the supervision of an appointed physician students have to:

Participate in the work of one unit;

Evaluate patients independently;

Write a detailed case history of one patient which has to be presented at the exam;

Participate in consultations.

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

### Requirements

1. The 6th year includes a 4-week-long rotation in Psychiatry in a hospital or clinic which is accredited for teaching by Semmelweis University.

2. If you want to complete your rotation abroad, then before you start it, you must present at our department an officially stamped statement of acceptance issued by the teaching hospital abroad where you intend to spend your rotation.

BE AWARE: The Letter of Acceptance for the 4-week-long Psychiatry internship requested from practice places abroad must state:

- a) The training place abroad is a teaching hospital
- b) A brief description of how Psychiatry is taught in that institution
- c) The name of the responsible tutor (name, e-mail)

3. The Psychiatry practice must consist of 8 hours on 20 (4x5) workdays at psychiatric wards. Students participate in the everyday work of the ward(s), in patients' admission, in ward rounds and in therapeutic decisions. One all-night-duty is compulsory within the rotation period.

4. Writing a case report during the rotation period is a task for every student. A sample case report is available on the website of our department

<http://semmelweis.hu/pszichiatria/oktatas/the-english-version-can-be-found-here/>

5. Case reports should not include patients' personal data (name, birth date, national insurance number, etc). Only those practice places are acceptable where the release of the case report is not forbidden by law. Students completing the internship abroad have to present at the exam the CERTIFICATE in which the tutor has indicated their performance during the internship on the scale: excellent-satisfactory-unsatisfactory and commented on their strengths and weaknesses.

**Without these documents students are not allowed to take their final exam in Psychiatry.**

**Please note that the Final Examination in Psychiatry cannot be taken within the 4<sup>th</sup> 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 5<sup>th</sup> 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: **Dr. Attila Tordai**

- 1 Introduction, the history of transfusion medicine
- 2 Immunological introduction: basic mechanisms important in transfusion medicine
- 3 Immune response to incompatible transfusion: antigen (protein, carbohydrate) recognition, primary/secondary immune response
- 4 The molecular structure and physiological role of red cell antigens
- 5 Plasticity of stem cells, regenerative medicine
- 6 Introduction of the HLA system, diagnostics in transplantation immunogenetics
- 7 Platelet, granulocyte antigen systems
- 8 The blood group serology compatibility
- 9 Immunomodulation effects of transfusion
- 10 Blood donors, blood letting for donation, donor screening, risk assessment and reduction, international trends
- 11 Red cell, platelet, granulocyte and plasma blood products: manufacturing, storage, quality parameters
- 12 Generation and clinical use of albumin and immunoglobulin blood products
- 13 Challenges and approaches of blood supply management, international examples
- 14 Steps and practices of transfusion execution, international outlook
- 15 Indications of red cell, platelet and granulocyte transfusion
- 16 Alternatives to red cell transfusion: stimulation of red cell formation
- 17 Apheresis and extracorporeal photopheresis
- 18 Transfusion aspects of hematology patient care, application of special blood products
- 19 Options for blood saving, peri-operative blood collection
- 20 Solid organ transplantation and its transfusion aspects (complications, case reports)
- 21 Infectious diseases transmitted by transfusion, epidemiology, screening, prevention
- 22 Transfusion aspects of the coagulation system, generation and clinical application of coagulation factor products
- 23 Treatment and long term care in inherited coagulation disorders
- 24 Effects of massive transfusion, factor substitution in acquired bleeding disorders
- 25 Transfusion aspects of cardiac surgery (complications, case reports)
- 26 Immunological complications of transfusions: hemolytic and non hemolytic
- 27 Non immunological complications of transfusions: circulatory and iron overload
- 28 Hungarian and international legal aspects of transfusion medicine
- 29 Test examination

# PREHOSPITAL EMERGENCY MEDICINE (OXYOLOGY)

## Ambulance practice

### National Ambulance Service

Lecturer: *Dr. Gábor Göbl*

## Syllabus

During the 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 **August 29 - September 2, 2016**, the second part between **January 23-27, 2017**.

**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, 2016.** Please write a letter of request addressed to the Academic Program Director when applying for the reduction! **The reduction will be made** from the 2<sup>nd</sup> 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, 2017! For the August exam latest until July 15, 2017 and for the November exam latest until October 15, 2017!**

– **that you have to leave your lecture book at the English Secretariat after each Final Examination** (because the secretaries need it to do the administration, you will not lose or forget it abroad, etc.)



# FACULTY OF DENTISTRY

Study Programs since the 2010/11  
academic year



*Faculty of Dentistry*

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

### BASIC MODULE

#### 1st semester

	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3,5	semifinal
compulsory	Medical Biology (Cell Biology)	C3L2P1	final
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Terminology	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	<b>Total Credit</b>	<b>25</b>	

### BASIC MODULE

#### 2nd semester

	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics	C5L2,5P3	final#	Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>30</b>		

## BASIC MODULE

## 3rd semester

	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	<b>Total Credit</b>	<b>29</b>		

## BASIC MODULE

## 4th semester

	subjects	credit code	examination	prerequisites
compulsory	Anatomy(Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology II.	C5L0P5	practice mark	Odontotechnology I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	Physical Education IV.	C0L0P2	signature	
	<b>Total Credit</b>	<b>32</b>		

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L1P2	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Oral Pathology I.	C2L2P0	semifinal	BASIC MODULE
compulsory	Pathology I.	C5L3P2	semifinal	BASIC MODULE
compulsory	Preventive Dentistry II.	C3L1P2	practice mark	BASIC MODULE
compulsory	Prosthodontics (Pre-clinical course)	C4L1P3	final#	BASIC MODULE
	<b>Total Credit</b>	<b>33</b>		

## PRE-CLINICAL MODULE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology
compulsory	Oral Pathology II.	C3L2P1	final#	Oral Pathology I.
compulsory	Pathology II.	C3L1P2	final#	Pathology I.
compulsory	Preventive Dentistry III.	C1L1P0	final#	Preventive Dentistry II.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Prosthodontics, Pre-clinical Course
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	<b>Total Credit</b>	<b>32</b>		

## CLINICAL MODULE

7th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology I.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	pract. mak	PathologyII.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
	<b>Total Credit</b>	<b>39</b>		

## CLINICAL MODULE

8th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	practice mark	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	practice mark	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	General Dentistry practice (summer,4weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>25</b>		

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## CLINICAL MODULE

## 9th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Prosthodontics III
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV.	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology II.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology II.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine III.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
	<b>Total Credit</b>	<b>42</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II.*	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Clinical Dentistry II.**	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III.
obligatory elective	Diploma Work	C20		9th semester's subjects
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Oral Medicine	C1L1P0	final#	Periodontology III.
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV.
	<b>Total Credit</b>	<b>54</b>		

\* at the Dept. of Prosthodontics

\*\* at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## Study Program for students started studies in the 2011/12 academic year

### BASIC MODULE

#### 1st semester

subjects code	subjects	credit code	examination	
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal	
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal	
compulsory	Medical Chemistry	C6L3P3,5	semifinal	
compulsory	Medical Biology (Cell Biology)	C3L2P1	final	
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark	
obligatory elective	Medical Terminology I.	C2L0P2	practice mark	
compulsory	Physical Education I.	C0L0P1	signature	
	<b>Total Credit</b>	<b>25</b>		

### BASIC MODULE

#### 2nd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics	C5L2,5P3	final#	Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>30</b>		



## BASIC MODULE

## 3rd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C8L3P5	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	<b>Total Credit</b>	<b>30</b>		

## BASIC MODULE

## 4th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C3L0P3	practice mark	Odontotechnology and Prosthodontics Preclinical I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P2	signature	
	<b>Total Credit</b>	<b>34</b>		

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L1P2	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Pathology	C6L3P2	final#	BASIC MODULE
compulsory	Preventive Dentistry I.	C3LP2	practice mark	BASIC MODULE
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	BASIC MODULE
	<b>Total Credit</b>	<b>31</b>		

## PRE-CLINICAL MODULE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology, General and Oral Microbiology
compulsory	Genetics and Genomics	C3L2P1	final	Biochemistry, Molecular and Cellbiology III.
compulsory	Oral Pathology	C4L2P2	final#	Pathology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Prosthodontics, Pre-clinical Course or Odontotechnology and Prosthodontics and Preclinical III.
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	1-6 semesters compulsory subjects
	<b>Total Credit</b>	<b>33</b>		

## CLINICAL MODULE

## 7th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	pract. mak	Pathology
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
	<b>Total Credit</b>	<b>39</b>		

## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	practice mark	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	practice mark	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	1-8 semesters compulsory subjects
	<b>Total Credit</b>	<b>25</b>		

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## CLINICAL MODULE

## 9th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C4L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology and Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1G1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Oral and Maxillofacial Surgery I.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
	<b>Total Credit</b>	<b>38</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequi- sites code	prerequisites
compulsory	Clinical Dentistry II.*	C4L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV
obligatory elective	Dermatology	C1L1P0.5	final#	Internal Medicine I.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III.
obligatory elective	Diploma Work	C20		9th semester's subjects
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Oral Medicine	C1L1P0	final#	Periodontology III..
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV.
	<b>Total Credit</b>	<b>50</b>		

\*at the Dept. of Prosthodontics

\*at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## Study Program for students started studies in the 2012/13 academic year

### BASIC MODULE

#### 1st semester

subjects code	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3,5	final#
compulsory	Medical Biology (Cellbiology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Terminology I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
<b>Total Credit</b>		<b>28</b>	

### BASIC MODULE

#### 2nd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C7L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C4L2P2	final#	Biophysics I.
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P4	semifinal	Medical Chemistry
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
<b>Total Credit</b>		<b>29</b>		

## BASIC MODULE

## 3rd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C8L3P5	semifinal	Anatomy, Histology, Embryology II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C6L3P3	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II.
				Biochemistry I.
				Biophysics
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P2	signature	
	<b>Total Credit</b>	<b>30</b>		

## BASIC MODULE

## 4th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C5L3P2	final#	Anatomy, Histology, Embryology III.
compulsory	Biochemistry, Molecular and Cellbiology III.	C6L3P3	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C3L0P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P2	signature	
	<b>Total Credit</b>	<b>34</b>		

#The grade influences the qualification of the diploma.

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

C= Credit point

L= Lecture (hours/week)

P= Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	BASIC MODULE
compulsory	General and Oral Microbiology	C4L2P2	final#	BASIC MODULE
compulsory	General and Oral Pathophysiology	C4L2P2	final#	BASIC MODULE
compulsory	Basic Immunology	C3L2P1	semifinal	Biochemistry, Molecular and Cellbiology III.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	BASIC MODULE
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	BASIC MODULE
compulsory	Pathology	C5L3P2	final#	BASIC MODULE
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	BASIC MODULE
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	BASIC MODULE
	<b>Total Credit</b>	<b>30</b>		

## PRE-CLINICAL MODULE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II
compulsory	Internal Medicine I.	C4L2P2	practice mark	General and Oral Pathophysiology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology
compulsory	Genetics and Genomics	C3L2P1	final#	Biochemistry, Molecular and Cellbiology III.
compulsory	Oral Pathology	C4L2P2	final#	Pathology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics, Pre-clinical Course III.
compulsory	Radiation protection	C2L1.5P1	semifinal	BASIC MODULE
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	1-6 semesters compulsory subjects
	<b>Total Credit</b>	<b>33</b>		



## CLINICAL MODULE

## 7th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral biology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I.
compulsory	Oral Diagnostics I.	C2L1P1	practice mark	Pathology
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
	<b>Total Credit</b>	<b>41</b>		

## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I.
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer,4weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>25</b>		

# 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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**CLINICAL MODULE**


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**9th semester**

<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Clinical Dentistry I.*	C3L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Internal Medicine I.
compulsory	Oral and Maxillofacial Surgery IV.	C6L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Oral and Maxillofacial Surgery I.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I.
compulsory	Pedodontics I	C6L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III.
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III.
compulsory	Oral Medicine	C1L1P0	Semifinal	Pharmacology and Toxicology II.
	<b>Total Credit</b>	<b>38</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry II.*	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Internal Medicine I.
obligatory elective	Obstetrics and Family Planning	C1L1P0	Semifinal	
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics II	C5L1P4	final#	Orthodontics I.
compulsory	Pedodontics II	C5L1P4	final#	Pedodontics I.
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics V.
	<b>Total Credit</b>	<b>48</b>		

\*at the Dept. of Prosthodontics

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## Study Program for students started studies in the 2013/14 academic year

BASIC MODULE			
1st semester			
subjects code	subjects	credit code	examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Medical Terminology I.	C4L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
<b>Total Credit</b>		<b>28</b>	

BASIC MODULE				
2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology II.	C2L0P4	practice mark	Hungarian Medical Terminology I.
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials, Biophysics I.
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
<b>Total Credit</b>		<b>31</b>		

## BASIC MODULE

## 3rd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C11L6P5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Hungarian Medical Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Physical Education III.	C0L0P1	signature	
	<b>Total Credit</b>	<b>28</b>		

## BASIC MODULE

## 4th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III.,
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C10L6P5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Medical Terminology IV.	C2L0P4	practice mark	Hungarian Medical Terminology III.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	<b>Total Credit</b>	<b>35</b>		

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	semifinal	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology IV.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
	<b>Total Credit</b>	<b>30</b>		

## PRE-CLINICAL MODUE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	<b>Total Credit</b>	<b>33</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3rd year study program

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## CLINICAL MODULE

## 7th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection ,Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	<b>Total Credit</b>	<b>40</b>		



## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1G0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer,4weeks)	C0L0P30	signature	1-8 semesters compulsory subjects
	<b>Total Credit</b>	<b>24</b>		

#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)

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**CLINICAL MODULE**


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**9th semester**

<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	<b>Total Credit</b>	<b>32</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequi- sites code	prerequisites
compulsory	Clinical Dentistry II.*	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	<b>Total Credit</b>	<b>50</b>		

\* at the Dept. of Prosthodontics

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## Study Program for students started studies in the 2014/2015 academic year

### BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
<b>Total Credit</b>		<b>26</b>	

### BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials, Biophysics I.
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
<b>Total Credit</b>		<b>33</b>		

## BASIC MODULE

## 3rd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	<b>Total Credit</b>	<b>26</b>		

## BASIC MODULE

## 4th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III.,
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	<b>Total Credit</b>	<b>36</b>		

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV.
				Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology IV.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/semester	signature	
	<b>Total Credit</b>	<b>30</b>		

## PRE-CLINICAL MODUE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I.
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology II.	C2L0P4	final	Hungarian Dental Terminology I.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/semester	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	<b>Total Credit</b>	<b>33</b>		

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

**CLINICAL MODULE**
**7th semester**

subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection, Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I.
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	<b>Total Credit</b>	<b>40</b>		



## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	1-8 semesters compulsory subjects
	<b>Total Credit</b>	<b>24</b>		

#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)

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**CLINICAL MODULE**


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**9th semester**

<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	<b>Total Credit</b>	<b>32</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	<b>Total Credit</b>	<b>50</b>		

\* at the Dept. of Prosthodontics

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## Study Program for students started studies in the 2015/2016 academic year

### BASIC MODULE

1st semester			
subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
	<b>Total Credit</b>	<b>26</b>	

### BASIC MODULE

2nd semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>33</b>		

Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## BASIC MODULE

## 3rd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Medical Latin II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I., Biophysics II.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	<b>Total Credit</b>	<b>26</b>		

## BASIC MODULE

## 4th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Biochemistry, Molecular and Cellbiology II.
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II., Medical and Dental Physiology I.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Biochemistry, Molecular and Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	<b>Total Credit</b>	<b>36</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program  
 #The grade influences the qualification of the diploma.

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

C = Credit point,

L = Lecture (hours/week),

P = Practice (hours/week)

## PRE-CLINICAL MODULE

## 5th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV. Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/sem	signature	Anatomy IV.
	<b>Total Credit</b>	<b>30</b>		

## Explanation

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

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## PRE-CLINICAL MODUE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Prosthodontics I.	C4L1P3	practice mark	Preventive Dentistry I., Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/sem	signature	The Medical Basis of Disaster Management I.
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	
	<b>Total Credit</b>	<b>33</b>		

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)



## CLINICAL MODULE

## 7th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	<b>Total Credit</b>	<b>38</b>		

## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L1P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Community Dentistry II.	C0L1P1,5	signature	Community Dentistry I.
obligatory elective	Ophthalmology	C1L1P0,5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0,5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	
	<b>Total Credit</b>	<b>26</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## CLINICAL MODULE

## 9th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P4	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Oral Diagnostics I.
	<b>Total Credit</b>	<b>32</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I., Prosthodontics IV., Conservative Dentistry and Endodontics IV.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P5	final#	Orthodontics I
compulsory	Pedodontics II	C6L1P5	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	<b>Total Credit</b>	<b>50</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

FACULTY OF DENTISTRY

BASIC MODULE



*Faculty of Dentistry*  
*1<sup>st</sup> year*

## Study Program for students started studies in the 2016/17 academic year

### BASIC MODULE

#### 1st semester

subjects code	subjects	credit code	Examination
compulsory	Anatomy, Histology, Embryology I.	C8L3P5	semifinal
compulsory	Physical Bases of Dental Materials	C2L2P0	semifinal
compulsory	Medical Chemistry	C6L3P3	final#
compulsory	Medical Biology (Cell Biology)	C3L2P1	final#
compulsory	Biophysics I.	C3L1.5P2	semifinal
compulsory	Hungarian Language	C2L0P4	practice mark
obligatory elective	Medical Latin I.	C2L0P2	practice mark
compulsory	Physical Education I.	C0L0P1	signature
<b>Total Credit</b>		<b>26</b>	

### BASIC MODULE

#### 2nd semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Anatomy, Histology, Embryology II.	C8L3P4	semifinal	Anatomy, Histology, Embryology I., Medical Biology (Cellbiology), Medical Latin I.
compulsory	Biophysics II.	C5L2P2	final#	Biophysics I., Physical Bases of Dental Materials , Medical Informatics
compulsory	Biochemistry, Molecular and Cellbiology I.	C7L3P3	semifinal	Medical Chemistry, Medical Biology (Cellbiology)
compulsory	Hungarian Medical Terminology	C2L0P4	practice mark	Hungarian Language
compulsory	General Dental Materials	C1L1P0	semifinal	Physical Bases of Dental Materials
obligatory elective	First aid	C1L0P1	practice mark	
obligatory elective	Medical Informatics	C3L1P2	semifinal	
compulsory	Physical Education II	C0L0P1	signature	
obligatory elective	Medical Latin II.	C2L0P2	practice mark	Medical Latin I.
obligatory elective	Dental Psychology	C2L2P0	semifinal	
obligatory elective	Medical Sociology	C2L1P1	semifinal	
compulsory	Dental Laboratory Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
compulsory	Nursing Practice (summer, 2 weeks)	C0L0P30	signature	Prerequisite of registering to the 3rd semester
<b>Total Credit</b>		<b>33</b>		

Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> 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)

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

- 1 McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 Publication Date: 22/03/2013
- 2 Sobotta Atlas of Human Anatomy (Package), 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 Publication Date: 25/06/2013
- 3 Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel Elsevier; 03/04/2014; ISBN 9780702051319
- 4 C.Rosse-P.Gaddum-Rosse: Hollinshead's Textbook of Anatomy. Lippincott-Raven. 4th ed. 1997. ISBN 0-397-51256-2
- 5 Stevens & Lowe's Human Histology , Elsevier, 4th ed. 2015 ISBN 978-0-723435020
- 6 Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473
- 7 Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427
- 8 Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer 2014, ISBN 9781469897806
- 9 Ebbing, DD-Grammon, SD: General Chemistry. 9<sup>th</sup> ed. 2009. Houghton Mifflin Co. Boston ISBN 10: 0-618-85478-6 / 13: 978-0-618-85478-7
- 10 Harper's Illustrated Biochemistry, 30th edition, Lange, ISBN-10: 0071825347
- 11 Tóth: Concise Inorganic Chemistry for Medical Students. (SOTE) (Bp.)
- 12 Laboratory Manual I-II. (Bp.)
- 13 Hrabák: Selected Collection of Chemical Calculations (SOTE) (Bp.)
- 14 Sasvári: Bioorganic Compounds (Bp.) SOTE
- 15 Csermely P.-Hrabák A.: Principles of Organic Chemistry. Bp. 1999.
- 16 Wilson, Mansfield, Heath, Spence: Dental Technology and Materials for Students. Blackwell Scientific Publications. ISBN 0-632-01763-5
- 17 Primary Preventive Dentistry. Ed.by Norman O.Harris, F.Garcia-Godoy. 5<sup>th</sup> ed. Appleton and Lange, Stamford. 1999. ISBN 0-8385-8129-3
- 18 Damjanovich – Fidy – Szöllösi (eds) Medical Biophysics, Medicine, Budapest, 2009. ISBN 978 963 226 127 0
- 19 Miklós Kellermayer: Medical Biophysics Practices. Semmelweis Publishers, Budapest, 2015. ISBN 978-963-331-349-7.
- 20 Alberts et al. Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546
- 21 McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access 7th Edition by Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 Publication Date: 22/03/2013
- 22 A.L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology 3rd Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885 Copyright: 2012
- 23 1st semester: Gyöngyösi L. & Hetesy B., 2012. Jó reggelt! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 24 2nd-3rd semesters: 2nd-3rd semesters: Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)

**Recommended textbooks:**

- 1 Stryer: Biochemistry. 4<sup>th</sup> ed. 1995. ISBN 0-7167-2009-4
- 2 Zumdahl: Chemical Principles. 3<sup>rd</sup> ed. 1998. Houghton-Mifflin Co. Boston. ISBN 0-395-83995-5
- 3 Sasvári-Müllner: Bioorganic Compounds 4 kötet. (Bp.)
- 4 McCabe J.F.: Applied Dental Materials. Blackwell Scientific Publications. ISBN 0-632-02826-2
- 5 First Aid manual. St Andrews' Ambulance Association and the British Red Cross St John Ambulance. Ed. Dorling Kindersley, 2002. ISBN: 0751337048.
- 6 Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S.Standing: 2015 ISBN : 9780702052309
- 7 RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4
- 8 A.L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology 3rd Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885 Copyright: 2012
- 9 Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 9780071780339
- 10 W.Kahle-H.Leonhardt-W.Platzer: Color Atlas and Textbook of Human Anatomy (in 3 volumes) 3rd revised ed. Thieme Inc. New York, 1986.
- 11 Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; Elsevier, 2016 , ISBN 9780723438274
- 12 Belák E. Medical Terminology for Beginners (earlier title: Medical Latin), Bp. Semmelweis Kiadó



# 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: 1<sup>st</sup> semester – the structure of the body wall (e.g. thorax, pelvis), extremities and the cranium, 2<sup>nd</sup> semester – the morphology of internal organs including the cardiovascular, digestive and urogenital systems; 3<sup>rd</sup> semester – the composition of the central nervous system, together with the organs of special senses and topography of body regions, and the 4<sup>th</sup> semester is devoted entirely to maxillo-facial topographical anatomy.

**Aims of the lectures in Histology** – Presentation of the cell, basic principles in cellular morphology, detailed description of the epithelial, connective, muscle and nervous tissues. During the 3 semesters, the lectures contribute to the gross anatomical description of organs with a detailed presentation of their fine structures, including ultrastructural details. Important chapters: basic tissues, viscera, central nervous system.

**Aims of the lectures in Embryology** – Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (basic embryology) as well as the development of the locomotor system (1<sup>st</sup> semester). In the 2<sup>nd</sup> and 3<sup>rd</sup> 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

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Lectures: 3 hours per week

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

Week	Lecture	Dissecting room	Histology lab
1.	1. <b>The role of anatomy, histology and embryology in the medical curriculum. Terminology</b> 2. <b>General osteology. Composition of the extremities.</b> 3. Concept and types of tissues, epithelial tissue, simple epithelia	Dissection room activity, tools safety and rules. Osteology.	<b>Introduction to histology.</b> Rules, use of the microscope. Histological stains. Study of a compact and a hollow organs: surfaces, homogenous structure, layered structure.
2.	4. <b>Skull. Sphenoid and ethmoid bones</b> 5. <b>Temporal bone</b> 6. Stratified epithelia	Osteology.	<b>Simple epithelia:</b> simple squamous (mesothel, pleura); simple cuboidal (kidney); simple columnar (gall bladder); pseudostratified (trachea)
3.	7. <b>Calvary, base and interior of the skull</b> 8. <b>Facial skeleton, orbit</b> 9. Glandular epithelium	Osteology.	<b>Stratified epithelia:</b> squamous, non keratinizing (esophagus); squamous keratinizing (skin); columnar (male urethra); transitional (urinary bladder)
4.	10. <b>Mandible</b> 11. <b>Maxilla, maxillary sinus</b> 12. <b>Nasal cavity, paranasal sinuses</b>	Osteology.	<b>Glandular epithelia:</b> goblet cells (colon); merocrine gland (salivary gland); apocrine gland (prostate); holocrine gland (sebaceous gland).
5.	13. <b>Oral cavity, pterygopalatine and infratemporal fossae</b> 14. Connective tissue, cells. Blood, hematopoiesis. 15. Connective tissue, fibres, types of the connective tissue	1. Osteology 2. <b>Test I.:</b> Osteology	<b>Connective tissue, fibres:</b> collagen fibres (tendon); elastic fibres (vessel wall); reticular fibres (liver); differential staining of the fibres (skin); <b>ground substance</b> (umbilical cord)

Week	Lecture	Dissecting room	Histology lab
6.	16. <b>Types and composition of joints (general arthrology) Features of the skeletal musculature (general myology)</b> 17. <b>Shoulder girdle, shoulder joint and the muscles acting upon it</b> 18. <b>Elbow joint and the muscles acting upon it</b>	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Connective tissue, cells:</b> various cell types (scar tissue); mast cells (peritoneum); fat cells (tongue, skin).
7.	19. <b>Bones, joints and muscles of the hand</b> 20. Supporting tissue (cartilage, bone) 21. Bone formation, bone remodelling	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Connective tissue types:</b> mesenchyme (umbilical cord); dense connective tissue (tendon); reticular tissue (lymph node); adipose tissue; cell rich connective tissue (uterus)
8.	22. <b>Pelvis: bones and ligaments</b> 23. <b>Hip joint and the muscles acting upon it</b> 24. <b>Knee joint and the muscles acting upon it</b>	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Blood, bone marrow.</b> Blood smear, bone marrow smear. <b>Supporting tissue:</b> hyaline cartilage (rib); fibrocartilage (meniscus); elastic cartilage (epiglottis).
9.	25. <b>Bones, joints and muscles of the foot</b> 26. <b>Vertebral column; actions and muscles.</b> 27. <b>Atlantooccipital and atlantoaxial joints. Muscles acting upon the joints</b>	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Bone, bone formation:</b> bone, cross and longitudinal sections. Endochondral ossification (digit); intramembranous ossification (skull).
10.	28. <b>Thoracic cage, diaphragm</b> 29. <b>Temporomandibular joint, muscles of mastication</b> 30. <b>Muscles of facial expression</b>	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Test II.</b> Epithelial, connective and supporting tissues
11.	31. <b>Muscles, fasciae and triangles of the neck</b> 32. Muscle tissue; skeletal muscle, smooth and cardiac muscle 33. Nervous tissue: neurons and supporting cells	Dissection of the extremities (joints, muscles, vessels, nerves)	<b>Muscle tissue:</b> smooth muscles (gut); striated muscle (skeletal muscle); cardiac muscle (heart) tissues.
12.	34. <b>Abdominal muscles, rectus sheath</b> 35. Nervous tissue: fibres, synapses, receptors, effectors 36. <i>Introduction to human embryology. Gametogenesis, fertilization. Cleavage</i>	1. Dissection of the extremities (joints, muscles, vessels, nerves) 2. <b>Test III.</b> Joints, muscles, vessels and nerves of the extremities	<b>Nervous tissue, cells:</b> multipolar neurons (autonomic ganglion); pseudounipolar neurons (spinal ganglion), peripheral nerve, motor end plate.
13.	37. <i>Blastulation, implantation, decidua</i> 38. <i>The embryonic disc. Formation of the germinal layers (ecto-, endo- and mesoderm).</i> 39. <i>Differentiation of mesoderm. Derivatives of the embryonic layers.</i>	Muscles of the head, neck and trunk (demonstration)	Placenta. Umbilical cord.
14.	40. <i>Neurulation. Folding of the embryo. Umbilical cord. Fetal membranes</i> 41. <i>Early embryonic circulation. Structure of the placenta; placental circulation</i> 42. <i>Development of the vertebral column, the locomotor system and the skull. Fontanelles</i>	Consultation in embryology Revision.	Revision.

## ANATOMY, HISTOLOGY AND EMBRYOLOGY II.

Lectures: 3 hours per week

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

### Second Semester

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
1.	1. Circulatory system, composition, significance. Histology of the vessels 2. Lymphatic organs 1- lymph node, tonsils 3. Lymphatic organs 2 - spleen, thymus	Dissection of heart, visceral complex	<b>Vessels:</b> arteries, veins, arterioles, venules, capillaries. <b>Lymphatic organs:</b> tonsils
2.	4. Chambers of the heart, external features 5. Structure of heart wall, myocardium, valves, anuli fibrosi 6. Vessels, innervation, conducting system, surface projection of the heart, pericardium	Dissection of heart, visceral complex, fresh heart	<b>Lymphatic organs:</b> spleen, thymus
3.	7. <i>Development of the heart (Film)</i> 8. <i>Development of the arteries and veins; malformations</i> 9. Gastrointestinal tract. Fine structure of the hollow and parenchymal viscera	Dissection of heart, visceral complex	<b>Oral cavity:</b> lip, filiform, fungiform vallate papillae, radix linguae
4.	10. Morphology and histology of the oral cavity 11. Morphology and histology of the soft palate and the faucial isthmus 12. Morphology and histology of the tongue and salivary glands	<b>Test I.:</b> Heart, great vessels, heart and vessels' development, fetal circulation	Ground teeth, tooth bud. Parotid, submandibular, sublingual glands
5.	13. Pharynx and parapharyngeal spaces 14. Morphology of the esophagus and the stomach 15. Histology of the stomach	Dissection: cervical viscera, vessels and nerves, branches of the aorta	<b>Gastrointestinal tract:</b> Oesophagus, cardia, fundus, pylorus of the stomach
6.	16. Morphology and histology of the duodenum and pancreas 17. Morphology and histology of the small intestine 18. Morphology and histology of the large intestine and rectum	Dissection: cervical viscera, vessels and nerves, branches of the aorta	Duodenum, jejunum ileum, colon, vermiform appendix
7.	19. Morphology and histology of the liver and biliary system. Portal vein 20. <i>Development of the fore-, mid- and hind-gut</i> 21. Peritoneum, cross sections	Demonstration of peritoneum, dissection of abdominal organs, vessels.	Liver, gall bladder, pancreas
8.	22. Morphology of the nasal cavity and paranasal sinuses 23. Larynx, cartilages, joints, muscles 24. Larynx, connective tissue skeleton, mucous membrane	Dissection: visceral complex (abdominal organs, vessels)	<b>Test II.:</b> Vessels, heart, lymphatic organs, gastrointestinal tract

**Easter break**

Week	Lectures	Practical sessions	
		Dissection room	Histology lab
9.	25. Morphology of the trachea and lung, pleura. 26. Mediastinum, cross sections 27. Histology and development of the respiratory system	Demonstration of thoracic and abdominal situs on fresh and embalmed cadavers	<b>Respiratory system:</b> larynx, trachea, lung.
10.	28. Morphology and histology of the kidney 29. Morphology and histology of the urinary passages, pelvis, ureter, and bladder 30. Development of the uropoietic apparatus	Dissection: visceral complex (abdominal organs, vessels)	<b>Urinary system</b> kidney, ureter, urinary bladder
11.	31. Morphology of the testicle. Spermiogenesis. 32. Morphology and histology of the epididymis, spermatic cord and the seminal vesicle and prostate 33. Coats of the testicles. Hernia canals.	<b>Test III.:</b> Anatomy and dev. of gastrointestinal and respiratory systems, cross sections of the thorax and abdomen	<b>Male genitals:</b> testis, epididymis, spermatic cord, seminal vesicle, prostate
12. (Competition 1st round)	34. 35. Morphology and histology of penis and male urethra 36. Morphology and histology of the ovary and the uterine tube. Oogenesis.	Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels Dissection of the abdominal and pelvic visceral complexes	Penis, glans penis. <b>Female genitals:</b> ovary, corpus luteum,
13. (Competition 2nd round)	37. Morphology and histology of the uterus, divisions and content of the broad ligament 38. Morphology and histology of the vagina and the external genital organs 39. The pelvic and urogenital diaphragms (male, female)	Dissection of abdominal and pelvic visceral complexes. Demonstration of pelvic situs.	Uterine tube, uterus (proliferation, secretion), vagina
14.	40. Cross sections of the male and female pelvis, 41. Development and malformations of the genital system, hermaphroditism. 42. Development of serous membranes, separation of body cavities	<b>Test:</b> urogenital apparatus, pelvic floor, perineum, hernia canals	Review

## GENERAL DENTAL MATERIALS

Lecturer: *Dr. Judit Borbély D.M.D.*

### Second Semester

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**Lectures** (1 hour/week)

History of dental education  
Impression materials I.  
Impression materials II.  
Metals, technologies  
Casts, models and dies  
Precious alloys, non precious alloys  
Investment materials, flasking methods  
Dental ceramics I- Silicate ceramics  
Dental ceramics II- Oxidceramics  
Dental resins  
Luting cements  
Restorative materials  
Technologies: CAD/CAM,CNC, sintering  
Auxiliary materials  
Consultation

## PHYSICAL BASES OF DENTAL MATERIALS

Tutor: *Dr. István Voszka*

### First Semester

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**Lecture (2 hours/week)**

1. Basic forms of material, atoms, interactions, bonds
2. Multiatomic systems. Gases. Interpretation of temperature. Boltzmann-distribution. Fluids. Interface phenomena. Liquid crystals.
3. Solid materials.
4. Methods for structure examination (diffraction, microscopic, spectroscopic methods)
5. Crystallisation. Metals, alloys.
6. Ceramics, polymers, composites.
7. Mechanical properties of materials 1. Elasticity.
8. Mechanical properties of materials 2. Plasticity, hardness.
9. Mechanical properties of materials 3. Rheological properties, viscoelasticity.
10. Other physical (optical, electrical, thermal) properties of materials
11. Comparison of the properties of dental materials
12. Bases of biomechanics. Structure, mechanical and other properties of tissues.
13. Physical bases of implantology.
14. Physical bases of orthodontics.

# MEDICAL BIOLOGY (Cell Biology)

## Department of Genetics, Cell- and Immunobiology

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

Course coordinator: **Dr. Orsolya Láng**

Subject code: **FOKOGEN004\_1A**

**Credit:3**

### Lectures (2 hours per week):

1. Cell membrane: structure and function
- 2.-3. Structure and function of nucleus I, II
4. Endoplasmic reticulum and the ribosomes
5. Golgi complex, secretion and protein transport
6. Lysosomes, endocytosis, vesicular transport
7. Structure and function of mitochondria and peroxisomes
8. Midterm (written)
9. Cytoskeleton and cellular movement
10. Cell adhesion, cell junctions
11. Extracellular regulation of cells, signal transduction
12. -13. Cell cycle and its regulation I, II
14. Cellular aging and programmed cell death (apoptosis)

### Practices(1 hour per week):

1. The light microscope (LM)
2. Light microscopic (LM) microtechnique
3. The electron microscope (EM)
4. Cell nucleus. Cyto(histo)chemistry
5. Endoplasmic reticulum and Golgi complex
6. Golgi complex and secretion
7. Endocytosis and lysosomes
8. Pre-midterm consultation
9. Immunohistochemistry
10. Cell and tissue culture
11. Store and supply of energy. Mitochondria. Peroxisome.
12. Cell surface differentiation, enzyme-histochemistry
13. Consultation
14. Cell death (necrosis and apoptosis)

### Important notes:

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

There is one midterm during the semester. Spare midterm is organized for those students, who miss the midterm because an acute illness, but they have to show up the medical record to the tutor in one week. There is no opportunity to improve the midterm scores.

Final exam consists of oral test (preparations, electron micrographs, methods applied in cell biology) and written test (multiple choice, essays, drawings, etc. covering theoretical part of the subject). Students have to pass both oral and written part of the exam. Exam grade is calculated as follows: midterm grade (30%), oral test grade (20%) and written test grade (50%).

**Core text:** Alberts et al. Essential Cell Biology (4th edition) Garland Science ISBN-13: 978-0815344544 ISBN-10: 0815344546

Lecture and practice presentations and additional texts are available on the homepage: <http://gsi.semmelweis.hu> (The user name and password is on course datasheet of the Neptun)

## BIOPHYSICS I.

Tutor: *Dr. István Voszka*

### First Semester

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

## BIOPHYSICS II.

### Second Semester

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<b>Week</b>	<b>Lecture</b> (2 hours per week)	<b>Laboratory</b> (2 hours per week)
1	Bonds and their significance in macromolecular structure; Boltzmann distribution, examples	The attenuation of gamma-radiation
2	Liquid crystals, membranes	Dosimetry
3	Electronic properties of condensed materials (solids, macromolecules)	Amplifier
4	Ultrasound properties, generation of ultrasound	Gamma energy determination
5	Ultrasonography, Doppler methods	Pulse generators (e.g. pacemaker, defibrillator)
6	Methods for structure examination heat	Sine wave oscillators (high frequency therapy, ultrasound)



7	Basic concepts of Thermodynamics, First law	Audiometry
8	General description of transport phenomena, Onsager's equation, examples	Isotope diagnostics
9	Diffusion; transport across membrane	Densitography (CT)
10	Resting potential and its local changes	Flow of fluids. Electric model of vascular circulation
11	Action potential, properties, interpretation	Electrocardiography
12	General characteristics of sensory function, hearing, vision	Diffusion
13	Biophysics of muscle function	Sensory function
14	Motor proteins	Repetition

## DENTAL PSYCHOLOGY

**Institute of Behavioral Sciences**

**Code:** FOKMAG019\_1A

**Credit:** 2

Head of the Department: **Prof. Dr. József Kovács**

Tutor: **Dr. Gyöngyvér Salavecz**

**2016-2017.**

### 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:

<b>1+2</b>	Psychotherapeutic methods, Dr. György Purebl
<b>3+4</b>	Principles of perception, pain, consciousness, emotions and communication -and their relations to dentistry. Gábor Suhai
<b>5+6</b>	Stress and stress management programs. Dr. Adrienne Stauder
<b>7+8</b>	Conscious states, sleep, dreaming, general anesthesia. Dr. Róbert Bódizs
<b>9+10</b>	Dental anxiety and music therapy. Dr. László Harmat
<b>11+12</b>	Health psychology and behavior , Dr. Róbert Bódizs
<b>13+14</b>	Techniques of establishing rapport with patients in fear and basics of formulating positive suggestions in dental practice. Gábor Suhai
<b>15+16</b>	Altered states of consciousness, dental anxiety and suggestive communication (I.) Gábor Suhai
<b>17+18</b>	Altered states of consciousness, dental anxiety and suggestive communication (II.) Gábor Suhai
<b>19+20</b>	Affects, emotion and motivation. Dr. György Purebl
<b>21+22</b>	Dental consequences of eating disorders. Bernadett Babusa
<b>23+24</b>	Problems with personality disordered patients in dental practice. Dr. László Harmat
<b>25+26</b>	Fables and imagination in dental practice. Éva Pollák
<b>27+28</b>	Review.

Department:

**Institute of Behavioral Sciences**

**Department of Psychology**

NET Building, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20<sup>th</sup> 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 Suhaishgabor@gmail.com

**Participation and making up for absences:**

Participation list will be recorded at the end of every lecture. To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. Maximum number of absences in a semester is 3.

**Certifying absence from lesson and exam:**

Medical certificate presented to the course leader.

**Semester requirements:**

Course will conclude with a written **semi-final examination** in the examination period.

**Requirement of semester signature:**

A signature will be given with the prerequisite of participation. One absence can be overlooked by the teacher if the student writes an essay. The topic of the essay must be discussed with the course leader in advance.

**Method of granting grade:** The result of the **semi-final**.

**Type of exam:** written **semi-final examination**

**Exam requirements:** Content of the lectures

**Sign up for exam:** through the Neptun system

**Modifying sign up for exam:** through the Neptun system

**Certifying absence from exam:**

A telephone message to the secretary of the Institute or an email message to the course leader.

**Recommended text books:**

- 1 Behavioral dentistry. Mostofsky DI, Forgione AG, Giddon DB (eds.), Blackwell Munksgaard, 2006.
- 2 Behavior & Medicine. 4<sup>th</sup> Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.
- 3 Fadem B: Behavioral Science, Lippincott Williams & Wilkins, 5<sup>th</sup> ed., 2008.
- 4 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6<sup>th</sup> ed., New York, Wiley, 2008.
- 5 Kopp M. - Skrabski Á.: Behavioral Sciences Applied in a Changing Society, Corvina, 1996.

# MEDICAL SOCIOLOGY (Dentsoc)

## Second Semester

Hour/semester: 15

Credit: 2

Responsible person and Institute for the course: **Dr. Zsuzsa Szántó**; Institute of Behavioural Sciences

Lecturers: Dr. Zsuzsa Szántó  
Dr. Katalin Kovács  
Dr. Bea Dávid  
Dr. Fruzsina Albert

Goals of the subject:

– To introduce to the students the social distribution of health and illness, the causes and consequences of health status inequalities, the role of psychosocial factors in health care, the social phenomena occurring in healing, the social situation of medicine, and the social embeddedness of the health care system.

Syllabus of the subject:

Week	Class type	Themes
1	Lecture	Introduction. Changing patterns of disease
2	Lecture	Health and illness behaviour.
3	Lecture	Social inequalities in health and mortality.
4	Seminar	Health and illness behaviour.
5	Seminar	Social inequalities in health and mortality.
6	Lecture	Health professions
7	Seminar	Health professions
8	Lecture	National variations of health care
9	Lecture	Health care and health policy
10	Lecture	Midterm examination
11	Seminar	Chronic illness and disability
12	Seminar	Ageing and care of the elderly
13	Seminar	Gender aspects of health
14	Seminar	Doctor-patient relationship

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 10 classes. Participation is documented through catalogues. A midterm exam is taken after the 8th 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 document at the next class. One seminar per semester can be supplemented by an extra assignment given by the teacher or attending the same class with another group.

### **Textbook:**

- 1 Gerry Humphris, Margaret S. Ling: Behavioural Sciences for Dentistry. Churchill Livingstone, London, 2005
- 2 Handouts for the lectures will be accessible on the homepage of the Institute of Behavioural Sciences: [www.magtud.sote.hu](http://www.magtud.sote.hu).

## **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**

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#### **Topics**

Principles of first aid. Recognition of an emergency. Assessment of the scene.

Dangerous scene. Safety measurements on the scene. Call for an ambulance.

Emotional viewpoints of managing emergencies.

Assessment of the patient. Responsiveness – unresponsiveness. Assessment of the responsive patient: complaints, signs for the severe condition. Positioning of the patient in specific conditions.

The unconscious patient. Airway management. Assessment of the vital signs.

Recovery position.

Heart attack. Sudden death. Chain of survival.

BLS (Basic Life Support)

BLS

AED (Automated External Defibrillator). PAD (Public Access Defibrillation)

BLS + AED

BLS + AED

Chocking. Drowning. Electrocution.

Injuries. Extrication of the patient: Rautek maneuvers. Helmet removal. Mobilization and immobilization of injured patients.

Bleeding control. Bandages. Burns. Fractures, dislocation, sprain.

Fainting. Shock. Allergy

Stroke. Convulsions. Diabetes mellitus: Hypoglycaemia. Shortness of breath.

Poisoning. Drugs. Drunkenness.

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

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

Mode of certifying absences: oral – referring to practices

Requirements: The student should be able to

recognize emergencies, and call for help

start with BLS + AED

provide airway management in unconscious patients

provide first aid for patients complaining for chest-pain, shortness of breath, signs for hypoglycaemia and having suffered from fainting, shock condition, convulsion, injuries.

The 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
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1. Getting Started With The Internet. TCP/IP	Practice
2. Mobile communication: HW	Practice
3. Mobile communication: SW	Practice
4. Basics of database managing.	Practice
5. Extracting data from a nutrition database using MS Access.	Practice
6. Basics of Spreadsheets.	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 – Latin, Hungarian

### Directorate for Language Communication

Lecturer: **Dr. Éva Kovács**

**Subject name: Medical Latin I.; Medical Latin II.**

**Code:** FOKVNYE173\_1A; FOKVNYE173\_2A

**Credit value:** 2

### Thematics:

Students are introduced to the basic vocabulary of scientific terminologies in general, and to the terminology of medicine, dentistry and pharmacy in special.

- Texts: Anatomical names, clinical and pathoanatomical diagnoses and prescriptions
- Grammar: Substantives: the 5 declensions; adjectives with 3, 2 and 1 ending; construction of the most important attributive structures with the vocabulary of anatomy, clinical subjects and pharmacy; gradation of adjectives; prepositions; verbs: stem forms of the verb and participles; numerals: usage in prescriptions;
- Vocabulary: appr. 500 words used in anatomy (especially in the oro-maxillofacial region, the oral cavity, the anatomy of the head), pathology; parallel forms of Latin and Greek vocabulary

### Attendance and absence:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester).

### Certifying absence:

A medical certificate is required if the student has been absent more than 3 times.

### Requirements:

midterms (week 7 and 13)

Topics of midterms: vocabulary, construction of Latin phrases, used in anatomy, pathology, pharmacology

Students who fail a midterm have to retake it.

### Semester signature:

Attendance of lessons is obligatory. Students are allowed to have maximum 3 absences a semester. In case of more absences, the teacher may deny giving the signature. Students who miss a class, can make up for it (max. two times a semester). Students have to pass the two midterms.

### Evaluation:

The evaluation of student performance is based on the marks for the 2 written papers as well as the active participation in classes.

- 0–50% = 1
- 51–60% = 2
- 61–75% = 3
- 76–89% = 4
- 90–100% = 5

### Textbooks:

#### Teaching material

- 1 *Medical Latin. Manuscript.* Compiled by the teachers of the Centre for Languages and Communication. Budapest, 2014, Semmelweis Egyetem Nyelvi Kommunikációs Központ.
- 2 *Excerpts of the following optional textbooks (chapters containing the basic vocabulary of dentistry):*
- 3 Belák Erzsébet: *Medical Latin.* Budapest, 2005, Semmelweis Kiadó.
- 4 Belák Erzsébet: *Terminology of Medicine.* Budapest, 2005, Semmelweis Kiadó.

**Medical Latin I.**

Week	Topics
1.	Introduction into medical Latin: alphabet, pronunciation, declensions, Greek and Latin elements. Anatomical planes and directions of the human body. The dictionary entry of nouns and adjectives, the 5 declensions
2.	Anatomical planes and directions of the human body. Possessive and attributive construction in anatomical terms (Genitive Singular; agreement of the adjective and noun)
3.	The anatomy of the bones. Declensions of adjectives; subjective and possessive construction with adjectives
4.	The anatomy of the bones. Exercises with possessive constructions.
5.	The cranium and the facial bones. Common endings of the 3 <sup>rd</sup> declension
6.	The cranium and the facial bones. Plural phrases in anatomy (Nominative Plural)
7.	1 <sup>st</sup> midterm
8.	Articulations and muscles of the head. Possessive phrases in plural (Genitive Plural)
9.	Articulations and muscles of the head. Exercises on possessive phrases in plural
10.	Exercises on vocabulary and grammar of the previous lessons
11.	Exercises on vocabulary and grammar of the previous lessons
12.	Review
13.	2 <sup>nd</sup> midterm
14.	Evaluation of student performance; retake of the midterms

**Medical Latin II.**

Week	Topics
1.	Grammatical exercises to maxillofacial anatomy and dental diagnoses. Introduction to medical prescription: <i>gramma, litra, gutta; numerals</i>
2.	Grammatical exercises to maxillofacial anatomy and dental diagnoses. Using Genitive and Accusative in the prescription
3.	Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural; prepositions with Accusative
4.	Grammatical exercises on maxillofacial anatomy. The Accusative Singular and Plural with prepositions: prescriptions and diagnoses ( <i>ICD</i> )
5.	Exercises on maxillofacial anatomy and dentistry. Verb forms in prescriptions (Imperative, passive and active voice)
6.	Exercises on maxillofacial anatomy and dentistry. Practising verbal forms in prescriptions; packaging materials used in pharmacology
7.	1 <sup>st</sup> midterm
8.	Exercises on maxillofacial anatomy and dentistry. The Ablative Singular and Plural; prepositions with Ablative
9.	Exercises on maxiofacial anatomy and dentistry. The Ablative Singular and Plural in diagnoses
10.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
11.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
12.	Translation of Latin diagnoses and prescriptions into English. Writing diagnoses and prescriptions in Latin
13.	2 <sup>nd</sup> midterm
14.	Evaluation of student performance; retake of the midterms

# Hungarian Language, Hungarian Medical and Dental Terminology

## Information on the course

The course is obligatory for dental students and is offered in 4 hours a week per term. Student performance is evaluated with a practical course grade. A written and oral examination is taken in the examination period at the end of the 4th term. Students obtain 4 and 2 credit points in the fourth term and in all other terms, respectively.

Hungarian Dental Language is an obligatory course for dental students in the 3rd year of their studies. A final examination consisting of a written and an oral part has to be passed at the end of the 6th term.

The prerequisite for enrolling in the 2nd term is that criteria of the first term (signature, practical course grade and credit points) are fulfilled. The prerequisite for enrolling in every subsequent term is that criteria of the previous term (signature, practical course grade and credit points) are fulfilled. Attendance at classes is obligatory. The term is not recognized if the student has had more than six absences regardless of the reasons.

## Curriculum and detailed course requirements

### Term 1 Hungarian Language

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Hungarian Language is a course for students in the first year without any previous exposure to Hungarian.

Students will be introduced to the basic vocabulary of general Hungarian. Topics of the course are arranged into 14 teaching units (weeks), with special attention to the most important expressions. Each text is linked to vocabulary, grammar issues and tasks. The course consists of 56 hours (4 hours per week). Students receive 2 credit points for the course.

#### Topic

*Vocabulary:* greetings, introduction, numbers, addresses, telephone numbers, place of residence, apartment, restaurant, shopping, furniture, orientation in the city, transport, main activities and daily routine.

*Grammar:* accusative, verb conjugation in present tense, postpositions and endings, as well as adverbs.

#### Requirement

Active use of about 600 words and expressions

Written tests (2 during the term) focus mainly on vocabulary and communication.

#### Textbooks

L. Gyöngyösi – B. Hetesy: *Jó reggelt!*

L. Gyöngyösi – B. Hetesy: *Jó napot kívánok!*

A. Marthy – Á. Végh: *Egészségére!*



## Term 2 Hungarian Medical Terminology

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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. Gyórfy: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

See all the other detailed curricula at **General Medicine, 1<sup>st</sup> year**

## COMPULSORY SUMMER PRACTICE

I.

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### **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.**

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***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 praemolar tooth.
- Waxing up of an occlusal surface.
- Artificial teeth

**Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!**

# BASIC MODULE



*Faculty of Dentistry  
2<sup>nd</sup> year*

**STUDY PROGRAMME****BASIC MODULE**

<b>3rd semester</b>				
<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Anatomy, Histology, Embryology III.	C7L3P4	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I., Medical Latin II.
compulsory	Biochemistry, Molecular and Cellbiology II.	C5L3P2	semifinal	Biochemistry, Molecular and Cellbiology I., Biophysics II.
compulsory	Medical and Dental Physiology I.	C9L6P3.5	semifinal	Anatomy, Histology, Embryology II., Biochemistry, Molecular and Cellbiology I. Biophysics II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course I.	C3L1P2	practice mark	General Dental Materials, Anatomy, Histology, Embryology II., Medical Latin II.
compulsory	Hungarian Dental Terminology I.	C2L0P4	practice mark	Hungarian Medical Terminology
compulsory	Physical Education III.	C0L0P1	signature	
	<b>Total Credit</b>	<b>26</b>		

**BASIC MODULE**

<b>4th semester</b>				
<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Anatomy (Maxillofacial Anatomy) IV.	C6L3P2	final#	Anatomy, Histology, Embryology III., Biochemistry, Molecular and Cellbiology II.
compulsory	Biochemistry, Molecular and Cellbiology III.	C5L3P2	final#	Biochemistry, Molecular and Cellbiology II., Medical and Dental Physiology I.
compulsory	Medical and Dental Physiology II.	C9L6P3.5	final#	Medical and Dental Physiology I., Biochemistry, Molecular and Cellbiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course II.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Conservative Dentistry and Endodontics, Pre-clinical I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course I.
compulsory	Hungarian Dental Terminology II.	C4L0P4	practice mark	Hungarian Dental Terminology I.
compulsory	General Dental Preclinical Practice	C4L1P3	semifinal	General Dental Materials, Anatomy, Histology, Embryology II.
compulsory	Physical Education IV.	C0L0P1	signature	
	<b>Total Credit</b>	<b>36</b>		

Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> 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)

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

- 1 Textbook: Berne-Levy-Koeppen-Stanton: Physiology (6th edition)
- 2 Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Péter Várnai, 2010)
- 3 Devlin: Textbook of Biochemistry with clinical correlations. 6<sup>th</sup> ed. J.Wiley and Sons, 2006. ISBN 0-470-03853-5 (paper and online version)
- 4 Wilson, Mansfield, Heath, Spence: Dental Technology and Materials for Students. Backwell Scientific Publications. ISBN 0-632-01763-5
- 5 A.Newbrun: Cariology Quintessence. ISBN 0867152052
- 6 C.M.Sturdevant: Operative Dentistry. Mosby ISBN 0-80166366-0
- 7 Walton-Torabinejad: Principle and Practice of Endodontics. W.B.Saunders Co. 2<sup>nd</sup> ed. 1996. ISBN 0-7216-4924-6
- 8 Herbert T. Shillingburg: Fundamentals of Fixed Prosthodontics – Quintessence 4<sup>th</sup> ed. 2012. ISBN 931386500
9. R.M. Basker, J.C. Davenport: Prosthetic Treatment of the Edentulous Patient – McMillan Press Ltd 5th ed. 2011. ISBN 978-1405192613

**Recommended textbooks:**

- 1 Principles of Medical Physiology. Ed. Fonyo A. Bp. Medicina Publ.House, 2001.
- 2 Ganong: Review of Medical Physiology. Lange
- 3 Monos E.: Physiology of the Venous systems. Bp. 1999.
- 4 Monos E: Hemodynamics: Biomechanics of the Blood Circulation. Semmelweis Univ. KODK. Bp. 2002.
- 5 Lodish et al.: Molecular Cell Biology. 3<sup>rd</sup> ed. Scientific American Books Inc. 1995.
- 6 Murray,Robert K.-Granner,Daryl K-Mayes,Peter A.-Rodwell,Victor W: Harper's Illustrated Biochemistry. 26<sup>th</sup> Ed. McGraw-Hill. ISBN 0-07-138901-6 (Online version: [www.lib.sote.hu](http://www.lib.sote.hu))
- 7 G.Nikiforuk: Understanding Dental Caries (1-2) Karger. ISBN 3-8055-3906-1(set)
- 8 Biochemistry Laboratory Manual. Ed.Gy.Szabados. Bp. Semmelweis Univ.
- 9 Field, James: PreClinical Dental Skills at a Glance, Blackwell Publishers (Wiley) ISBN13: 9781118766675

# ANATOMY, HISTOLOGY AND EMBRYOLOGY III.

Department of Anatomy, Histology & Embryology

Course Director: *Dr. Andrea D. Székely*

## First Semester

**Lectures:** 3 hours per week

**Laboratory:** 4 hours per week

Week	Lecture	Dissecting room	Histology lab
1.	1. <b>Introduction to the study of the nervous system. Meninges</b> 2. <b>Blood supply to the brain, CSF circulation</b> 3. <b>Gross anatomy and development of the telencephalon, hemispheres. The lateral ventricles</b>	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. <b>Gross anatomy and development of the diencephalon. The III. ventricle</b> 5. <b>Gross anatomy and development of the brain stem and the cerebellum. The IV. ventricle</b> 6. <i>Differentiation of the neural tube, development of the spinal cord</i>	Lateral ventricles, third ventricle Brain stem, fourth ventricle, cerebellum	–
3.	7. <b>Gross anatomy of the spinal cord, spinal segment. Dermatomes</b> 8. Neuronal architecture of the spinal cord: proprioceptive and nociceptive (withdrawal) reflex arcs. 9. Neuronal architecture of the spinal cord: autonomic reflex arc. Spinal pathways	Cross sections of the brain. Specimen demonstration: spinal cord together with the membranes	–
4.	10. Microscopy of the brain stem: tracts and nuclei of the medulla oblongata 11. Microscopy of the brain stem: tracts and nuclei of the pons 12. Microscopy of the brain stem: tracts and nuclei of the midbrain. Reflex arc of mastication	Fine structure of spinal cord. Revision Test I: Anatomy and development of the brain and the spinal cord	–
5.	13. Cerebellar cortex, cerebellar pathways 14. <b>Topographical anatomy of the limbs</b> 15. Cerebral cortex, primary cortical centres	Dissection of the ventral regions of the limbs. Microscopy of the CNS	Nervous system I.
6.	16. Structure and connections of the basal ganglia (extrapyramidal system). 17. Motor pathways 18. Sensory pathways. Microscopy of the thalamus	Dissection of the ventral regions of the limbs. Microscopy of the CNS	Nervous system II.

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

# ANATOMY, HISTOLOGY AND EMBRYOLOGY IV.

## Second Semester

**Lectures:** 3 hour per week

**Laboratory:** 2 hours per week

Week	Lecture (Monday 10.00-11.40 Thursday 13.30-14.15)	Dissection room (Monday 8.00-9.30)
1.	1. Introduction, the composition and development of the skull 2. Maxilla, mandible. The temporomandibular joint, masticatory muscles, mechanism of mastication 3. Walls and parts of the oral cavity, the oral mucosa	Bones and spaces of the skull, content of the orbit
2.	4. Anatomy, histology and innervation of the tongue 5. Topography, histology, innervation of the salivary glands 6. The palate and the faucial isthmus	Prosected specimen: demonstration of the head@neck: oral cavity, tongue and the salivary glands
3.	7. Nasal cavity and paranasal sinuses 8. The pharynx and the parapharyngeal spaces 9. The cavity and muscles of the larynx	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section
4.	10. The mucosa of the larynx 11. Development of the face, malformations 12. Pharyngeal pouches, development of the tongue	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth
5.	13. Anatomy of the teeth I. 14. Anatomy of the teeth II. 15. Histology of the teeth I.	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth, morphology and histology (photos)
6.	16. Histology of the teeth II. 17. Parodontium 18. Tooth development I.	Prosected specimen: demonstration of the head@neck: oral cavity, tongue, salivary glands pharynx, larynx. Mediansagittal head section Teeth, morphology and histology (photos)
7.	19. Tooth development II., malformations 20. Bone formation, bone remodelling and supplementation 21. Anatomical relevances in gnathology	Maxilla, mandible. Prosected specimen: demonstration of the temporomandibular joint, muscles of mastication and facial expression.
8.	22. Blood vessels of the head and neck region 23. The lymphatic system and the cutaneous innervation of the head&neck region <b>24 1st Midterm: lectures 1-21.</b>	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&neck regions. Regional anatomy of the head
<b>Easter break</b>		
9.	26. The concept of the spinal nerve, dorsal branches, cervical plexus and brachial plexus 27. Nerves of the head&neck region I.: CN 5 28. Innervation of the teeth and the gingiva, the anatomy of dental local anaesthesia	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&neck regions. Regional anatomy of the head



<b>Week</b>	<b>Lecture</b> (Monday 10.00-11.40 Thursday 13.30-14.15)	<b>Dissection room</b> (Monday 8.00-9.30)
10.	29. The reflex arc of mastication, the neuroanatomy of trigeminal neuralgia 30. Nerves of the head&neck region II. CN 7 and 9 31. Nerves of the head&neck region III CN 10, 11 and 12	Demonstration of the final's specimen: parapharyngeal space, cross section of the head and the neck
11.	32. Superficial regions and muscles of the head 33. Deep regions of the head. 34. Topography of the orbit	Prosected specimen(torso and head): demonstration of the vessels and nerves of the head&-neck regions.
<b>12.</b> (Competition 1st round)	37. Muscles and fasciae and the deep regions of the neck 38. Sectional anatomy of the head 39. Sectional anatomy of the neck	Demonstration of the final's specimen: parapharyngeal space, cross section of the head and the neck
<b>13.</b> (Competition 2nd round)	40. The cranial parasymphetic and sympathetic system 41. Topography of the neurocranium 42. The clinical significance of the SMAS	2nd Midterm: Topographical and sectional anatomy of the head and neck regions including the visceral organs
14.	43. Histology I. 44. Histology II. 45. Radiological anatomy of the jaws, teeth and the maxillary sinus	Summary and repetition

## 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**

Year: 2016/2017

### 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

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

## Second semester

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

### Practices, 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:**

*Textbook:* Berne-Levy-Koeppen-Stanton: Physiology (6th edition).

*Practice book:* Practices in Medical Physiology (Edited by: Péter Enyedi and Péter Várnai, 2010)

# CONSERVATIVE DENTISTRY AND ENDODONTICS, PRE-CLINICAL I.

## Department of Conservative Dentistry

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

## Second Semester

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Phantom-course (Pre-clinical laboratory course)

### **Lecture** (1 hour/week)

Introduction to operative dentistry

Clinical dental anatomy, histology.

Occlusion

Cariology: the lesion (macromorphology, enamel caries, dentinal caries, advanced carious lesion). Fundamentals in cavity preparation (nomenclature/caries, cavity from, cavity classification/)

Steps in cavity preparation by Black.

Cutting instruments and mechanical and biological considerations.

Class I. Facial Pit Cavity preparation for amalgam. Class I. Occlusal Cavity Preparation for Amalgam. Class VI. Cavity preparation for Amalgam.

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

Class II. Cavity preparation for Amalgam.

Class III. Cavity preparation for Tooth-Colored Material.

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

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

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

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

Cavity preparations for Composit resin and porcelain inlay restorations.

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

Preparation for Porcelain Veneers.

### **Note:**

The maximum number of absences in a semester is 3.

During the semester 3 midterm examinations should be passed.

Practical course grade.

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

Introduction to practice: general Department's policy. Rules of the house.

Distribution of instruments.

Handing over of instruments.

Discussion of drilling methods

Drilling practice I.

Drilling practice II.

Drilling practice III. Practical exam

Grinding of extracted carious human teeth

Black's class I. and V. cavity preparation for plastic restoration.

Preparation of class II. Cavities (I.)

Preparation of class II. cavities. (II.)

Preparation of class III. and IV. cavities

Cavity preparation by modified Black's principles. Practical exam

Class I. and V. cavity preparation for inlay

Class II. cavity preparation for metal inlay

Class II. inlay cavity preparation.

Practical exam

Complete of the works.

# GENERAL DENTAL PRECLINICAL PRACTICE

## Department of General Dental Preclinical Practice

Head and tutor: *Dr. Krisztina Márton D.M.D., Ph.D.*

## Second Semester

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

The **Department of General Dental Preclinical Practice** is responsible for the preparation of dental students for the practical stages of the clinical practice requiring high precision and excellent manual skills. The aim of this special education is to provide the students with a professional preclinical conservative dentistry, prosthodontics, periodontology, oral surgery and orthodontics manual and theoretical training, which will be used in the clinical treatment procedures. It consists of the simulation of the clinical stages on phantom heads, but furthermore students also have the opportunity to study the basics of minimal- and micro invasive dentistry and the most important rules of infection control.

### Theoretical lessons:

1. Oral diseases.
2. Establishment of the Dental Clinic. Instrumentation of the Dental Office.
3. Dentistry in the Field of the Life Sciences. Role of Dental Science in Human Medicine. The Dental Team.
4. Infection Control. Cross Infection.
5. Infection Control. Disinfection and Sterilization in Dentistry.
6. Organization of the Dental Team. Fluid Control, Four-handed Dental Treatment.
7. Macroscopic Anatomy of the Teeth, Guiding Planes and Nomenclature.
8. Preparation Techniques. Restorative Dentistry and Endodontics.
9. Preparation Techniques. Prosthodontics.
10. Operative Techniques. Oral Surgery.
11. Operative Techniques. Periodontology.
12. Operative Techniques. Paedodontics and Orthodontics.
13. Minimal Invasive and Micro Invasive Techniques in Dentistry.
14. Consultation.

### Recommended textbook:

Field, James: PreClinical Dental Skills at a Glance, Blackwell Publishers (Wiley) ISBN13: 9781118766675

## INTRODUCTION TO ODONTOTECHNOLOGY AND PROSTHODONTICS PRE-CLINICAL COURSE I-II.

### Department of Prosthodontics

Head of Department: **Prof. Dr. Péter Hermann**

**Lecturer: Dr. Ida Barbara Kispélyi**

Since the creation of an independent training, the Stomatological curriculum has put great emphasis on a preclinical foundation course, the Prosthodontics Propaedeutic course, the syllabus of which has also included mastery of dental techniques, indispensable for a dentist. Until the visit of the EU Committee in the late 90s, the course was structured in such a manner that in the first and second semester of the second academic year students had 3 hours of practices and one hour of lecture per week; during the first semester treatment of complete edentulousness was simulated through fabrication of complete dentures, while in the second semester students prepared 3-unit bridges and single crowns on partial edentulous 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:

3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> 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 pre-clinical course – lectures

### I. Semester

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1. History of Dental Technology and Dentistry
2. The establishment of the dental office, members of the dental team
3. The structure of the dental laboratory, the dental technician as the member of the dental team
4. Types of the prosthetic appliances
5. Types of casts, Casting as a kind of information transfer
6. Labside and chairside steps of making complete denture
7. Primary impression, primary cast
8. The occlusal rim, jaw registration
9. Fabrication of the trial denture, and the try in procedure
10. Fitting of dentures, Short time and long time recall procedures.
11. Partial edentulousness, and partial dentures (RPD)
12. Labside and chairside steps of making RPD
13. Fabrication of metal based removable partial denture / casted metal baseplate
14. Consultation

## Odontotechnology and Prosthodontics pre-clinical course – practice

### I Semester

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1. Lab introduction, course introduction
2. Upper and lower primary impression
3. Upper and lower primary cast
4. Outlining of the special tray, fabrication of lower and upper acrylic special tray
5. Fabrication of upper and lower acrylic special tray
6. Secondary impression, and fabrication of upper and lower occlusal rim
7. Fabrication of upper and lower occlusal rim
8. Jaw registration
9. Mounting of the artikulator
10. Fabrication of upper and lower trial denture
11. Fabrication of upper and lower trial denture
12. Fabrication of upper and lower trial denture
13. Processing dentures, Fitting of the dentures
14. Consultation

### II. Semester

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1. Course introduction, tooth preparation: 21,24,27
2. Tooth preparation: 21,24,27
3. Tooth preparation: 21,24,27
4. Upper two phase impression, lower antagonistic impression, jaw registration
5. Upper two phase impression, lower antagonistic impression, jaw registration
6. Antagonistic cast, master cast, mounting of the artikulator
7. Antagonistic cast, master cast, mounting of the artikulator

8. Wax pattern fabrication of an acrylic crown (21), wax pattern fabrication of a four unit bridge (porcelan and acrylic fused to metal)
9. Wax pattern fabrication of an acrylic crown (21), wax pattern fabrication of a four unit bridge (porcelan and acrylic fused to metal)
10. Wax pattern fabrication of an acrylic crown (21), wax pattern fabrication of a four unit bridge (porcelan and acrylic fused to metal)
11. Wax pattern fabrication of an acrylic crown (21), wax pattern fabrication of an fou unit bridge (porcelan and acrylic fused to metal)
12. Spruing, Investing
13. Spruing, Investing
14. Metal casting of the metal framework, veneering of the framework

## **ELECTIVE SUBJECT for Dentistry 2<sup>nd</sup> 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**

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#### **Weekly topics of the seminars:**

1. „We have never been modern?” – An initiation to critical approaches to evidence base in medicine – How to respond? - / - Discussion of the semester: Requirements and timescale.
2. Alternatives 1: Narratives and explanatory models – Confusions and the lay perspective
3. Alternatives 2: Complementary medicine – Competition at our doorstep
4. Alternatives 3: Healing and folk medicine – Wisdom or beliefs?
5. Alternatives 4: Biomedicine for anthropology, or the twist of perspectives
6. Challenges 1: Migrants, refugees and minorities
7. Challenges 2: Reproduction, sex, age, death and other trends in „western” medicalization
8. Challenges 3: Nutrition and taboos - biopower and social body
9. Challenges 4: Placebo, pharmaceuticals and the rule of pharmaceutical industry
10. Challenges 5: Public medicine, private medicine and the reproduction of inequities
11. Favourite themes 1: Alcohol, drug, and AIDS at crossroads of culture and law
12. Favourite themes 2: Shrinks and madness – CBS and the mirage of the normal
13. Fieldworks: Discussion 1.
14. Fieldworks: Discussion 2.  
Recapitulation, feedback and evaluation.

# LANGUAGE COURSE – Hungarian

## Language Communication Center

### Term 3 Hungarian Dental Terminology I

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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. Györfly: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Végh: *Egészségére!*

### Term 4 Hungarian Dental Terminology II

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Hungarian Dental Terminology II is a course for students who completed the course Hungarian Dental Terminology I.

Course objectives are to extend the range of basic knowledge and skills, as well as to apply creatively what has been learnt so far. Students focus on professional communication and learn expressions of dental documentation.

#### Topic

- Students will be introduced to further topics and grammar issues during the course to help professional communication with patients who students will see in the third year.
- Vocabulary: properties, comparisons, paediatrics, doctor's surgery, medical history, pain, disease, tooth extraction, etc.
- Grammar: comparative, prepositions, spatial relationships, date indication, imperative and genitive
- The course consists of 56 hours (4 hours per week). Students receive 4 credit points for the course.
- Evaluation is based on two written tests and active participation in classes.
- A written and oral examination is taken at the end of the 4th term.

### Textbooks

M. Györfy: *Mi a panasz?*

R. Halász: *Anamnézis magyarul*

Á. Silló: *Szituációk*

A. Marthy – Á. Vég: *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, 1<sup>st</sup> 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: August 29– September 2, 2016

Precondition: There isn't.

#### 1. **Introduction, technical details introduction of Central Library's Homepage: [www.lib.sote.hu](http://www.lib.sote.hu) and its facilities**

Literary research

Introduction: homepage of central library

Training: researching, keywords

– Basic computer knowledge for literature search

#### 2. **PubMed database**

The meaning of PubMed

Introduction of PubMed

National Library Medicine-Medline and thesaurus

Entrez databases

MESH and PubMed Searching

#### 3. **Periodicals, Scientometry: Impact factor (JCR)**

– Training: Browser and matching searching, archive and the newest editions

– Characterization of periodicals/reviews/journals, ISSN, DOI

Electronical edition (Science Direct, Springer, LWW, Biomed Central, InterScience, Nature Publishing Group)

**Impact factor (JCR)**

Fundamentals of science

ISI- JCR Science Edition and Social Science Edition, IF:

**calculating Impact factor** and its role by measuring scientific publications

List of Journals with IF: **Journal Citation Report** and its editions.

**Searching an exact data in JCR**, handling data: sorting and filtering journals

4. **Searching International Library/Book/Periodical catalogues**

Hungarian electronical catalogues

Semmelweis Univ. Central Library (Budapest) <http://www.lib.sote.hu>

National Library of Medicine (Bethesda, USA)

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=nlmcatalog>

Deutsche Zentralbibliothek für Medizin (Germany) <http://www.zbmed.de>

Karolinska Institute (Sweden) <http://search.kib.ki.se/miks/bin2/>

Worldcat <http://www.worldcat.org/>

Amazon [www.amazon.com](http://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<sup>nd</sup> year**

# PRE-CLINICAL MODULE



*Faculty of Dentistry  
3<sup>rd</sup> year*

## STUDY PROGRAMME

### PRE-CLINICAL MODULE

5th semester				
subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics, Pre-clinical II.	C4L1P3	final#	Anatomy (Maxillofacial Anatomy) IV.
				Conservative Dentistry and Endodontics, Pre-clinical I. General Dental Preclinical Practice
compulsory	General and Oral Microbiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	General and Oral Pathophysiology	C4L2P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Basic Immunology	C3L2P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology III.	C2L0P4	practice mark	Hungarian Medical Terminology II.
compulsory	Oral and Maxillofacial Surgery, Pre-clinical course	C2L0P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Pathology	C5L3P2	final#	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Preventive Dentistry I.	C3L1P2	practice mark	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III.
				Medical and Dental Physiology II.
compulsory	Odontotechnology and Prosthodontics Preclinical Course III.	C3L0P3	final#	Odontotechnology and Prosthodontics Preclinical Course II. General Dental Preclinical Practice
compulsory	The Medical Basis of Disaster Management I.	C0L2 hours/sem	signature	
	<b>Total Credit</b>	<b>30</b>		

Explanation

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

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)



## PRE-CLINICAL MODUE

## 6th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics I.	C4L1P3	practice mark	Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Internal Medicine I.	C3L2P2	practice mark	General and Oral Pathophysiology, Pathology
compulsory	Oral and Maxillofacial Surgery I.	C4L1P3	practice mark	Oral and Maxillofacial Surgery, Pre-clinical course, Pathology
compulsory	Oral Biology	C5L3P2	final#	General and Oral Pathophysiology General and Oral Microbiology , Anatomy (Maxillofacial Anatomy) IV.
compulsory	Genetics and Genomics	C2L2P1	final#	Biochemistry, Molecular and Cellbiology III., Medical and Dental Physiology II.
compulsory	Oral Pathology	C4L2P2	final#	Pathology, General and Oral Microbiology, General and Oral Pathophysiology
compulsory	Preventive Dentistry II.	C1L1P0	final#	Preventive Dentistry I., Conservative Dentistry and Endodontics, Pre-clinical Course II., Odontotechnology and Prosthodontics Preclinical Course III
compulsory	Prosthodontics I.	C4L1P3	practice mark	Odontotechnology and Prosthodontics Preclinical Course III. , Conservative Dentistry and Endodontics, Pre-clinical II.
compulsory	Radiation protection	C2L1.5P1	semifinal	Anatomy (Maxillofacial Anatomy) IV., Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Hungarian Dental Terminology IV.	C2L0P4	final	Hungarian Dental Terminology III.
compulsory	Oral Diagnostics I.	C2L1P1	semifinal	Pathology, General and Oral Pathophysiology
compulsory	The Medical Basis of Disaster Management II.	C0L2 hours/sem	signature	
compulsory	Dento-Alveolar practice (summer, minimum 1 week)	C0L0P30	signature	prerequisite of registering to the 7th semester
	<b>Total Credit</b>	<b>33</b>		

# The grade influences the qualification of the diploma  
 C = Credit point  
 L = Lecture (hours/week)  
 P = Practice (hours/week)

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

- 1 McCracken's Removable Partial Prosthodontics (10/e) Glen P.McGivney-Alan B.Carr. Hardback Mosby, 1999. ISBN 0323006787
- 2 Schillenburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 3<sup>rd</sup> ed. 1997. ISBN 93 13 86 500
- 3 Craig,R.G.: Restorative dental material. Mosby, 10<sup>th</sup> ed.
- 4 R.M.Basker-J.C.Davenport: Prosthetic Treatment of the Edentulous Patient. 5<sup>th</sup> ed. McMillan Press Ltd. ISBN 978-1405192613
- 5 Neil-Nairne: Complete Denture Prosthetics. Wright. ISBN 72 36 20 636
- 6 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8
- 7 C.M.Sturdevant: Operative Dentistry. Mosby. ISBN 0-80166366-0
- 8 A.Newbrun: Cariology Quintessence. ISBN 0-867152052
- 9 Walton, Torabinejad: Principles and Practice of Endodontics. W.B. Saunders Co. 2<sup>nd</sup> ed. 1996. ISBN 0-7216-4924-6
- 10 Primary Preventive Dentistry. Ed.by:Norman O.Harris, F.Garcia-Godoy. 5<sup>th</sup> ed. Appleton and Lange, Stamford. 1999. ISBN 0-8385-8129-3
- 11 Samaranyake et al.: Essential Microbiology for Dentistry. Edinburgh, Churchill Livingstone. ISBN: 0443049890
- 12 Sibernagl S.-Lang F.: Color Atlas of Pathophysiology. Thieme, Stuttgart, 2000. ISBN 0-86577-866-3(TNY) ISBN 3-13-116551-0 (GTV)
- 13 Ferguson D.B.:Oral Bioscience. Churchill Livingstone, 1999. (Harcourt Publ.Ltd.) ISBN 0-443-05373-1
- 14 Heckner F: Practical Microscopic Hematology. 4<sup>th</sup> ed. Williams and Wilkins Trada Bldh. 1993. ISBN 0-8121-1711-5
- 15 Robbins: Basic Pathology, 2008. V. Kumar, A. K. Abbas, N. Fausto, R. Mitchell Saunders; 8 edition
- 16 Szende B.-Suba Zs: Introduction to histopathology. Bp. Medicina. 1999.
- 17 Szabó Gy: Oral and Maxillofacial Surgery. Bp. Semmelweis Publ. 2001.
- 18 Koesner K.R.:Manual of Minor Oral Surgery for the General Dentist. Blackwell Munsgaard, 2006.
- 19 Worthington-Lang-LaVelle: Osseointegration in Dentistry. An Introduction. Quintessence, Chicago, 1994.
- 20 Sethi, A.-Kaus, Th: Practical implant dentistry. Quintessence, London. 2005.
- 21 Andreoli,T.E.-Bennett,J.C.-Carpenter,C.C.J.-Plum,F.: Cecil Essentials of Medicine. 4<sup>th</sup> ed. W.B. Saunders Co. 2000.
- 22 Textbook: Falus A. Immunology, Semmelweis PH, 2001.
- 23 Medical Genetics and Genomics (e-book)

**Recommended textbooks:**

- 1 Nikiforuk: Understanding Dental Caries.(1-2) Karger.
- 2 Murray, J.J.: The Prevention of Oral Disease. 3<sup>rd</sup> ed. Oxford Univ. Press 1996. ISBN 0 19 2624563 (Hbk) ISBN 0 19 2624571 (Pbk)
- 3 Fluoride in Dentistry. 2<sup>nd</sup> Ed.: Fejerskov,O.-Ekstrand,J.-Burt,B.A. Munksgaard, 1996. ISBN 87-16-11282-2
- 4 Preventív fogászat. Szerk. Bánóczy J.-Nyárasdy I. Bp. Medicina. 1999. ISBN 963-242-003-9
- 5 Pathophysiology and Disease. An Introduction to Clinical Medicine. Lange Medical Book. Prentice-Hall International Inc. ISBN 0-8385-8095-5
- 6 Jansen van Rensburg B.G: Oral Biology. Quintessence Publishing Co. Inc. 1995. ISBN 0-86715-271-0
- 7 Goldschlager N.:Principles of Clinical Electrocardiography. 3<sup>rd</sup> ed. Appleton and Lange, 1989. ISBN 0-8385-7951-5
- 8 Marsh, Ph.-Martin, M.V: Oral Microbiology. Oxford, Wright. ISBN: 0723610517
- 9 D.Tóth F: Microbiology for Dentistry. Vol.I-II. University of Debrecen, 2002.
- 10 E.C.Combe: Notes on dental materials. Univ.Manchester, 1986.
- 11 J.F.McCabe: Applied dental materials. Univ. Newcastle, 1990.
- 12 Howe: A Minor Oral Surgery. Wright. 1987. ISBN 723608237.
- 13 Howe: The Extraction of Teeth. Wright. 1990. ISBN 723622310.
- 14 Seward et al.: An Outline of Oral Surgery. Wright. 1998. ISBN 0-7236-0735-4 és -0407-x
- 15 Peterson: Contemporary Oral and Maxillofacial Surgery. Mosby, 2003.
- 16 Peterson: Principles of Oral and Maxillofacial Surgery. Decker, 2004.
- 17 Robinson, Howe: Tooth Extraction. A Practical Guide. Oxford, 2000.
- 18 Harrison's Principles of Internal Medicine, Petersdorf, Adams, Braunwald, Isselbacher, Martin, Wilson, McGraw-Hill Book Company. 15<sup>th</sup> ed.

# GENERAL AND ORAL PATHOPHYSIOLOGY

## Department of Oral Biology

Lecturer: **Prof. Dr. Gábor Varga**

Tutor: **Dr. Kristóf Káddár M.D.**

## First Semester

Lectures (2 hours per week)	Practices (2 hours per week)
Pathophysiology of gastric disorders. GERD. Peptic - and duodenal ulcer. Intestinal digestion and absorption. Diseases and regulation of exocrine pancreas. Acute and chronic pancreatitis	Gastric function
Pathophysiology of liver. Processes leading to the lysis of liver cells. Viral hepatitis Development of jaundice. Fatty liver. Pathophysiology of cirrhosis Cardiac insufficiency. Forward and backward heart failure. Cardiomyopathies. Hypo- and hyperventillation. Obstructive and restrictive respiratory disorders. Emphysema. Respiratory insufficiency	Liver
Shock. Circulatory failure in shock. Various mediators in shock. Depressed functions in various tissue in shock.	ECG-1 (Rhythm, frequency, axis, development of various waves on the normal ECG)
Regulation of blood pressure in hypertension. Risk factors and definitions in hypertension. Processes leading to elevation in blood volume and total peripheral resistancy. Consequences of hypertension	ECG-2 (Defects of excitation. ES)
Defects in water intake. Hypovolemia, exsiccosis. Hyperhydrosis. Changes in sodium intake: hypo- and hyper natremia	ECG-3 (Defects in conductance, blocks.)
Pathophysiology of kidney functions. Acute renal failure. Chronic renal failure. Uremia syndrome. Nephrosis.	ECG-4 (Defects of repolarisation. Myo- cardiac infarction)
Protein metabolism. Development of hypoproteinemia. Low protein and amino acid intake and absorption. Complete and incomplete proteins Kwashiorkor and marasmus. Energy balance. Low and high energy intake. Regulation of metabolic rate. Anorexia nervosa. Various types of obesities. Control of appetite and energy balance.	ECG-5 (Hypertrophy, hypokalemia) Midterm exam
Lipid metabolism. Absorption and metabolism of lipids. Regulatory and endocrine effect of WAT.	Urine analysis, renal function tests
Atherosclerosis. Risk factors and epidemiological aspects. Various theories for the development of atherosclerosis (lipid theory, connective tissue theory, immune theory, thrombogene theory, response to injury etc)	Proteins, malnutrition astric function
Endocrin disorders. Regulation of hormone activities: hypothalamus hormones. Hormone receptor sin the brain. Pituitary- hormones. Panhypopituitarisnm. Changes in the release and activity of thyroid hormones and glucocorticoids. Short and long feed backs	Salt and water metabolism
Impaired carbohydrate metabolism. Hypo- and Hyperglycemic states. Etiology and pathogenesis of primary and secondary diabetes.	Lipid metabolism. Atherosclerosis
Acute and chronic complications and oral side of diabetes. (Oral manifestations in diabetes.)	Diabetes
Pain sensation: central and oral mechanisms.	Clinico-chemical assays for endocrine disorders
Pathophysiology of malignancies.	Molecular laboratory diagnostic
Acid-base regulation. Respiratory acidosis and alkalosis. Metabolic acidosis, alkalosis. Mechanisms in compensation.	Acid base analysis

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

# PATHOLOGY

## 1<sup>st</sup> Department of Pathology

Course director and tutor: **Dr. Attila Zalatnai**

### First Semester

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#### Lectures

(3 hours per week)

#### Lecture

Introduction. Historical backgrounds.

Cell and tissue injury. Adaptive responses. Necrosis.

Acute inflammation. Vascular and cellular events.

Acute inflammation Morphological patterns.

Chronic inflammation.

Extracellular matrix. Repair. Wound healing.

Immunopathology. Cellular components. Immunologically mediate tissue injury.

Transplantation. Immunodeficiency. Autoimmune diseases.

Neoplasia. Classification. Histological diagnosis. Invasion and metastasis.

Growth patterns.

Carcinogenesis.

Epidemiology of malignancies. Preblastomatosis. Screening.

Tumor therapy. Tumor immunology.

Benign and malignant tumors of epithelial and mesenchymal origin.

Developmental and genetic diseases.

Environmental and nutritional pathology

Hemodynamic diseases. Water and electrolyte disturbances.

Edema. Shock.

Hyperaemia. Haemorrhage. Thrombosis.

Embolism. Infarct.

Infectious and parasitic diseases. Viral and bacterial diseases.

Tuberculosis. Syphilis. Leprosy. Diseases caused by fungi, nematodes, cestodes.

Blood vessels. Atherosclerosis. Hypertension. Inflammatory diseases.

Aneurysms. Tumors.

Heart diseases. Congenital, ischemic, hypertensive heart diseases.

Rheumatic heart disease. Inflammatory diseases. Cardiomyopathy.

Respiratory system. Pathology of larynx and trachea. Lung cancer.

Lesions affecting lung parenchyma.

Bronchitis. Asthma. Emphysema. Pneumoconiosis. Diseases of the pleura.

Gastrointestinal tract. Esophagus. Stomach.

Small and large intestine. Peritoneum.

Liver and biliary system. Mechanism of jaundice. Hepatic failure.

Acute and chronic hepatitis.

Liver cirrhosis. Toxic injury. Tumors

Kidney. Non-inflammatory lesions. Inflammatory glomerular lesions.

Tubulointerstitial diseases. Renal diseases associated with systemic conditions. Vascular diseases. Tumors.

Urinary tract and male reproductive system

Gynecologic pathology. Vulva. Cervix. Body of uterus and endometrium.

Fallopian tube. Ovary. Placenta and neonatal pathology.

Gestational throphoblastic disease.

#### Practices

(2 hours per week)

#### Laboratory

AUTOPSY

Schemical meditors.

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

AUTOPSY

AUTOPSY

HISTOLOGY

Consultation.

AUTOPSY

AUTOPSY

Pathology of the breast.	AUTOPSY
Blood and lymphoid organs. Benign and malignant disorders of lymphoid cells. Hodgkin's disease. Disorders of the spleen.	AUTOPSY
Disorders of the mononuclear phagocyte system. Acute and chronic myeloproliferative syndromes.	AUTOPSY
Endocrine system.	AUTOPSY
Gallbladder and extrahepatic bile ducts. Pancreas. Diabetes.	HISTOLOGY
Head and neck pathology.	AUTOPSY
Bones and joints, skeletal muscles.	AUTOPSY
Pediatric oncology.	HISTOLOGY
Nervous system. Trauma. Circulatory and inflammatory diseases.	AUTOPSY
Demyelinating and metabolic diseases.	
Tumors of the nervous system. Peripheral nervous system.	AUTOPSY
Pathology of the skin.	AUTOPSY
Clinicopathological conference	HISTOLOGY

## EXAMINATION (FINAL)

The semifinal examination at the end of the first semester will be a written test. Three different times for the test writing can be chosen. Students are requested to announce the time they have chosen to the tutor of the 1st Institute of Pathology and Experimental Cancer Research until mid – December. Students who have failed the exam on one occasion can retake the exam on the next test-writing day, at least one week from the first trial.

**Note:** Lectures will be held in the lecture hall of the 1st Institute of Pathology and Experimental Cancer Research.

Autopsy and Histopathology practices will be held in the 1st Institute of Pathology and Experimental Cancer Research. During the histopathology exercises 100 slides will be studied. The list of slides will be available at the beginning of the semester.

The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester two midterm examinations should be passed.

## ORAL PATHOLOGY

**1<sup>st</sup> Department of Oral, Dental and Maxillofacial Surgery**

Lecturer: **Dr. Attila Zalatnai**

### Second Semester

**Lectures** (2 hours/week) **Practices** (2 hours/week)

Developmental disturbances in number of teeth. Developmental disturbances in shape and size of teeth.

Developmental disturbances in structure of the teeth.

Growth disturbances of teeth. Premature eruption, delayed eruption.

Disturbances of situation of the teeth. Impacted and embedded teeth. Lobodontia.

Developmental disturbances of the jaws and the temporomandibular joint.

Developmental anomalies of the face and soft oral tissue.

Developmental disturbances of the salivary glands. Etiology of malformations.  
Discoloration of the teeth. Dental plaque. Dental calculus.  
Dental caries. Etiology and epidemiology. Contributing factors in dental caries.  
Clinical aspects of dental caries. Histopathology of dental caries.  
Microbiology and immunobiology of caries. Attrition. Abrasion. Erosion.  
Hypercementosis. Resorption of the teeth.  
Diseases of the pulp. Periapical lesions.  
Periodontal diseases Implantation. Reimplantation. Transplantation.  
Homoiotransplantation.  
Inflammation of the oral mucosa and tongue. Halitosis (Stink of the mouth.)  
Cysts of jaws.  
Cysts of the oral floor, neck and salivary glands.  
Focal infection. Diseases of the jaws.  
Physical, heat, chemical and electrical injuries of oral and paraoral structures.  
Diseases of microbial origin of oral and paraoral structures.  
Diseases of the blood and blood forming organs.  
Injury from inorganic chemicals and disturbances of metabolism of oral and paraoral structures.  
Avitaminosis. Mucocutaneous disorders.  
Diseases of accessory nasal sinus. Diseases of the temporomandibular joint.  
Diseases of the nerves and muscles, facial hemihyperplasia and hemihypoplasia.  
Premalignant lesions  
Benign oral epithelial tumors. Benign oral mesenchymal tumors.  
Odontogenic tumors. Benign tumors of the jaws.  
Malignant tumors of epithelial origin.  
Malignant tumors of mesenchymal origin.  
Malignant lymphomas.  
Malignant odontogenic and non-odontogenic tumors of the jaws.  
Metastatic tumors of the jaws. Biopsy technique. Healing of oral wounds.  
Staging and grading of oral tumors. Spread of oral and paraoral tumors.  
Regional and general metastases of oral and paraoral tumors.  
Etiology of paraoral tumors.  
Diseases of oral and paraoral lymphoid tissue. Joining of diseases.  
Diseases of salivary glands.  
Benign tumors of salivary glands.  
Malignant tumors of salivary glands.  
Oral and paraoral syndromes.  
General manifestations of oral diseases.  
Forensic oral pathology.

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

# GENERAL AND ORAL MICROBIOLOGY

## Department of Medical Microbiology

Program Director: **Dr. Dóra Szabó**

Tutor: **Dr. Ágoston Ghidán**

## First Semester

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

## 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

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

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

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Phantom-course (Pre-clinical laboratory course)

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

Amalgam and tooth color restorations (indications and

contraindications, mixing amalgam, mercury hygien, silicate cement, acrylic resin, composite resin).

Amalgam restorations (indications; contraindications; inserting cement bases; mixing amalgam; mercury hygiene, finishing and polishing restauration).

Tooth-colored restorations (acrilic 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, glazing the restoration).

The rubber dam.

Direct gold restauration (inlay).

Indirect inlay-onlay restauration.

The dental pulp. Diagnosis of pulpal damage.

Endodontic morphology and access cavities.

Introduction; moderm endodontics; scope of endodontics. General and systemic aspects of endodontics (the differential diagnosis of dental pain, examination, systemic disease and endodontics; endodontics and infective endocarditis).

Basic instrumentation in endodontics.

Conventional root canal therapy: preparation of the root canal system.

Conventional root canal therapy: medicaton.

Conventional root canal therapy: root filling.

Surgical endodontics.

Preparation for restoration of the endodontically treated tooth the pinledge restoration; onlay restoration; veneers techniques; crowns.

#### **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 restaurations. 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

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

(3 hours/week)

Rules of clinical practice. Registrations of case history

and dental status. Clinical diagnostics of dental caries

Treatment of the patients in lying position "four-handed" method

Morphology, histology and physiology of dental pulp

Treatment plan      Clinical practice

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

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)

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

Practices (2 hours/week)

Seminar or clinical practice

# PREVENTIVE DENTISTRY II.

## Second Semester

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Lectures 1 (hour/week)

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

# PROSTHODONTICS I.

## Second Semester

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The reasons and the consequences of the tooth loss. Complaints, medical history, extra-oral and intra-oral examination, treatment plans, and prognosis at edentulous 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:

3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> Semester

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module I:

General Dental Material Science

Preliminary studies requested for the course of Odontotechnology and Prosthodontics preclinical course module II:

Odontotechnology and Prosthodontics preclinical course module I

Preliminary studies requested for the course of Odontotechnology and Prosthodontics Preclinical course module III:

Odontotechnology and Prosthodontics Preclinical course module II

# ODONTOTEHCNOLOGY AND PROSTHODONTICS PRECLINICAL COURSE –practices

## First Semester

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1. Course introduction
2. Impression taking methods for RPDs
3. Mastercast
4. Working cast
5. Wax pattern fabrication for metal based removable partial denture
6. Wax pattern fabrication for metal based removable partial denture
7. Wax pattern fabrication for metal based removable partial denture
8. Impression taking with the open tray method for single tooth implant replacement
9. Impression taking with the open tray method for single tooth implant replacement
10. Impression taking with the open tray method for single tooth implant replacement
11. Casting of the impression with the technical analog
12. Casting of the impression with the technical analog
13. Practical final exam
14. Consultation

## INTERNAL MEDICINE I.

### 2<sup>nd</sup> Department of Internal Medicine

Tutor: *Dr. Gábor Békési*

## Second Semester

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### **Lectures**(2 hours per week)

Introduction to internal medicine.  
History taking.  
Physical examination

Respiratory diseases. Physical examination and respiratory diagnostic procedures. Bronchitis. Pneumonias. Syndromes of the respiratory system.

Bronchiectasis. Lung abscess. Pulmonary embolism. Chronic aspecific respiratory disorders. Tumors of the lung.

Disorders of the cardiovascular system. Physical examination. Examination of the peripheral blood vessels. Coronary heart disease. Acute myocardial infarction. Acute heart failure. Shock.

### **Practices** (2 hours per week)

The bases of the diagnostic procedures in the internal medicine  
(The exact preparation of the patient's case history, the methods of physical examination of the patients)

The medical examination of the heart and lung (percussion, auscultation)

The investigation of the peripheral arterial pulse rata and blood pressure

Practicing injection technique

Chronic heart failure.

The physical examination of the abdominal organs

Rheumatic fever. Valvular heart disorders.  
Infective endocarditis. Disorders of the pericardium.  
Cor pulmonale.

The medical considerations of dentistry and dental considerations of internal medicine

Cardiac arrhythmias. Conduction disturbances.  
Hypertension.

Consultation

Atherosclerosis. Thromboangiitis obliterans.  
Raynaud's phenomenon.

Headache. Dental relation of the heart diseases

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

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**Practices** (2 hours per week)

Oral surgery as a part of general surgery  
The surgical anatomy of the teeth  
The splanchnocranium. The Maxillary Nerve  
The mandible, the Mandibular Nerve  
The injection (instrumentation, rules, techniques)  
Midterm (written)  
Surgical hygiene. The principle of antisepsis and asepsis  
The operation theater  
Oral surgical instrumentation  
The removal of teeth/ practice on phantom  
The removal of teeth/ practice on phantom  
The removal of teeth/ practice on phantom  
The removal of teeth/ practice on phantom  
Semester closing midterm (oral + practical)  
Practicing, repetition



# ORAL AND MAXILLOFACIAL SURGERY I.

## Second Semester

### Lectures (1 hour per week)

The history of oral surgery  
 Clinical examination and diagnostics  
 Pain control. The physiologic and psychologic aspects of pain  
 The mode of action of local anaesthetics.  
 The pharmacological properties of local anaesthetic drugs  
 The technique of local anaesthesia Part I. (anaesthesia of teeth)  
 The technique of local anaesthesia Part II. (Matas, block of n. alv. sup. ant., anaesthesia of the tongue, the lip, the bucca)  
 The technique of local anaesthesia Part III. (Inflamed tissues, trismus)  
 Summerising clinical implications /video/  
 Complications of local anaesthesia.  
 Conscious sedation in dentistry  
 Indication and contraindication of tooth removal  
 Operation technique of dentoalveolar surgery Part I. (surg. tools, flaps, suturing)

Operation technique of dentoalveolar surgery Part II. (complications of tooth removal, surgical root removal) (video)  
 Problems with the eruption of teeth.  
 The removal of the impacted teeth  
 Guest speaker  
 Midterm exam  
 Consultation

### Practices (3 hours per week)

Surgical anatomy of the jaws and teeth  
 Local anesthesia  
 Oral and maxillofacial surgical instruments  
 Clinical diagnosis, medical examination of the patients

Midterm demonstration

Practicing simple tooth extraction

Practicing simple tooth extraction

Practicing tooth extraction

Minor oral surgery

Minor oral surgery

Midterm Demonstration

Minor oral surgery  
 Minor oral surgery  
 Midterm Demonstration

**Note:** Lectures will be held in the lecture hall of the Department of Maxillofacial Surgery and Dentistry. The maximum number of absences in a semester is 3. More than 3 absences invalidate the semester. During the semester three midterm examinations should be passed.  
 Practical course grade (five-scale).

# ORAL BIOLOGY

Lecturer: **Prof. Dr. Gábor Varga**

Tutor: **Dr. Beáta Kerémi D.M.D.**

## Second Semester

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### **Lectures** (3 hours per week)

The oral mineralized tissues –  
Amelogenesis-dentinogenesis – cementogenesis

dentin and cementum. Microanatomy 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-rem mineralization-phenomena – The inorganic and organic composition of teeth – Role of fluoride and carbonate in calcium and dental tissue phosphate solubility demineralization -rem mineralization-phenomena

Abnormal development and mineralization of enamel, dentin and cementum – Pulpal mineralization and dentin-pulp phenomena; dentin permeability – Nutrition and hormonal influences on the oral mineralized tissues

The salivary glands and saliva – Ultrastructure and innervation

– The physiology of salivary gland secretion

acute leukemias Plasma cell dyscrasias  
Neurological and pharmacological control of salivary gland secretion – Chemical composition and physical properties of saliva – Influences of saliva on oral tissues.

Nutritional and hormonal influences on salivary gland function and saliva composition. – Immune and non-immune defense mechanisms – Salivary secretion of drugs – S. gland regeneration 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 – Neuro-physiology of mastication – Kinesiology

### **Practices** (2 hours per week)

Hematology I.  
Cellular components of the whole blood  
The function of the individual cells.  
Normal blood cell values  
Cellular elements of the bone marrow  
Methods for examining the peripheral blood smear and the bone marrow.  
Hematology II.  
Immature cellular forms  
The red and white blood cell series

Hematology III.  
White blood cell disorders  
Disorders related to segmented cells.  
Disorders related to mononuclear cells

Hematology IV. Malignant white cell disorders  
Part I. Classification of leukemias. Acute leukemias Cytochemical differentiation of

Hematology V.  
Malignant white cell disorders. Part II.  
Chronic leukemias. The importance of oral symptoms in the early diagnosis of leukemias

Hematology VI.  
Abnormalities of red blood cell production.  
Classification of anemias.  
Aplastic, iron deficiency, Abnormalities of red blood cell production. Platelet disorders  
Folate- and Vit. B12-deficiency anemia  
Polycythemia, erythrocytosis.

Midterm exam of hematology

and electromyography of oral musculature –  
Phenomenon of deglutition – Microcirculation and innervation of the tongue – Role of the tongue in speech and other oral phenomena. Physiology of olfaction – Food consistency and its effects on oral phenomena

The oral mucosa and periodontium – Ultrastructure of oral mucosa – epithelial cell and oral mucosa metabolism – Epithelial cell adhesion and aggregation Bacterial tooth and epithelial interaction. Transmucosal absorption. – The physiology and composition of sulcular fluid. – Microcirculation of the gingiva and periodontium – The biochemistry of the structure proteins of the periodontium – Ultrastructure of alveolar and associated bone – Physiology of bone remodeling, mechanical effects on bone – Physiology of bone remodeling, mechanical effects on bone Eruption and resorption – Oral immunological mechanism – Nutritional and hormonal influences on the oral mucosa and periodontium  
Plaque associated diseases – Structures adhering 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

The biological effects of ionizing radiation – The sources of ionizing radiation in the environment – General and specific effects: cell and genedamages – Radiation diseases and its consequences – Oral symptoms of therapeutic irradiations and the management of head and neck irradiated patients

Determination of salivary flow rate and collection of samples for analysis

Measurement of fluoride concentration

Oral clearance measurements  
Oral cytology

Analyses of oral hard tissues

Measurement of plaque and salivary pH

**Note:** A final exam will be organized at the end of the semester. During the semester one midterm examination (hematology) should be passed. The mark of that will also be considered when establishing the mark of the final. During the final examination there are the following requirements:

- 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

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**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

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Week Lecture (1 hour/week) Practice (1 hour/week)

1. Introduction to Oral Diagnostics. Importance and rules of dental diagnostics and document .
2. Dental anamnesis. Difficulties of the general health status assessment. Indication and contraindication of dental treatment relating to the general health status. Risk patients.
3. Examination of oral mucosa. Stomato-oncological screening.
4. Oral diseases in general practice.
5. The diagnostics of disorders of TMJ, upper and lower jaws and dentures. Planning of the treatment.
6. Fábíán and Fejérdy Classification of partially edentulous arches.
7. Orthodontic Diagnostics and treatment plan.
8. Diagnostics of the caries. Methods and instruments. Dental disorders with non-caries origin.
9. Endodontic Diagnostics and emergency interventions
10. Examination methods of parodontium and oral hygiene. Influence of the results on the treatment plan. Examinations of oral hygiene, dental status and parodontium within screenings. Indices.
11. Diagnostics of the salivary glands and their function. Diagnostic procedures of halitosis.
12. Role of diagnostics in Esthetic Dentistry. Optical and formal characteristics of the teeth. Diagnostics and rehabilitation with the harmony of dentures and the face.
13. Diagnostic failures in general praxis.
14. Early diagnosis and preventive approach

### Rules of practices

Activity of the students:

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

Written theoretical evaluation will be organized in one of the practices in this semester.

**SEMMELWEIS UNIVERSITY / FACULTY OF DENTISTRY Faculty of Dentistry Exam:**

Practical hours should be visited during 2 days. The time of practices is between 8.00 a.m – 1.00 p.m. Semifinal exam will be organized at the end of third year, second semester.

Minimal expectations: reaching the minimum level of the written theoretical evaluation (mark 2) presentation of three written case-demonstrations reaching the minimum quality level (mark 2) Non-performance of the minimal expectations invalidate the semester!

**Textbook:**

1. Bricker, Langlais, Miller: Oral Diagnosis, Oral Medicine and Treatment Planning (second edition) 2 BC Decker Inc Hamilton London 2002.

**Recommended books:**

- 1 Bengel, Veltman, Loevy, Taschini: Differential Diagnosis of Diseases of the Oral Mucosa Quintessence Publishing Co. Inc. Chicago, Illinois 1989
- 2 Manfred Strassburg/Gerdts Knolle : Diseases of the Oral Mucosa A Color Atlas (Second Edition) Quintessence Publishing Co. Inc. Carol Stream Illinois 1994 3 "hand-outs" will be prepared and presented for the students by the lecturers

## GENETICS AND GENOMICS

**Department of Genetics, Cell- and Immunobiology**

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

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

**Subject code: FOKGEN181\_1A**

**Prerequisite subject: Medical Biochemistry, Molecular and Cell Biology III., Medical and Dental Physiology II**

**Credit:2**

**Lectures (2 hours per week):**

1. Introduction to human genetics, the human genome
2. 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 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

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#### 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:

**5<sup>th</sup> 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.

**6<sup>th</sup> 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 1<sup>st</sup> semester of the following year.

**The method of certificate for the workshops and the exam absences:**

Certificate of absence: medical, official – court of justice, local government, Students' Union, etc.

**The mid-term controls' (reports, midterm) number, topic and date, replacements and repairs:**

Method of making up for the absence justified by certificate: participation in a supplementary lesson.

**Requirements for the signature:**

Students must participate in the lesson announced to acquire signature, or in case of absence justified by certificate, in a supplementary lesson. Only registered students may participate in a supplementary lesson announced.

**The method of grading:** signature

**Type of examination:** none

**Requirements:** none, students must fulfill the obligation to attend the lessons.

**Application for exam:** none

**Changing procedure for exam application:** none

**Absence from the examination:** none

**Notes, textbooks, study aids and literature list:** to be issued later

## LANGUAGE COURSE – Hungarian

### Language Communication Center

### Term 5 Hungarian Dental Terminology III

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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.*



## 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!**

## NOTE

# CLINICAL MODULE



*Faculty of Dentistry  
4<sup>th</sup> year*

**STUDY PROGRAMME****CLINICAL MODULE**

<b>7th semester</b>				
<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	General and Dental Radiology	C4L2P2	final#	Radiation protection Pathology, General and Oral Microbiology
compulsory	Conservative Dentistry and Endodontics II.	C4L1P3	practice mark	Conservative Dentistry and Endodontics I., Prosthodontics I.
compulsory	Internal Medicine II.	C3L2P1	semifinal	Internal Medicine I., Genetics and Genomics
compulsory	Oral and Maxillofacial Surgery II.	C4L1P3	practice mark	Oral and Maxillofacial Surgery I., Oral Pathology Radiation protection
compulsory	Periodontology I.	C2L2P0	semifinal	Oral Biology, Pathology, Oral Pathology
compulsory	Pharmacology, Toxicology I.	C2L1P1	semifinal	Pathology, Biochemistry, Molecular and Cellbiology III. Medical and Dental Physiology II.
compulsory	Prosthodontics II.	C7L1P6	semifinal	Prosthodontics I., Conservative Dentistry and Endodontics I.
compulsory	Orthodontics Pre-Clinical	C1L0P1	practice mark	Oral Biology, Pathology, Oral Pathology
obligatory elective	Neurology	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Psychiatry	C1L1P0	semifinal	Internal Medicine I.
obligatory elective	Dental Ethics	C2L2P0	semifinal	Pathology
compulsory	Gnathology	C3L1P2	final#	Prosthodontics I. Conservative Dentistry and Endodontics I.
obligatory elective	Public Health	C3L1,5P2	final#	General and Oral Microbiology
compulsory	Community Dentistry I.	C0L0P1	signature	Oral Pathology
obligatory elective	Pediatrics	C1L1P0.5	semifinal	Internal Medicine I., Pathology
	<b>Total Credit</b>	<b>38</b>		

## CLINICAL MODULE

## 8th semester

subjects code	subjects	credit code	examination	prerequisites
compulsory	Conservative Dentistry and Endodontics III.	C4L1P3	practice mark	Conservative Dentistry and Endodontics II., Prosthodontics II.
compulsory	Internal Medicine III.	C1L1P0	final#	Internal Medicine II.
compulsory	Oral and Maxillofacial Surgery III.	C4L1P3	semifinal	Oral and Maxillofacial Surgery II. Pharmacology, Toxicology I.
compulsory	Periodontology II.	C4L1P3	semifinal	Periodontology I., Internal Medicine II.
compulsory	Pharmacology, Toxicology II.	C3L2P2	final#	Pharmacology, Toxicology I.
compulsory	Prosthodontics III.	C4L1P3	practice mark	Prosthodontics II., Conservative Dentistry and Endodontics II.
obligatory elective	Surgery	C3L2P1	final#	Internal Medicine I., Pathology
compulsory	Implantology I.	C1L1P0	semifinal	Oral and Maxillofacial Surgery II. Periodontology I.
compulsory	Community Dentistry II.	C0L1P,5	signature	Community Dentistry I.
obligatory elective	Ophthalmology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
obligatory elective	Otorhinolaryngology	C1L1P0.5	final#	Pathology, Anatomy (Maxillofacial Anatomy) IV.
compulsory	General Dentistry practice (summer, 4 weeks)	C0L0P30	signature	prerequisite of registering to the 9th semester
	<b>Total Credit</b>	<b>26</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

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

- 1 Katzung, B.: Basic and Clinical Pharmacology. 8<sup>th</sup> ed. Lange Medical Books/McGraw-Hill, 2001.
- 2 Peter, E.S., Freund-Meredith B., McGuire.: Health, Illness and the Social Body. (A Critical Sociology.) Prentice Hall, Upper Saddle River, New Jersey.
- 3 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
- 4 Mumenthaler: Neurology. Georg Thieme Verlag 1990. ISBN 3 13 523 909 3
- 5 Kaplan & Sadock's Synopsis of Psychiatry. Tenth Edition. Eds: B.J. Sadock V.A. Sadock, Lippincott Williams, 2007
- 6 Fuller G.: Neurological Examination Made Easy. 3<sup>rd</sup> ed. Churchill Livingstone. 2004. ISBN 0443074208
- 7 Rajna Péter: Ideg- és elmegyógyászati szakkifejezések

- 8 Hoag, Pawlak: Essentials of Periodontics. Mosby. ISBN 80162228x.
- 9 Goaz, White: Oral Radiology. Mosby. ISBN 801618738.
- 10 T.G.Wilson-K.S.Kornman: Fundamentals of Periodontics Quintessence. 1996. ISBN 0-86715-303-2
- 11 The Washington Manual of Surgery. 3<sup>rd</sup> ed. 2002. Lippincott Williams & Wilkins. ISBN 0-7817-3389-8
- 12 Worthington-Lang-LaVelle: Osseointegration in Dentistry. An Introduction. Quintessence, Chicago, 1994.
- 13 Sethi, A.-Kaus, Th: Practical implant dentistry. Quintessence, London, 2005.
- 14 Bricker,S.L.-Langlais,R.P.-Miller,C: Oral Diagnosis, Oral Medicine and Treatment planning. 2<sup>nd</sup> ed. 2002. B.C.Decker Inc. Hamilton London
- 15 Andreoli,T.E.-Bennett,J.C.-Carpenter,C.C.J.-Plum,F.:Cecil Essentials of Medicine. 4<sup>th</sup> ed. W.B. Saunders Co. 2000.
- 16 The New Public Health: An Introduction for the 21<sup>st</sup> Century. By: T.Tulchinsky, E.A.Varavikova. 2000. ISBN 0-12-703350-5
- 17 Gerry Humphris, Margaret S. Ling: Behavioural Sciences for Dentistry. Churchill Livingstone, London, 2005  
Handouts for the lectures in Dentsoc will be accesible ont he homepage of the Institute of behavioural Sciences: www.magtud.sote.hu.
- 18 McCracken's Removable Partial Prosthodontics (10/e) Glen P. McGivney-Alan B. Carr. Hardback, Mosby, 1999. ISBN 0323006787
- 19 Schillingburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 4th ed. 2012. ISBN 93 13 86 500
- 20 R.M.Basker-J.C.Davenport: Prosthetic Treatment of the Edentulous Patient. 5<sup>th</sup> ed. McMillan Press Ltd. ISBN 978-1405192613
- 21 Mohl, Zarb, Carlsson, Rugh. A Textbook of Occlusion. Quintessence. Chicago, 1988.
- 22 McNeill: Science and Practice of Occlusion. Quintessence. Chicago, 1997.

### Recommended textbooks:

- 1 Bengel,Veltman,Loevy,Taschini: Differential Diagnosis of Diseases of the Oral Mucosa. Quintessence Publishing Co. Inc. Chicago, Illinois 1989.
- 2 Manfred Strassburg/Gerdtn Knolle: Diseases of the Oral Mucosa A Color Atlas 2<sup>nd</sup> ed. Quintessence Publ. Co.Inc. Carol Stream Illinois 1994.
- 3 Coleman,G.C.-Nelson,J.F.: Principles of Oral Diagnosis. Mosby-Year Book, Inc.St.Louis, Missouri, USA 1993. "hand-outs" will be prepared and presented for the students by the lecturers
- 4 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. Bp. SOTE. 1992.
- 5 Behavioral dentistry. Mostofsky DI, Forgione AG, Giddon DB (eds.), Blackwell Munksgaard, 2006.
- 6 Behavior & Medicine. 4<sup>th</sup> Edition, Danny Wedding, Hogrefe & Huber Publishers, Seattle, 2006.
- 7 Fadem B: Behavioral Science, Lippincott Williams & Wilkins, 5<sup>th</sup> ed., 2008.
- 8 Sarafino E.P.: Health Psychology. Biopsychosocial interactions. 6<sup>th</sup> ed., New York, Wiley, 2008.
- 9 Kopp M. - Skrabski Á.: Behavioral Sciences Applied in a Changing Society, Corvina, 1996.
- 10 Alan Stoudemire: Human Behaviour: An Introduction for Medical Students. Lippincott Company, 1994. ISBN 0-397-51337-2.
- 11 Gatchel R.J., Baum A., Krantz D.S.: An Introduction of Health Psychology. McGraw-Hill 1989. ISBN 0-07-100729-6
- 12 Lindhe, J. (ed.): Clinical Periodontology and Implant Dentistry. Munksgaard. 1998. ISBN 87-16-12060-4.
- 13 Principles of Oral Diagnosis. Ed.: Coleman,G.C.-Nelson, J.F. Mosby-Year Book, Inc. St.Louis, Missouri. 1993. ISBN 0-8016-1005-2
- 14 Rose,L.F.-Kaye,D.:Internal Medicine for Dentistry. 2<sup>nd</sup> ed. Mosby. 1990.
- 15 Surgery – Basic Science and Clinical Evidence. Ed. Norton, J.A. 1<sup>st</sup> ed. 2000. Springer. ISBN 0-387-9844-X
- 16 Baehr,M.M.D- Frotscher,M.M.D:Duus's Topical Diagnosis in Neurology: Anatomy, Physiology, Signs, Symptoms. Thieme. Medical Publ. 2005. ISBN 3136128044
- 17 Lindsay K.-Bone I.-Callender R.: Neurology and Neurosurgery. Illustrated. 4<sup>th</sup> ed. Churchill Livingstone, 2004. ISBN 0443070563
- 18 Szirmai I.-Kamondi A.-Arányi Zs.-Kovács T: Neurological examination. Bp. Semmelweis Publ. 2006. ISBN 963 9656062
- 19 J. Okeson: Management of Temporomandibular Disorders and Occlusion, 7th ed. 2012, Mosby
- 20 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8, 1984.

# PHARMACOLOGY, TOXICOLOGY I.

Lecturer: **Dr. László Köles**

Tutor: **Dr. Erzsébet Kató**

## First Semester

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### Lectures (1 hour per week)

1. Introduction to pharmacology
2. Pharmacokinetics
3. Basics of the neurotransmission of autonomic nervous system
4. Parasympathomimetics
5. Sympathomimetics
6. Alpha and beta receptor antagonists
7. Skeletal muscle relaxants
8. Anxiolytics, sedative-hypnotics
9. Antipsychotics
10. Antidepressants and antimanic drugs
11. Penicillins,  $\beta$ -Lactamase inhibitors. carbapenems. monobactams.
12. Macrolides, ketolides, lincosamides, streptogramins.
13. DNA gyrase inhibitors, antifolates, metronidazol
14. Antiviral drugs

### Practices (1 hour per week)

1. Pharmacodynamics I.
2. Pharmacodynamics II. Basic principles of prescription writing. Drug formulations
3. General anesthetics
4. Parasympatholytics
5. Pharmacology of the respiratory tract
6. Sympatholytic and antisympathotonic drugs
7. 1st midterm exam, prescription writing
8. Antiepileptics
9. Drugs for neurodegenerative diseases, nootropic drugs, anorectic agents
10. Desinfectants and antiseptics
11. 2nd midterm exam. Cephalosporins, glycopeptide antibiotics
12. Aminoglycosides, chloramphenicol, tetracyclines, glycolcyclines, linezolid
13. Antituberculosics, special antibiotics (polymyxins, bacitracin, nitrofurantoin, phosphomycin)
14. Antifungal, antiprotozoal and antihelminthic drugs

## PHARMACOLOGY, TOXICOLOGY II.

### Second Semester

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#### Lectures (1 hour per week)

1. Inhibitors of platelet aggregation
2. Inhibitors of the renin-angiotensin-aldosterone system. Calcium channel blockers.
3. Diuretics
4. Antianginal drugs
5. Antihypertensive agents
6. Drugs acting on bone homeostasis.
7. Gluco- and mineralocorticoids
8. Local anesthetics
9. Pharmacology of the cyclooxygenase- inhibitors. Acetylsalicylic acid.
10. Natural opioids
11. Pharmacology of the smooth muscles.
12. Drugs used in the treatment of peptic ulcer and reflux disease
13. Anticancer drugs
14. Toxicology in the dental practice

#### Practices (2 hours per week)

1. Anticoagulants, fibrinolytics, treatment of bleeding
2. Antiarrhythmic drugs, prescription writing
3. Drugs used in the treatment of congestive heart failure.
4. Antihyperlipidemic drugs. Drugs used in the treatment of peripheral vascular diseases. Local circulation improving drugs. Drugs acting on erythropoiesis
5. Drugs acting on glucose homeostasis
6. 1st midterm exam. Drugs influencing the thyroid function. Prescription writing
7. Hypothalamic and pituitary hormones. Sexual hormones and contraceptives. Drugs influencing uterus function.
8. Clinical use of local anesthetics
9. Non-steroidal antiinflammatory drugs and further non-opioid analgesics. Drugs used in the treatment of gout and migraine.
10. Synthetic opioids. Drugs of abuse.
11. 2nd midterm exam. Prescription writing
12. Pharmacology of the gastrointestinal tract
13. Immunopharmacology. Treatment of rheumatoid arthritis
14. Prescription exam



## INTERNAL MEDICINE II.

2<sup>nd</sup> Dept. of Internal Medicine

Tutor: *Dr. Gábor Békési*

### First Semester

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**Lectures** (2 hours per week)    **Practices** (1 hour per week)

Immunologic principles. Lymphocytic system.  
 Immunoglobulins. Types of immunologic reactions.  
 Polycythemia. Agranulocytosis. The leukemias.  
 Hodgkin's disease and non-Hodgkin's lymphoma.  
 Introduction to anemia and approach to patients with anemia. Iron deficiency anemia. Megaloblastic anemia. Aplastic anemia. Hemolytic anemias.  
 Plasma cell disorders. Multiple myeloma.  
 Waldenström's macroglobulinemia.  
 Heavy-chain disease. Amyloidosis.  
 Hemostatic disorders. Thrombocytopenia.  
 Thrombocytosis. Vascular purpuras. Disorders of the coagulation mechanism.  
 Autoimmunity. Systemic lupus erythematosus.  
 Sjögren's syndrome.  
 Atopic diseases. Allergic rhinitis. Asthma of allergic etiology. Urticaria and angioedema. Serum sickness.  
 Drug allergy. Contact dermatitis.  
 Immunodeficiency diseases.  
 Rheumatoid arthritis. Juvenile rheumatoid arthritis.  
 Reiter's syndrome. Bechet's syndrome.  
 Systemic sclerosis. Polymyositis and dermatomyositis. Wegener's granulomatosis.  
 Hypothalamic and pituitary disorders. Hyperpituitary syndromes. Anterior pituitary insufficiency.  
 Diabetes insipidus. The adrenal cortex.  
 Cushing's syndrome. Addison's disease.  
 Diabetes mellitus. Diagnosis and classification of diabetes mellitus. Complication and treatment of diabetes mellitus. Gout.  
 Diabetes mellitus. Diagnosis and classification of diabetes mellitus. Complication and treatment of diabetes mellitus. Gout.  
 The thyroid gland. Hypothyroidism. Hyperthyroidism.  
 Thyroiditis. Hypoparathyroidism. Hyperparathyroidism.  
 Viral diseases. Herpes simplex. Varicella-zoster virus. Cytomegalovirus. Epstein-Barr virus. Influenza. AIDS.  
 Bacterial disorders. Tuberculosis. Diseases caused by fungi. Salmonellosis. Shigellosis.

**Note:** The maximum number of absences in a semester is 3  
 More than 3 absences invalidate the semester  
 Semi-final examination

## INTERNAL MEDICINE III.

### Second Semester

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#### **Lectures** (1 hour per week)

Diseases of the kidney. Physical examination.  
 Urine analysis.  
 Primary glomerular disorders. Nephritic syndrome.  
 Interstitial nephritis. Tubular disorders.  
 Acute and chronic pyelonephritis. Nephrolithiasis.  
 Acute and chronic renal failure.  
 Disorders of the digestive system. History taking and physical examination. Special techniques for diagnosing disorders of the digestive system.  
 Disorders of the esophagus. Peptic ulcer disease.  
 Tumors of the stomach.  
 Crohn's disease. Chronic ulcerative colitis.  
 The malabsorption syndrome.  
 Colonic and rectal neoplasms.  
 Acute abdomen. Mechanical obstruction and ileus.  
 Disorders of the liver. Physical examination.  
 Diagnostic procedures.  
 Jaundice. Cirrhosis of the liver.  
 Acute and chronic hepatitis.  
 Disorders of the gall bladder and the biliary tract.  
 Disorders of the pancreas.

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

## CONSERVATIVE DENTISTRY AND ENDODONTICS II.

### Department of Conservative Dentistry

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

### First Semester

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#### **Lectures** (1 hour 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  
 Reconstruction of root-canal treated teeth: post & core  
 Indications and methods of endodontics surgery  
 Emergency treatment in Endodontics

#### **Practices**

(3 hours per week)  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice

Complications and failures in the course of root canal treatment

Endodontic microbiology

Endodontic Periodontic Interrelationship  
Clinical practice

New instruments in endodontics (The Endo-Endodontic System)

Caries therapy. Cast metal restoration

Caries therapy: ceramic and composite inlays

Preparation for Crown

Clinical practice

Clinical practice

Clinical practice

Clinical practice

Clinical practice

Clinical practice

Clinical practice

**Note:**

The maximum number of absences in a semester is 3.

More than 3 absences

invalidate the semester

students have to make:

4 amalgam fillings

4 esthetic restorations

Practical course grade 1 root-canal

filling 15 hours assistance

## CONSERVATIVE DENTISTRY AND ENDODONTICS III.

### Second Semester

**Lectures/Seminars** (1 hour per week)

Preventive Endodontics: protecting the pulp

Evaluation of success and failure in Endodontics

Esthetic dentistry: Bleaching discolored teeth.

Internal and External

Direct fillings of molars: amalgam or composite

Local anesthesia in Conservative Dentistry and its complications

Treatment of cervical lesion

New equipment and methods in Conservative Dentistry

Indications and techniques of veneer

Discussion of thesis of diploma work

Discussion of thesis of diploma work

Special dental treatment of some general diseases

(AIDS, hepatitis, diabetes, epilepsy, etc.).

Principles of the Oral Health Insurance System.

"Anatomie" of dental praxises.

Management of Traumatized Teeth

Special cavity preparation. (Tunnel, slot, mini cavities)

**Practices** (3 hours per week)

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

**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

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#### **Lectures** (1 hour per week)

The reasons and the consequences of tooth loss  
 Partially dentate patients  
 Infection control in prosthodontics  
 Psychology and psychopathology  
 of denture intolerance  
 Fix appliances, types of crown  
 and bridges  
 Tooth preparation I.  
 Tooth preparation II.  
 The adhesive bridges  
 Impression for fix restorations  
 Fixed partial dentures  
 Dowel restorations  
 Removable partial denture  
 Major connectors of upper and lower RPD  
 Indirect and direct retainers of RPD  
 Clinical and laboratorial steps of fixed partials dentures  
 Consultation

#### **Practices** (6 hours per week)

Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients

**Note:** The maximum number of absences in a semester is 3 weeks.  
 More than 3 absences invalidate the semester  
 During the semester one midterm examination should be passed  
 Semifinal examination.

## PROSTHODONTICS III.

### Second Semester

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#### **Lectures** (1 hour per week)

Diagnosis and treatment planning  
 Oral health for the partially edentulous patient  
 Principles of partial denture design  
 Construction of removable partial dentures  
 Classification of the partially edentulous dental arches  
 Treatment planning for the class 0., 1A. and 1B.  
 dental arches  
 Treatment planning for the class 2A. dental arches  
 Treatment planning for the class 2B. dental arches  
 Treatment planning for the class 2A/1. and 3.  
 dental arches  
 Maxillo-facial prosthetics

#### **Practices** (3 hours per week)

Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients

Implants in prosthodontics  
 Orthodontic aspects of prosthodontics  
 Consultation

Partially dentate patients  
 Partially dentate patients  
 Partially dentate patients

**Note:** The maximum number of absences in a semester is 3.  
 More than 3 absences invalidate the semester  
 During the semester one midterm examination should be passed  
 Practical course grade

## SURGERY

### I. Department of Surgery Department Section of Surgery

#### Second Semester

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##### **Lectures** (2 hours per week)

Surgery of the neck. Thyroid and parathyroid  
 Surgical treatment of the chest wall, breast, pleura, lung and mediastinum  
 Oesophageal surgery (injuries, diverticula, malignant diseases)  
 Gastric and duodenal surgery (benign diseases)  
 Gastric and duodenal surgery (malignant diseases)  
 Surgery of gall-bladder and extrahepatic biliary system  
 Surgery of the small intestines and colorectum (benign and malignant diseases)  
 Appendicitis  
 Surgery of the liver, pancreas and spleen. (injuries, inflammatory diseases and tumors)  
 Bowel obstructions  
 Hernias  
 Basic principles in vascular surgery  
 Shock. Cardiopulmonary resuscitation.  
 intensive therapy  
 General principles of traumatology.  
 First aid.  
 Traumatological management of catastrophes.  
 Burned patients.  
 Urology Consultation

##### **Practices** (1 hour per week)

Visiting patients' ward  
 Visiting operating theater  
  
 Visiting patients' ward  
  
 Visiting patients' ward  
 Visiting operating theater  
 Visiting operating theater  
  
 Visiting patients' ward  
  
 Visiting patients' ward  
 Visiting operating theater  
  
 Visiting patients' ward  
 Visiting patients' ward  
 Visiting patients' ward  
 Visiting operating theater  
  
 Visiting operating theater  
  
 Visiting patients' ward

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



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

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#### **Lectures** (2 hours per week)

Radiation physics  
 Dental caries  
 Pulp cavity  
 Extraction of the teeth  
  
 Root canal therapy  
  
 Periapical lesions  
  
 Periodontal disease  
  
 Cysts of the jaws  
  
 Hypercementosis  
 Excessive bone formation  
 Injuries to teeth  
 Osteomyelitis  
 Tumors  
 Apicoectomy  
  
 Anomalies  
 Salivary gland diseases  
 Resorption of the teeth  
 Radiation biology  
 Health physics  
 Long-cone paralleling technique  
 Traditional extraoral radiographic examinations  
 Panoramic technique I.  
  
 Panoramic technique II.

#### **Practices** (2 hours per week)

Normal radiographic anatomy: Tooth anatomy (lecture)  
 Normal radiographic anatomy: Anatomic landmarks of the maxilla (lectures)  
 Normal radiographic anatomy: Anatomic landmarks of the mandible (lecture)  
 Development of the teeth, Deciduous teeth (lect.)  
 Recognition of the teeth, anatomic landmarks and caries  
 Development of the teeth, deciduous teeth, extraction of the teeth  
 Periapical lesions  
**1<sup>st</sup> midterm**  
 Periodontal disease  
**2<sup>nd</sup> midterm**  
 Cysts of the jaws  
**3<sup>rd</sup> midterm**  
  
 Hypercementosis  
 Excessivebone formation  
 Injuries to teeth  
 Osteomyelitis  
 Tumors, apicoectomy  
 Anomalies  
  
 Review  
  
 Review  
  
 Viewing of the examination radiographs I.  
 Viewing of the examination radiographs II.

**Note:** The maximum number of absences in a semester is 3.  
 More than 3 absences invalidate the semester.  
 During the semester three midterm examinations should be passed.  
 Final exam



# PSYCHIATRY

Tutor: **Prof. Dr. István Bitter**

**Department of Psychiatry and Psychotherapy**

**Lectures:** 1/week

**Examination:** Semi-final

**Textbook:**

Kaplan&Sadock's Synopsis of Psychiatry. Tenth Edition. Eds: B.J. Sadock V.A. Sadock, Lippincott Williams, 2007

**Schedule**

Subject of psychiatry, classification of disorders, diagnostic methods (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 Illiczky*

## First Semester

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### **Classroom lectures:**

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

### **Bedside practice, patient demonstration**

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

### **Requirements:**

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

### **Basic reading:**

1 *Fuller G.* Neurological Examination Made Easy (3<sup>rd</sup> edition) Churchill Livingstone, Published April 2004. ISBN 0443074208

### **Suggested reading:**

1 *Lindsay K., Bone I., Callender R.:* Neurology and Neurosurgery Illustrated., 4<sup>th</sup> edition Churchill Livingstone – Published February 2004. ISBN 0443070563

# PERIODONTOLOGY I, II.

## Department of Periodontology

### First Semester

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**Lectures** (2 hours per week)

Exam: semi-final

### Second Semester

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**Lectures** (1 hour per week)

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

**Practices** (3 hours per week)

Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Midterm Demonstration  
 Clinical practice  
 Clinical practice  
 Clinical practice

Clinical practice

Clinical practice  
 Clinical practice

**Midterm Demonstration**

Clinical practice

Clinical practice

Clinical practice

**Note:** The maximum number of absences in a semester is 3.  
 More than 3 absences invalidate the semester.  
 During the semester two midterm demonstrations should be passed.  
 Semi-final

# PUBLIC HEALTH

Tutor: *Dr. András Terebessy*

## English Dental

<b>Lectures</b> (1,5 hours per week)	<b>Practicals</b> (2 hours per week)
Definition of Public Health; Past, present and future of Public Health	Introduction Basic demographical data
Demography: International and Hungarian situation	Public Health Program of EU
General epidemiology Analytical and intervention methods on field of chronic non-communicable diseases	Visit into the Central Kitchen of the University
Lifestyle: smoking, alcohol consumption, drug-abuse	Practical aspects of epidemiological investigations: study-planning and analysis
Epidemiology and prevention of non-communicable diseases I	Dentist's task on prevention of non-communicable diseases I.: smoking, alcohol consumption and drug-prevention
Epidemiology and prevention of non-communicable diseases II	Dentist's task on prevention of non-communicable diseases II: HBP-prevention
Epidemiology and prevention of Cancer	Dentist's task on prevention of non-communicable diseases III: cancer-prevention Screening-screening programs
Environmental health : water, soil, air	Dentist's task on environmental health problems
Occupational health	Dentist's task on occupation diseases prevention
<b>Lectures</b> (1,5 hours per week)	<b>Practicals</b> (2 hours per week)
Basics of healthy diet; Nutrition disorders	Assessment of nutritional status; nutritional disorders;
Mother-, child and youth health care	Basics of healthy diet; Computer planning and controlling diet in public catering
General Epidemiology of communicable diseases – International and Hungarian aspects	Family planning, Youth health
Nosocomial Infections Reemerging, emerging and deliberately emerging infections	General epidemiology of communicable diseases Immunization, Vaccination programs
Ethic of Public Health	Sterilization, disinfection Laboratory investigations in case of communicable diseases Nosocomial infections
Structure and financing of Health Care Systems	Food-hygiene; food-borne diseases

# DENTAL ETHICS

## First Semester

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### Bioethics

Course Syllabus.

### Institute of Behavioral Sciences

Tutor: *Dr. József Kovács*

(28 hours)

#### Course objectives:

- To enable students to recognize ethical issues when encountered in everyday clinical practice and research
- To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patient research subjects and fellow health care professionals
- To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

#### Lectures

##### 1. week

#### Basic concepts of ethics.

Descriptive ethics, normative ethics, metaethics.

General ethics and applied ethics.

Bioethics, medical ethics, health care ethics. Similarities and differences.

The role of bioethics in a pluralistic society.

The relationship between law and ethics.

Reasoning in ethics. The most common mistakes.

##### 2. week

#### Normative theories of ethics.

Deontological theories of ethics. (The Golden Rule, Kant and the categorical imperative, the principle of double effect, W.D. Ross and the prima facie duties.)

Teleological theories of ethics. (Act and rule utilitarianism.)

Theories of natural law.

Contractarian theories of ethics. (The theory of justice of John Rawls)

##### 3. week

#### The basic principles of dental ethics.

The principle of respect for autonomy.

The principle of non-maleficence.

The principle of beneficence.

The principle of justice.

Arguments against „principalism“.

#### **4. week**

##### **The concept of health and disease.**

Naturalistic definitions of health.  
The medical model of defining health.  
Normativist definitions of health.  
Some questions of psychiatric ethics.

#### **5. week**

##### **Informed consent.**

Simple consent and paternalism in medicine.  
The emergence of the doctrine of informed consent.  
Standards for information disclosure for patients.  
When is informed consent not necessary?  
Standards of competence and incompetence.  
The right to refuse medical treatment.  
Some psychological and communicational aspects of informed consent.

#### **6. week**

##### **Information disclosure to terminally ill patients. Telling the truth to patients.**

The history of information disclosure to terminally ill patients.  
Pros and cons for lying to terminally ill patients.  
The weaknesses of the arguments in favour of lying.  
The dying process according to E. Kübler-Ross.  
How to communicate the bad news to terminally ill patients.  
The physician's relationship with the relatives of the deceased patient.

#### **7. week**

##### **Justice in Health Care I. Ethical questions of macroallocation.**

Higher and lower level macroallocational problems.  
The role of personal responsibility in maintaining health.  
The principles and practice of rationing in contemporary health care systems. (Soft and hard rationing.)  
Medical ethics and medical economics. Ethical questions of cost-benefit and cost effectiveness analysis. The QALY.  
The problem of right to health care. (The libertarian, the liberal and the socialist views about the right to health care.)  
The role of the market and that of the state in the health care system.  
Ethical problems of financing health care. (Fee-for-service, capitation, fixed salary, DRG-system, etc.)  
Setting health care priorities in Oregon.  
Attempts to define a just health care system.

#### **8. week**

##### **Ethical questions of reproductive medicine.**

Abortion.  
Artificial insemination from donor.  
In vitro fertilization, surrogate motherhood.  
Ethical questions of genetic counseling.  
Ethical questions of embryo experimentation.

#### **9. week**

##### **Justice in Health Care II. Ethical questions of microallocation. Moral dilemmas in the allocation of scarce medical resources.**

The concept of microallocation.

Ethical analysis of various selection criteria. (Medical benefit, psychological ability, supportive environment, social value criterion, resources required criterion, age, ability to pay, random selection, personal responsibility for the illness, etc.)

### 10. week

#### **Ethical questions of animal experimentation.**

History of the thinking about the moral status of animals.

The philosophical significance of the Darwinian conception of nature.

The views of Peter Singer: antispeciesism.

The views of Tom Regan: animal rights.

Ethical questions of experimentation on animals on the basis of a moderate animal protectionist's view.

Critical anthropomorphism.

Alternatives to animal experimentation.

### 11. week

#### **Euthanasia and the withholding of life-sustaining treatment**

Definitions.

The sanctity of life versus the quality of life doctrine.

Is there any difference between active and passive euthanasia?

The practice of active euthanasia in the Netherlands. The Rummelink Report.

Refusal of life sustaining treatment by competent and incompetent patients.

Possibilities to extend the autonomy of patients: living will, durable power of attorney, substituted judgement, etc.

The concept of medically futile treatment.

Ethical problems of the treatment of handicapped newborns. (The debate about the treatment of spina bifida babies, the Baby Doe case, the legal situation, etc.)

### 12. week

#### **Ethical questions of human experimentation.**

Possible forms of experimentation on humans.

Contradiction between the two roles of the physician. (Healer and scientist.)

The ethics of Randomized Controlled Clinical Trials. (RCT)

Randomization and prerandomization.

### 13. week

#### **Ethical questions of organ- and tissue transplantation.**

Some problems of justice concerning kidney transplantation and chronic haemodialysis.

Ethical questions of transplantation from living kidney donors.

The concept of death.

Ethical questions of organ harvesting from the dead.

The debate about the market of organs.

Ethical questions of using embryo- or foetal tissue in human therapy.

Ethical problems of using anencephal newborns as organ donors.

### 14. week

#### **The rights of patients.**

The role of patient's rights in the transformation of the paternalistic physician-patient relationship.

Moral versus legal rights.

A list of basic rights of patients.

Mechanisms to ensure the realizations of patient's rights. (Patient's rights advocates, ombudsman, hospital ethics committees, institutional review boards, arbitration, etc.)

**Course Faculty:**

Prof. József Kovács, MD, PhD, (Head of the Department of Bioethics), 210-2930/56350;

e-mail: kovjozs@net.sote.hu

Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@yahoo.com

Imre Szebik, MD, PhD e-mail: szebimre@net.sote.hu

Jeno Lorincz, MD, JD e-mail: lorjen@net.sote.hu

**Department:**

**Institute of Behavioral Sciences**

**Department of Bioethics**

NET Building, 19<sup>th</sup>, 20<sup>th</sup> floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20<sup>th</sup> floor, Room-2005

**List of questions**

1. Deontological theories of ethics.
2. Utilitarian theories of ethics.
3. The principles of dental ethics
4. Justice and dental ethics: the allocation of scarce medical resources.
5. Paternalism in dental practice
6. Informed consent
7. Information disclosure for terminally ill patients
8. Advance Directives
9. Experimentation on human subjects
10. Objection to Transplantation of Organs and Counterarguments
11. Ethical problems of live organ donation
12. Organ donation from brain-dead donors: the system of donor cards.
13. Organ donation from brain-dead donors: presumed consent
14. Active and Passive Euthanasia
15. Withdrawing and withholding life sustaining treatment.
16. Models of the dentist-patient relationship
17. Ethical issues related to treating patients with partially compromised capacity
18. Professional norms and bad outcomes
19. Ethical questions raised by HIV and AIDS in dental practice
20. Confidentiality issues in dental practice
21. Moral issues related to the HIV positive dentist
22. Possible criteria for distributing the society's resources
23. Social justice – the free market view of justice
24. Ethical issues in advertising dental services
25. Professional obligations in dentistry

**Textbook:**

Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

**Important:**

To participate on at least 75% of the total number of lessons is a prerequisite of getting the signature.

Doctor's certificate is required to justify absence from the lessons and the exam.

Exam type: semi-final

Sign up for the exam: through the Neptun system.



# GNATHOLOGY – lectures and practices

Department of Prosthodontics

Lecturer: *Prof. Dr. Péter Hermann*

## First Semester

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**Lecture** (1 hour/week)    **Practice** (2 hours/week)

### Week

1. Introduction into the physiology of the stomatognathic system.  
Morphology of the masticatory system. Occlusion.
  2. Mandibular positions.  
Centric occlusion.
  3. Movements of the mandibule.  
Occlusal concepts. Role of occlusion in the clinical practice.
  4. Types of articulators.  
Mounting of the articulators.
  5. Mounting of the adjustable articulator: Arcus Digma  
Complete denture fabrication in the articulator.
  6. Diagnosis and management of the problems related to the temporomandibular joint.
  7. Traumatic occlusion – Occlusal trauma  
Periodontological aspect of gnathology
  8. Examination of patients. Occlusal diagnostics.
  9. Facebow transfer. Mounting of semiaadjustable articulators.
  10. Occlusal analysis in the articulator.
  11. Occlusal adjustment.
  - 12-13-14. Waxing up occlusal surface of different teeth: maxillary incisor and canine and occlusal surface of premolar and molar.
- Final examination**

## IMPLANTOLOGY I. – lecture

Department of Oro-Maxillofacial Surgery and Stomatology

Lecturer: *Dr. Árpád Joób-Fancsaly*

Course Syllabus:

History of oral implantology. Different types of implants. Indications, contraindications of implant rehabilitations. Preoperative diagnosis. Surgical placement of implants. The biology and morphology of osseointegration and mucosal seal. Implant biomechanics. Treatment plans, bone grafting methods. Parodontological and esthetic aspects of implant rehabilitation. Implant prosthodontics. Different dental implant systems. Case presentations, planning and completing implant treatments in different edentulous situations. Failures and complications.

**Semi-final examination**

## COMMUNITY DENTISTRY

### Department of Community Dentistry

Head of department and supervisor of the subject: **Dr. Péter Kivovics**

Tutor: **Dr. Orsolya Németh**

1st semester: only practice

2nd semester: lecture and practice

Time: 14 x 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 Peridodontics aspects.

The curriculum of the Community Dentistry is an integral part of the other subjects.

It is necessary to teach this special field of dentistry separately. Introduction of individual cases in community dentistry helps with understanding other fields of dentistry as well.

This subject is especially important for graduates as they do not possess enough theoretical and practical knowledge yet. It would make them capable to solve any emergency case with ease.

Department of Community Dentistry is responsible for all Budapest and Pest region dental care, therefore is able to provide sufficient number of patients for practical education.

## COMPULSORY SUMMER PRACTICE

4-weeks (120 hours) at a Dental Office

(Conservative Dentistry of Periodontology)

The student has to practice whole-scale comprehensive dental treatment including: Oral Prophylaxis, Restorations, Root Canal Therapy and Minor Prosthodontics as well as Er. Management.

**Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!**

# CLINICAL MODULE



*Faculty of Dentistry  
5<sup>th</sup> year*

**STUDY PROGRAMME****CLINICAL MODULE**

<b>9th semester</b>				
<b>subjects code</b>	<b>subjects</b>	<b>credit code</b>	<b>examination</b>	<b>prerequisites</b>
compulsory	Clinical Dentistry I.*	C2L0P6	practice mark	Conservative Dentistry and Endodontics III. Prosthodontics III.
compulsory	Conservative Dentistry and Endodontics IV	C3L0P3	practice mark	Conservative Dentistry and Endodontics III., Prosthodontics III.
obligatory elective	Forensic Dentistry	C1L1P0	semifinal	Pharmacology, Toxicology II.
compulsory	Oral and Maxillofacial Surgery IV.	C5L1P5	practice mark	Oral and Maxillofacial Surgery III.
compulsory	Implantology II.	C2L1P1	final#	Oral and Maxillofacial Surgery III.
compulsory	Orthodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Pedodontics I.	C5L1P5	practice mark	Conservative Dentistry and Endodontics III.
compulsory	Periodontology III.	C3L1P2	practice mark	Periodontology II.
obligatory elective	Prehospital Emergency Medicine	C1L1P0	semifinal	Internal Medicine III., First Aid
compulsory	Prosthodontics IV.	C3L0P3	practice mark	Prosthodontics III., Conservative Dentistry and Endodontics III.
compulsory	Oral Diagnostics II.	C1L0P1	semifinal	Oral Diagnostics I.
compulsory	Oral Medicine	C1L1P0	semifinal	Pharmacology and Toxicology II.
	<b>Total Credit</b>	<b>32</b>		

\*at the Dept. of Prosthodontics or at the Dept. of Conservative Dentistry

#The grade influences the qualification of the diploma.

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

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

## CLINICAL MODULE

## 10th semester

subjects code	subjects	credit code	prerequisites code	prerequisites
compulsory	Clinical Dentistry II. *	C3L0P6	practice mark	Clinical Dentistry I.
compulsory	Conservative Dentistry and Endodontics V	C3L0P3	final#	Conservative Dentistry and Endodontics IV., Prosthodontics IV.
obligatory elective	Dermatology	C1L1P0.5	final#	Pharmacology, Toxicology II.
obligatory elective	Obstetrics and Family Planning	C1L1P0	semifinal	Internal Medicine III., First Aid
obligatory elective	Diploma Work	C20		
compulsory	Oral and Maxillofacial Surgery V.	C4L1P3	final#	Oral and Maxillofacial Surgery IV.
compulsory	Orthodontics II	C6L1P4	final#	Orthodontics I
compulsory	Pedodontics II	C6L1P4	final#	Pedodontics I
compulsory	Periodontology IV.	C3L1.5P2	final#	Periodontology III.
compulsory	Prosthodontics V.	C3L0P3	final#	Prosthodontics IV., Conservative Dentistry and Endodontics IV.
	<b>Total Credit</b>	<b>50</b>		

## Explanation

**15 credits** should be gained from the **elective subjects** during the 5-year studies – see the elective list after the 3<sup>rd</sup> year study program

# The grade influences the qualification of the diploma

C = Credit point

L = Lecture (hours/week)

P = Practice (hours/week)

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

- 1 Becker W.-Naumann H.- Pfaltz R.: Ear, Nose and Throat Diseases. Thieme. Stuttgart, 1994. ISBN 3-13671202-1.
- 2 Répássy,G.: Otolaryngology. Eger, Radó Ny. 2000.
- 3 Current Pediatric Diagnosis and Treatment. 13<sup>th</sup> ed. W.E.Hathaway, W.W.Hay. Appleton and Lange Medical Book. ISBN 0838514006, ISSN 0093-8556
- 4 Lecture Notes of Forensic Medicine (Bp.) 1994.
- 5 Gerhard K. Lang: Ophthalmology / a Pocket Textbook Atlas. Thieme / 2000. ISBN 3-13-126161-7 (GTV) ISBN 0-86577-936-8 (TNY) 1 2 3 4 5
- 6 Dénes J.-Gábris K.-Hidas Gy.-Tarján I.: Pedodontics. Bp. SOTE 1995.
- 7 Andlaw, R.J.-Rock,W.P.: A Manual of Pediatric Dentistry. 1998. ISBN 0443053723
- 8 T.G.Wilson-K.S.Kornman: Fundamentals of Periodontics Quintessence. 1996. ISBN 0-86715-303-2
- 9 R.A.Cawson-E.W.Odell: Essentials of Oral Pathology and Oral Medicine. Churchill Livingstone, 1998. ISBN 0-443-06121-1
- 10 Szabó Gy.: Oral and Maxillofacial Surgery. Bp. Semmelweis Publ. 2001.
- 11 Bricker,S.L.-Langlais,R.P.-Miller,C: Oral Diagnosis, Oral Medicine and Treatment planning. 2<sup>nd</sup> ed. 2002. B.C.Decker Inc. Hamilton London 2002.
- 12 McCracken's Removable Partial Prosthodontics (10/e) Glen P. McGivney-Alan B. Carr. Hardback, Mosby, 1999. ISBN 0323006787
- 13 Schillinburg et al.: Fundamentals of Fixed Prosthodontics. Quintessence 4th ed. 2012. ISBN 93 13
- 14 R.M. Basker-J.C. Davenport: Prosthetic Treatment of the Edentulous Patient. 5th ed. McMillan Press Ltd. ISBN 978-1405192613, 2011.

**Recommended textbooks:**

- 1 J Hunter, J Savin, M Dahl: Clinical Dermatology, 4<sup>th</sup> ed. Blackwell Publishing, 2007, Paperback, ISBN 9781405146630
- 2 J Bologna, J Jorizzo, R Rapini: Dermatology, 2<sup>nd</sup> ed. Elsevier, 2007. Hardback, ISBN 9781416029991
- 3 DJ Gawkrödger: Dermatology. An illustrated colour text, 4<sup>th</sup> ed. Churchill Livingstone Elsevier, 2007, Paperback, ISBN 9780443104213
- 4 JE Fitzpatrick et al: Dermatology Secrets in Color with Student Consult Access. 3<sup>rd</sup> ed. Hanley & Belfus, 2006. ISBN 1560536160
- 5 R. Graham-Brown, J Bourke: Mosby's Color Atlas and Text of Dermatology. 2<sup>nd</sup> ed. Elsevier Mosby, 2006. ISBN 072343364X
- 6 M Lebwohl et al: Treatment of Skin Disease, 2<sup>nd</sup> ed. Elsevier Mosby, 2005, ISBN 0-32-3036031
- 7 M Lebwohl, W Heymann, J Berth-Jones, I Coulson: Treatment of Skin Disease. Comprehensive Therapeutic Strategies, Expert Consult – Online and Print Hardbound, 2009, ISBN: 0702031216
- 8 Online: www.lib.sote.hu – Adatbázisok, adattárak – OVID – Books@OVID – Dermatology – Fitzpatrick's Dermatology in General Medicine
- 9 Burkit's Oral Medicine: Lynch,A.M.& Malcom,A. Lippincott. 1996. ISBN 0-397-51242-2
- 10 Lindhe, J. (ed.): Clinical Periodontology and Implant Dentistry. Munksgaard. 1998. ISBN 87-16-12060-4.
- 11 McDonald, F.-Ireland, A.J.: Diagnosis of the Orthodontic Patient. Oxford Univ. Press. 1998. ISBN 0-19-262889-5
- 12 Graber,T.M.-Vanarsdall,R.L.: Orthodontics. Current Principles and Technics. Mosby Year Book, Inc. 1994. 2<sup>nd</sup> ed. ISBN 0-8016-6590-6
- 13 D.Hull-D.I.Johnston: Essential Paediatrics. 3<sup>rd</sup> ed. Churchill Livingstone. 1994. ISBN 0-443-04782-0.
- 14 Hollwich, F: Pocket Atlas of Ophthalmology. Thieme Verl. 2<sup>nd</sup> Rev. Ed. Stuttgart, 1986. ISBN 0-86577 244 4
- 15 Knight's Forensic Pathology. 3<sup>rd</sup> ed. 2004. Arnold.
- 16 Manual of Emergency Medicine. 5<sup>th</sup> ed. By Jon L.Jenkins, G.R.Braen. 2004 Lippincott Williams and Wilkins. Product nr. 479531-1019
- 17 Neil-Walter: Partial Dentures. ISBN 06 32 08 025 8, 1986.

# OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY

Lecturer: **Prof. Dr. László Tamás**

Tutor: **Dr. Beáta Bencsik**

## First Semester

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### **Lectures** (1 hour per week)

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

Acute and chronic otitis media. Etiology, diagnosis, complications and therapy.

Types of hearing losses. Fundamental audiological diagnostic methods. Surgical management of hearing losses. Otosclerosis and cochlear implant.

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

Infections and tumors of the nose and paranasal sinuses. Therapeutical possibilities. Borderlines and related aspects between the oral surgery and ENT. Fundamental aspects of maxillofacial traumatology.

Clinical aspects of diseases of the mouth and pharynx. Diseases of the labial, oral and laryngeal mucosa.

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

Diseases of the salivary glands. Emergency management of suffocation. Conicotomy and tracheotomy. Foreign bodies in the trachea and oesophagus

### **Practices** (0,5 hour week)

Routine clinical examinations in practice.

Evaluation of different types of perforations of the tympanic membrane. Cadaver bona practice. Paracentesis on moulage.

Routine audiology. Operating theater. Video demonstration.

Anterior and posterior rhinoscopy. X-ray photos of the paranasal sinuses. Clinical management of epistaxis.

Operating theatre. Luc. Caldwell operation. Functional endonasal surgery. Endoscopic examination of the paranasal sinuses.

Peritonsillar abscess. Indications and dangers of the tonsillectomy. Adenotomy. Basis of conservative of the mouth and pharynx treatment of disease.

Direct and indirect laryngoscopy. Videostroboscopy and fiberoscopy.

## PEDIATRICS

### **2<sup>nd</sup> Department of Pediatrics**

Tutor: **Dr. Judit Müller**

## First Semester

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### **Lectures** (1 hour per week) **Practices** (0,5 hour week)

Development and Growth  
 Childhood Nutrition and its Disorders  
 Fluid and Electrolyte Disorders  
 Newborn Infant: Diseases and Disorders  
 Genetic Disorders  
 Congenital Heart Diseases  
 Respiratory Diseases  
 Neurologic and Muscular Disorders

Endocrine Disorders  
Infectious Diseases, Immunization  
Gastrointestinal Tract Disorders  
Hematologic Disorders  
Malignant Diseases in Childhood  
Kidney and Urinary Tract Diseases  
Allergic Diseases

## PROSTHODONTICS IV-V.

### First Semester

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Clinical practices, Integrated practices  
Treatment of partial edentulousness, fixed and removable dentures.  
No lectures.

### Second Semester

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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

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

### Second Semester

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**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 Szűcs*

## First Semester

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### **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)

Arnbulatory narcosis in head and neck surgery, coagulopathies, anticoagulant treatment.

Sinus lifting.

Dentoalveolar deformities.

Guest speaker

Consultation

### **Practices** (5 hours / week)

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

Practicing minor oral surgery

### **Midterm Demonstration**

Practicing minor oral surgery

Practicing minor oral surgery

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

More than 3 absences invalidate the semester.

During the semester three midterm examinations should be passed.

Practical course grade

# ORAL AND MAXILLOFACIAL SURGERY V.

## Second Semester

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**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

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**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 fluorideprophylaxe.

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.  
 Secondary disease of caries of permanent teeth, endodontic treatment.  
 Endodontic treatment of immature teeth.  
 Consultation.

**Practice** (5 hours/week)  
 Treatment of patients.  
 Type of evaluation: Practical grade (1-5 grading system)

## PEDODONTICS II.

### Second Semester

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

- |    |  |
|----|--|
| 1  | Radiology in pedodontics.  |
| 2  | Minor oral surgery in pedodontics, local anaesthesia.                                |
| 3  | General anesthesia.  |
| 4  | Prothesis in pedodontics.  |
| 5  | Traumatic injuries of primary and permanent teeth.                                   |
| 6  | Complex therapy of traumatic injuries of permanent teeth.                            |
| 7  | Parodontology and oral diseases in childhood.  |
| 9  | Administration of medicine in pedodontics.   |
| 10 | Diagnostic competition.  |
| 11 | Organizing of pedodontic treatment and nursing.<br>Administration and documentation. |
| 12 | Significance of agegroup in pedodontics.   |
| 13 | Consultation.  |

**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

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

The subject, the significance of orthodontics, and its relation to caries and parodontology.  
Etiology, acquired and hereditary anomalies.  
Orthodontic elements, terminology.  
Relationship between function and anomalies. Angle diagnostic system.  
X-ray diagnosis, evaluation of telerradiogram.  
The date of the beginning of treatment and the length of treatment time.  
Basic principle of orthodontic treatment. Biological and mechanical fundamentals.  
Classification of orthodontic appliances. The appliances' historical survey.  
Removable appliances. Active and passive plates.  
Removable appliances. Functional jaw orthopedic appliances.  
Elements of fixed appliances.  
Types and characters of orthodontic arches.  
Multiband systems I. (edgewise, light-wire, twin-wire)  
Multiband systems II. (bioprogressive, straightwire)  
Appliances used rarely in Hungary (head-gear, face-bow, quad helix, hyrax)

#### **Practice** (5 hours/week)

Treatment of patients.  
Type of evaluation: Practical grade (1-5 grading system)

## ORTHODONTICS II.

### Second Semester

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#### **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)

## PERIODONTOLOGY III.

### Department of Periodontology

#### First Semester

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##### **Lectures** (1 hour/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. Gingivectomy  
 Cause related periodontal surgery II. Modified Widman  
 Flap operations

##### **Practices** (2 hours/week)

Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
**Midterm Demonstration**  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
 Clinical practice  
**Midterm Demonstration**  
 Clinical practice  
 Clinical practice

**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

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##### **Lectures** (1,5 hours / week)

##### **Week Lectures** (Part One)

1 Reevaluation II. Correcting phase in periodontal surgery  
 2 Correcting periodontal Surgery -Mucogingival surgery I.  
 3 Mucogingival Surgery Gingival esthetics II.  
 4 Periodontal regeneration  
 5 Periodontal regenerative processes – biological barrier membranes  
 6 Periodontal regenerative processes – growths factors and other biochemical means  
 7 Prosthodontic rehabilitation I.  
 8 Prosthodontic rehabilitation II. The white esthetics

##### **Seminar** (2 hours/week)

Literature review  
 Clinical case conference  
 Literature review  
 Clinical case conference  
 Literature review

##### **Midterm Demonstration**

Clinical case conference  
 Clinical case conference

9	Periodontal follow-up – periodontal maintenance	Literature review
10	Perio – endodontic relationship	Literature review
11	The evaluation of the success of the comprehensive periodontal treatment	Differential diagnosis
12	The occlusion and the periodontium	Consultation
13	Consultation	
14	Written final exam – periodontal diagnostics	

**Note:** The maximum number of absences in a semester is 3.  
 More than 3 absences invalidate the semester.  
 During the semester two midterm demonstrations should be passed.  
 Practical course grade and **final** exam

## ORAL MEDICINE

Head of department: *Prof. Dr. Péter Windisch*

### First Semester

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#### Lectures (1 hour/week)

##### Week Lectures

1. Vesiculo-bullous oral diseases
2. Oral signs and symptoms of benign tumors
3. Precancerous conditions in the oral cavity
4. Leukoplakia
5. Malignant tumors of the oral mucous membrane
6. Oral signs and symptoms of hematological diseases
7. Clinical differential diagnosis of gingival enlargements
8. Lichen oris
9. The diseases of the lip
10. The diseases of the tongue
11. The diseases of the salivary glands
12. The oral considerations of HIV infection and viral hepatitis
13. The role of the vitamins in the etiology of oral mucosal disorders
14. Written final exam

**Note:** The maximum number of absences in a semester is 3.  
 More than 3 absences invalidate the semester.  
 During the semester two midterm demonstrations should be passed.  
 Practical course grade and **semi-final** exam

## IMPLANTOLOGY II.

### Department of Oro-Maxillofacial Surgery and Stomatology

Lecturer: **Dr. Árpád Joób-Fancsaly**

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

#### Course Syllabus:

History of oral implantology. Different types of implants. Indications, contraindications of implant rehabilitations. Preoperative diagnosis. Surgical placement of implants. The biology and morphology of osseointegration and mucosal seal. Implant biomechanics. Treatment plans, bone grafting methods. Parodontological and esthetic aspects of implant rehabilitation. Implant prosthodontics. Different dental implant systems. Case presentations, planning and completing implant treatments in different edentulous situations. Failures and complications.

## ORAL DIAGNOSTICS II.

### Department of Oral Diagnostics

**Address:** Bp. VIII., Szentkirályi u. 47. 1088

**Tel.:** 459-1500/59161, 317-1044

Tutor: **Prof. Dr. Csaba Dobó Nagy**

email: oral@fok.usn.hu

### Fifth year 1st semester

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Lecture -0 Practice (1 hour/week)

#### Rules of practices

Activity of the students:

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

**Exam:** Practical hours should be visited during 2 days. The time of practices is between 8.00 a.m – 1.00 p.m.

Semifinal exam will be organized at the end of fifth year, first semester.

Minimal expectations : reaching the minimum level of the written theoretical evaluation (mark 2)  
presentation of three written case-demonstrations reaching the minimum quality level (mark 2)  
Non-performance of the minimal expectations invalidate the semester!

**Textbook:**

- 1 Bricker, Langlais, Miller: Oral Diagnosis, Oral Medicine and Treatment Planning (second edition) 2 BC Decker Inc Hamilton London 2002

**Recommended books :**

- 1 Bengel, Veltman, Loevy, Taschini: Differential Diagnosis of Diseases of the Oral Mucosa Quintessence-Publishing Co. Inc. Chicago, Illinois 1989
- 2 Manfred Strassburg/Gerdt Knolle : Diseases of the Oral Mucosa A Color Atlas (Second Edition) Quintessence Publishing Co. Inc. Carol Stream Illinois 1994 3 "hand-outs" will be prepared and presented for the students by the lecturers

## PREHOSPITAL EMERGENCY MEDICINE

**National Ambulance Service**

Program Director: *Dr. Gábor Göbl*

Tutor: *Dr. László Gorove*

### First Semester

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**Topics**

The principles of emergency medicine.

The field assessment.

Patient assessment.

Transportation trauma

BLS – AED, ACLS

Prehospital care of the injured patient

Analgesia, anesthesia in the emergency care

Unconsciousness, confused states

Acute chest syndromes. ACS

Acute cardiac failure. Arrhythmias in the emergency care

The shock process. Evaluation and in field management of shock conditions.

Stroke syndromes. Hypertensive emergencies.

Acute dyspnea. Artificial ventilation on the spot

Acute abdominal syndromes

Toxicology in the emergency care

Pediatric oxyology

Obstetrical first aid

CPR revision

**Note:** participation at 75% of lessons is necessary. Compensation is possible using the notes of the lectures and the recommended book.

Mode of certifying absences: Oral in case of absence from lectures, written in case of absence from semi-final examination within 3 working days.

Requirement of the semester signature in the lecture book: Participation at the lectures in 75% of cases. Type of the examination: semi-final

It will be tested, whether the student is able to recognize and manage emergencies.



# DERMATOLOGY

Lecturer: **Prof. Dr. Márta Marschalkó**

Tutor: **Dr. Bernadett Hidvégi**

**Department of Dermatology, Venerology and Dermatooncology**

## Second Semester

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**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

**2<sup>nd</sup> Dept. of Obstetrics and Gynecology**

Head of Department: **Prof. Dr. Nándor Ács**

## Second Semester

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**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**

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

Introduction. History of ophthalmology.  
Conjunctivitis ("red eye").  
Keratitis ("red eye").  
Uveitis ("red eye"). Differential diagnostic approach of the "red eye".  
Basics of optics.  
Diseases of the crystalline lens. Cataract surgery. Diseases of the retina. Intraocular tumours.  
Glaucoma (pathomechanismus).  
Glaucoma (conservative and surgical treatment).  
Diseases of the eyelids. Ocular injuries. Sudden visual loss. First aid in ophthalmology.

#### **Practical guide** (0,5 hour/week)

Anatomy of the eye. Patient's history.  
Objective and subjective symptoms of eye-diseases.  
Eyelids and lacrimal system.  
Examination of the anterior segment of the eye (focal light, slit lamp).  
Refractive errors. Checking of visual acuity.  
Basics of orthoptics.  
Examination of the refractive media and retina. (Ophthalmoscope)  
Diagnosis of glaucoma (perimetry, checking of intraocular pressure, gonioscopy).  
Treatment of glaucoma.  
First aid in cases of ocular injuries.  
First aid in sudden visual loss.  
Differential diagnostic approach of the "red eye".  
Differential diagnostic approach of the "painful" eye.  
Consultation.

# FORENSIC DENTISTRY

## Department of Forensic Medicine

Tutor: *Dr. Zoltán Szőlősi*

### First Semester

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#### 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 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> 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

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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

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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. *Oppurtunistic screening*

This mean the comprehensive dental examination of a particular patient attending a dental service. This screening is not only concentrating on detection of oral premalignancies oral malignancies, but also other developmental and inflammatory lesions.

Basic investegative methods of head and neck region  
 detailed case history (with special aspects on tumors, life syle, persistant, 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 patienst could be inhanced 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 pathomechanismus of oral tumors
3. Rate and efficacy of different screening methods (screen or not to screen)
4. Basic clinical signs and symptoms of oral malignancies and premalignancies I.
5. Basic clinical signs and symptoms of oral malignancies and premalignancies II.
6. Consultation
7. Possibilities of early detection and prevention
8. Diagnostic process of oral malignancies I. Traditional physical examination
9. Diagnostic process of oral malignancies II. Traditional physical examination
10. Diagnostic process of oral malignancies novel Procedures (e.g. lightningdevices)
11. Contemporary diagnostical possibilities and a multidisciplinary cooperation
12. Social and dental rehabilitation after the treatment of oral cancer
13. Consultation /Examination

## PEDODONTIC AND ORTHDONTIC PREVENTION

### ORTHODONTIC DIAGNOSIS I-II. - both for the 5th year

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Department of Pedodontics and Orthodontics

**1 lecture / week**  
**1 credit point**

## DIRECT AESTHETIC DENTISTRY 4<sup>th</sup> year

### Department of Conservative Dentistry

Head of the Department: *Dr. Zsuzsanna Tóth*

Tutor: *Dr. Kamil Al-Katib, Dr. Zsolt Döbrentey*

Durations: 1 lecture and 3 practice  
Every class : 3h (4x45 min)

Credit value: 1 credit point

Maximum group size: 50

### Direct Aesthetic Dentistry I. (basic course) - 1<sup>st</sup> semester (autumn)

This elective course is for dental students having finished successfully Conservative Dentistry III.

#### 1st week: theory

Advanced caries diagnostic and adequate treatment alternatives. The development of adhesive technology, and its potential in the light of direct restorations . Material science of composites. Stratification techniques, polymerization stress reduction. Minimally invasive and advanced preparation methods (tunnel-, sandwich- technique). Isolation techniques. Using photopolymerization devices . Practical possibilities in recontouring of tooth shapes. Theory and practice of anatomical layering technique Tooth anatomy and basic skills of Gnathology. Tooth color: hue, value, chroma, translucency, fluorescence, metamerism, opalescence, intensives. Dental photography.

#### 2nd week: practice

Anterior wax-up. Proper design of cervico - oro – vestibular - incisal dimensions. Perikymata, grooves, character lines, and its effect on the visual dimension of the tooth.

#### 3rd week: practice

Restorations in the front region. Preparation of a standardized full composite first incisor using the anatomical stratification technique.

#### 4th week: practice

Medium size restoration in the molar region. Creation of appropriate cusps-fissure relation.

### Direct Aesthetic Dentistry II. (advanced course) - 2<sup>nd</sup> semester (spring)

This elective course is for dental students having finished successfully Direct Aesthetic Dentistry I.

#### 1st week: theory

Diagnostic criteria of aesthetic dentistry. The division between direct and indirect techniques. Color theory in the light of different composite materials. Physical , chemical properties and biocompatibility of materials used. Anatomical layering technique on complex and difficult cases: fluorotic spots, transparency, halo effect, discolored cracks, fissure staining . Advanced tooth anatomy: macro and micro-morphology . Smile design. Connection between aesthetics, function and durability. The adhesive technology frontier areas . Based on the use of composite Biomimetic principles. Special instruments. Documentation, dental photography and basics of presentation.

**2nd time: practice**

Direct veneer for randomized middle-aged „patients

**3rd time: practice**

Rebuilding the veneer for elderly patient.

**4th time: practice**

Large restoration in the molar region. Creation of appropriate cusp- fissure relation, using stain technique for making the restoration more life-like.

## POSTGRADUATE COURSES

Head of Secretariat: **Dr. János Gerle**

E-mail: gerle@fok.usn.hu

Phone: 459-1500/ ext 59391; 59392

Administrators:

**Ms. Erika Sviderszky Blahó**

**Office hours:** Monday, Tuesday 13.30-15.30, Wednesday, Thursday 9.00-12.00

**Phone:** 266-7006, **fax:** 266-4715, **email:** szkepz@dent.semmelweis-univ.hu

**Ms. Veronika Gecse**

**Office hours:** Monday, Tuesday 13.30-15.30, Wednesday, Thursday 9.00-12.00

**Phone:** 266-7006, **fax:** 266-4715, **email:** szkepz@dent.semmelweis-univ.hu

Postgraduate courses are available at the Faculty of Dentistry at Semmelweis University, ending with a specialty exam in the following fields:

1. Pedodontics
2. Orthodontics
3. Periodontology
4. Dentoalveolar Surgery
5. Conservative and Proshetic Dentistry.

The language of the postgraduate courses and the specialty exams is Hungarian. The courses convey theoretical knowledge and practical skills.

If you wish to take a specialty exam you must meet the following requirements:

you can take a specialty exam after 36 months of professional practice fulfilled as an employee, according to Hungarian law. To complete this practice, therefore, you must obtain a work permission. professional practice includes theory and treating patients. You will need a good command of the Hungarian language to understand theory, and be able to communicate with patients

Non-European citizens must have their degree nostrificated

# FACULTY OF PHARMACY



*Faculty of Pharmacy  
1<sup>st</sup> year*

## STUDY PROGRAMME

### First Year

1 <sup>st</sup> semester					
Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination
General and Inorganic Chemistry I. Practice GYASKASKG1A	–	5	5	–	practical course grade
General and Inorganic Chemistry I. GYASKASKE1A	4+1	–	5	–	semi-final
Introduction to Health Informatics I. Practice GYINFBEIG1A	–	1	–	–	signature
Introduction to Health Informatics I. GYINFBEIE1A	1	–	2	–	semi-final
Biophysics I. Practice GYFIZBIFG1A	–	3	2	–	practical course grade
Biophysics I. GYFIZBIFE1A	2	–	3	–	semi-final
Biology I. Practice GYGENBILG1A	–	2	2	–	practical course grade
Biology I. GYGENBILE1A	2	–	2	–	semi-final
Medical Terminology** GYLEKOTRG1A	–	2	2	–	practical course grade
Mathematics I. Practice GYEGYMATG1A	–	2	2	–	practical course grade
Mathematics I. GYEGYMATE1A	2	–	2	–	semi-final
Physical Education I. GYTSITSG1A	–	1	0	–	signature
History of Sciences, Propedeutics GYEGYTTPE1A	2	–	2	–	semi-final
Hungarian Medical Terminology I. * GYLEKMSZG1A	–	4	4	–	practical course grade
<b>Total Credit</b>			<b>33</b>		



**2nd semester**

<b>Subjects</b>	<b>Lectures</b>	<b>Practices</b>	<b>Credit Points</b>	<b>Prerequisites</b>		<b>Examination</b>
General and Inorganic Chemistry II. GYASKASKE2A	3	–	3	GYASKASKE1A	General and Inorganic Chemistry I.	final #
Analytical Chemistry I. (qualitative) GYASKANKG1A	2	5	5	GYASKASKE1A	General and Inorganic Chemistry I.	practical course grade
Anatomy GYANTANAE1A	2	–	4	GYGENBILE1A	Biology I.	semi-final
Anatomy Practice GYANTANAG1A	–	2	–	GYGENBILE1A	Biology I.	signature
Introduction to Health Informatics II. Practice GYINFBEIG2A	–	1	–	GYINFBEIE1A	Introduction to Health Informatics I.	signature
Introduction to Health Informatics II. GYINFBEIE2A	1	–	2	GYINFBEIE1A	Introduction to Health Informatics I.	semi-final
Biophysics II. Practice GYFIZBIFG2A	–	3	2	GYFIZBIFE1A	Biophysics I.	practical course grade
Biophysics II. GYFIZBIFE2A	2	–	3	GYFIZBIFE1A	Biophysics I.	final #
Biology II. Practice GYGENBILG2A	–	2	1	GYGENBILE1A	Biology I.	practical course grade
Biology II. GYGENBILE2A	2	–	2	GYGENBILE1A	Biology I.	final #
Pharmaceutical Botany I. GYNOVGYNG1A	1	2	3	GYGENBILE1A	Biology I.	practical course grade
Mathematics II. Practice GYEGYMATG2A	–	1	1	GYEGYMATE1A GYINFBEIE1A	Mathematics I. Introduction to Health Informatics I.	practical course grade
Mathematics II. GYEGYMATE2A	2	–	2	GYEGYMATE1A GYINFBEIE1A	Mathematics I. Introduction to Health Informatics I.	semi-final
Physical Education II. GYTSITSNG2A	–	1	0	GYTSITSNG1A	Physical Education I.	signature
First Aid GYTRAEELSE1A	1	--	0			signature
Hungarian Medical Terminology II. * GYLEKMSZG2A	–	4	2	GYLEKMSZG1A	Hungarian Language I.	practical course grade
<b>Total Credit</b>			<b>30</b>			

# The grade influences the qualification of the diploma

\* Obligatory courses

\*\* Obligatory elective courses: (2 credit points).

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

- 1 Alberts Essential Cell Biology (4th edition) Garland Science, ISBN-13: 978-0815344544; ISBN-10: 0815344546
- 2 Genetics and Genomics (e-book)
- 3 Vígh B: The Construction of the Human Being. Short anatomy. (Bp.) 1999. Magánkiad.
- 4 Damjanovich – Fidy – Szöllösi (eds) Medical Biophysics, Medicine, Budapest, 2009. ISBN 978 963 226 127 0
- 5 Laboratory Manual of Medical Physics and Statistics, Semmelweis University Institute of Biophysics and Radiation Biology Budapest, 2005. ISBN 963 9129 60 7
- 6 Rost et al.: Botany, a brief introduction to plant biology. Wiley.
- 7 Mihalik: Botany for Students of Pharmacy. (Szeged)
- 8 Lásztity-Noszál: Practical Inorganic and General Chemistry. Bp. (SOTE)
- 9 Lásztity-Gyimesi: Qualitative Inorganic Analysis. Bp. (SOTE)
- 10 Körös: General Chemistry. Bp. (SOTE)
- 11 Körös: Inorganic Chemistry. (Szeged)
- 12 Masterton-Hurley: Chemistry. Principles and Reactions. Saunders College Publishing, 1998.
- 13 1st semester: Gyöngyösi L. & Hetesy B., 2012. Jó reggelt! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)
- 14 2nd-3rd semesters: 2nd-3rd semesters: Gyöngyösi L. & Hetesy B., 2011. Jó napot kívánok! Bp. Semmelweis Egyetem Egészségtudományi Kar (available at Vas u. 17. Bookshop)

**Recommended textbooks:**

- 1 Bland M.: An Introduction to Medical Statistics. (Oxford medical publication)
- 2 Batschelet, E.: Introduction to Mathematics for Life Scientists
- 3 Maróti-Berkes-Tölgyesi: Biophysics Problems. A Textbook with Answers. Bp. Akadémiai K. 1998. ISBN 963 05 7526 4
- 4 Alberts et al.: Molecular Biology of the Cell. Garland Science/Taylor & Francis Group Publ. (4<sup>th</sup> or 5<sup>th</sup> edition)
- 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

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**Lectures:** 2 hours per week

**Practicals:** 2 hours per week

Differential and differential coefficient. Rules for derivations of functions.

The derivative of the power function.

Derivation of composite and inverse functions. Differentiability of the elementary functions. Higher order derivatives.

Application of differentiation for calculation of limits of fractions.

An iterative method to solve equations (Newton-method).

Expansion of differentiable functions to power series. The Taylor series of  $\exp x$ ,  $\sin x$ ,  $\cos x$ ,  $\ln x$  and other functions.

Qualitative examination of functions. Roots, extremes and inflexion points.

The multiplicity of a root.

The complete discussion of elementary functions.

Integration as the inverse operation of derivation. The indefinite integral.

Integration of power functions. Integration of simple elementary functions.

Integration of products (the rule of "partial integration"). Integration of composite functions. Integration of rational fractions.

Area under a curve: the definite integral. Improper integrals.

The concept of a differential equation. Differential equations arising in physics, chemistry, biology, botanics and other fields. The homogeneous linear differential equation with constant coefficients: solution and proof of unicity.

Separation of variables as the method of solution. General and particular solutions. Introduction of new variables.

Nonlinear differential equations of the first order.

Differential equations of the chemical reactions of 0th, 1st and 2nd order.

Functions of several variables. Partial derivatives of first and second order.

Differentiability and exact differential. Application of exact differential in error calculations. Maxima and minima of two-variable functions.

Different kinds of integration of functions of several variables. Integration along a line. Point functions and independence of the integral of the path.

Calculation of the integral along different curves.

## MATHEMATICS II.

University Pharmacy, Department of Pharmacy Administration

Tutor: *Dr. Andrea Meskó*

### Second Semester

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**Lectures:** 2 hours per week

**Practicals:** 1 hour per week

Introduction and information. The most common calculations in laboratory. Some hints for numerical calculations.

Biometrics and/or biostatistics. Statistical inference. Frequency distributions. Theoretical distribution and probability. The normal distribution.

Measures of central tendency (mode, median, mean etc.) Applications of the weighted mean. Measures of dispersion.

Standard deviation and variance. The coefficient of variation. Error bounds. The standard error of the mean.

The concept of "regression line". The linear regression: coefficients, interpretation, application.

The correlation coefficient: formula and interpretation. Uses and misuses of correlation coefficient.

Lack of correlation vs. independence. Spurious correlations. Coefficient of determination.

Sampling distributions. Important distributions derived from the normal one:  $t$ ,  $F$ , and chis-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.

Sequences and series. Series of functions. Power series.

Radius of convergency.

# BIOLOGY I.

## Department of Genetics, Cell- and Immunobiology

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

Course coordinator: **Dr. Orsolya Láng**

Subject code: GYGENBILG 1A (practice)

GYGENBILE1A (lecture)

**Credit:4**

## 1<sup>st</sup> Semester

Lectures: 2 hours per week

Practice: 2 hours per week

Week	Lecture	Practice
1.	The cell membrane: structure and function	The light microscope in use
2.	Structure and function of the nucleus I	General view of the cell. Light and electron microscopic microtechnique.
3.	Structure and function of the nucleus II	Cell nucleus. Cyto(histo)chemistry
4.	Endoplasmic reticulum and the ribosomes	Endoplasmic reticulum
5.	Golgi complex, secretion and protein transport	Golgi complex
6.	Lysosomes, endocytosis, vesicular transport	Midterm (written)
7.	Structure and function of mitochondria and peroxisomes	Secretion. Immunohistochemistry
8.	The cytoskeleton,	Endocytosis. Cellular digestion. Enzyme-histochemistry
9.	Cellular movement	Cell and tissue culture
10.	Cell adhesion, cell junctions	Store and supply of energy. Mitochondria. Peroxisome.
11.	Extracellular regulation of cells, signal transduction I	Cytoskeleton and cellular movement
12.	The cell cycle and its regulation I	Cell surface differentiation, ultrastructure of cellular junctions
13.	The cell cycle and its regulation II	Midterm (written)
14.	Cellular aging and programmed cell death (apoptosis)	Cell death (necrosis and apoptosis)

### Important notes:

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

There are two midterms during the semester. To get practice grade and signature the average of the midterms have to be 2.0. Missed or failed midterms might be repeated two times. No improvement of midterm grade.

Requirement of lecture signature is: practice grade and not more than three absences from the lectures.

Students having lecture and practice signature may give the exam. Exam is a written test (multiple choice, essay, drawing etc. similar to midterms) covering practice and lecture parts.

## BIOLOGY II.

### Department of Genetics, Cell- and Immunobiology

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

Course coordinator: **Dr. Orsolya Láng**

**Subject code: GYGENBILG\_2A (practice)**

**GYGENBILE\_2A (lecture)**

**Prerequisite: Biology I.**

**Credit: 3**

Lectures: 2 hours per week

Practices: 2 hours per week

### Second Semester

Week	Lectures	Practices
1.	Meiosis	Typical and atypical mitosis
2.	Introduction to human genetics; human genom	Meiosis and gametogenesis
3.	Mutations and polymorphisms I.	Cytogenetics I
4.	Mutations and polymorphisms II.	Cytogenetics II
5.	Epigenetics	Introduction to humangenetics; special methods of human-genetics
6.	Cytogenetics I	Molecular genetics I
7.	Cytogenetics II	Midterm I (written)
8.	Autosomal inheritance I.	Molecular genetics II
9.	Autosomal inheritance II.	Molecular genetics III
10.	Role of sex in inheritance	Application of genetic methods in the study monogenic inheritance I.
11.	Genetics of sex	Application of genetic methods in the study monogenic inheritance II.
12.	Relationship of genom and environment. Complex inheritance	Complex inheritance
13.	Pharmacogenetics, -genomics	Midterm II
14.	Gene and genom manipulation	Consultation

**Important notes:** see at Biology I.

Students having lecture and practice signature may give the final exam. Final exam is a written test (multiple choice, essay, drawing etc. similar to midterms) covering practice and lecture parts of Biology I and II.

## BIOPHYSICS I.

Tutor: *Dr. Károly Módos*

### First Semester

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#### **Lectures** (2 hours per week)

Introduction; structure of matter; interactions  
 Gases, crystals, liquids, Boltzmann distribution  
 Properties of condensed matter  
 Liquid crystals, membranes  
 Structural organization of macromolecular systems  
 Radiations, light, optics  
 Wave and corpuscular nature of light  
 Light absorption and emission, light scattering, vision  
 Electromagnetic radiations, thermal radiation  
 Luminescence  
 Lasers

#### X-radiation

Ionizing radiations, radioactive decay

#### Dosimetry

Sound, ultrasound, hearing

#### **Laboratory** (3 hours per week)

Laboratory safety rules  
 Data processing  
 Emission spectroscopy. Light sources  
 Spectrophotometry  
 Optical lenses; light microscope

Detection of nuclear radiations  
 Oscilloscope  
 Radioactive power of an X-ray tube

Special light microscopes  
 Gamma energy determination  
 Electronic blood particle counting  
 Picoscale  
 Determination of skin-impedance  
 Concentration determination with refractometer  
 Isotope diagnostics  
 Repetition, consultation

## BIOPHYSICS II.

### Second Semester

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#### **Lecture** (2 hours per week)

Transport phenomena, flow of fluids and gases  
 Diffusion, osmosis  
 Thermodynamic aspects of transport processes  
 Laws of thermodynamics  
 Membrane potential  
 Signals as information carriers, signal processing  
 Detectors, transducers, displays  
 Basic electronic units and circuits  
 Physical methods for structural analysis I  
 Physical methods for structural analysis II  
 Regulatory system in technics and b  
 Some diagnostic methods, endoscopy, thermography, ultrasound echo, Doppler, X-ray  
 Isotope diagnostics  
 Magnetic resonance imaging  
 Some therapeutic methods, laser surgery, radiation therapy  
 Research fields in the Department of Biophysics and Radiation Biology

#### **Laboratory** (3 hours per week)

U V-dosimetry  
 Dosimetry  
 Amplifier  
 The attenuation of gamma-radiation  
 Pulse generators  
 Sine wave oscillators  
 Audiometry  
 Densitography (CT)  
 Calculations  
 Flow of fluids. Electric model of vascular system  
 Electrocardiography

Diffusion  
 Sensory function  
 Repetition

Repetition

# GENERAL AND INORGANIC CHEMISTRY I.

Lecturers: *Dr. Béla Noszál, Dr. István Szalai*

Tutor: *Dr. Krisztina Kurin-Csörgei*

## First Semester

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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 moleculer 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.  $K_p$  and  $K_c$ . The Le Chatelier principle. The temperature and pressure dependence of the equilibrium constant.

Acid/base equilibria. Conjugated acid-base pairs and their strengths.

The acid/base equilibria of water. The pH and its calculation. Strength of acids and bases. Hydrolysis. Buffer systems.

Complex formation equilibria. Types of ligands. Mass balance equations, calculation of complex equilibria. Heterogeneous equilibria, the solubility product constant, solubility.

Chemical kinetics. Reaction order and molecularity. First order reactions.

Age determinations based upon radioactive decompositions. Second order,

pseudofirst order and zero order reactions. Reaction mechanisms.

The temperature dependence of the reaction rate, collision theory.

Catalysis. catalysts. Autocatalytic reactions. Enzyme catalysed, induced and oscillatory reactions.

Thermochemistry. Hess's law. Internal energy and enthalpy changes of reactions.

Entropy. Spontaneity of chemical reactions, the free energy. Coupled reactions and their spontaneity.

Photochemistry and radiation chemistry. States of matter. Properties and kinetic

theory of gases. Properties of liquids. The surface tension. Freezing, boiling.

The phase diagram of water. Crystal structures, unit cell. The rate of crystallization. Sublimation.

The mechanism of dissolution. Types of concentrations. Rules of dilute solutions.

Determination of MM by colligative properties.



# PRACTICAL GENERAL AND INORGANIC CHEMISTRY

## First Semester

### **Lectures** (4+1 hours per week)

Methods of purification of chemical substances. Recrystallization.  
 Sublimation.  
 Ion exchange. Distillation.  
 Chemical purification.  
 Preparation of inorganic compounds.  
 Stoichiometry of chemical reactions.  
 Theoretical yield, actual yield and percent yield. Types of chemical reactions.  
 Acid-base reactions. Preparation of inorganic compounds by acid-base reactions.  
 Acid-base properties of salt solutions, hydrolysis.  
 Thermal decomposition of inorganic compounds (acids, bases, salts). magnesium metal sample.  
 Oxidation-reduction reactions. Balancing redox equations.  
 Preparation of inorganic compounds by oxidation-reduction reactions.

Complex formation reactions. Naming of complex ions and coordination compounds.  
 Methods of preparation of double salts and coordination compounds.

Calculation of pH in solutions of acids and bases.  
 Buffer solutions and their functions, calculation of pH of buffer solutions.

Precipitation reactions. Equilibria in precipitation reaction.

Problem-solving in general chemistry. (Calculation of molar masses of nonelectrolytes from colligative properties).

Problem solving in general chemistry (Electrochemistry)

### **Practicals** (5 hours per week)

Safety instructions. General instructions on the requirements. Recrystallization of  $\text{KA1(SO4)2} \cdot 12 \text{H}_2\text{O}$ . Sublimation of iodine.  
 Chemical purification of sodium chloride.  
 Water purification using ion exchange resins.  
 Distillation of hydrochloric acid.  
 Preparation of  $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$

Preparation of  $(\text{NH}_4)_2\text{SO}_4$ ,  $\text{H}_3\text{BO}_3$  from borax ( $\text{Na}_2\text{B}_4\text{O}_7$ )  
 Preparation of  $\text{CaHPO}_4$ . Observation of hydrolysis of some salts.  
 Observation of thermal decompositions.  
 Determination of the mass of a

Observation of some oxidation-reduction Reactions.  
 Preparation of metallic copper and metallic manganese.  
 Reactions of metals.  
 Preparation of  $\text{Cu}_2\text{O}$  and  $\text{FeSO}_4$

Preparation of precipitated sulfur.  
 Experimental observation of direction of redox reactions (standard potentials).  
 Preparation of a double salt (Mohr salt,  $(\text{NH}_4)_2 \text{Fe(SO}_4)_2 \cdot 6 \text{H}_2\text{O}$ )  
 Preparation of a buffer solutions.  
 Preparation of  $\text{Cu}(\text{NH}_3)_4 \text{SO}_4$  and  $\text{Co Hg(SCN)}_4$  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

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3 hours per week (lecture)

### Weeks Introduction

- 1 The elemental composition of the Universe. Origins of the elements. The composition of the lithosphere, hydrosphere and atmosphere. The evolution of the atmosphere. The classification of the elements: metals, nonmetals and metalloids. Trends in metallic and nonmetallic character.
- 2 **Chemistry of hydrogen, oxygen, nitrogen and carbon.**  
Hydrogen: occurrence, preparation, chemical properties, uses. Binary hydrogen compounds (hydrides). Oxygen: occurrence, preparation, chemical properties, uses. Ozone. Peroxides, superoxides.
- 3 Nitrogen: occurrence, chemical properties. Hydrogen compounds of nitrogen. Oxides and oxyacids of nitrogen. The nitrogen cycle in nature. Carbon: elemental forms of carbon. Inorganic compounds of carbon. The carbon-oxygen cycle in nature.

### 4 **Chemistry of other nonmetallic elements**

- The noble gases. (He, Ne, Ar, Kr, Xe, Rn) and their compounds. The halogens (F, Cl, Br, I, At): occurrences, preparation, properties and uses. Oxyacids and oxyanions. The biological role of halogens.
- 5 The group 6A elements (S, Se, Te). General characteristics, occurrences, preparation, properties. Oxides, oxyacids and oxyanions of sulfur and selenium. Sulfur and selenium in biology.
  - 6 The group 5A elements (P, As, Sb, Bi). General characteristics, occurrences, preparation, properties. The oxycompounds of phosphorus. – The biological significance of the P–O bond. Silicon. The major element of the geosphere. Silicates. Clay minerals. Glass. – A comparison of the properties of carbon and silicon. Boron and its compounds.

### **Metals**

- 7 Occurrence and distribution of metals. Metallurgy. The physical and chemical properties of metals and alloys. The alkali metals (Li, Na, K, Rb, Cs). General characteristics. Some important compounds of sodium and potassium.
- 8 The alkaline earth metals (Be, Mg, Ca, Sr, Ba). General characteristics. Some important compounds of magnesium and calcium. The zinc-group metals (Zn, Cd, Hg). Occurrences, chemical properties.
- 9 The transition metals. Physical properties, electron configurations and oxidation states. The chemistry of selected transition metals: chromium, manganese, iron, copper, molybdenum, platinum.

### **Chemistry of coordination compounds**

- 10 The structure of complexes. Types of ligands. Chelates. Isomerisms. Bonding in complexes. The magnetic and optical properties of complexes.
- 11 The dynamics of coordination compounds: Complex equilibria, ligand exchange rates. The coordination chemistry of alkali metal ions. (Host-guest complexation.)

### **Metals in biology**

- 12 Life essential metals and ligands in biosystems. Metals in enzymatic and trigger processes. Metals in oxygen and nitrogen biochemistry.
- 13 Metals in biomineralization. Metal-induced toxicity. The biomedical use of metal complexes and metal complexation.

### **The chemistry of the environment**

- 14 A brief overview of the chemistry of the lithosphere, hydrosphere and atmosphere.

# 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.  
 Analytical classification of cations. Group reactions of cations. Analytical groups and periodic table of the element. Summary of properties of elements and reactions of Group I cations.  
 Ion reactions in aqueous solution. Acidbase reactions. Thioamphoterism. Summary of properties of elements and reactions of Group II cations.  
 Complex formation reactions. Complex equilibria. Pearson classification of acids and bases.  
 Precipitation reactions. Equilibria in cations. precipitation reactions. Solubility and pH.  
 Precipitation and solubilities of metalsulfides. group of cations.  
 Summary of properties of elements and reactions of Group III cations.  
 Solubility and complex ion equilibria and application in qualitative analysis of ions.  
 Summary of properties of elements and reactions of Groups IV–V cations. Flame tests. Atomic spectroscopic methods of qualitative analysis.  
 Classification of anions into analytical groups. Group reagents for qualitative analysis of anions.  
 Oxidation-reduction.  
 Oxidation-reduction reactions in qualitative chemical analysis.  
 Summary of reactions of common anions.

### Practicals (5 hours per week)

General rules of work in the laboratory of analytical chemistry. Study of reactions of Group I cations.  
 Part I: Bi<sup>3+</sup>, Pb<sup>2+</sup>, Cd<sup>2+</sup>.  
 Study of reactions of Group I cations.  
 Part II: Hg<sub>2</sub><sup>2+</sup>, Hg<sup>2+</sup>, Ag<sup>+</sup>, Cu<sup>2+</sup>.  
 Identification of cations in mixture of Group I cations.  
 Study of ion reactions of Group II cations:  
 As<sup>III</sup>/<sub>III</sub>, <sup>V</sup>/<sub>V</sub>, Sb<sup>III</sup>/<sub>III</sub>, <sup>V</sup>/<sub>V</sub>, Sn<sup>II</sup>/<sub>II</sub>, <sup>IV</sup>/<sub>IV</sub>.  
 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<sup>2+</sup>, Ni<sup>2+</sup>, Fe<sup>2+</sup>, Fe<sup>3+</sup>, Cr<sup>3+</sup>.  
 Study of ion reactions of Group III  
 Part II: Al<sup>3+</sup>, Mn<sup>2+</sup>, Zn<sup>2+</sup>. Analysis of unknown mixture of the third analytical  
 Study of ion reactions of Groups IV–V cations.  
 Analysis of Group III cations in unknown samples. Detection of cations in the mixture of the fourth and fifth analytical groups of cations.  
 Analysis of unknown samples containing cations of the Groups I–V.  
 Study of reactions of the first analytical group anions.  
 Study of reactions of the second and third analytical groups of anions.  
 Study of reactions of the fourth group of anions.  
 Identification of anions in the mixture of Groups I–IV anions.  
 Special tests for mixture of anions.

**Lectures** (2 hours per week)

Analysis of cation-anion solution sample. Preliminary and specific tests.  
 Analysis of cation-anion unknown solid sample. General procedure for chemical analysis.  
 Physical methods of qualitative analysis.

**Practicals** (5 hours per week)

Analysis of cation anion unknown solution sample (3–5 ions).  
 Analysis of cation anion unknown solid samples (3–5 ions).  
 Analysis of unknown simple substances.

## PHARMACEUTICAL BOTANY I.

**Department of Plant Anatomy**

Tutor: **Dr. Gábor Kovács**

### Second Semester

**Week Lectures**

- 1 Introduction. The Plant Kingdom. The botanical sciences. Pharmaceutical Botany, the program of the lectures.
- 2 Compartmentalization and metabolic pathways in plant cells.
- 3 Chloroplast and photosynthesis. Starch formation and degradation.
- 4 Synthesis of cell wall polysaccharides. Cell wall formation and architecture. Plasmodesmata. Mucilage synthesis and the dynamics of hydrophilic secretion.
- 5 Mitochondrion and respiration.
- 6 Lipid metabolism. Fatty acid polymers: cutin, suberin. Wax. Terpenoids. The lipophilic secretion.
- 7 Amino acid and protein metabolism. The N cycle. Protein bodies, protein mobilization. Protein secretion.
- 8 Formation of alkaloids and phenolics. Lignification. Vacuole, cell sap, osmoregulation, crystal formation, autophagy, autolysis.
- 9 Nucleic acid metabolism. The nucleus. Plant specificities of mitosis and meiosis.
- 10 Organizational types of plants. The cormophyte plant body. Tissues, tissue system. Meristems.
- 11 Dermal tissue system.
- 12 Conductive tissue system.
- 13 Ground tissue system.
- 14 Secretory structures.

**Practicals**

Fundamentals in Botany. The use of the light microscope. Knowledge of the medicinal plants  
 Plant cells (plasmolysis, cycloses).  
 Plastids, reserve polysaccharides, protein bodies.  
 Cell wall, structural polysaccharides and other wall substances.  
 Vacuole, crystals, lipid bodies.  
 1<sup>st</sup> Test Work. Stem morphology (buds).  
 Monocots: analysis of a living plant.  
 Analysis of dicots representing ancestral type (Ranunculaceae).  
 Simple tissues, meristems.  
 Dermal tissue system, trichomes.  
 2<sup>nd</sup> Test Examination  
 Analysis of living plants (Rosaceae, Apocynaceae), medicinal plants.  
 Conductive tissue system.  
 Ground tissue system.  
 Analysis of living plants (Papaveraceae, Primulaceae).  
 3 Test Work  
 Knowledge of the medicinal plants.  
 Pteridophyta.

A visit to Research Institute for Medicinal Plant (Budakalász) by coach, to study the chemotaxonomic plant collection. Field practice in the mountains near to Budapest to study the springtime blossoming medicinal plants.

# ANATOMY

Tutor: *Dr. Ágnes Csáky*

## Second Semester

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The aim of the subject is to introduce to the fundamentals of the structure of the human body and by this teach the essential terms used in the communication between pharmacists and physicians. The topic anatomy also serves as a preliminary study for later clinical subjects and deals with the basic methods of morphological research. The programme refers to anatomical books and periodicals helping the pharmacists to complete their knowledge in necessary.

### Lecture Practice

1	Introduction, general Embryology	Microscopy: stratified epithelium,
2	Basic tissue	connective tissue, cartilage, bone
3	Bone, joint and muscle types	Macroscopy: bones and joints of the
4	Ossification, development of the vertebral column	shoulder girdle and upper limb
5	Heart and its development	Microscopy: artery and vein, blood,
6	Blood vessels	lymph node spleen, palatine, tonsil
7	Blood, development of the blood cells	Macroscopy: bones and joints of the
8	Lymphatic organs	pelvis girdle and lower limb
9	Respiratory system	Microscopy: lung, submandibular gland,
10	Development of lung and intestines	liver, pancreas
11	Intestinal tract.	Macroscopy: vertebral column and skull
12	Digestive glands	
13	Kidney	Microscopy: stomach ileum, kidney,
14	Ureter, urinary bladder, urethra	ureter
15	Inner and outer genitals	Macroscopy: muscles, vessels and
16	Development of the urogenital organs	nerves of the upper limb.
17	Endocrine gland	Microscopy: ovary, uterus, placenta,
18	Development of the nervous system	testis, penis
19	Spinal cord.	Macroscopy: muscles, vessels and
20	Oblongate medulla, pons, mesecephalon	nerves of the lower limb.
21	Diencephalon, neurosecretion	Microscopy: hypophysis, thyroid, adrenal
22	Cerebral cortex	gland, cerebellum, spinal cord.
23	Cerebellum, extrapyramidal system	Macroscopy: intestinal complex
24	Olfactory and limbic systems	
25	Eye, optic tracts and centers	Microscopy: eye, organ of Corti
26	Auditory and static system	
27	Gustatory buds, skin and accessory organs	Macroscopy: brain and spinal cord.
28	Development of the sensory organs	
29–30	Repetition, complementary day for holidays	

# HISTORY OF SCIENCES, PROPEDEUTICS

University Pharmacy, Department of Pharmacy Administration

Lecturer: **Prof. Dr. Ágnes Kéry**

Tutor: **Dr. Andrea Balázs**

## First Semester

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**Week Lectures** (2 hours per week)

- 1 The place and importance of the subject in the curriculum.  
Profession's history as bridge, methods, main fields.  
Symbols of medicine and pharmacy.
- 2 Knowledge of medicine and pharmacy in Babylonia-Assyria.  
Knowledge of medicine and pharmacy in Egypt.
- 3 Knowledge of medicine and pharmacy in Greece. Hippocratic medical writing.  
Knowledge of medicine and pharmacy in Rome. Galen.
- 4 The Arabs and the European Middle Ages. Transit ways of knowledge.  
Monastic medicine and pharmacy. The School of Salerno.  
Universities emerge, the birth of European professional pharmacy.
- 5 The idea of renaissance. Paracelsus and chemical drugs.  
Homeopathy as an example of medical sectarianism.
- 6 Development of pharmacy in Italy and France.  
Development of pharmacy in Germany and Britain.
- 7 Development of Pharmacy in Hungary.
- 8 Pharmaceutical education in Europe. Development of education.
- 9 Definition of drugs. Aspects of classification.  
Classification of drugs according to their origin and on the basis of strength.
- 10 Classification of drugs by their pharmaceutical action, use and by the place of application.  
Drug and doses. Specially named doses.
- 11 Drug utilization. How could be influenced the increased drug consumption?  
Drug abuse. Prevention of drug abuse.  
Narcotic controls.
- 12 International professional trends. F.I.P., I.P.S.F.. Unification of drug standards.  
Pharmaceutical literature: treatises, pharmacopeias, formularies, journals, periodicals.
- 13 Ordering of drug preparation. Pharmacy, galanic laboratories, pharmaceutical factories.
- 14 Pharmacists, connections with physicians, etc.  
Health for all – all for health by the year 2000.

# FIRST AID

## Department of Traumatology

Head of Department: **Prof. Dr. László Hangody**

Tutor: **Dr. Tamás Gál**

**Curriculum Year: 2016/2017**

**Type of subject:** Mandatory

## Second Semester

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### 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-II.

## Institute of Digital Health Sciences

Credit: 2

1 lect. + 1 pract/ week / two semesters

<b>THEMES/1. semester</b>	
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
1. Getting Started With The Internet. TCP/IP	Practice
2. Mobile communication: HW	Practice
3. Mobile communication: SW	Practice
4. Basics of database managing.	Practice
5. Extracting data from a nutrition database using MS Access.	Practice
6. Basics of Spreadsheets.	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



<b>THEMES/2. semester</b>	
1. The knowledge in medicine and pharmacy (Dinya)	Lecture
2. Biomedical signal processing (Tamus).	Lecture
3. Computer security (Tamus)	Lecture
4. e-prescription (Daragó)	Lecture
5. Informatics Data of Drug Financing (Zajzon)	Lecture
6. Drug and pharmacotherapeutic databases on the Web (Zajzon)	Lecture
7. Informatics of Drug Planning (Dinya)	Lecture
1. Electronics databases: Medline, Micromedex, Cochrane Library	Practice
2. Pharmaceutical Problems and Excel Solutions	Practice
3. Studying scientific publications via electronic library of the university. Studying and comparing the structure and format, that is the restrictions determined by several editorials. Searching papers as basics for a medical study (syndromes, diagnoses, therapy).	Practice
4. Structure of a scientific publication. The importance and meaning of the sections of the paper.	Practice
5. Structure of an oral presentation and slides. Studying papers as publications and slides, as presentations.	Practice
6. Making an article on a medical study by special formal constraints and restrictions.	Practice
7. Making a presentation on the same theme.	Practice

## TERMINOLOGY (1st semester)

### Responsible organisational unit:

**Faculty of Health Sciences, Division of Foreign Languages and Communication**

**Programme director: Zöldi Kovács Katalin PhD**, Head of the Division

2 lessons per week, 2 credits

**Assessment:** 3 written tests

### Role of subject in fulfilling the aim of training:

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

Brief description of subject:

The main aim of the subject is:

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

**Course content of practical lessons:**

## 1. Grammar:

*Nouns*: the 5 Declensions*Adjectives* - construction of the most important attributive structures with the vocabulary of anatomy, clinical subjects and of pharmaceuticals.*Prepositions* (in anatomical, clinical and pharmaceutical phrases)*Numerals*: Usage on prescriptions.

## 2. Texts containing:

a) anatomical names;

b) clinical and patho-anatomical diagnoses;

c) prescriptions

## 3. Vocabulary

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

Course material, recommended text book(s), professional literature and supplementary reading(s)  
Belák E. *Medical Terminology for Beginners* (earlier title: *Medical Latin*), Budapest: Semmelweis Kiadó.**Basics of Foreign Language (module 1.)**

Magyar orvosi szaknyelv 1.

**Responsible organisational unit:****Faculty of Health Sciences, Division of Foreign Languages and Communication****Programme director:**

Zöldi Kovács Katalin PhD, Head of the Division

**4 lessons per week**, 4 credits,**Assessment:** end-term written and oral exam**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

Brief description of subject:

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

**Course content of practical lessons:**

Lesson 1-2: The alphabet

Lesson 3-4: Greetings

Lesson 5-6: Where are you from?

Lesson 7-8: Introducing people

Lesson 9-10: Numbers-phone numbers

Lesson 11-12: What time is it?

Lesson 13-14: Practising telling the time

- Lesson 15-16: Days
- Lesson 17-18: When do you study?
- Lesson 19-20: What is it? - food
- Lesson 21-22: Consolidation
- Lesson 23-24: Test 1 + situations
- Lesson 25-26: What is the food like? - adjectives
- Lesson 27-28: What do you think of English tea?- giving opinions
- Lesson 29-30: I would like a tea
- Lesson 31-32: Shopping for food
- Lesson 33-34: Ordering food- in a café
- Lesson 35-36: Rooms in the flat
- Lesson 37-38: Furniture in the rooms
- Lesson 39-40: Where are the furniture?
- Lesson 41-42: As a guest
- Lesson 11-12: At a party
- Lesson 43-44: Where can I find the library?
- Lesson 45-46: When shall we meet?
- Lesson 47-48: Asking for information, setting programs
- Lesson 49-50: Places in the city
- Lesson 51-52: Consolidation
- Lesson 53-54: Test 2 + situations and communication practice
- Lesson 55-56: Assessment

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

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

## Basics of Foreign Language (module 2.)

Magyar orvosi szaknyelv 2.

**Responsible organisational unit:**

**Faculty of Health Sciences, Division of Foreign Languages and Communication**

**Programme director: Zöldi Kovács Katalin PhD**, Head of the Division

**4 lessons per week, 2 credits,**

**Assessment:** midterm (written) and endterm (written and oral) tests

**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language/' and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

**Brief description of subject:**

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

**Course content of practical lessons:**

- Lesson 1-4: Forming questions
- Lesson 5-6: Plural forms
- Lesson 7-8: What do you like doing in your free time?
- Lesson 9-10: I would like to.....
- Lesson 11-12: Communication skills
- Lesson 13-14: A date – what do you like?
- Lesson 15-16: I like dancing, swimming etc.
- Lesson 17-18: I can ride a bike, drive etc.
- Lesson 19-20: Communication practice
- Lesson 21-22: Can I help you? In a clothes shop
- Lesson 23-24: Can I give you something else?
- Lesson 25-26: Communication practice
- Lesson 27-28: Consolidation
- Lesson 29-30: Test 1 + situations
- Lesson 31-32: I have a headache- at the doctor
- Lesson 33-34: At the chemist's
- Lesson 35-36: Communication practice- at the doctor, at the chemist's
- Lesson 37-38: My family, family members
- Lesson 39-40: Family relations
- Lesson 41-44: Communication practice- introducing your family
- Lesson 45-48: My boss' wife – social relations
- Lesson 49-50: Consolidation
- Lesson 51-54: Test 2 – situations, communication practice
- Lesson 55-56: Assessment

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

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



*Faculty of Pharmacy  
2<sup>nd</sup> year*

# STUDY PROGRAMME

## Second Year

### 3<sup>rd</sup> semester

Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination	
Analytical Chemistry (quantitative) I. GYASKAKKG1A	2	5	7	GYASKANKG1A GYEGYMATE2A GYASKASKE2A	Analytical Chemistry (qualitative) Mathematics II. General and Inorganic Chemistry II.	practical course grade
Physical Chemistry I. GYFKTFIKE1A	4	–	4	GYASKASKE2A GYEGYMATE2A GYFIZBIFE2A	General and Inorganic Chemistry II. Mathematics II. Biophysics II.	semi-final
Pharmaceutical Botany II. Practice GYNOVGYNG2A	–	3	2	GYGENBILE2A GYNOVGYNG1A	Biology II. Pharmaceutical Botany I.	practical course grade
Pharmaceutical Botany II. GYNOVGYNE2A	1	–	2	GYGENBILE2A GYNOVGYNG1A	Biology II. Pharmaceutical Botany I.	final #
Organic Chemistry I. Practice GYSZKSZKG1A	–	5,5	5	GYASKASKE2A GYASKANKG1A GYINFBEIE2A	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	practical course grade
Organic Chemistry I. GYSZKSZKE1A	4	–	5	GYASKASKE2A GYASKANKG1A GYINFBEIE2A	General and Inorganic Chemistry II. Analytical Chemistry (qualitative) Introduction to Health Informatics II.	semi-final
Physical Education III. GYTSITSNG3A	–	1	0	GYTSITSNG2A	Physical Education II.	signature
Hungarian Medical Terminology III. * GYLEKMSZG3A	–	4	2	GYLEKMSZG1A	Hungarian Language II.	practical course grade
<b>Total Credit</b>			<b>27</b>			

4<sup>th</sup> semester

Subjects	Lectures	Practices	Credit Points	Prerequisites		Examination
Analytical Chemistry (quantitative) II. Practice GYASKAKKG2A	–	5	3	GYSZKSZKE1A GYASKAKKG1A	Organic Chemistry I. Analytical Chemistry (quantitative) I.	practical course grade
Analytical Chemistry (quantitative) II. GYASKAKKE2A	2	–	6	GYSZKSZKE1A GYASKAKKG1A	Organic Chemistry I. Analytical Chemistry (quantitative) I.	final #
Biochemistry I. GYOBIBIKE1A	3	–	3	GYGENBILE2A GYSZKSZKE1A GYFIZBIFE2A	Biology II. Organic Chemistry I. Biophysics II.	semi-final
Physical Chemistry II. GYFKTFIKG2A	1	4	5	GYFKTFIKE1A	Physical Chemistry I	practical course grade
Colloid Chemistry I. GYKOLKOLE1A	2	–	2	GYFKTFIKE1A	Physical Chemistry I.	semi-final
Organic Chemistry II. Practice GYSZKSZKG2A	–	5,5	4	GYSZKSZKE1A	Organic Chemistry I	practical course grade
Organic Chemistry II. GYSZKSZKE2A	4	–	5	GYSZKSZKE1A	Organic Chemistry I	final #
Hungarian Medical Terminology IV.* GYLEKMSZG4A	–	4	2	GYLEKMSZG1A	Hungarian Language III.	practical course grade
Physical Education IV. GYTSITSNG4A	–	1	0	GYTSITSNG3A	Physical Education III.	signature
Summer Practice I.** GYSZGNSZG1A	–	35	4	GYASKAKKE2A GYSZKSZKE2A	Analytical Chemistry II. Organic Chemistry II.	
<b>Total Credit</b>			<b>30+4</b>			

# The grade influences the qualification of the diploma

\* Obligatory courses

\*\* 4 weeks (140 hours) summer practice in elective place (accredited public / community pharmacy, Galenical laboratory, research institute, university department) after the second and third year.

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

- 1 Everett, D.H.: Basic Principles of Colloid Science. Royal Society of Chemistry, London, 1988. ISBN 0-85186-443-0
- 2 Atkins, P.W.: Physical Chemistry. 6<sup>th</sup> ed. Oxford Univ. Press ISBN 0-190850101-3 Paperback. **Or:** Atkins, P.W., de Paula J: Atkins' Physical Chemistry. 7<sup>th</sup> ed. Oxford Univ. Press. ISBN 0-19-897285-9
- 3 Buvári-Barcza: Quantitative Analytical Chemistry. Bp. (SOTE)
- 4 Murray (et al.): Harper's Biochemistry. Stanford. Appleton-Lange 2000. ISBN 0-8385-3684-0.

**Recommended textbooks:**

- 1 Shaw, D.J.: Introduction to Colloid and Surface Chemistry. Butterworth-Heinemann Ltd. Oxford, 1992. ISBN 0-7506-1182-0
- 2 Csempesz, F.: Experimental Colloid Chemistry. Bp. SOTE. 2012.
- 3 Skoog, West, Holler: Fundamentals of Analytical Chemistry. Saunders College Publishing Co.
- 4 Carey, F.A.: Organic Chemistry. McGraw-Hill Book Co. New York 1992 ISBN 0-07-009831-X
- 5 M. Jones, Jr.: Organic Chemistry. W.W. Norton and Co. New York, London. 1997. ISBN 0-393-10210-6.
- 6 Harwood L.M., Claridge T.D.W.: Introduction to Organic Spectroscopy. Oxford Univ. Press
- 7 Laidler, K.J.-Meiser, J.H.: Physical Chemistry. 1999. 3<sup>rd</sup> ed. Houghton Mifflin Co. Boston, ISBN 0-395-91848-0
- 8 Steiner E.: The Chemistry Maths Book. Oxford Univ. Press. ISBN 0-19-855913-5
- 9 Nelson, Fox, Lehninger, A.L.: Principles of Biochemistry. 3<sup>rd</sup> ed. 2000. Worth Publ. New York, ISBN 1-57259-153-6



# QUANTITATIVE ANALYTICAL CHEMISTRY I.

Tutor: *Dr. Krisztina Kurin-Csörgei*

## First Semester

Lectures (2 hours per week)	Practicals (5 hours per week)	
	Topic	Task
Introduction. Review of some elementary concepts. Titrimetric methods of analysis.	Introduction.	Laboratory introduction; Safety and order in the laboratory; The schedule of the semester; Practical and theoretical requirements in the semester
Acid-base reactions, repetition of different calculations. Titration curves in acid-base titration.	Calibration	Calibration of burette (3-6-9-12 ml); Calibration of pipettes (10, 20 ml)
End point detection Acid-base indicators.	Acidi-Alkalimetry	Practicing the use of the laboratory tools; Determination of sulfuric acid
Standard solutions in acid-base acid titrations and the survey of the most important methods.	Acidi-Alkalimetry	Standardization of 0.1 N hydrochloric
Acid-base titrations in non-aqueous solutions. Determination of organic bases in glacial acetic acid.	Acidi-Alkalimetry	<b>Test I.</b> Determinations of hydroxide and carbonate ions in the presence of each other
Effects of common ion, pH, complex formation and redox processes on precipitation.	Acidi-Alkalimetry (Instrumental)	Potentiometric titration of acetic acid; Conductometric determination of Beta-ine hydrochloride
Formation and morphology of precipitates. Development and treatment of precipitates.	Acidi-Alkalimetry	Indirect determination of sodium thio-sulfate Determination of "Lidocain" in nonaqueous solution
Important methods in precipitation gravimetry.	Acidi-alkalim.; Chelatometry	Determination of lactic acid; Chelatometric determination of lead
Precipitation titrimetry.	Chelatometry	<b>Test II.</b> Determination of calcium and magnesium ions in mineral water
Complex formation, chelate effect. Stability constant. Complexometric and chelatometric titrations.	Chelatometry  aceticum	Determination of copper and zinc in the presence of each other; Determination of aluminium in "Aluminium tartaricum solum"
Effect of pH and foreign ligands on ions the apparent stability constant. Chelatometric titrations. Titration curves. Methods of end point detection.	Gravimetry  Gravimetry; Argentometry	Gravimetric determination of sulfate in the form of BaSO <sub>4</sub> ; (precipitation, preparation of filter) filtration, washing, weighing of BaSO <sub>4</sub> precipitate; Determination of chloride ions by Mohr's method
Types and applicability of EDTA titrations.	Argentometry Determination of bromide ions by	<b>Test III.</b> Volhard's and Fajans' methods
Redox reactions and their mechanism. The redox potential and its calculation.	Komplexometry Supplements	Determination of cyanides by Liebig-Denigees' Method; Supplements
The effect of pH, the complex and precipitate formations on redox potential. Redox equilibria.	Supplements Closing	Supplements; Closing

# QUANTITATIVE ANALYTICAL CHEMISTRY II.

## Second Semester

<b>Lectures</b> (2 hours per week)	<b>Practicals</b> (5 hours per week)	
	<b>Topic</b>	<b>Task</b>
Titration curves in oxidimetry. Titrations with permanganate solution.	Introduction  Permanganometry	Safety and order in the laboratory Practical and theoretical requirements in the semester The schedule during the semester Redox titrations (permanganometry) Standardization of » 0.1N potassium permanganate solution
Titrations with chromate and cerium (IV). Bromatometry I.	Permanganometry	Determination of the total iron content by Zimmermann-Reinhardt method Permanganometric determination of bromide ions (Winkler's method)
Bromatometry II. Reactions with periodate and their analytical use.	Chromatometry  Bromatometry	Determination of Mohr salt with chromatometric titration Bromatometric determination of arsenic (III) (from As <sub>2</sub> O <sub>3</sub> ) or antimony (III) compounds (in form of "tartar emetic": antimony tartarate) Determination of azophene
Iodometric titrations and other reductometric methods.	Bromatometry Cerimetry	<b>TEST I.</b> Bromatometric determination of ascorbic acid (Vitamin C) in tablets (e.g. Vit C, Rutascorbin, Béres C) Cerimetric determination of amidazophene
Sampling and preparatory processes in analytical chemistry.	Iodometry	Standardization of » 0.01N sodium thiosulfate solution. Determination of phenol in water / acetyl salicylic acid content in tablets (e.g. Aspirin, Kalmopyrin, Istopyrin,...) by Koppeschaar's method
Interactions between electromagnetic radiations and materials. Emission spectroscopy.	Iodometry	Iodometric determination of copper (II)-ions Determination of mannitol by Malaprade's reaction with periodate
Flame emission photometry, atomic absorption spectrophotometry. ICP-ES and ICP-MS possibilities.	Iodometry	Determination of iodide by Winkler's method
Molecular absorption spectroscopy in UV-VIS region as well as in IR.	Optional measurements	<b>TEST II.</b> One selection from "Other determinations"
Possibilities of spectrophotometric method(s) in complex systems.	Instrumental Analysis	Computer aided learning of modern instrumental analytical methods (HPLC; GC; UV-Vis Spectrophotometry)
Separation methods in analytical chemistry.	Optional measurements	From "Potentiometric determinations" From "Other determinations"

<b>Lectures</b> (2 hours per week)	<b>Practicals</b> (5 hours per week)	
	<b>Topic</b>	<b>Task</b>
Distillation, extraction and their possibilities.	Spectrophotometry  Semi-quantitative analysis	Spectrophotometric determination of iron content in multivitamin tablets Spectrophotometric determination of phosphate content in egg shell Semi-quantitative analysis using "Merkoquant" testpapers
Different planar chromatographic methods and their use in pharmaceutical analyses. Gas chromatographic methods.		
High performance liquid chromatography. Supercritical fluid extraction and chromatography.	Optional measurements	From "Potentiometric determinations" From "Other determinations"
HPCE and its future application. Survey on analytical chemistry.	Final test  Determination	<b>TEST III.</b> (Qualitative and quantitative analysis of complex samples) Quantitative determination of the sample
Summary.	Supplements Closing	Supplements Closing

**Potentiometric determinations:**

1. Direct potentiometric determination of fluoride content in tooth paste
2. Potentiometric titration of bromide content of "Elixirium thymi composita"
3. Potentiometric titrations of iodide and chloride ions in presence of each other
4. Potentiometric titration using computer controlled burette:  
Determination of phosphoric acid content in "Coca Cola"

**Other determinations:**

1. Complexometric determination of metals in coins: (e.g., 1- Ft; 2- Ft; 5- Ft; US cent; Groschen) ( $\text{Cu}_2^+$  -  $\text{Ni}_2^+$ ;  $\text{Cu}_2^+$  -  $\text{Ni}_2^+$  -  $\text{Zn}_2^+$ ;  $\text{Cu}_2^+$ ;  $\text{Al}_3^+$ )
2. Determination of calcium and magnesium ions in mineral water (e.g., Römerquelle, Teodora Quelle, Margitsziget), in bitter water (Míra) and in tap water
3. Chelatometric determination of aluminium ions in "Aluminium aceticum tartaricum solutum"
4. Iodometric determination of  $\text{Cr}_3^+$  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**

<b>Week</b>	<b>Lectures</b> (4+1*** hours per week)	<b>Practices</b>	<b>Practicals</b> (seminars: 2 hours biweekly, practices: 8 hours biweekly)
1	Qualitative molecular orbital theory of organic compounds		
2-3	Saturated acyclic and cyclic hydrocarbons. Constitution, conformation	1-2	Basic laboratory processes.
4	Stereochemistry of organic compounds. Configuration. Compounds having one center of chirality. Principles of the IUPAC nomenclature.		
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**

<b>Week</b>	<b>Lectures</b> (4+1*** hours per week)	<b>Practices</b>	<b>Practicals</b> (seminars: 2 hours bi-weekly, practices: 8 hours biweekly)
1-2	Oxocompounds. Addition to carbon-oxygen double bond. Aliphatic electrophilic substitution. C-H acids	1-6	Basic methods for preparations of organic compounds (10 preparations).
3-4	Carboxylic acids and their derivatives.	1-6	Nomenclature of organic compounds with C=O bond, of heterocyclic and of bioactive compounds
5	Carbonic acids and their derivatives. Polyfunctional organic compounds.	1-6	Spectroscopic analysis of organic compounds
6	Carbohydrates. Stereochemistry of organic compounds having more than one center of chirality.		
7	Amino acids, peptide, proteins.		
8-9	electron excessive heteroaromatic compounds.?		
10-11	electron deficient heteroaromatic compounds.?		
12	Terpenoids, carotenoids, steroids.		
13	Nucleic acids. Alkaloids.	6	Electronic literature searching
14	Organic chemistry in the periodic system. Organic synthesis.		

\*\*\* 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

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### Week *Lectures* (4 hours per week)

- 1 Selection rules and intensity. Anharmonicity. The vibrations of polyatomic molecules. Normal modes. Vibrational Raman spectra.
- 2 Chromophores. The fate of electronically excited states: Fluorescence, Phosphorescence, laser action.  
Photoelectron spectroscopy: UPS, XPS, ESCA
- 3 Nuclear magnetic resonance: The technique, the chemical shift.  
Electron spin resonance. Mass spectroscopy.
- 4 The permanent electric dipole moment. Polarizability. Polarizabilities at high frequencies. The refractive index. Additive properties.  
Heat, work and the conservation of energy.  
Heat capacity enthalpy. State functions.
- 5 Changes in internal energy. The temperature dependence of the internal energy and enthalpy. The relation between  $C_v$  and  $C_p$ .  
The reaction enthalpy. Hess's law and reaction enthalpies.  
The temperature dependence of reaction enthalpies. (Kirchhoff's law).
- 6 The definition of entropy. The entropy change in the system.  
Carnot efficiency. The Helmholtz and Gibbs functions. Maximum work.  
The third law of thermodynamics.  
Standard molar Gibbs function.
- 7 The temperature and pressure dependence of the Gibbs function.  
The chemical potential of a perfect gas. The solid-liquid boundary.  
The liquid – vapour boundary. The solid-vapour boundary.  
The solid – liquid – vapour equilibrium.
- 8 Partial molar volume. Partial molar Gibbs function.  
The thermodynamics of mixing. The elevation of boiling point.  
The depression of freezing point. Solubility. Osmosis.
- 9 Vapour pressure diagrams. The representation of distillation. Azeotropes.  
The solvent and solute activities. The phase rule.
- 10 The Gibbs function minimum. Exergonic and endergonic reactions.  
Perfect gas equilibria. A recipe for equilibrium constants.  
The response of equilibrium to the conditions (temperature and pressure).  
Reaction rate. Rate laws and rate constants. The determination of the rate law.  
First-, second- and higher order reactions, half lives.
- 11 The temperature dependence of reaction rates. Reactions approaching equilibrium.  
Consecutive reactions and parallel processes. The steady-state approximation.  
Chain reactions. Photochemical reactions, radiolysis.
- 12 Catalysis. Fast reactions. Collision theory. Activated complex theory.  
Thermodynamic aspects. Adsorption at surfaces. Catalytic activity at surfaces.
- 13 Mean activity coefficients. Debye–Hückel theory. The ionic strength.  
The mobilities of ions. The measurement of transport numbers.  
Conductivities and ion-ion interactions. Diffusion and transport.  
The metal ion/metal electrode. The ion (insoluble salt) metal electrode.  
Oxidation-reduction electrodes. Liquid junctions and membrane potentials.
- 14 Kinds of cell. E.m.f. and electrode potentials, the sign convention.  
The concentration dependence of the e.m.f. Standard electrode potentials.  
Thermodynamic data from cell e.m.f.-s and applications of e.m.f. measurement.  
The rate of charge transfer. The current density. Overpotential. Polarography.

## PHYSICAL CHEMISTRY II.

### Second Semester

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<b>Week</b>	<b>Lectures</b> (1 hour per week) <b>Practicals</b> (4 hours per week)
1	Determination of freezing point depression.
2	Calibration of a thermometer. Determination of the temperature of a phase transition.
3	Studying IR Spectra.
4	Spectrophotometric investigations in the ultraviolet region.
5	Determination of ionization constant of indicators by spectrophotometric method.
6	Solubility product determination by potentiometric method.
7	Measurement of pH by hydrogen-electrode, measurement of redox potential.
8	Deadstop titration, determination of ionization constant of a weak acid.
9	Computer assisted conductimetric titration.
10	Polarography.
11	Studying the kinetics of the hydrolysis.
12	Investigation of stressed decomposition of a medicine.
13	Studying of the surface tension.
14	Supplementary lab.

## COLLOID CHEMISTRY I.

Lecturer: *Dr. Ferenc Csempesz*

### Second Semester

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<b>Week</b>	<b>Lectures</b> (2 hours per week)
1	What are colloids? Definitions, nomenclature, historical perspective.
2	Basic principles of colloid stability Intermolecular forces, interparticle forces, effect of the intervening medium. Electrostatic forces and the electrical double layer.
3	Steric repulsion, the effect of adsorbed or anchored layers. The total interaction potential curve.
4	Preparation of colloidal dispersions Dispersion methods, condensation methods: nucleation and particle growth. Emulsion and dispersion polymerization. Preparation of monodisperse colloids.
5	Interfaces Surface tension, surface energy, wetting phenomena.
6	Adsorption: the Gibbs adsorption equation, the influence of adsorption on interparticle forces The effect of the curvature of surfaces on equilibrium.
7	Some important properties of colloids. Kinetic properties: Brownian motion, diffusion, osmosis, Donnan equilibrium, dialysis, electrokinetic phenomena, sedimentation and creaming. Scattering of radiation: light scattering, neutron scattering.
8	Rheology: viscosity, Newtonian and non-Newtonian systems, rheology of suspensions of colloidal particles.

<b>Week</b>	<b>Lectures</b> (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

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<b>Weeks</b>	<b>Lectures</b> (1 hour per week)	<b>Practicals</b> (3 hours per week)
1	Embryo development. The root apex, primary structure of roots. Root modifications Brassicaceae	Germination, seedlings. Plants representing fam.: Fabaceae,
2	The shoot apex. The primary structure of stems. Stemroot connection.	Roots. Plants representing fam.: Apiaceae, Euphorbiaceae.
3	Secondary growth of roots and stems.	Stems I. Plants representing fam.: Solanaceae, Lamiaceae
4	Development and anatomy of leaves. Adaptations to the environment. Shoot modifications.	Stems II. Plants representing fam.: Asteraceae
5	The movement of water in plants. Mineral nutrition. Transport of assimilates.	<b>1. Test Work:</b> Plants representing fam.: Cannabaceae
6	Initiation and anatomy of flowers. Sporopolliniferous and gametogenesis in angiosperms. Fruits and seed.	Woody stems (Gymnosperms),  The fungi (introduction). I. Test Work on the knowledge of medicinal plants
7	Control of growth and development.	The Fungi I.
8	Mycophyta, Bryophyta, Pteridophyta, Gymnospermatophyta	The Fungi II.



**Weeks Lectures** (1 hour per week)

- 9 Angiospermatophyta: Magnoliidae  
Preparing a cleared specimen
- 10 Angiospermatophyta: Hamamelididae,  
Caryophyllidae
- 11 Angiospermatophyta: Rosidae  
**2. Test Work on the knowledge  
of medicinal plants.**
- 12 Angiospermatophyta: Dilleniidae
- 13 Angiospermatophyta: Asteridae  
flower, seed, fruit.
- 14 Angiospermatophyta: Monocotyledoneae  
the practicals.

**Practicals** (3 hours per week)

- 2. Test Work:** Fungi
- Leaf and flower anatomy
- Morphology and anatomy of the seed
- Morphology and anatomy of the fruit.
- 3. Test Work:** woody stems, leaf,
- Consultation, questioning, finishing  
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.
- Enzyme inhibition. Regulatory enzymes: allosteric enzymes, covalently modulated regulatory enzymes.
- Fine mechanism of enzyme action. Three-dimensional structure of chymotrypsin, a serine protease.  
Mechanism of acetylcholinesterase catalysis.
- Bioenergetics. Introductory remarks. High energy compounds. Glycolysis.
- Oxidative decarboxylation of pyruvate Citric acid cycle.
- Metabolic transport through the mitochondrial membranes.  
Respiratory chain.
- Oxidative phosphorylation. Mitochondrial import and export of reductive equivalents.

- Energetics of glucose oxidation. Pasteur effect. Heat production by the brown adipose tissue.
- Carbohydrate metabolism. Cellular uptake and production of glucose. Gluconeogenesis. Regulation of glycolysis and gluconeogenesis.
- Glycogen metabolism. Blood glucose and regulation of glycogenolysis and glycogenesis. Hexose interconversions.  
Galactosemia and galactosuria. Fructosuria and fructose intolerance.
- The phosphogluconate oxidative pathway. Significance and regulation of the pentose phosphate pathway.  
Biosynthesis of hexosamines. Biological role and synthesis of glycoproteins and glycolipids
- Betaoxidation of fatty acids. Metabolism of ketone bodies.
- Digestion of lipids. Synthesis of triglycerides and phospholipids.
- Synthesis of fatty acids.
- Biosynthesis of cholesterol and bile acids.

## Basics of Foreign Language (module 3.)

Magyar orvosi szaknyelv 3.

**Responsible organisational unit:**

**Faculty of Health Sciences, Division of Foreign Languages and Communication**

**Programme director:**

Zöldi Kovács Katalin PhD, Head of the Division

**4 lessons per week, 2 credits,**

**Assessment:** midterm (written) and endterm (written and oral) tests

**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective communication in the language they use during their field practice both in their everyday life /'survival language'/ and in their academic studies. Raising students' awareness of cultural differences is one of our top priorities.

Brief description of subject:

The first three modules are dedicated to learning basic general vocabulary and grammar. In the third module students acquire basic structures and the vocabulary for everyday topics / e.g. travelling in a city, travelling abroad, arranging accommodation etc. /, language for „survival.“. The course places special emphasis on phrases essential for everyday communications, e.g. past time activities, telephoning, buying/ordering tickets etc. Grammar is of less importance in this phase of language studies.

**Course content of practical lessons:**

Lesson 1-2: What was your weekend like?

Lesson 3-4: What did you do yesterday?

Lesson 5-6: Did you like the city?

Lesson 7-8: Have you ever been to England?

Lesson 9-10: What did you do on Monday?

Lesson 11-12: Communication practice: What did you do?

Lesson 13-14: What did your neighbour say?

Lesson 15-16: Practising past tense

Lesson 17-18: He didn't know that we were there. –Past tense

Lesson 19-20: Communication practice- Practising past tense

- Lesson 21-22: Consolidation
- Lesson 23-24: Test 1 + situation
- Lesson 25-26: I'd like a ticket to London.
- Lesson 27-28: Travelling by train
- Lesson 29-30: Travelling abroad
- Lesson 31-32: Communication practice: travelling
- Lesson 33-34: Accommodation
- Lesson 35-36: Booking accommodation
- Lesson 37-38: Booking accommodation- conversations
- Lesson 39-40: At a hotel
- Lesson 41-42: Communication practise: travelling and booking accommodation
- Lesson 43-46: Customs and festivities – modal auxiliaries
- Lesson 47-48: At the dentist
- Lesson 49-50: Healthy lifestyle
- Lesson 51-52: Consolidation
- Lesson 53-54: Test – situation, communication practice
- Lesson 55-56: Assessment

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

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

## Basics of Foreign Language (module 4.)

Magyar orvosi szaknyelv 4.

**Responsible organisational unit:**

**Faculty of Health Sciences, Division of Foreign Languages and Communication**

**Programme director:**

Zöldi Kovács Katalin PhD, Head of the Division

**4 lessons per week, 2 credits,**

**Assessment:** midterm (written) and endterm (written and oral) tests

**Role of subject in fulfilling the aim of training:**

The role of this subject is to help students acquire the basic vocabulary, grammar and language skills they need for the effective professional communication in the language they use during their field practice. With the help of this course they become able to communicate with the patients in the Hungarian hospitals.

**Brief description of subject:**

The fourth module is dedicated to learning basic medical vocabulary. Students acquire the skills needed in taking family, social, and medical history in internal medicine. They also learn how to address the patient during an examination and give advice for the treatment.

**Course content of practical lessons:**

- Lesson 1-4: Revision
- Lesson 5-6: Family history – asking for family members, names
- Lesson 7-8: Family history – describing state
- Lesson 9-10: Family history – communication practice

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

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

Marthy Annamária – Végh Ágnes. *Egészségére!* - Magyar orvosi szaknyelv. Semmelweis Egyetem Egészségtudományi Kar, 2010.

## SUMMER PRACTICAL TRAINING PROGRAM I.

**Four weeks:** 35 hours/week, min. 6/max. 8 hours/day. The aim of the summer practical training: getting acquainted with the pharmacy as a sanitary unit.

**Duties and respects:**

- 1 Survey of duties in a public pharmacy of drug dispensing.
- 2 Introduction to the structure of a public pharmacy: rooms, office, laboratories, stores etc., accessories.
- 3 Knowledge related to the storage of drugs in a pharmacy. Storage of drugs according to their activity, strength etc.
- 4 Accessories in a public pharmacy. Practising their use, working with pharmacy balances etc.
- 5 Examination of chemical and crude drugs already learnt in the 1st–4th semesters. (Knowledge of materials, organoleptic, physicochemical methods etc.)
- 6 Practising of some pharmaceutical technological manipulations: measuring, compounding, sieving, milling filtration, homogenization of powders, ointments etc.  
Getting acquainted with the equipments of these manipulations.  
Right selection of the accessories: scale, scale-relations, place etc.
- 7 Drug dispensing according to regulations. Corking of flasks for solutions, signal-signature, packing, presentation. Esthetic demunt.
- 8 Labour safety in a pharmacy. (Inflammable, explosive goods, acids, corrosive chemicals etc.)

**Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!**

# STUDY PROGRAMME



*Faculty of Pharmacy*  
*3<sup>rd</sup> year*

## Third Year

5<sup>th</sup> semester

Subjects	Lectures	Practices	Credit Points	Prerequisites		Examination
Biochemistry II. Practice GYOBIBKIG2A	–	1,5	0	GYSZKSZKE2A GYOBIBIKE1A	Organic Chemistry II. Biochemistry I.	signature
Biochemistry II. GYOBIBKIE2A	2,5	–	3	GYOBIBIKE1A GNYELATG1A	Biochemistry I. Medical Terminology	final #
Physiology I. Practice GYKIKELG1A	–	1	2	GYOBIBIKME1A GNYELATG1A	Biochemistry I. Medical Terminology	practical course grade
Physiology I. GYKIKGELE1A	5	–	4	GYOBIBIKME1A GNYELATG1A	Biochemistry I. Medical Terminology	semi-final
Pharmaceutical Chemistry I. GYGYKGYKG1A	4	5	8	GYASKAKKE2A GYSZKSZKE2A GYFKTFIKG2A GNYELATG1A	Analytical Chemistry (quantitative) II. Organic Chemistry II. Physical Chemistry II. Medical Terminology	practical course grade
Pharmaceutical Technology I. GYGYIGYTG1A	2	3	5	GYSZKSZKE2A GYKOLKOLE1A GYFKTFIKG2A GNYELATG1A	Organic Chemistry II. Colloid Chemistry I. Analytical Chemistry (quantitative) II. Medical Terminology	practical course grade
Basic Immunology GYGENIMUE1A	2	–	2	GYGENBILE2A GNYELATG1A GYHUMANAE1A	Biology II. Medical Terminology Anatomy	semi-final
Colloid Chemistry II. GYKOLKOLG2A	–	2	2	GYKOLKOLE1A GYFKTFIKG2A GYSZKSZKE2A	Colloid Chemistry I. Analytical Chemistry (quantitative) II. Organic Chemistry II.	practical course grade
Hungarian Medical Terminology V. GYLEKMSZG5A	–	4	2	GYLEKMSZG1A	Hungarian Language IV.	final
<b>Total Credit</b>			<b>28</b>			

### 6<sup>th</sup> semester

Subjects	Lectures	Practices	Credit Points	Prerequisites		Examination
Physiology II. Practice GYKIKGELG2A	–	1	2	GYOBIBKIE2A GYKIKELE1A	Biochemistry II. Physiology I.	practical course grade
Physiology II. GYKIKGELE2A	5	–	4			final #
Pharmacognosy I. Practice GYFMGGNDG1A	–	4	3	GYNOVGYNE2A GYOBIBKIE2A GYGYKGYKG1A	Pharmaceutical Botany II. Biochemistry II. Pharmaceutical Chemistry I.	practical course grade
Pharmacognosy I. GYFMGGNDE1A	2	–	3			semi-final
Pharmaceutical Chemistry II. Practice GYGYKGYKG2A	–	5	4	GYKOLKOLG2A GYOBIBKIE2A GYGYKGYKG1A	Colloid Chemistry I. Biochemistry II. Pharmaceutical Chemistry I.	practical course grade
Pharmaceutical Chemistry II. GYGYKGYKE2A	4	–	4			semi-final
Pharmaceutical Microbiology GYMIKGMIE1A	3	–	5	GYOBIBKIE2A GYKIKGELE1A GYGENIMME1A	Biochemistry II. Physiology I. Basic Immunology	final #
Pharmaceutical Microbiology Practice GYMIKGMIG1A	–	2	–			signature
Pharmaceutical Technology II. Practice GYGYIGYTG2A	–	5	4	GYGYKGYKG1A GYKOLKOLG2A GYGYIGYTG1A	Pharmaceutical Chemistry I. Colloid Chemistry I. Pharmaceutical Technology I.	practical course grade
Pharmaceutical Technology II. GYGYIGYTE2A	2	–	3			semi-final
Summer Practice II. ** GYSZGNSZG2A	–	35	4			signature
<b>Total Credit</b>			<b>32+4</b>			

# The grade influences the qualification of the diploma

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4 weeks (140 hours) summer practice in elective place (accredited public / community pharmacy, Galenical laboratory, research institute, uni-versity department) after the second and third year.

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

- 1 Falus A.: Immunology. Bp. Semmelweis K. 2001.
- 2 Csemesz: Experimental Colloid Chemistry. Bp. (SOTE)
- 3 Szász, Takács, Végh: Pharmaceutical Chemistry Lecture Notes I-II. (Bp.) SOTE
- 4 Szász, Budvári: The Quality Control of Medicinal Compounds. (Bp.) SOTE
- 5 Szász, Budvári: The Quality Control of Pharmaceutical Preparations. (Bp.) SOTE
- 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.)
- 10 Levinson,W.-Jawetz, E.: Medical Microbiology and Immunology. 7<sup>th</sup> ed. McGraw-Hill Co. 2002. ISBN 0-07-138217-8
- 11 Bruneton J.: Pharmacognosy Phytochemistry Medicinal Plants. Lavoisier Publ. 2<sup>nd</sup> ed. Paris, 1999. ISBN 1-898298 637
- 12 Principles of Medical Physiology. Ed. Fonyo A. Bp. Medicina Publ.House, 2001.
- 13 Bray,J.J.-Cragg,P.A.-Anthony D.C: Macknight,Roland G.Mills: Lecture notes on human physiology. 4<sup>th</sup> ed. 1999. Blackwell Science. ISBN 086542-775-5

**Recommended textbooks:**

- 1 Berne,R.M.-Levy,M.N-Koeppen-Stanton: Physiology. 4<sup>th</sup> ed. Mosby Year Book Inc. 1998.
- 2 Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry. 10<sup>th</sup> ed. J.N. Delgado, W. Remers, 1998. ISBN 0-397-50877-8
- 3 Evans, W.C.: Trease and Evans' Pharmacognosy. Bailliere Tindell, London, 1989.



# PHARMACEUTICAL CHEMISTRY I.

Director: **Dr. Péter Horváth**

Tutor: **Prof. Dr. Krisztina Takács–Novák**

## First Semester

Week	Lectures (4 hours per week)	Practicals (5 hours per week)
1	Introduction. (Pharmaceutical Chemistry, Pharmacopoeias ) Methods for identification of inorganic compounds. Solubility, acidity-basicity.	Equipping, repetitional analytical tasks.
2	Preliminary testing of organic compounds, classification Identification of organic functional groups	Preliminary testing and systematization of inorganic and organic compounds official in Ph. Eur.
3	General purity tests in Pharmacopoeias	Preliminary testing and systematization of inorganic and organic compounds official in Ph. Eur.
4	Structural and physical chemistry of drug action I.-II	General reaction of organic functional groups Analysis of IR spectra
5	Structural and physical chemistry of drug action III-IV.	General purity tests of inorganic ions I.
6	Narcotics Sedato-hypnotics and anxiolytics	General purity tests of inorganic ions II.
7	Major analgetics	General purity tests of inorganic ions III.
8	Minor analgetics	Complete pharmacopoeial qualification of an inorganic compound official in Ph. Eur.
9	Psychopharmacons	Narcotics, sedato-hypnotics
10	UV-VIS spectroscopy in the analysis of drug mixtures ORD and CD spectroscopy in the analysis of drug mixtures	Major analgetics I.
11	Separation techniques I.-V. Application of chromatographic methods for the drug analysis. TLC	Major analgetics II.
12	GC, HPLC, CE	Minor analgetics I.
13	Cholinergic and adrenergic agents	Minor analgetics II.
14	Cholinergic and adrenergic agents	Psychopharmacons

**PHARMACEUTICAL CHEMISTRY II.****Second Semester**

<b>Week</b>	<b>Lectures</b> (4 hours per week)	<b>Practicals</b> (5 hours per week)
1	Protonspeciation of drugs	Equipping, identification
2	Determination of protonation constants Optimization of pH-dependent processes	Drugs acting on the vegetative nervous system I.
3	Cardiac glycosides, sugars Analysis of cardiac glycosides, sugars	Drugs acting on the vegetative nervous system II.
4	Local anaesthetics	Local anaesthetics
5	Cardiovascular drugs: antiarrhythmic agents Cardiovascular drugs: antianginal agents	Digitalis glycosides, sugars
6	Cardiovascular drugs: antilipaemic agents Cardiovascular drugs: antihypertensive agents	Determination of protonation macroconstants
7	Diuretics	Determination of protonation microconstants
8	Vitamines	Determination of logP
9	Quality assurance, GLP, validation Non-steroid antiinflammatory agents	Diuretics
10	Corticosteroids Sexual hormones	Steroidal hormones
11	NMR: phenomena NMR: d, J, T1, T2	Complete pharmacopoeial qualification of an organic compound official in Ph. Eur.
12	NMR: multiplicity, 1D NMR NMR: spin echo, 2D NMR, MRI, MRS	Non-steroidal antiinflammatory agents
13	Desinfectants Chemotherapeutic agents: sulfonamides	Quality assurance, GLP, validation I.
14	Chemotherapeutic agents: antimalarial drugs, fluoroquinolones Antidiabetics	Quality assurance, GLP, validation II.

# PHARMACEUTICAL TECHNOLOGY I.

## Department of Pharmaceutics

Director: *Dr. István Antal*

Tutor: *Dr. Mária Hajdú*

## First Semester

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### Lectures

History of pharmaceutical compounding and technology  
 Dosage forms as drug carrier systems. Classification of dosage forms and routes of administration.  
 Technological aspects of quality, safety, and efficacy.  
 The tasks, construction, and equipments of a pharmacy. Storage of pharmaceuticals.  
 Technological considerations of the pharmacopoeia (Eur. Ph.)  
 Physical chemical principles in the pharmaceutical technology.  
 Basic operations for pharmaceutical compounding.  
 Liquid dosage forms. Theory and classification.  
 Excipients for liquid dosage forms.  
 Preparation of solution, aromatic water, syrup, mucilago, mixture, gargle, enema.  
 Drops for internal and external use.  
 Principle and practice of aseptic preparation. Eye drops.  
 Preparations made by extraction.  
 Disperse systems and their physical chemical characteristics.  
 Emulsions.  
 Suspensions.

### Practice

Introduction, general information, labour safety.  
 The prescription. Nomenclature.  
 Weighing and balances. Control and measuring.  
 Dose calculations. Reading prescriptions.  
 Computer in the pharmacy practice.  
 Preparation of simple solutions.  
 Preparation of composite solutions.  
 Preparation of drops.  
 Preparation of ophthalmic solutions  
 Preparation of decoctions and infusions.  
 Preparation of suspensions without excipients.  
 Preparation of suspensions with excipients.  
 Preparation of emulsions  
 Dispensing a test preparation independently.

## PHARMACEUTICAL TECHNOLOGY II.

### Second Semester

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#### **Lectures**

Dosage forms with coherent structure

Semi-solid preparations. Classification and preparation.

Ointments, gels, pastes. Eye ointments.

Tests of semisolid preparations. Rheology and other characteristics.

Cosmetics.

Rectal and vaginal preparations.

Tests of suppositories.

Dosage forms prepared by aggregation. Pills, boluses, sticks, foams, medicated chewing gums.

Compounding powder preparations.

Compounding veterinary preparations.

Incompatibility problems I. Solutions.

Incompatibility problems II. Solid dosage forms

Incompatibility problems II. Other dosage forms and role of excipients.

Good Pharmacy Practice.

Laws governing the pharmacy practice.

#### **Practice**

Formulae Normales: the guide for pharmaceutical compounding in Hungary.

Preparation of ointments of solution and emulsion type.

Preparation of ointments of emulsion and suspension.

Preparation of ointments of composite type.

Directions of eye ointments and gels. Preparations of eye ointments.

Preparation of pastes.

Preparation of cosmetics.

Preparation of suppositories by cold compression and by moulding.

Preparation of vaginal preparations.

Preparation of pills.

Preparation of multidose powders. Topical powders.

Preparation of single-dose powders. Division of powders. Manual capsule filling machine.

Preparations of veterinarian preparations.

Guidelines for the preparation of incompatible drugs.

Incompatibility problems of solutions

Incompatibility problems of powder mixtures.

Incompatibility problems of emulsions.

Incompatibility problems ointments.

Health accessories in pharmacy.

Dispensing a test preparation independently.

# PHARMACOGNOSY I.

Director: **Dr. Szabolcs Béni**

Lecturer: **Prof. Ágnes Kéry, Dr. László Kursinszki, Dr. Szabolcs Béni**

Tutor: **Dr. Anna Sóllyomváry**

## Second Semester

### Lectures (2 hours per week)

Pharmacognosy, History of pharmacognosy.  
 Medicinal plant - vegetable drug.  
 Nomenclature. Classification of vegetable drugs.  
 From plant to phytopharmaceutical (phytotherapy).  
 Sources of drugs, factors involved in the production of drugs. Quality control.  
 Compounds of primary metabolism.  
 Carbohydrates. Mono- and oligosaccharides and their drugs. Homogenous polysaccharides and their drugs.  
 Heterogenous polysaccharides: gums, neutral and acidic mucilages, pectins; polysaccharides from microorganisms and fungi. Algae polysaccharides.  
 Lipids. Generalities, vegetable oils, alkyne derivatives.  
 Amino acids (which are not constituents of proteins).  
 Cyanogenic glycosides, glicosinolates. Betalains.  
 Protein sweeteners. Lectins. Enzymes.  
 Compounds of special (secondary) metabolism.  
 Plant phenolics in general. Phenols, phenolic acids, derivatives and crude drugs.  
 Coumarins and coumarin containing drugs.  
 Medicinal application and toxicity.  
 Lignans, lignan containing drugs. Biological interest of lignans. Silybum marianum and its significance.  
 Flavonoids, chemical structure and classification, biological properties, use of flavonoid-containing drugs, therapeutical significans.  
 Chief flavonoid containing vegetable 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 hydralyzable and condensed tannins, biological significance. Chief tannin -containing drugs.  
 Polyketides-quinones. Naphthoquinone-containing drugs. Laxative hydroxyanthraquinone glycosides.  
 Pharmacological properties.  
 Main hydroxianthraquinone 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 vegetable drugs.  
 Vegetable 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.

## Dept. of Medical Biochemistry

Lecturer: **Dr. Attila Ambrus**

Tutor: **Dr. Erzsébet Maróthy-Tóth**

## First Semester

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### Lectures (2,5 hours per week)

Lipid metabolism: Intestinal absorption of lipids.  
Plasma lipoproteins and lipid transport. Outline of triacyl glycerol metabolism. Regulation of lipid metabolism: lipogenesis and lipolysis.  
Metabolism of steroid hormones.

Metabolism of steroid hormones.  
Metabolism of arachidonic acid, eicosanoids.  
Nutritionally essential amino acids. Interconversion. of amino acids: transamination. Overall aspects of amino acid metabolism.

Amino acid catabolism. Fate of nitrogen:  
Deamination.  
Elimination of ammonia: The urea cycle. Biosynthesis of nonessential amino acids.

Metabolic fates of individual amino acids: glycolytic and ketogenic amino acids. Amino acid decarboxylation: biogenic amines.

Nucleotide metabolism: biosynthesis and catabolism of purine and pyrimidine nucleotides.

Physical properties of DNA. Structure of DNA (A, B, Z-DNA).

Topoisomerases. Supercoiling of DNA. The structure of nucleosome. Replication in prokaryotes.

DNA polymerases. Okazaki fragments. DNA ligase. The mechanism of replication. Origin of replication. Replication of eukaryotic cells. The cell cycle. DNA polymerase alpha, beta, gamma and delta. Mutations, Ames test. The repair processes. Excision repair of UV-induced thymine-thymine dimers.

The different types of RNAs. Prokaryotic transcription. The role of sigma factor. The operon model. The lac and trp operons. Eukaryotic replication. Transcription factors. Enhancers. The maturation of the different RNAs. Splicing.

Translation. The genetic code. Initiation, elongation and termination. Signals for protein sorting.  
Biochemical preparations in therapy. Biotechnological methods for drug preparation. Recombinant DNA technology. Therapy of the diseases (inherited enzymopathies) by biochemical preparations.

### Practicals

(1,5 hours every **second** week)

Seminar: Lipoprotein lipase and carnitine deficiency

Seminar: Pyruvate dehydrogenase and pyruvate carboxylase deficiency

Seminar: Liver failure

Midterm: lipids and amino acids

Seminar: Vitamin B12 and folate deficiency

Midterm: nucleotides and macromolecules

Microsomal drug metabolism. Microsomal mono-oxygenase system: induction of cytochrome P-450.

Seminar: gene therapy

Conjugation reactions in detoxification.

Mechanism of the regulation of biomechanical pathways by hormones. Biochemistry of the hormonal action.

Receptors, classification of receptors. The ion channels.

Calcium homeostasis.

The signal transduction: the G-proteins, role of the adenylate cyclase and phosphoinositol system in signal transduction. The protein kinases and phosphorylation of specific proteins.

Interaction of receptors and hormones. Mechanism of Consultation.

neurotransmission. The cholinerg and adrenerg transmission. The insulin and steroidreceptors.

## COLLOID CHEMISTRY II.

Tutor: *Dr. Ferenc Csmpesz*

### First Semester

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**Practice** (2 hours per week)

- Surface and interfacial tensions
- Measurement of the surface, the tension of aqueous surfactant solutions.
- Determination of oil/water and oil/ solution interfacial tensions.
- Adsorption at interfaces
- Determination of vapour adsorption isotherm by gravimetric method.
- Adsorption from solution; determination of adsorption isotherm for methylene blue on cellulose.
- Wetting of solid surfaces
- Determination of contact angles. Flotation of kaolin suspensions by cationic surfactants, characterization of the wetting properties of kaolin particles.
- Stability of colloidal dispersions
- Determination of critical coagulation concentration of electrostatically stabilized sols.
- Flocculation and stabilization of sols by uncharged polymers and polyelectrolytes.
- Electrokinetic phenomena
- Measurement of electrophoretic mobility by moving boundary method, determination of zeta potential.
- Separation to components of a dye mixture by zone electrophoresis.
- Suspensions and emulsions
- Determination of particle size distribution by Andreasen pipette.
- Determination of apparent viscosity of concentrated suspensions, investigation of thixotropy. Preparation of emulsion by dispersion method, determination of the type of emulsion. Measurement of the viscosity of concentrated emulsions by rotational viscometric method.
- Association colloids
- Determination of critical micelle formation concentration by conductometric titration. Solubilization of organic acids, determination of solubilization saturation.
- Macromolecular colloids
- Determination of the relative molecular mass of polymers by viscosity measurements. Dependence of the viscosity of polyelectrolyte solutions on pH.
- Phase states and structures of polymers
- Determination of the thermomechanical curve of a polymer by Höppler consistometer. Determination of the relative deformation of a polymer at various loading times.

# PHYSIOLOGY I.

## First Semester

Week	Lecture (5 hours per week)
1	Historic overview, concepts of physiological control, homeostasis. Basics in cell physiology. Cell-to-cell interactions. Cellular membranes and transmembrane transport. Membrane receptors. Ionic equilibria and resting membrane potentials, ion channels and gates. Action potentials, synaptic transmission.
2	Muscle. Contractile mechanism. Skeletal, cardiac, and smooth muscles. Biomechanics, electrical properties, metabolism.
3	Physiology of blood circulation. Introduction. Functional organization of the cardiovascular system, basic principles and conditions of its healthy functioning. Dynamics of blood and lymph flow: Physiological functions of the blood vessels, their significance in the healthy functioning of the organism. Principles of hemodynamics. Rheology of blood.
4	Biomechanical properties of the vessel wall. Significance of vessel geometry. Signal transduction in the blood vessels. Pressure & flow in large vessels. Circulatory resistance. Measurement of pressure, flow and cardiac output. Factors influencing blood pressure. Venous circulation.
5	Cardiac functions: Biomechanical basis of cardiac functions. Cardiac pump. Signal transduction in the cardiomyocytes.
6	Cardiac cycle. Electrical activity of the heart. Transmembrane potentials. Conduction in cardiac fibers, cardiac excitability, cardiac rhythmicity, electrocardiography.
7	Microcirculation. Tissue oxygenization. Fluid movement across the capillary wall. Control of lymphatic flow and interstitial fluid volume.
8	Cardiovascular control mechanisms: Systemic control mechanisms. Local control mechanisms. Control of cardiac output.
9	Circulation through organs and special regions: Coronary circulation. Circulation of blood and cerebrospinal fluid in the brain. The blood-brain barrier. Regulation of cerebral circulation. Brain metabolism & oxygen requirements.
10	Splanchnic circulation. Circulation through skeletal muscles. Circulation of the skin. Thermoregulation. Placental & fetal circulation. Physiological aspects of circulatory shock.
11	Pulmonary circulation. Structure and function of the respiratory system, pulmonary mechanics. Gas transport between the lungs and the tissues. Regulation of RBC count - erythropoietin, acclimatization.
12	Regulation of respiration: Neural and chemical control of respiration. Adaptation of cardiorespiratory system and skeletal muscle to physical exercise.
13	Whole body metabolism. Gastrointestinal motility and secretions. Innervation of the GI tract. GI hormones. Regulation of GI motility. Regulation of GI secretion: Salivary secretion; Gastric secretion; Exocrine pancreas.
14	Liver & biliary system. Digestion & Absorption. Carbohydrates, lipids and proteins. Absorption of water and electrolytes. Absorption of vitamins and minerals.

### **Practice and consultation** (2 hours biweekly)

Recording of compound action potential of the frog sciatic nerve, Sim Nerve  
 Experiments on the rat nerve-muscle preparation, Sim Muscle  
 Experiments on isolated rat heart, Sim Heart  
 Smooth muscle activity of isolated, superfused muscle strips, Sim Vessel



# PHYSIOLOGY II.

## Second Semester

Week	Lecture (5 hours per week)
1	Formation and excretion of urine. Physiological functions, their significance in the maintenance of the internal milieu and in healthy functioning of the organism. Renal circulation. Glomerular filtration.
2	Tubular functions. Mechanisms adjusting the composition of urine. Fluid compartments. Regulation of extracellular fluid composition and volume. Role of the kidneys in the control of blood pressure. Micturition.
3	Regulation of acid-base balance.
4	General principles of endocrine physiology. The pituitary gland. Posterior lobe hormones. Anterior lobe hormones. Growth hormone and physiology of growth.
5	The adrenal cortex. Blood supply and its control. Innervation. Structure and biosynthesis of adrenocortical hormones. Effects of glucocorticoids and control of their secretion. Effects of mineralocorticoids and control of their secretion. Effects of adrenal androgens and estrogens. Endocrine regulation of calcium metabolism and the physiology of bone.
6	The thyroid gland. Formation and secretion of thyroid hormones. Control of synthesis and secretion. Transport and metabolism of thyroid hormones. Effects of thyroid hormones. Clinical correlates. Endocrine functions of the pancreas and the regulation of carbohydrate metabolism. Hormonal control of intermediary metabolism.
7	The reproductive glands. Development and function of the reproductive system. The female reproductive system. The menstrual cycle. Ovarian hormones. Control of ovarian function. Pregnancy. Lactation. The male reproductive system. Endocrine function of the testes. Control of testicular function.
8	Principles of sensory systems. Sensory receptors. Electrical and ionic events in receptors. "Coding" of sensory information. Somatosensory functions. Cutaneous, deep and visceral sensation; pathways. Pain. Arousal mechanisms, sleep and the electrical activity of the brain. The reticular formation and the reticular activating system. The thalamus and the cerebral cortex. Evoked cortical potentials and the EEG. Physiologic basis of consciousness and sleep.
9	Spinal organization of motor function. Monosynaptic reflexes. Polysynaptic reflexes. Spinal reflexes. Ascending and descending pathways. Spinal and supraspinal control of muscular tone. Effects of lesions. Spinal shock.
10	Control of posture and movement. The vestibular system. Basal ganglia. Cerebellum. Lateral and medial descending pathways involved in motor control (spinal integration, medullary, midbrain and cortical components).
11	The visual system. The image-forming mechanism. The photoreceptor mechanism: Genesis of action potentials. Responses in the visual pathways and cortex. Color vision. Eye movements
12	The auditory system. Chemical senses. Olfactory receptors and pathways. Physiology of olfaction. Taste receptor organs and pathways. Physiology of taste.
13	The autonomic nervous system and its central control. Anatomic organization and chemical transmission. Adrenal medulla. Control of autonomic functions.
14	Neural basis of instinctual behavior. The integrative role of the hypothalamus. Limbic functions. Sexual, maternal and feeding behavior. Fear and rage. Motivation. Emotion. "Higher functions of the nervous system". Conditioned reflexes, learning and related phenomena. Learning and memory. Functions of the neocortex.

### Practice and consultation (2 hours biweekly)

Indirect measurement of arterial pressure and recording heart sounds

Kidney function

Determination of parameters of acid/base equilibrium

Endocrinology lab

Electroencephalogram (EEG) experiment

# PHARMACEUTICAL MICROBIOLOGY

Program director: **Prof. Dr. Éva Ádám**

Tutor: **Dr. Orsolya Dabai**

## Second Semester

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### Lectures (3 hours per week)

Introduction. Short history, subject and aim of Microbiology. Occurrence and importance of microorganisms in the nature. General microbiology. Microbial genetic. Principles and practice of sterilization. Sterile pharmaceutical products. Sterility control. Contamination of non-sterile pharmaceuticals in hospital and community environment. Chemical disinfectants, antiseptics and preservatives. Types of antibiotics and synthetic antimicrobial agents. Mechanisms of action of the antibiotics. Bacterial resistance to antibiotics. Interactions Principles of microbial pathogenicity and epidemiology. Immunity to microbes. Active and passive immunization. Bacteria causing purulent diseases. Bacteria causing enteric diseases. Causative agents of respiratory tract. Aerobic and anaerobic endospore forming bacteria. Other anaerobic microbes. Spirochetes. Rickettsiae. Chlamydia. Mycoplasmas Parasitology (parasites and helminths). Causative agents of human mycosis and their therapy. General virology. Interactions between viruses and the human host. Characterization of virus Families causing human diseases. Respiratory pathogen viruses and the most important diseases. Enteric viruses and diseases caused by them. Hepatitis viruses. Arthropod-borne viruses and diseases caused by them. Other important virus caused diseases. Slow virus infections. Conventional and non-conventional agents. Prions. AIDS. The role of viruses in carcinogenesis. Antiviral chemotherapy. Interferon. Immunity to viral infections. Application of microorganisms in the pharmaceutical sciences. Production of therapeutically useful substances by recombinant DNA technology. New ways in vaccine production. The manufacture and quality control of immunological products. Importance of nosocomial infections. Factory and hospital hygiene and good manufacturing practice.

### Practices (2 hours per week)

Introduction to basic microbiology. Laboratory rules. Morphology of bacteria (Microscopic examinations I.) Morphology of bacteria. Staining procedures (Microscopic examinations II.) Methods for cultivation of bacteria. Examination of biochemical activity of microorganisms I. Colony morphology of bacteria. Examination of biochemical activity of microorganisms II. Laboratory procedures of sterilization and disinfection. Antibiotic susceptibility of bacteria. In vitro antigen-antibody reactions (serological reactions). Bacteria causing purulent diseases Bacteria of the respiratory tract I. Bacteria of the respiratory tract II. Normal flora and pathogens of the gastrointestinal tract. Aerobic and anaerobic endospore forming Bacteria. Spirochetes. Chlamydiae. Morphology and cultivation of human pathogen Fungi. Medically important protozoons. Medically important helminths. Cultivation of viruses. Virus-cell interactions. Bacteriophages. Medical virology. The most important viral diseases: prevention and therapy. 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 mid-term, 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](http://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)**

Marthy Annamária – Végh Ágnes. *Egészségére! - Magyar orvosi szaknyelv*. Semmelweis Egyetem Egészségtudományi Kar, 2010.

## COMPULSORY SUMMER PRACTICE II.

### Program

**Four weeks:** 35 hours/week; min. 6 max. 8 hours/day.

The aim of summer practical training: to deepen theoretical and practical knowledge of Pharmaceutical Technology learnt in the 3rd year; adaptation of basic knowledge (chemistry, physics, colloids, physiology etc.) to the practical work in pharmacies.

### **Duties and respects:**

1. Appreciation of prescriptions, reading of prescriptions (Formula Magistralis, Formula Normales, Formula Originalis). The forms of dispensing, dose calculating etc. Preparation of medicaments (Formula Magistralis) under supervision of the instructing pharmacist.
2. Prescriptions and regulations of narcotics
3. Various dosage forms (solutions, suspensions, emulsions, ointments, solid dosage forms etc.), their preparation.
4. Practising of the pharmaceutical technological manipulations, procedures etc.
5. Aseptic production of medicaments. Main technological steps.
6. Guidelines for the preparation of incompatible drugs. Preparation of these medicaments.
7. Health accessories.
8. Control of medicines and raw materials in the pharmacy. Administration in the pharmacy.
9. Organization of drug supply.

**Important note: Document certifying the completion of the practice must be handed in at registration! Registration to the next year is not allowed without it!**

## NOTE



*Faculty of Pharmacy  
4<sup>th</sup> year*

# STUDY PROGRAMME

## Fourth Year

The prerequisite to start 4<sup>th</sup> year is to take a Basic Hungarian Language Exam (oral).

7 <sup>th</sup> semester						
Subjects	Lectures	Practices	Credit Points	Prerequisites		Examination
Pharmacognosy II. Practice GYFMGGNDG2A	-	4	3	GYFMGGNDE1A GYGYKGYKE2A	Pharmacognosy I. Pharmaceutical Chemistry II.	practical course grade
Pharmacognosy II. GYFMGGNDE2A	2	-	3	GYFMGGNDE1A GYGYKGYKE2A	Pharmacognosy I. Pharmaceutical Chemistry II.	final #
Pharmaceutical Chemistry III. Practice GYGYKGYKG3A	-	4	3	GYGYKGYKE2A GYKIKGELE2A	Pharmaceutical Chemistry II. Physiology II.	practical course grade
Pharmaceutical Chemistry III. GYGYKGYKE3A	2	-	3	GYGYKGYKE2A GYKIKGELE2A	Pharmaceutical Chemistry II. Physiology II.	final #
Pharmacology and Toxicology I. Practice GYGYHHATG1A	-	2	2	GYKIKGELE2A GYGYKGYKE2A GYMIKGMIE1A GYGENIMME1A	Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology	practical course grade
Pharmacology and Toxicology I. GYGYHHATE1A	4	-	4	GYKIKGELE2A GYGYKGYKE2A GYMIKGMIE1A GYGENIMME1A	Physiology II. Pharmaceutical Chemistry II. Pharmaceutical Microbiology Basic Immunology	semi-final
Pharmaceutical Technology III. Practice GYGYIGYTG3A	-	9	5	GYGYKGYKE2A GYGYIGYTE2A	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	practical course grade
Pharmaceutical Technology III. GYGYIGYTE3A	3	-	4	GYGYKGYKE2A GYGYIGYTE2A	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	semi-final
Basic Medical Pathophysiology I. GYGYHKKAE1A	2	-	2	GYKIKGELE2A GYMIKGMIE1A	Physiology II. Pharmaceutical Microbiology	semi-final
Industrial Pharmaceutical Technology I.* GYGYIIGTE2A	2	-	2	GYGYKGYKE2A GYGYIGYTE2A	Pharmaceutical Chemistry II. Pharmaceutical Technology II.	semi-final
<b>Total Credit</b>			<b>31</b>			



8<sup>th</sup> semester

Subjects	Lectures	Practices	Credit Points	Prerequisites	Examination	
Pharmacology and Toxicology II. Practice GYGYHHATG2A	-	2	2	GYGYHHATE1A GYGYKGYKE3A GYGYIGYTE3A GYGYHKKAE1A	Pharmacology and Toxicology I. Pharmaceutical Chemistry III. Pharmaceutical Technology III. Basic Medical Pathophysiology I.	practical course grade
Pharmacology and Toxicology II. GYGYHHATE2A	4	-	4	GYGYHHATE1A GYGYKGYKE3A GYGYIGYTE3A GYGYHKKAE1A	Pharmacology and Toxicology I. Pharmaceutical Chemistry III. Pharmaceutical Technology III. Basic Medical Pathophysiology I.	final #
Pharmaceutical Technology IV. Practice GYGYIGYTG4A	-	9	6	GYGYKGYKE3A GYGYIGYTE3A GYFMGGNDE2A	Pharmaceutical Chemistry III. Pharmaceutical Technology III. Pharmacognosy II.	practical course grade
Pharmaceutical Technology IV. GYGYIGYTE4A	3	-	4	GYGYKGYKE3A GYGYIGYTE3A GYFMGGNDE2A	Pharmaceutical Chemistry III. Pharmaceutical Technology III. Pharmacognosy II.	final #
Pharmacy Administration I. GYEGYSZE1A	2	-	2	GYINFBEIE2A GYEGYTTPE1A GYGYIGYTE3A	Introduction to Health Informatics II. History of Sciences, Propedeutics Pharmaceutical Technology III.	semi-final
Basic Medical Pathophysiology II. GYGYHKKAE2A	2	-	2	GYGYHKKAE1A GYGYHHATE1A	Basic Medical Pathophysiology I. Pharmacology and Toxicology I.	final #
Public Health GYNEINETE1A	2	-	2	GYKIKGELE2A GYMIKGMIE1A	Physiology II. Pharmaceutical Microbiology	final #
Public Health Practice GYNEINETG1A	-	2	2	GYKIKGELE2A GYMIKGMIE1A	Physiology II. Pharmaceutical Microbiology	practical course grade
Written scientific thesis (diploma work) I. GYXXXSZDG1A	-	4	0	All of the 7 <sup>th</sup> semester subjects		signature
Industrial Pharmaceutical Technology II. * GYGYINIPE1A	2	-	2	GYGYINIPE1A Technology I. GYGYIGYTE3A III.	Industrial Pharmaceutical Pharmaceutical Technology	semi-final
<b>Total Credit</b>			<b>26</b>			

# The grade influences the qualification of the diploma

\*Obligatory elective subject

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

- 1 Rang H.P.-Dale M.M.-Ritter J.M.-Moore P.K.: Pharmacology. 5<sup>th</sup> ed. Churchill Livingstone, 2003. ISBN 0 443 071454
- 2 Hadházy P.: The Basis of Functional and Medical Pathology. Bp.
- 3 The New Public Health: An Introduction for the 21<sup>st</sup> Century. By: T.Tulchinsky, E.A.Varavikova. 2000. ISBN 0-12-703350-5
- 4 Dandy, D.J.: Essential Orthopaedics and Trauma. 2<sup>nd</sup> ed. 1989. Churchill Livingstone.
- 5 Z.Vincze: Pharmacy Administration. Lecture notes.

**Recommended textbooks:**

- 1 Forrai J.-Ballér P.: Chrestomathy on the History of Medicine. Bp. SOTE 1992.
- 2 C. Edwards-P. Stillman: Minor Illness or Major Disease? (Ph. P. Pharmaceutical Press, 2000.) ISBN 0 85369 447 8

## PHARMACEUTICAL CHEMISTRY III.

Director: **Dr. Péter Horváth**

### First Semester

Week	Lectures (2 hours per week)	Practicals (4 hours per week)
1	Antibiotics I.	Equipping, identification
2	Antibiotics II.	Desinfectants, chemotherapeutics
3	Antibiotics III.	Antibiotics
4	Analysis of drug mixtures I.	Identification of drug mixtures
5	Analysis of drug mixtures II.	Identification of drug mixtures
6	Analysis of drug mixtures III.	Quantitative determination of drug mixtures
7	Anticancer agents	Quantitative determination of drug mixtures
8	Antiviral agents	Quantitative determination of drug mixtures
9	Lipophilicity in drug research	Quantitative determination of drug mixtures
10	Rational methods of drug design I.	Quantitative determination of drug mixtures
11	Rational methods of drug design II.	Quantitative determination of drug mixtures
12	Lead compound discovery strategies I.	
13	Lead compound discovery strategies II.	
14	Antihistamines	

## PHARMACEUTICAL TECHNOLOGY III-IV.

### Department of Pharmaceutics

Director: **Dr. István Antal**

### First Semester

#### Lectures

Scope of industrial pharmaceutical technology. History and development.

Aspects of the pharmaceutical development. Preformulation studies.

Applying principles of chemical engineering for the manufacturing of pharmaceutical preparations.

Critical manufacturing parameters and principles of scaling up.

Requirements and conditions for manufacturing (Good Manufacturing Practice)

Quality assurance and manufacturing. Safety regulations.

Validation. Concepts of the statistical process control.

Basic procedures: comminution, powdering, sieving.

Basic procedures: separation, filtering, settling, extraction.

Basic procedures: homogenization, dispersing, distillation, evaporation.

Basic procedures: fluidization.

Basic procedures: drying.

Basic procedures: freeze-drying.  
Basic procedures: crystallization.  
Sterilization.  
Formulation of parenteral preparations.  
Manufacturing of large and small volume parenterals.  
Pirogenicity. Endotoxins.  
Stability of pharmaceutical preparations. Stability tests. Stabilization methods.  
Preparations for inhalation. Aerosols.

### **Practice**

#### *Pilot plant laboratory*

Controlling the drying process.  
Study of the filtration process.  
Mixing of solids.  
In-process control of the homogenization process.  
Study on parameters of fluidization.  
Investigations of factors affecting the size reduction in ball-mill.  
Control of raw materials.  
Preparation and stability test of emulsions.  
In-process control of manufacturing solid dosage forms.  
Manufacturing suppositories. Determination of the replacing factor.

#### *Laboratory for parenteral preparations*

Aseptic processing.  
Autoclaving.  
Determination of inside pressure of bottles at different filling volumes.  
Preparation of dextrose infusion.  
Preparation of mannitol infusion.  
Filtration by frame filter.  
Control of infusions and injections containing dextrose (pH, refractive index, degradation product).  
Preparation and control of infusions containing electrolytes and sugars.  
Preparation of infusions used in acidosis.  
Determination of endotoxin concentration in parenteral solutions by the quantitative LAL test.  
Adjustment of isotonicity.

#### *Chemical laboratory*

Control of the formation of calcium acetilsalicylate with oscillometry.  
Acid neutralizing tests of antacids (USP tests and "pH-stat" method).  
Determination of the lipase activity.  
Investigation on the catalytic oxydation of ascorbic acid.  
Stability test of hydrocortisone-hemisuccinate solutions.  
Stability test on the decrease of acetic acid content of Spiritus antirheumaticus.  
Stability test of solutions containing penicillin.  
Real-time stability test of tablets containing aspirin.  
Accelerated stability test of solutions containing phenobarbital sodium.  
Computer Aided Practice (accelerated stability testing).

*Physical laboratory*

Test of ion-exchange resins.

Determination of the dissociation constant of drugs.

Increasing of solubility of salicylic acid by changing permittivity.

Concentration determination of sugar syrups by viscometry.

Viscometric evaluation of macromolecular colloids used as stabilizers

Investigation of phase-inversion of emulsions by viscometry.

Determination of the average molecular mass of polyethylene glycols by viscometry.

Determination of the critical micelle concentration by stalagmometry.

Investigation of surfactants using the Donnan's pipette.

Investigation of solubilization of volatile oils by aqueous titration method.

Particle size analysis of suspensions by the Andreasen's cylinder.

Particle size analysis of suspensions by the the Wiegner's tube.

## Second Semester

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### 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 pharmaceuticals.

Technological aspects of genomics and biopharmaceuticals.

Technological aspects of veteriner drug delivery.

Innovation and the pharmaceutical technology. Generics and supergenerics.

### Practice

#### *Pilot plant laboratory*

Preformulation studies and product development.

Ointment preparation.

Preparation of liquid dosage forms (solutions, elixirs, syrups, mixtures).

In-process control tests for solutions.

Tablet compression and in-process control of tablet manufacturing.

Pellet preparation in a high-shear mixer

Preparation of coating dispersions.  
Coating of pellets in fluid bed.  
Coating of tablets.

*Laboratory for parenteral preparations*

Preparation of injections liable to hydrolysis.  
Determination of the chloride ion concentration by ion selective electrode.  
Filling and closing of ampoules.  
Preparation and control of aerosols.  
Preparation of heat sensitive injections.  
Sterilization by membrane filtration. Integrity testing of membranes.  
Nonaqueous injections.  
Freeze-drying.  
Preparation of injections liable to oxidation  
Control of drug content of ascorbic acid injection  
Preparation of suspension injections  
Color determination of ascorbic acid injections  
Isotonicity setting based on freezing point depression  
Isotonicity setting based on sodium chloride equivalents

*Chemical laboratory*

Testing of containers (hydrolytic resistance; physical resistance; blister closing testing; light transmission test, adsorption test)  
Investigation of the interaction between acetylsalicylic acid and caffeine.  
Investigation of the interaction between papaverine hydrochloride and phenobarbital sodium with potentiometric method.  
Investigation of the interaction between methyl-p-oxy-benzoate and macromolecules by dynamic dialysis.  
Formulation of KCl prolonged release capsules and their dissolution test.  
Dissolution test of aspirin containing tablets with rotating basket method.  
Study on impurities by HPLC, GC/MS and LC/MS analytical methods.  
Preparation of oxytetracycline containing microcapsules.  
Testing dissolution profile of coated pellets.

*Physical laboratory*

Slipping-and drop point determination of ointment and suppository bases.  
Study on drug release of suppositories.  
Investigation of compression strength of suppositories.  
Study of disintegration of suppositories.  
Congealing-and softening point determination of ointment and suppository bases  
Penetrometric test of ointments.  
Study on the rheological behaviour of ointments with rotational viscometer.  
Examination of drug distribution in suspension type suppositories.  
Determination of the adsorptive surface of medicinal charcoal.  
Study of polymorphism.  
Determination of particle size and particle size distribution by sieve analysis.  
Investigation of flow properties and real density of granules.  
Investigation of disintegration of tablets and capsules.

## PHARMACOGNOSY II.

Director: **Dr. Szabolcs Béni**  
 Lecturer: **Prof. Ágnes Kéry, Dr. László Kursinszki, Dr. Szabolcs Béni**  
 Tutor: **Dr. Anna Sólyomváry**

### First Semester

#### **Lectures** (2 hours per week)

Terpenoids: biogenetic generalities.  
 Classification. Regular and irregular monoterpenes, sesquiterpenes. Essential oils.  
 Lamiaceae containing essential oils.  
 Anise-flavored essential oils.  
 Asteraceae containing essential oils.  
 Iridoids. Chief iridoid containing drugs.  
 Sesquiterpene lactones. Chief drugs containing sesquiterpene lactones.  
 Diterpenes. Diterpene-containing drugs of potential interest. Triterpenes and steroids.  
 Biosynthesis, classification.  
 Saponins. Biological and pharmacological interest. Chief saponin containing drugs.  
 Adaptogens. Ginseng, Siberian Ginseng.  
 Cardiac glycosides. Structures, chief vegetable drugs.  
 Starting materials for steroid hormone semisynthesis.  
 Other significant steroids and triterpenes.  
 Carotenoids. Chief carotenoid-containing drugs.  
 Alkaloids in general. Protoalkaloids and their chief drugs.

Alkaloids derived from ornithine and lysine.  
 Tropane-, pyrrolizidine-, quinolizidine-, indolizidine-, piperidine alkaloids and their drugs.  
 Alkaloids derived from nicotinic acid.  
 Alkaloids derived from phenylalanine and tyrosine: phenethylamines-, isoquinolines-, benzyltetraisoquinoline-, phenethylisoquinoline alkaloids and their drugs.  
 Alkaloids derived from phenylalanine and tyrosine: Morphinan alkaloids.  
 Alkaloids derived from tryptophan: ergotine alkaloids, monoterpenoid indole alkaloids and chief drugs.  
 Alkaloids derived from anthranilic acid: quinoline, quinazoline alkaloids. Alkaloids derived from histidine: imidazole alkaloids. Terpenoid alkaloids.  
 Purine bases.  
 Alkaloids with miscellaneous structure.  
 Vitamins and vitamin containing drugs.  
 Plants in complementary and traditional systems of medicine.  
 Plants in prevention, Functional foods

#### **Practicals** (4 hours per week)

Essential oil containing drugs (Lamiaceae, Asteraceae, Apiaceae)

Methods in essential oil analyses (GC, TLC). Steam distillation of essential oils.

Bitter substances of plants.  
 Classification, reactions, bitter value.

Saponins and chief saponin drugs.

Methods used in the identification and quality control of saponins.

Cardioactive glycosides and chief drugs.  
 Methods used in the analyses of cardioactive glycosides.

Tropane, piridine and piperidine alkaloid containing drugs.  
 Quantitative assays in alkaloid chemistry (titration)

Quinoline, isoquinoline and morphine group alkaloids, their chief drugs.

Methods in alkaloid chemistry: TLC, TLC-densitometry, spectrophotometry.  
 Indol, purine alkaloids. Alkaloids with miscellaneous structure. Chief drugs.  
 Methods in alkaloid chemistry: Column chromatography.

Practical examination.

Practical examination.

# PHARMACOLOGY AND TOXICOLOGY I-II.

## Department of Pharmacodynamics

Course Director: **Prof. Dr. György Bagdy**

Tutor: **Dr. Tamás Tábi**

## First Semester

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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

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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.

526 Pharmacotherapy of heart failure

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Diuretic drugs  
 Antidysrhythmic drugs  
 Antihypertensive drugs  
 Calcium-channel blockers  
 Antianginal drugs  
 Lipid-lowering drugs  
 Haemostasis and thrombosis  
 The haemopoietic system  
 The respiratory system  
 Pharmacology of the gastrointestinal system  
 Pharmacology of the reproductive system  
 Diabetes and antidiabetic drugs  
 Pharmacology of bone metabolism  
 Vitamins  
 Pharmacology of the thyroid, retinoides

## PHARMACY ADMINISTRATION I.

**Faculty of Pharmacy**  
**University Pharmacy Department of Pharmacy Administration**

Director: *Prof. Dr. Romána Zelkó*

Tutor: *Dr. Ágnes Mészáros*

### 4th year term 2

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#### **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

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Fundamental pathological processes  
Psychiatry: diagnostic systems  
Delirium, dementia, amnesic disturbances  
Inflammation. Tissue repair. Pain. Edema  
Injuries produced by high and low temperatures and electricity  
Schizophrenia.  
Depressive disorders  
Anxiety disorders. Drug induced disorders  
Sleep disorders.  
Eating disorders. Impulse control disorders  
Epilepsy.  
Neurodegenerative disorders  
Inflammatory diseases of the central nervous system  
Headache.  
Backache  
Disorders of erythropoiesis and haemostasis  
Varicose veins.  
Thrombo-embolic disorders  
Congestive heart failure.  
Atherosclerosis  
Ischaemic heart disease.  
Cardiac arrhythmia  
Inflammatory diseases of the heart  
Hypertension.  
Circulatory shock

### Second Semester

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Gastrointestinal disorders I  
Gastrointestinal disorders II  
Gastrointestinal disorders III  
Respiratory diseases I.  
Respiratory diseases II.  
Genitourinary disorders  
Infectious disorders I.  
Infectious disorders II.  
Ophthalmologic disorders I.  
Ophthalmologic disorders II., Ear disorders  
Endocrine and metabolic disorders I.  
Endocrine and metabolic disorders II.  
Musculoskeletal disorders  
Immunologic disorders, Oncologic disorders  
Dermatologic disorders, Consultation

# PUBLIC HEALTH

Tutor: *Dr. András Terebessy*

## Second Semester

Lectures (2 hours per week)	Practices (2 hours per week)
The development and role of public health in medicine. Basic principles of epidemiology and demography.	Introduction to Public Health. Principles of epidemiology of communicable diseases.
Global situation of communicable diseases in the world and in Hungary. Life expectancy, morbidity, mortality in Hungary.	Classification of communicable diseases. Disinfection and sterilisation. Laboratory investigations
The occurrences of communicable diseases. Surveillance. New immunizations, chemoprophylaxis.	Activity of doctors in case of communicable diseases. Immunisations: vaccines and sera. Nosocomial infections.
Infections of Gastrointestinal and Respiratory Tract.	Epidemiology I. (Most important rates and indices).
Haematogen infections and infections of the skin.	Epidemiology II. (Methods of epidemiology, calculations: standardisation, risk).
STD. AIDS/HIV. Viral hepatitis.	The role of the pharmacist in primary prevention of smoking, alcohol and drugs.
New, emerging diseases. Health care in case of disasters.	The role of the pharmacist in healthy nutrition and required physical activity.
Malnutritions. Nutrition related non infectious diseases. Vegetarianism.	Nutrition I. (Healthy nutrition. Assessment of nutritional status. Diet planning.)
Acute food-borne diseases.	Nutrition II. (Prevention of food – borne diseases)
Water hygiene.	Practical aspects of water hygiene.
Air-and soil hygiene.	Practical aspects of air hygiene.
Occupational risk factors, prevention of occupational diseases. Ionising and non-ionising radiation	Occupational diseases, accidents. Vibration, noise.
The health care system, quality assurance.	Toxicology. Radiation hygiene.
Maternal, infant child and youth health care.	Practical aspects of maternal, infant, child and young people hygiene.
Health promotion and health education.	Practical aspects of health education.

Practices are compulsory for each student.

### The obligatory material for the final exam:

The material of the lectures and practices compulsory textbooks, see List of Textbooks

## INDUSTRIAL PHARMACEUTICAL TECHNOLOGY I:

### Dosage form and product development

#### Department of Pharmaceutics

Director: *Dr. István Antal*

### First semester

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The subject is recommended for the students interested in several fields of industrial pharmaceutical technology such as research and development of new dosage forms and medicinal preparations.

#### **Topics:**

History of industrial pharmacy. Profiles of the pharmaceutical industry, career for pharmacists. Pharmaceutical technological aspects of product authorization. Evolution of dosage forms. Innovation and intellectual property. Preformulation and formulation studies. Optimization of dosage form composition. Control of active substance and excipients, physic-chemical and solid state characterization. Novel drug delivery systems. Design of the manufacturing process. Critical formulation attributes and process parameters. Comparison of scaling-up methods.

## INDUSTRIAL PHARMACEUTICAL TECHNOLOGY II:

### Operations and procedures

#### Department of Pharmaceutics

Director: *Dr. István Antal*

### Second semester

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The subject is recommended for the students interested in several fields of industrial pharmaceutical technology such as operations and procedures in the manufacture of medicinal preparations.

#### **Topics:**

Evolution of pharmaceutical manufacturing operations and procedures. Novel technologies for the production of dosage forms. Quality by design, manufacturing related to quality assurance and quality control. Critical parameters in the production. In-process control methods. Process Analytical Technology. Novel analytical methods for testing production and product quality. Validation of the manufacturing method. Methods for statistical process control. Current Good Manufacturing Practice.



*Faculty of Pharmacy  
5<sup>th</sup> year*

# STUDY PROGRAMME

## Fifth Year

### 9<sup>th</sup> semester (12 weeks)

Subjects	Lectures	Practices	Credit Points	Examination
Compulsory Practical Training I. (2 months) * GYSZGSZVG1A	–	40	8	practical course grade
Biopharmacy-Pharmacokinetics Practice GYGYIBFKG1A	–	3	2	practical course grade
Biopharmacy-Pharmacokinetics GYGYIBFKE1A	2	–	2	semi-final
Pharmaceutical Sociology, Ethics GYMAGGYEE1A	2,5	–	2	semi-final
Basic Drug Therapy Practice GYGYHGTGR1A	–	2	0	signature
Basic Drug Therapy GYGYHGTRE1A	2	–	4	semi-final
Pharmacy Administration II. Practice GYEGYGSZG2A	–	2	2	practical course grade
Pharmacy Administration II. GYEGYGSZE2A	2	–	2	final #
Clinical Pharmaceutical Care GYEGYGYGE1A	2	–	4	semi-final
Clinical Pharmaceutical Care Practice GYEGYGYGG1A	–	3	–	signature
Written Scientific Thesis (diploma work) II. GYXXXSZDG2A	–	6	0	signature
Facultative subject 1.	3	–	2	semi-final
Facultative subject 2.	3	–	2	semi-final
Facultative subject 3.	3	–	2	semi-final
<b>Total Credit</b>			<b>32</b>	

### 10<sup>th</sup> semester (16 weeks)

Subjects	Lectures	Practices	Credit Points	Examination
Compulsory Practical Training I. (4 months) * GYSZGSZVG2A	–	40	16	Practical course grade
Diploma Defence GYXXXDIVE1A			15	final
Board exam (practical) GY_ZVTGYKVA	–	–	0	final
Board exam (written) GY_ZVTIBVA	–	–	0	final
Board exam (oral) GY_ZVTSZBVA	–	–	0	final
<b>Total Credit</b>			<b>31</b>	

## \* COMPULSORY PRACTICAL TRAINING AND PROGRAM OF THE 5<sup>TH</sup> YEAR PHARMACY STUDENTS

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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 9<sup>th</sup> semester:

1. The first part of the practical training (2 months/320 hours) has to be done in a public/community Pharmacy from July 18, 2016 to September 16, 2016.  
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 19, 2016 to December 9, 2016.
3. Examination Period (6 weeks) from December 12, 2016 to January 27, 2017.

### Program in the 10<sup>th</sup> 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 25, 2017 to May 25, 2017 in Budapest.
5. The deadline of the defence of the diploma work is March 20, 2017.

### 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!)

- 1 Walker and Edwards: Clinical Pharmacy and Therapeutics. Longman Group UK Limit. 1994. ISBN 0 443 04553
- 2 Z. Vincze: Pharmacy Administration. Lecture Administration.
- 3 Wells BG., DiPiro JT., Schwinghammer TL., Hamilton CW.: Pharmacotherapy Handbook. 6<sup>th</sup> ed. McGraw-Hill, New York, 2006
- 4 Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

### Recommended textbooks:

- 1 Herfindal-Gourley-Hart, L: Clinical Pharmacy and Therapeutics. Williams and Wilkins USA. ISBN 0 683 03966 0
- 2 Fincham, J.E.-Wertheimer, A.I.: Pharmacy U.S. Health Care System. ISBN L-56024-097-0
- 3 Smith, M.C: Studies in Pharmaceutical Economics. ISBN 0-7890-0062-8
- 4 Ritschel, W.A.: Handbook of Basic Pharmacokinetics. Drug Intelligence Publ. Inc. Hamilton Press, 1999. ISBN 0-914768-40-9

# CLINICAL PHARMACEUTICAL CARE

## Faculty of Pharmacy

### University Pharmacy Department of Pharmacy Administration

Director: **Prof. Dr. Romána Zelkó**

Tutor: **Dr. Ágnes Mészáros**

## 5th year term 1

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### Lectures

1. About clinical pharmacy
2. Pharmaceutical care
3. Individual therapy with magistral preparation
4. Clinical guidelines in the treatment of type 2 diabetes mellitus
5. Clinical guidelines in the treatment of hypertension
6. Special conditions influencing drug therapy
7. Clinical bio-analytical analyses
8. Therapeutic drug monitoring, 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

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### Lectures

Introduction into biopharmacy and pharmacokinetics. Terms and definitions.  
 Modeling the fate of drugs in the body (LADME and other models).  
 Transport processes and absorption mechanisms. Factors influencing the absorption.  
 Basic concepts and importance of the Biopharmaceutical Classification System.  
 Biopharmaceutical considerations of drug distribution and metabolism.  
 Bioanalytical methods.  
 Excretion and clearance of drug. The biological half-life.  
 Bioavailability and influencing factors.  
 Studies and regulations on bioequivalence.  
 Importance of food-drug interactions.  
 Compartmental and non-compartmental modeling.  
 Physiologically based pharmacokinetic models.  
 Pharmacokinetics of multiple dosing.  
 In vitro – in vivo correlation and relationship.  
 Pharmacokinetic and metabolism investigations during preclinical and clinical development.

### Practices

Study on the distribution of salicylic acid in a three-phase system.  
 In vitro test for drug liberation from a patch system.  
 In vitro drug release from ointments with local effect.  
 In vitro dissolution profile of conventional and modified release nitrofurantoin containing preparations.  
 Determination of diclofenac sodium in synovial fluid samples.  
 Urinary excretion kinetics of aspirin.  
 Determination of theophylline plasma levels in beagle dogs after iv. administration.  
 Determination of theophylline plasma levels in beagle dogs after po. administration.  
 Calculation of bioavailability.  
 Computer modeling and analysis in pharmacokinetics.  
 Analyzing data to establish in vitro-in vivo correlation.

# PHARMACEUTICAL SOCIOLOGY, ETHICS

**Credit: 2**

Lecturer: **Prof. Dr. József Kovács**

**Syllabus** (14 hours)

Course objectives:

- a. To enable students to recognize ethical issues when encountered in everyday practice and research
- b. To provide students with a conceptual-logical system, which helps them to address ethical questions and to resolve ethical dilemmas in an efficient way
- c. To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patients, research subjects and fellow health care professionals
- d. To help the would be health care professional to understand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

## **1. week (Lecture)**

Basic concepts of ethics.

Descriptive ethics, normative ethics, metaethics.

General ethics and applied ethics.

Bioethics, medical ethics, health care ethics. Similarities and differences.

The role of bioethics in a pluralistic society.

The relationship between law and ethics.

Reasoning in ethics. The most common mistakes.

## **2. week (Lecture)**

Normative theories of ethics. The basic principles of medical ethics.

Deontological theories of ethics. (The Golden Rule, Kant and the categorical imperative, the principle of double effect, W.D. Ross and the prima facie duties.)

Teleological theories of ethics. (Act and rule utilitarianism.)

Theories of natural law.

Contractarian theories of ethics. (The theory of justice of John Rawls)

The principle of respect for autonomy.

The principle of non-maleficence.

The principle of beneficence.

The principle of justice.

Arguments against „principalism“.

## **3. week (Lecture)**

Justice in Health Care .. Ethical questions of macro- and microallocation

Higher and lower level macroallocational problems.

The principles and practice of rationing in contemporary health care systems. (Soft and hard rationing.)

Medical ethics and medical economics. Ethical questions of cost-benefit and cost effectiveness analysis.

The problem of right to health care. (The libertarian, the liberal and the socialist views about the right to health care.)

The concept of microallocation.

Ethical analysis of various selection criteria. (Medical benefit, psychological ability, supportive environment, social value criterion, resources required criterion, age, ability to pay, random selection, personal responsibility for the illness, etc.)

#### 4. week (Lecture)

Informed consent and truth telling

Simple consent and paternalism in medicine.

The emergence of the doctrine of informed consent.

Standards for information disclosure for patients.

When is informed consent not necessary?

Standards of competence and incompetence.

The right to refuse medical treatment.

Some psychological and communicational aspects of informed consent.

The history of information disclosure to terminally ill patients.

Pros and cons for lying to terminally ill patients.

The weaknesses of the arguments in favour of lying.

The dying process according to E. Kübler-Ross.

How to communicate the bad news to terminally ill patients.

The physicians's relationship with the relatives of the deceased patient.

#### 5. week (Lecture)

Euthanasia and the withholding of life-sustaining treatment

Definitions.

The sanctity of life versus the quality of life doctrine.

Is there any difference between active and passive euthanasia?

The practice of active euthanasia in the Netherlands. The Rummelink Report.

Refusal of life sustaining treatment by competent and incompetent patients.

Possibilities to extend the autonomy of patients: living will, durable power of attorney, substituted judgement, etc.

The concept of medically futile treatment.

Ethical problems of the treatment of handicapped newborns. (The debate about the treatment of spina bifida babies, the Baby Doe case, the legal situation, etc.)

#### 6. week (Lecture)

Ethical questions of human experimentation.

Possible forms of experimentation on humans.

Contradiction between the two roles of the physician. (Healer and scientist.)

The ethics of Randomized Controlled Clinical Trials. (RCT)

Randomization and prerandomization.

#### 7. week (Lecture)

Ethical questions of organ- and tissue transplantation.

Some problems of justice concerning kidney transplantation and chronic haemodialysis.

Ethical questions of transplantation from living kidney donors.

The concept of death.

Ethical questions of organ harvesting from the dead.

The debate about the market of organs.

Ethical questions of using embryo- or foetal tissue in human therapy.

Ethical problems of using anencephal newborns as organ donors.

**Course Faculty:**

Professor József Kovács, MD, PhD, (Head of the Department of Bioethics), 210-2930/6350; e-mail: kov-jozs@net.sote.hu

Ágnes Dósa, MD, JD, PhD e-mail: dosaagi@yahoo.com

Imre Szebik, MD, PhD e-mail: szebimre@net.sote.hu

Jeno Lorincz, MD, JD e-mail: lorjen@net.sote.hu

**Department:**

Institute of Behavioral Sciences

Department of Bioethics

NET Building, 19th, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room-2005

**List of questions**

1. Deontological theories of ethics.
2. Utilitarian theories of ethics.
3. The principles of medical ethics
4. Justice and medical ethics: the allocation of scarce medical resources.
5. Paternalism in medical practice
6. Informed consent
7. Information disclosure for terminally ill patients
8. Advance Directives
9. Medical confidentiality
10. Experimentation on human subjects
11. Objection to Transplantation of Organs and Counterarguments
12. Ethical problems of live organ donation
13. Organ donation from brain-dead donors: the system of donor cards.
14. Organ donation from brain-dead donors: presumed consent
15. Stages of Dying
16. Active and Passive Euthanasia
22. Withdrawing and withholding life sustaining treatment.

**Important notes:**

**To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (Two absences from the lectures is the maximum number permitted.) The student can make up for the absences in practicals held at other times elsewhere.**

**Justification of an absence: Doctor's certificate**

**Semester requirement: To participate on at least 75% of the total number of lessons.**

**Grade: The result of the semi-final.**

**Sign up for the exam: Through the NEPTUN system.**

**Modifying of the exam date: Through the NEPTUN system.**

**Justification of absence from the exam: A telephone message to the secretary of the Institute.**

**Textbook:**

Conrad Fischer—Caterina Oneto (2009): USMLE Medical Ethics: The 100 cases you are most likely to see on the exam (Second edition) New York: Kaplan Publishing ISBN: 9781419553141

# SOCIOLOGY

(14 hours)

## **Course objectives:**

To introduce to the students the concepts of the social distribution of health and illness, the causes and consequences of health status inequalities, the role of psychosocial factors in health care, the social phenomena occurring in healing, the social situation of medicine, and the social embeddedness of the health care system.

## **Course syllabus**

- 1 Social Science and Pharmacy (lecture)
- 2 Sociological Understanding of Health and Illness (lecture)
- 3 Lay Health Beliefs and "Help-seeking" Behavior (lecture)
- 4 Social Factors and Health (lecture)
- 5 Social Inequalities and Health (lecture)
- 6 Is Pharmacy a Profession? (lecture)
- 7 Pharmacist and Health Promotion (lecture)

## **Course Faculty:**

Zsuzsa Szántó, PhD, (Head of the Department of Sociology), 210-2930/56338; e-mail: szanzsu@net.sote.hu

Katalin Kovács, PhD e-mail: kovacs.katalin@gmail.com

## **Department:**

Institute of Behavioral Sciences

Department of Sociology

NET Building, 19th, 20th floor

1089. Budapest, Nagyvárad tér 4.

Tel: 210-2953

Secretary: NET Building, 20th floor, Room-2005

**Important notes:** To participate on at least 75% of the total number of lessons is a prerequisite for getting the signature. (Two absences from the lectures is the maximum number permitted.) The student can make up for the absences in practicals held at other times elsewhere. Participation submitting home paper.

**Justifying absence:** with doctor's certificate

**Semester grade:** The result of the semi-final and home paper.

**Justifying absence from the exam:** A telephone message to the secretary of the Institute.

## **Textbook:**

- 1 Kevin Taylor, Sarah Nettleton, Geoffrey Harding: Sociology for pharmacists. Taylor and Francis, London, 2003
- 2 Handouts for the lectures will be accessible on the homepage of the Institute of Behavioral Sciences: [www.magtud.sote.hu](http://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

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#### 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

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### **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 gastroesophageal 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)

## FACULTATIVE SUBJECTS

### PHYTOCHEMISTRY Institute of Pharmacognosy

The aim of this subject is to introduce the pharmacy students interested in crude drug researches and knowledges deeper into phytochemistry. It is a laboratory practice completed with some theoretical lectures. Learning this theses, the students obtain an expertness in the qualification and standardization of crude drugs and herbal remedies, as well as in discovery of biologically active substances from them, using different isolation methods and chromatographic (TLC, GC, HPLC) techniques, photometry or other equipment. They acquire the identification and characterization of the most important substances and attain the mode of the scientific research work in this field.

- 1 Investigation methods used in phytochemistry  
UV and IR spectroscopy in phytochemical analysis
- 2 Chromatography (TLC, PLC, HPLC, GC) in phytochemical analysis.
- 3 Type of active substances and their quantitative determination in plant material  
Different methods and their comparing valuation for the determination of flavonoid content.
- 4 Determination of tannin and procyanidin content, determination of anthraglycoside content, determination of total essential oil content.
- 5 Determination of alkaloid content, determination of bitter substance content.
- 6 Qualitative investigation and detection of active components  
TLC investigations of different glycosides and their aglycons.
- 7 GC investigation of essential oil components
- 8 Possibility of standardization of complex plant products  
Preparing (extraction, purification, etc.) of investigated samples dependent on different medicament forms.
- 9 Chemical analysis of tea mixtures, tea decocts, aqueous solutions
- 10 Chemical analysis of tinctures, aqueous alcoholic solution
- 11 Chemical analysis of oleaginous solutions, ointments
- 12 Consultation

## 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 wellknown 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

- 1 Cardiac and cardiotoxic natural products  
Vasodilators.
- 2 Plant preparations for troubles of memory, equilibrium and auditory disturbance.  
The horse-chest, its preparations and effectivities.
- 3 Oxy- and methoxycumarines in medical plants.  
The occurrence of rutin and diosmine.
- 4 The bitter principals.  
The appetiser preparations.
- 5 The essential oils.  
Procyanidine crude drugs and preparations.
- 6 The liver therapy (natural products and medical plants).  
Choloretics and cholagoges with plant origin.
- 7 Cholesterin level decreasing diets and others for diabetics.  
Slimming cures and their aims. Fat-reducing mechanism.
- 8 Plant sedatives, their effects and combinations.  
Natural products with stimulating and animating activity (stress).
- 9 Urological phytopreparations and some for prostata diseases.
- 10 The Kneipp cures and their possibilities.  
Gerontology.
- 11 Antitussives, expectorants and their application. Antiasthmatics.  
Treatment of rheumatism.
- 12 Phytopharmacy in the therapy of psoriasis. Unclean skin and eczema.  
Immunstimulant medicinal plants.
- 13 Cure of cold with medicinal plant remedies, Phytopreparations.  
Plant compounds for the badly healing wounds.
- 14 Medical plant remedies in the family doctor's activity.  
Importance of medicinal plants in pediatrics.

# HEALTH INFORMATICS

## Institute of Digital Health Sciences

Credit: 2

2 hours/week

THEMES	
1-2.	Introduction to usage of SAS program. Command of Edit menu in the SAS program: file menu, edit menu, view menu, data menu, transform menu, graphs menu, utilities menu, help menu
3.	Biostatistics principles: descriptive statistics, hypothesis theorem, CI intervals.
4.	Case study of descriptive statistics
5.	ANOVA models: Student's test, one way and multiple-way ANOVA designs
6.	Case study of ANOVA
7.	Regression analysis: correlation coefficient, one and multiple variable regression models
8.	Case study of regression analysis
9.	Nonparametrics methods : khi-square, Fisher's exact test, associations.
10.	Case study of nonparametrics models
11.	Logistic model
12.	Case study of logistic models
13.	Taxonomy: clusters, factorial analysis
14.	Final test: solution of a data processing problem

# 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. iridoids, peptides).
2. Structure elucidation of natural products.
3. Application of NMR spectroscopy for the stereostructure of organic micromolecules (e.g. alkaloids, iridoids).
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, ginkgolide).
9. Solid phase synthesis of polypeptides and polynucleotides.
10. Total synthesis of saccharides, sasharides in total synthesis.
11. Cosmogogenesis and molecular evolution of organic molecules.

## 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<sub>2</sub>, N<sub>2</sub> and O<sub>2</sub>. The biochemistry of the latter is an intriguing topic of bioinorganic chemistry. The deposition of certain solid inorganic compounds (CaCO<sub>3</sub>, Ca-phosphates, etc.) in the organism is under biological control and worth dealing with briefly.

Among the biomedical problems some metaldependent diseases (e.g. Wilson's disease, Menkes' disease) are touched upon. Much time will be devoted to metal complexes of antitumor activity and to those that are used in the treatment of rheumatoid arthritis.

Metal ion toxicity, an increasing hazard due to the contaminated environment, and chelate therapy are the topics that also deserve attention.

A look into the future closes the course.

## BIOTECHNOLOGY

### Department of Plant Anatomy (ELTE)

#### Topics

1. Introduction to biotechnology Historical evolution of biotechnology. Biotechnology as an interdisciplinary pursuit. Application of biotechnology. Substrates of biotechnology.
2. Applied genetics Selection and screening. Culture maintenance. Mutagenesis. Protoplast and cell fusion technologies.
3. Introduction to genetic engineering The emergence of recombinant DNA technology. Regulation and control of recombinant DNA experimentation. Basic recombinant DNA techniques. Restriction endonucleases and other DNA and RNA modification enzymes.
4. Gene cloning Transformation. Cloning vectors. Construction of libraries. Identification of transformants and recombinants. Gene isolation and analysis. Nucleic acid labelling and detection. Hybridization analysis. DNA sequencing. DNA amplification by the polymerase chain reaction.
5. Expression of foreign DNA in bacteria Control of gene expression in bacteria and in eukaryotes. Expression of eukaryotic genes in bacteria. Alternative host organisms.
6. Cloning in higher organisms Gene cloning in mammalian cells. Vector systems. Gene transfer methods. Plant tissue culture techniques. Rotoplast fusion. Plant genetic engineering. Transformation using *Agrobacterium* as a gene vector. Direct gene transfer. Crop improvement using molecular techniques: resistance to herbicides and diseases. RFLP-analysis.
7. Application of molecular biology in medicine Diagnosis of genetic disorders. DNA fingerprinting. Case applications.
8. Genetic engineering and the pharmaceutical industry Fermentation products. Antibiotics production. Protein production. Recombinant virus vaccines. Monoclonal antibodies.
9. Fermentation technology Microbial cultivation. Bioreactor design. Media design. Instrumentation and process control. Scale-up. Animal and plant cell cultivation. Solid substrate fermentation.
10. Enzyme technology Enzyme engineering. Site-directed mutagenesis. Enzyme stabilization. Product of enzymes. Immobilized enzymes. Immobilization of cells.
11. Biosensors Principle and structure of biosensors. Application in clinical chemistry and medicine. Application in fermentation industries.

## 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 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.
4. Chemical stability and reactivity: thermodynamics and kinetics: qualitative and quantitative predicting methods; case studies.
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

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1 hour/week

The subject is recommended for the students interested in fields of traditional pharmaceutical compounding such as preparation of several dosage forms (solutions, eyedrops, ointments, suppositories, powders).

#### Topics:

- Past and future of pharmaceutical compounding
- Combined preparations for individual therapy
- Pharmacopoeial aspects of compounded dosage forms.
- Practical guidelines for traditional compounding (Formulae Normales)
- Pharmaceutical substances, synonyms.
- Dose calculations.
- Functional excipients in the formulation.
- Practical problems of incompatibilities in combined preparations.

# PHARMACONFORMATICS

3 hours/ week

#### 1. Aims :

- to present state of art computing and telecommunication techniques including the INTERNET and to illustrate how these techniques are applied in drug industry, pharmacies and clinical patent management.
- to discuss various data base and knowledge base management systems, health care information systems, decision support tools for pharmacotherapeutic problem solving, educational programs and telemedicine techniques as they are applied in drug research and development, and in evidence based pharmacotherapy
- to teach pharmacy students how to rely on informatics tools when making cost effective decisions and trying to improve patient compliance.

#### 2. Organization of the course :

The course consists of lectures and practices. Lectures provide theoretical foundations as well as examples of the use of various technologies and methods in research and pharmacy practice. Practices allow students to work with different medical databases, information systems, and decision support tools that address various drug related problems

Lectures	References	Hour
1. MEDICAL INFORMATICS AS A DISCIPLINE	HEALTH INFORMATICS IN THE 21st CENTURY by John Mantas, Document 506 GLOBAL INFORMATION SOCIETY AND HEALTHCARE by Jean ROBERTS Document 508	2
2. DATA TYPES, CLINICAL DATA-BASES, DATA BASE MODELS, AND MEDICAL IMAGES	TERMING, CODING AND GROUPING SYSTEMS IN HEALTH by Rudiger KLAR, Document 416 DATA-BASES, SPREADSHEETS AND WORD PROCESSING IN HEALTH by Francesco PINCIROLI, Luisa PORTONI Document 401	2
3. THE THERAPEUTIC PROCESS AND THE MEDICAL RECORD	HEALTHCARE RECORD by Jos AARTS Document 407	2
4. HEALTH CARE INFORMATION SYSTEMS	OPERATIONAL USES OF HOSPITAL INFORMATION SYSTEMS by Marie-Christine JAULENT, Document 405 ARCHITECTURES IN HEALTH by Sergio TORRES, Jose TORRES Document 422	2
5. COMPUTER-BASED SUPPORT FOR PHARMACISTS (AN OVERVIEW)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
6. REPRESENTING DRUG-RELATED KNOWLEDGE (classification of drugs, describing drug properties, drug informationsystems, examples)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
7. HOSPITAL PHARMACY AND DRUG-USE MONITORING SYSTEMS (informatics of public and hospital pharmacies, patient education)	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990	2
8. INFORMATION RESOURCES AND THE INTERNET, KNOWLEDGE COUPLERS EVIDENCE-BASED DRUG THERAPY (pharmacoeconomics and outcome research planning therapeutic protocols)	REFERENCE SOURCES IN HEALTH by Jean ROBERTS, UK Document 412 ELECTRONIC COMMUNICATIONS IN HEALTH by Enrique GOMEZ AGUILERA, Francisco DEL POZO GUERRERO, Teresa ARREDONDO WALDMEYER, Andres MARTINEZ FERNANDEZ, Document 403	2
9. INFORMATICS OF DRUG PRESCRIPTION	EXPERT SYSTEMS AND ARTIFICIAL INTELLIGENCE IN HEALTH by Jana ZVAROVA, Jan TALMON Document 424 COMPUTER-AIDED DIAGNOSTIC SUPPORT by Ann OOSTENDORP, Document 408	2
10. COMPUTER SUPPORT FOR PLANNING DRUG THERAPY (Watchdog, focusing, critiquing and advisory systems, patient-centred pharmacotherapy), PLANNING DRUG DOSAGE	EH Shortliffe and LE Perrault Medical Informatics, Reading MA Addison Wesley, 1990 Van Bommel and M.Musen: Handbook of Medical Informatics, Springer, 197 (www.mihandbook.stanford.edu)	2
	Total:	20

PRACTICES:	10 hours
1. Informatics of high throughput screening (METABOL EXPERT)	2
2. Drug information systems (Micromedex and Internet resources) Resources of evidence based medicine (Cochrane library)	2
3. Analysis of dose response data in pharmacology (PROBIT analysis) Evaluation of clinical trial data (analysis of variance)	2
4. An antibiotic advisor UTI	2
5. A drug-dosage planning assistant USC PACK	2
Total:	10



# 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 director of the English Language Program and by the Educational Board of each Faculty on the basis of the department's written prior approval. "Checking" exams can be prescribed by the departments. PE exemption: Only under condition the diagnosis is checked by a licensed Hungarian health care practitioner, too.

**Application deadline:** **Prior to registration to the first and the second semester!**  
**For transfer students admitted at the Faculty of Dentistry: July 15**

**No reduction of tuition fee is granted in case of exemptions.**

# DIPLOMA WORK (Degree Thesis) AT THE FACULTY OF MEDICINE AND PHARMACY

## The dissertation and degree thesis

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- 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.

# RULES OF REGISTERING FOR DIPLOMA WORK TOPICS AT THE FACULTY OF DENTISTRY

## The schedule of announcing diploma work topics:

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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 4<sup>th</sup> year in September. The foreign language students must also appoint a student as year responsible.

## Rules of registering for topics:

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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:

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### Fictitious department

1. Vital exhaustion and cardiovascular diseases	Szentágothai János1.*	Vizi E. Szilveszter 1.	
C: Dr. Santiago Ramon Y Cajal			
2. Cognitive therapy for depression	Knoll József 3.	Vizi E. Szilveszter 2.*	Pléh Csaba 3.

Dr. Magyar Kálmán

3. The addiction model of eating disorders	Kodály Zoltán 3.	C: Koessler János	
4. Insomnia – health consequences, diagnosis and treatment	Eötvös József 1.*	Szemere Bertalan	Teleki László 2.
C: Pruzsinszky József			
5. Family therapy in eating disorders	Pálinkás József (TDK)	Toró Tibor 1.	
C: Wigner Jenő			
6. Relationship between personality disorders and mental diseases	Vizi E. Szilveszter 3.	Szentágothai János 2.	
C: Réthelyi Miklós			

- The red color indicates the student having an accepted topic
- Pálinkás József as a TDK-student of Wigner Jenő has an advantage over the other student even if they signed the topic as a first choice
- The \* after the ranking number indicates:
  - Szentágothai and Vizi E. competed for the 1. topic and even if they both were about to win another topic; they reached an agreement by mutual consent
  - the agreement between Eötvös and Szemere

### Order of approval:

The year responsible finalizes the table for a predefined date and informs the year about the results. All students manually fill out the consultation pages in two copies based on the table. The consultation pages can be downloaded from the website of the faculty. On the pages, the chosen topic and the name of the supervisor must be represented.

All four-year students must have the completed papers confirmed in the organizational unit by 30<sup>th</sup> 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 7<sup>th</sup> 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, 13<sup>th</sup> 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:**

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The head of the organizational unit prepares a list of topics and indicates the names of the supervisors. The topic which is being processed or has been defended in the last three years cannot be announced. The organizational units forward their topic lists – for the Hungarian and foreign language students separately arranged – to the Dean's Office (as well as to the competent Foreign Language Secretariats) until the end of June. The topics are going to be summarized and mailed through the year responsible - by the foreign language students appointed student (year responsible) – to the students starting the IV. year in September. The year responsible prepares an electronical table, which has to be sent with the explanatory notes made by the HÖK (Student Council) and approved by the Dean's Office to the fourth-year students. The students can only choose from that list of topics, which is written in their language of education. After the completed negotiations and agreements all students manually fill out the consultation pages in two copies. The consultation pages can be downloaded from the website of the faculty. On the pages, the chosen topic and the name of the supervisor must be represented. All fourth-year students are to have filled out pages confirmed (signed and sealed by the supervisor) in the education department (responsible to the topic) until 30th October. One copy of the consulting page has to be presented to the representative of the organizational unit, who certifies that the chosen topic is not processed by other students. The countersigned, certified page has to be transmitted to the Dean's Office until the end of the 7. semester. The other copy of the consulting page is kept by the student, which has to be signed by the supervisor at each of the obligatory consultations.

The student is allowed to write the diploma work from a topic apart from the announced ones should one of the institutes agree and provide a supervisor.

The obligation of preparing a diploma work may be waived by the dean for the following students:

- Who prepare a rector paper as one of a maximum of two authors and receive a first prize
- Who write a course work and it is rewarded at the competition of a professional scientific society

Exceptions to the thesis writing exemption does not exempt from the obligation of defense. (TVSz. 24.§. 10.)

To change the topic of the diploma work underway is possible until the end of the 8th semester.

## The content requirements of the diploma work

The diploma work is based on individual professional work. It is a didacted study which proves the student's material knowledge and ability to synthesize. It is important to keep the Hungarian language's (or the specific language's in case of foreign language education) rules and spelling in mind. The structure and correlations of the individual chapters should be logical. Its message follows each other, in terms of wording it is a continuous free-text description.

### Structure of diploma work:

- Title  
It should be short, compact and express the content well.
- Content  
It should contain the titles of the below listed numbered chapters and the occurrent another subchapters as well as the page numbers.
- Introduction
- The introduction should convince the reader about the theoretical or/and practical importance of the thesis and account for the topic selection.
- The intention of the thesis  
It has to be formulated what kind of professional goals the author is trying to achieve with the presentation of the topic and the development and/or solution of the chosen problem.
- Literary background of the theme  
The most important national and international publications of the chosen topic should be presented. It can be the presentation of the importance and problems of the topic, the applied methods, the results, observations, conclusions, references or processing of similar topics.
- Method section  
The applied qualitative and quantitative methods, statistical analysis, applied softwares should be listed according to the different methods and relevance. At this point the toolbar of the project work can be described, if it is in the thesis incorporated.
- Results  
The professional achievements with interpretation should be factually listed. The charts and tables can help systematize and interpret the results.
- Conclusions, findings, suggestions  
Confirmation, confrontation and rejection of statements, conclusions based on the results; forward-looking recommendations and opinions in the literature.
- Summary  
The summary should repeat the most important issues raised in your thesis. The summary should not contain new information or findings which do not occur in the thesis.
- References (see the formal requirements below)
- In case of presence of not own intellectual properties (publication, chart, table) the professional journal source has to be given and represented in the bibliography. **For lack of aforesaid it constitutes plagiarism, which can imply initiation of investigation or immediate suspension of student status.**
- Acknowledgements
- List of all collaborators who were helping to write the thesis through supplying of data, making analysis or giving professional advice.
- Figures, tables (in the thesis they can also be among the text)
- All figures and tables – separately – need to be added a title and a line number. The title, the letterheads of the tables, the measures of the charts has to be given so that the charts and the tables can be independently interpreted of the context. There must be a reference for all charts and tables, otherwise they cannot be included in the thesis. Charts and tables containing the same information should not be included in the paper at the same time. In so far as

any chart or table derives from literary sources, that has to be represented below them with the precise designation of the reference.

- List of concepts and abbreviations
- Appendices
- Not closely related to the theme or longer topics eg.: chart, table, questionnaire, other document have to be indicated in the annex. The annex has to be supplied with a title and a serial number and referred in the text.

## The formal requirements of the diploma work

The general **formal requirements** of the thesis are as follows:

- length: it must be no less than 50,000 characters and no longer than 100,000 (excluding spaces). Tables and references are included in the length, but figures, footnotes and the literature list are not.
  - margins: at the top, bottom, left, and right edges of the page: 2,5 cm
  - gutter margin: on the left side, 1,5 cm
  - page numbering: these numerals must be centered under the text beginning with the front page
  - paragraph alignment: justified
  - font size: 12
  - font type: Times New Roman
  - font colour: black
  - line spacing: 1,5
  - table of contents: at the beginning of the thesis with page number
  - figures, tables: tables and figures are referenced with a line number in the text, should be numbered for identification; all have a title and are understood independently of the context
  - printing: single-sided printing
  - number of copies to be delivered: 3 paper - based and 1 electronic - based
- The three paper-based copies must be submitted in black leather cover (with golden subtitles). The outside cover must indicate the student's name and the year of submitting the diploma work under the „DIPLOMA WORK“ subtitle. The inside cover must indicate the title of the thesis, the name of the student, the name, title and workplace of the supervisor. On the spine of the thesis the name of the student and the year have to be placed.
- The electronic version has to be made in „word“ and „pdf“ format.
- bibliography: The bibliography must be listed and represented at the end of the thesis after the following criteria.  
The literary items must be referred in the citation with the representation of the author and the year. The line numbers in the bibliography can also be represented in square brackets.  
In the bibliography alphabetic order by author has to be applied. In case of books, monographs the name(s) of the author(s), the year of publication, the title of the publication, the name and the place of the publisher have to be given.  
In case of a journal article the name in italics, the volume number and the page number (from... to) of the journal have to be presented behind the author(s), year and title. It is also possible to mark a web resource at which the exact web address and the exact date of the query should be marked after the author and the title of the publication.  
It is important that all listed literary items should be referred in the thesis. All statements, facts, data which are not intellectual products of the thesis writer should contain the data source. If



one source is referred by the thesis writer at more places, the source has to be marked at all places. It is an important requirement that a verbatim citation can only be cited between quotation marks with exact source mark and exact designation of the place of the source (in case of a book or a journal: page number). The failure of this counts as plagiarism, which may apply the immediate suspension of student status at worst!

Examples of use of numbered items:

...

...: „*certain plaque bacteria are able to communicate with sulcus epithelial cells too by bacterial surface molecules.*” [23]

...

**References:**

...

23. Gera I: *The bacterial biofilm and the possibilities of chemical plaque control*. Literature review. *Fogorv. Szle.* 2008; 101: 91-99.

24. Gera I: *Parodontology*. Semmelweis Kiadó, Budapest, 2009; 94.

...

The outside and inside covers of the diploma work should follow the next patterns:

**Outside cover:**

DIPLOMA WORK

(THE NAME OF THE STUDENT)

Budapest  
year

### Inside cover:

Semmelweis University  
Faculty of Dentistry

...( THE NAME OF THE STUDENT )...

...( THE TITLE OF THE DIPLOMA WORK )...

Supervisor:

(name of the supervisor)  
(title of the supervisor)  
(workplace of the supervisor)

## TIME MANAGEMENT, DEADLINES

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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

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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

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**The thesis which contains plagiarism cannot be defended! The verbatim quotations without quotation marks and marking the source; charts, statistical data, takeover of illustration without marking the source; rewording text or passage without marking the source counts as plagiarism.**

### 1. The structure of the thesis

- Is it easy to overview?
- Does the title of the thesis fit to its content?
- Are there forward recommendations, conclusions?
- Does the layout of the thesis help to recognize the structure of the thesis?
- Is the layout, structure of the thesis professionally correct, logical?
- Are the individual chapters and subchapters properly separated from each other?

### 2. The professional relevance of the thesis

- Does the thesis satisfy the objective? Are the statements supported?
- Do the relevant subjects of the core curriculum appear in the thesis?
- Promoting of the independent investigation.
- Are the methods and equipments displayed in the analysis and examination of the focus of the thesis topic correctly applied by the writer?
- Does it show all analytical methods?
- Are the results, consequences logical and correct? Are they evaluated in the light of the results found in the literature?

### 3. Use of references

- Does the student appropriately use the references?
- Are the references critically and correctly summarized during the presentation of problems, analysis, interpretation of the interpretation of results?
- Does the citation mode fulfill the expectations?
- Are the references in the text present on the reference list and vice versa?
- Is the bibliography relevant (significant literary items, timeliness, theme fit)?
- Is the thesis formally correct?
- Does it contain a reference from foreign literature?

#### **4. Use of charts and tables, other formal requirements**

- Is there a reference for every chart and table in the text?
- Can they be easily found based on the references?
- Are the charts and the tables numbered? Do they have a title? Are there references to their sources?
- Is there a perspicuous table of content?
- Are the pages numbered?
- Is there relevant information in the letterhead and in the footer? Do they help to orientate in the document?
- Are the spelling and the wording appropriate?

#### **5. Correct and consistent use of terms**

- Is the terminology used by the author uniform and correct?
- Does the student uniformly treat the foreign words (coherent application of Latin medical terminology, names of institutions)?
- Does the student use abbreviations list or glossary?

#### **6. Does the thesis provide a unified view?**

## **EVALUATION OF FINAL THESIS**

The diploma work (as part of the compulsory subjects) is evaluated on a five-scale grade. Grades: fail (1), pass (2), satisfactory (3), good (4), excellent (5). The extent of individual research will be taken into consideration.

The defense of the diploma work takes place before a committee of three members of the given unit. The committee chairman is the head of the unit or a by him/her appointed certified instructor of the unit. The two other members are the supervisor and an other instructor of the unit.

That theses which are formally inadequate (eg.: less than 50000 characters) or have not been submitted until the deadline can be corrected, completed or resubmitted after an appropriate time (eg.: a month) but at the latest until the 1st May of the 10. semester. Theses assessed as insufficient based on content during the process of defense can be re-submitted, rewritten until the 20th August. Writers of such theses' can only be admitted to the period of retaken examinations at the end of August. A failed diploma work may only be corrected once. (TVSz. 24.S. 8.)

## **TREATMENT OF THE THESIS**

The head of the organizational unit will return a copy of the successfully defended diploma work to the student after the defense. The other two copies and a copy of the minutes (which bears record to the assessment of the thesis) will be kept by the unit. The diploma work (the paper - based and the electronic version) will be kept at the library of the unit for a period of 5 years.

One copy of the minutes will be sent to the Dean's Office 1st April at the latest. In case of a foreign language student it has to be forwarded to the competent Foreign Language Secretariat.

## SAMPLE

### Disclaimer Statement

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Undersigned..... (1.) time of birth..... Neptun code.....  
fourth year student of group no. ....at Semmelweis University, Faculty of Dentistry hereby voluntarily resign of the elaboration of the thesis-topic in favour 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 "Leaving Certificate" (Absolutorium) in their lecture book validated by the Dean's signature.

The Leaving Certificate is essential for the permission to take the General Board Examination.

# GENERAL BOARD EXAMINATION – GBE (Complex Final Examination)

The final examination consists of the following:

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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)

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### The degree, the certificate

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1. A condition of obtaining the degree or certificate issued by the university is that the credit value of subjects completed at another higher education institution and recognised by the university in a credit transfer procedure may not be more than 50% of the credits required by the qualification criteria for obtaining the degree.
2. The conditions of issuing the degree: a type "C" intermediate language certificate in English, German, French, Spanish, Italian or Russian, issued or recognised by the state, and passing at least one basic-level university final examination. (One of these must be English.)  
The passing of that examination must be proved by presenting the original language certificate or a certified copy of it.
3. The rector of the University may delegate the right to sign degrees to the dean of the Faculty concerned.
4. If, because of the provisions of paragraph 1, the degree is issued after the final examination period, the degree will be signed by the head of the educational organisational unit instead of the chairman of the final examination board if the chairman of the final examination board is no longer employed by the University when the degree is issued.
5. The degree issued by the University must also contain the classification of the degree.
6. The certificates mentioned in Annex 2 and Annex 2/a are issued by the Dean's Office concerned and this Office keeps records of all certificates issued.
7. The relevant Dean's Office is responsible for issuing the diploma supplement.
8. The classification of the degree (diploma) is based on the cumulative, weighted grade point average, rounded to two decimal places.

### Classification on a scale of five grades:

- 4.51 – 5.00 distinction
- 3.51 – 4.50 good
- 2.51 – 3.50 satisfactory
- 2.00 – 2.50 pass

### Qualification on a scale of three grades:

- 4.51 – 5.00 summa cum laude
- 3.51 – 4.50 cum laude
- 2.00 – 3.50 rite

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

9. Method of calculation of the classification of degrees:

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

where:

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

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

*n* = the number of required comprehensive examinations

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

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

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

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

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

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



## COST OF THE PROGRAM FOR TWO SEMESTERS

Tuition fee for the 2016/2017 academic year

<b>Medicine</b>	<b>USD 9,100 / semester</b>
<b>Dentistry</b>	<b>USD 9,100 / semester</b>
<b>Pharmacy</b>	<b>USD 6,000 / semester</b>

The first year tuition fee (+ the registration fee – USD 220 payable in the 1<sup>st</sup> semester) should be paid in two installments (unless the Hungarian Visa regulations have different conditions):

Within two weeks after receipt of the Letter of Acceptance

Medicine	USD	9,320	(USD 9,100 tuition fee + USD 220 registration fee registration fee is payable once during the studies)
Dentistry	USD	9,320	(USD 9,100 tuition fee + USD 220 registration fee registration fee is payable once during the studies)
Pharmacy	USD	6,220	(USD 6,000 tuition fee + USD 220 registration fee registration fee is payable once during the studies)

Before February 1	Medicine	USD	9,100
	Dentistry	USD	9,100
	Pharmacy	USD	6,000

In consecutive years the annual tuition fee should be paid:  
See details under title: „Fees – Important“

Dentistry students pay additional material fee:

years 3, 4 & 5:	USD 3,600
(first semester:	USD 1,800
second semester:	USD 1,800)

Please note that this fee is subject to change!

Transfer students pay the highest tuition fee in force in the actual academic year and pay the same sum during their studies.

Application fee for transfer students: USD 200

Registration fee for transfer students: USD 220

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.

Payments can be made by bank transfer in **USD** to the bank account of the university program or by cash payment personally in any MKB Bank ([www.mkb.hu](http://www.mkb.hu)) branch office:

Account name: IS International Studies  
Account (IBAN) number:  
HU12-10300002-10476764-40120020  
Bank name: MKB Bank  
Bank address: H-1056 Váci u. 38., Budapest, Hungary  
Swift/BIC code: MKKBHUHB

Note: The transfer sheet should include **the name of the student** as it is written in the passport and the remark **"SE Uni"**.

Personal checks and money orders are not accepted.

Please note that the above mentioned net amounts have to arrive to the account – the commission charges have to be paid by the student.

**NOTE: With all kind of inquiries concerning your payment, please turn to the College International at [info@studyhungary.hu](mailto:info@studyhungary.hu)**

## REFUND POLICY

### 1. Prior to registration at the university

**Refundable:** 100% of payment except the 1<sup>st</sup> year students' **USD 2000 deposit**, which is **non-refundable**

### 2. After registration at the university

#### **Withdrawal of studies:**

Students, compelled to withdraw for academic/disciplinary reasons or have been accepted/transferred by another institute of higher education are not entitled to a refund of the tuition fee. Students are entitled to a refund on a pro rata basis if studies are interrupted due to a sound reason (eg. the death of parents/guardians or due to a requirement to fulfill a military service obligation). The refund is applicable from the first day of the month following report of the above mentioned conditions with accompanying official certificates.

#### **Suspension of studies:**

a. **Student's legal relationship is suspended after registration within a month following the beginning of the semester**  
Tuition fee is non-refundable. It can be transferred to the next active semester.

b. **Student's legal relationship is suspended after registration after more than a month following the beginning of the semester**

Tuition fee is non-refundable. It cannot be transferred to the next active semester and the semester must be considered as active.

**No other claims are acceptable.**

## STUDENT SERVICES CENTER

College International

Mail: H-1406 Budapest 76,  
P.O. Box 51, Hungary  
Address: H-1071 Budapest, VII.  
Bethlen Gábor tér 2., Hungary  
Phone: (36-1) 413-3015  
Fax: (36-1) 413-3030  
E-mail: [info@studyhungary.hu](mailto:info@studyhungary.hu)  
Home Page: <http://www.studyhungary.hu>

## 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](mailto: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](mailto: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](mailto:info@edu.unideb.hu)

Tel.: + 36 52 258-051, + 36 52 258-052

# RESIDENCE VISA, RESIDENCE PERMIT

## For citizens of the European Economic Area countries (EU + EEA citizens)

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Citizens of the above states 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 and apply for a **Registration Certificate** not later than 93 days following their entry to Hungary.

### Documents required for the Registration Certificate:

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- school certificate in Hungarian
- form for issuing Registration Certificate and Reporting Accommodation
- lease contract of the apartment - *bérelti szerződés* (original, written in Hungarian, signed by two witnesses)
- proof of funds to cover your expenses (bank account statement about approx. 1000-1500 USD or receipts about changing equivalent Hungarian Forints)
- official bill stamps for 1000 Forints ("*okmánybélyeg*" from the Post Office)
- ID card or valid travel document
- certificate about a valid health insurance for Hungary (included in your tuition fee, you'll get it at registration)

### To receive the Registration Certificate, you have to turn to the:

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**Immigration Office** (Client's Service #5 – "5.sz. Kirendeltség"):

Address: 13<sup>th</sup> district, Szegedi út 35-37, Ground floor. (Twin Office Center Office Building)

To get there: from Keleti Railway Station take buses #20E, #30, #30A, #32 or #230 until the stop "Szegedi út"

Opening hours:

Monday:	8 <sup>30</sup> -13 <sup>00</sup>	
Tuesday:	13 <sup>00</sup> -18 <sup>00</sup>	
Wednesday:	8 <sup>30</sup> -12 <sup>00</sup>	(special office hours for international students)
Thursday:	8 <sup>30</sup> -13 <sup>00</sup>	
Friday:	8 <sup>30</sup> -12 <sup>00</sup>	

To book an appointment in advance email to [bpkir5@bah.b-m.hu](mailto:bpkir5@bah.b-m.hu)

## For citizens of Non-EU countries arriving without visa

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You are required to submit your application for long stay to the Immigration Office within **90 days** after your arrival.

### Documents required for the residence permit:

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- school certificate in Hungarian
- passport valid at least until the end of 2017
- Application form for residence permit for the purpose of study (you can download it from <http://www.bmbah.hu/ujpdf/angol/71.pdf>)
- housing registration form – "*lakcímbjelentő*" (signed by the owner(s) or an authorized person)
- lease contract for the apartment in Hungarian (1 original and 1 copy signed by two witnesses)

- property page of the apartment – “*tulajdoni lap*” to be provided by the owner (original, not older than 1 month)
- 1 passport-size photo
- official bill stamp for **18 000** Forints (“*okmánybélyeg*” from the Post Office)
- proof of funds to cover your expenses (bank account statement about approx. 1000-2000 USD or receipts about changing equivalent Hungarian Forints)
- certificate about a valid health insurance for Hungary (included in your tuition fee, you'll get it at registration)

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**To receive the Residence Permit, you have to turn to the:**

**Immigration Office** (Client's Service #5 – “5.sz. Kirendeltség”):

Address: 13<sup>th</sup> district, Szegedi út 35-37, Ground floor. (Twin Office Center Office Building)

To get there: from Keleti Railway Station take buses #20E, #30, #30A, #32 or #230 until the stop “Szegedi út”

Opening hours:

Monday:	8 <sup>30</sup> -13 <sup>00</sup>	
Tuesday:	13 <sup>00</sup> -18 <sup>00</sup>	
Wednesday:	8 <sup>30</sup> -12 <sup>00</sup>	(special office hours for international students)
Thursday:	8 <sup>30</sup> -13 <sup>00</sup>	
Friday:	8 <sup>30</sup> -12 <sup>00</sup>	

To book an appointment in advance email to [bpkir5@bah.b-m.hu](mailto:bpkir5@bah.b-m.hu)

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**Entry for Long Stay (exceeding 90 days)**

Foreign nationals (**under visa obligation**) wishing to pursue studies in Hungary are required to apply for entry for a long stay (exceeding 90 days) for the purpose of studies in their home countries and enter the country on the entry permit issued by the Hungarian Embassy or Consulate.

**The entry permit is valid for a single entry and up to 30 days of stay in Hungary. Within 3 DAYS upon arrival you 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.**

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**The following documents are required for the application for the entry permit (visa):**

- A wholly and legibly completed Application for residence permit for the purpose of studies
- 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)
- Acceptance Letter from the University
- proof of payment of the tuition fee
- proof of funds to cover your expenses 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 EUR 60
- the Hungarian Embassy may ask for your flight reservation and flight ticket and the address of your residence in Hungary (unless you have already made arrangements for a permanent place of residence in Budapest in response to this question on the application form you should write the address of Star Hotel - Budapest 1078, István u. 14 - at which you can stay for the first couple of days on arrival)

**Within 30 days on arrival in Hungary you have to apply for the Residence Permit.**

### **The following documents are required for the Residence Permit:**

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- 1 passport-size photo
- your passport including the visa
- completed housing registration form – “lakcímbjelentő” (signed by the owner/s or an authorized person)
- completed data sheet for receiving the residence permit
- your lease contract (1 original and 1 copy signed by two witnesses)
- property page of the apartment – “tulajdoni lap” provided by the owner (original, not older than 1 month)
- valid medical insurance for the whole period covered by the residence permit (included in your tuition fee, you’ll get it at registration)

### **To receive the residence permit, you have to turn to the IMMIGRATION OFFICE (Client’s office III):**

Address: 11<sup>th</sup> district Budafoki út 60. (entrance from Sztregova street)  
From Móricz Zsigmond tér, bus No.33 5<sup>th</sup> bus stop-Hengeralmos utca.

### **Opening hours of the Immigration Office (residence permit application)**

<b>Monday:</b>	<b>8<sup>30</sup>-13<sup>00</sup></b>	
<b>Tuesday:</b>	<b>13<sup>00</sup>-18<sup>00</sup></b>	
<b>Wednesday:</b>	<b>8<sup>30</sup>-12<sup>00</sup></b>	<b>(Student day)</b>
<b>Thursday:</b>	<b>8<sup>30</sup>-13<sup>00</sup></b>	
<b>Friday:</b>	<b>8<sup>30</sup>-12<sup>00</sup></b>	

## **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 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% 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 15<sup>th</sup> – first semester  
February 15<sup>th</sup> – 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.

**No 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."

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

### *Faculty of Pharmacy*

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

## HOW TO GET A CERTIFICATE WHICH PROVES THAT THE DIPLOMA ISSUED BY SEMMELWEIS UNIVERSITY IS IN CONFORMITY WITH THE EU REQUIREMENTS, AND A CERTIFICATE OF GOOD STANDING

<http://www.enkk.hu/index.php/en/department-of-migration-and-human-resources-methodology/certificates-for-recognition-in-a-foreign-country/certificate-of-conformity>

In order to get the abovementioned certificates a request should be provided to the ENKK's Department of Migration and Monitoring.

### **CERTIFICATE OF CONFORMITY**

(It states that the diploma satisfies the training requirements laid down in European Parliament and Council Directive 2005/36/EC on the recognition of professional qualifications.)



**The following documents are required:**

application form  
copy of the passport or ID card,  
copy of any official paper that proves the applicant's address (optional)  
copy of the diploma  
receipt about the fee of the procedure

**CERTIFICATE OF GOOD STANDING**

(It provides information about the applicant's ethical/ criminal background and his or her right to practice in Hungary)

**The following documents are required:**

application form  
copy of the passport or ID card,  
copy of any official paper that proves the applicant's address (optional)  
copy of the diploma  
receipt about the fee of the procedure

- + **Original Hungarian Police Record not older than 3 months** (The police record has to attest that the applicant has a clean criminal record and that he/she is not under the effect of a non-appealable sentence imposed for a criminal offence suspending the health care activity. )

**Police Record can be requested:**

at any post offices or  
personally at the criminal authority (Central Office for Administrative and Electronic Public Services; H-1133 Budapest, Visegrádi utca 110-112. (Mo-Fri: 8.00-20.00, Sat, Sun: 8.00-14.00) or  
by ENKK( In this case the applicant should attach a handwritten authorisation concerning the police record can be required directly by the ENKK and the receipt of the bank transfer about the fee of police record ( 3.100,- HUF) (In this case the procedure can take more than 30 days.)

**Contact information:****Postal address:**

Egészségügyi Nyilvántartási és Képzési Központ /Health Registration and Training Center  
Migrációs és Monitoring Főosztály /Department of Migration and Monitoring  
Bélteki Zsolt  
1380 Budapest Pf.:1188

**General information about the procedures:**

Tel: +36-1-235-7965

E-mail: recognition@enkk.hu

Information about ongoing cases:

You can contact the consultants directly on Monday between 9.00-11.30 am. and on Tuesday and Thursday between 9.00-11.00 am. and 13.00-15.00 pm.

Nándor Rikker

Tel: +36-1-235-79-22

E-mail: rikker.nandor@enkk.hu

Nóra Nacsa

Tel: +36-1-235-79-27

E-mail: nacsa.nora@enkk.hu

Nóra Kovács

Tel: +36-1-235-79-29

E-mail: kovacs.nora@eekh.hu

Judit Bunyitai

Tel: +36-1-235-79-41

E-mail: bunyitai.judit@enkk.hu

**In person:**

Egészségügyi Nyilvántartási és Képzési Központ (ENKK)

Budapest (V.), Akadémia u. 7.

Office hours: Tuesday, Thursday 8.30-11.15 a.m. and 12.00-15.30 p.m.

**Web: [www.enkk.hu](http://www.enkk.hu) /English version (logo) / Department of Migration and Monitoring/ Certificates for recognition in a foreign country**

**The price is 27,750,- HUF** per each certificate. (Price can change.)

**Account details:**

Egészségügyi Nyilvántartási és Képzési Központ  
10032000-00285788

**From abroad:**

Egészségügyi Nyilvántartási és Képzési Központ  
Swift code: MANEHUHB  
IBAN number: HU28 1003 2000 0028 5788 0000 0000  
Bank: Magyar Nemzeti Bank

**Important note:** Applicants who have graduated at the Faculties of Medicine, Dentistry since 1 September 1986, and at the Faculty of Pharmacy since 1 September 2007 may apply for the certificate of conformity!

**Additional information concerning the certificate of good standing:**

The Certificate of Good Standing attests that the applicant

- has a clean criminal record, and is not under the effect of a non-appealable sentence imposed for a criminal offence suspending the health care activity concerned on the day of issue of this certificate;
- is not under the effect of a non-appealable sentence imposed for the violation of the professional ethical rules;
- is entitled or not to pursue healthcare activities in Hungary.

The entitlement depends on the membership in the professional chamber (Hungarian Medical Chamber (MOK), Hungarian Pharmaceutical Chamber(MGYK), Hungarian Chamber of Health Professionals (MESZK)) and on the Operational Registration:

- If the Applicant does not have a membership in the chamber, the Applicant is not entitled to pursue healthcare activities in Hungary at all,
- If the Applicant has a membership in the chamber, but does not have a valid Operational Registration, the Applicant is entitled to pursue healthcare activities only with supervision in Hungary,
- If the Applicant has a membership in the chamber, and also has a valid Operational Registration, the Applicant is entitled to pursue the healthcare activity **without supervision** in Hungary.

In order to avoid registration problems in the Host Country, please contact the competent authority before applying for the Certificate of Good Standing if chamber membership and Operational Registration in Hungary is needed or not.

## SAMPLE APPLICATION FORM IN ENGLISH AND IN HUNGARIAN

### **REQUEST concerning the issue of a certificate to be used in the recognition of the diploma, qualification in another country**

I'm ..... (name) applying for the following certificate(s) that I need to get my diploma, qualification recognised in ..... (name of the country). (Please put an X before the requested certificates):

- certificate of conformity issued for doctors, specialists in medicine, dentists, specialists in dentistry, pharmacists, nurses, midwives (Pursuant to Section 60/C of Act C of 2001 and with reference to Article 24., 25., 28., 29., 31., 34., 35., 40-41., 44. of Directive 2005/36/EC) - certificate of acquired rights issued for doctors, specialists in medicine, dentists, specialists in dentistry, pharmacists, nurses, midwives (Pursuant to Section 60/B of Act C of 2001 and with reference to Article 23., 27., 30., 33., 37., 43. of Directive 2005/36/EC)
- a certificate which attests the length of the healthcare activity pursued in Hungary (Pursuant to Section 60/B of Act C of 2001)
- a certificate of good standing (Pursuant to Section. 110/A of Act CLIV of 1997)
- a certificate which attests the level of the qualification (Pursuant to Section 60/A of Act C of 2001)
- other

#### **Personal data (Please write with capitals)**

Surname: .....

Given name: .....

Name at birth: .....

Mother's maiden name: .....

Place and date of birth: .....

Registered address: .....

Mailing address: .....

Telephone: .....

E-mail: .....

Basic register number: .....

#### **I enclose the following documents (Please put an X before the selected ones):**

- copy of the passport/ID card
- copy of the proof of evidence concerning the applicant's registered address
- copy of the diploma/qualification
- fee (by postal cheque or bank transfer)
- original Hungarian Police Record or its certified copy
- original certificate from the employer or its certified copy
- other

#### **I'd like to get the issued certificates (Please put an X before the selected one):**

- personally
- by post
- by an authorised person (please attach an authorisation)
- other way:

#### **Other remarks, requests:**

I hereby declare that the information contained in my application are true, and I agree with the use of the aforementioned data by the Office with regards to my application.

Date: .....

Signature

REQUEST concerning the issue of a certificate to be used in the recognition of the diploma, qualification in another country

# AZ OKLEVÉL, BIZONYÍTVÁNY KÜLFÖLDÖN TÖRTÉNŐ ELISMERTETÉSÉHEZ SZÜKSÉGES HATÓSÁGI BIZONYÍTVÁNY KIADÁSA IRÁNTI KÉRELEM

Alulírott ..... (név) kérem, hogy oklevelem/bizonyítványom .....  
.....-i (ország neve) elismertetése céljából részemre a következő hatósági bizonyítványokat kiállítani sziveskedjék (Kérjük, hogy X-szel jelölje a kért hatósági bizonyítványokat!):

- konformitást tanúsító hatósági bizonyítvány általános orvos, fogorvos, szakorvos, gyógyszerész,
- ápoló, szülésznő részére (a 2001. évi C. tv. 60/C. §-a alapján a 2005/36/EK irányelv 24., 25., 28., 29., 31., 34., 35., 40-41., 44. cikke tekintetében)
- szerzett jogot tanúsító hatósági bizonyítvány általános orvos, fogorvos, szakorvos, gyógyszerész,
- ápoló, szülésznő részére (a 2001. évi C. tv. 60/B. §-a alapján a 2005/36/EK irányelv 23., 27., 30., 33., 37., 43. cikke tekintetében)
- a magyarországi egészségügyi szakmai tevékenység időtartamát tanúsító hatósági bizonyítvány (a 2001. évi C. tv. 60/B. §-a alapján)
- jó hírnév igazolás (1997. évi CLIV. tv. 110/A. §-a alapján)
- végzettségi szintet tanúsító hatósági bizonyítvány (a 2001. évi C. tv. 60/A. §-a, valamint a 2005/36/EK irányelv 11. cikke alapján)
- egyéb:

## **Kérelmező személyes adatai (Kérjük nyomtatott nagy betűkkel kitölteni!)**

Családi név: .....

Utónév: .....

Születési név: .....

Anyja születési neve: .....

Születési hely, idő: .....

Lakóhely: .....

Levelezési cím: .....

Telefon: .....

E-mail: .....

Alapnyilvántartási szám: .....

## **Kérelmemhez az alábbi dokumentumokat csatolom (Kérjük X-szel jelölni!):**

- Útlevel/személyi igazolvány fénymásolata
- Lakcímkártya fénymásolata
- Bizonyítvány/oklevél fénymásolata
- Igazgatási szolgáltatási díj megfizetését igazoló csekkszelvény/átutalási bizonylat
- Eredeti hatósági erkölcsi bizonyítvány vagy annak hiteles másolata
- Eredeti munkáltatói igazolás vagy annak hiteles másolata
- Egyéb:

## **A hatósági bizonyítványokat a következő módon szeretném megkapni (Kérjük X-szel jelölni!):**

- Személyesen
- Postai úton
- Meghatalmazott veszi át helyettem (meghatalmazás külön csatolandó)
- Egyéb:

## **Egyéb kérés, megjegyzés:**

Alulírott nyilatkozom, hogy a kérelemben feltüntetett adatok a valóságnak megfelelnek és személyes adataim kezeléséhez hozzájárulok.

Kelt: .....

kérelmező aláírása

## EXTRA CURRICULAR FEES

1. First retake of a semi-final or final examination second and third retakes	free 2,000 HUF / 3,000 HUF (students of dentistry)
2. Uncertified absence from the exam – Examination and Studies Regulations §19/ 5.	4,000 HUF (students of medicine) 3,000 HUF (students of dentistry)
3. Retake of the General Board Examination (each part of the GBE)	8,000 HUF
4. Default charges:	
a) delay of registration (when the tuition fee is paid) – read more details about the <i>registration requirements</i> under the next title “Important”	5,000 HUF
b) failing to hand in the diploma work on time - two weeks postponement - every plus week	3,000 HUF 2,000 HUF/week
5. Failing to report any change in data registered in the Neptun System	5,550 HUF
6. Copy of the diploma (per number of copies and languages)	4,000 HUF/each
7. Copy of the lecture book (index)	6,000 HUF (plus bill stamps in HUF 2,000 value)
8. Official transcript	2,000 HUF/each (the old type: 500 HUF/page)
9. Failing to keep any deadlines:	5,550 HUF

## IMPORTANT

### **Registration requirements**

Please note that the date of registration for the first semester is between **29 August- 2 September, 2016** and for the second semester is between **23-27 January, 2017**. In order to fulfill the registration requirements, you must **pay your tuition fee**, you must bring your **index 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 2 September, 2016 and 27 January, 2017, 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 obtain 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 - 112Visegrádi 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 current Hungarian address correct and shows up in the 'Street, number' text box. ***Please note: you must have your correct, current Hungarian address uploaded in the Neptun system because the permanent student card will be mailed to that address!***

The plastic card **takes** about **6 month** 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 in the mail.

# UNICard

## green colour card

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Semmelweis Egészségügyi Kft. (SEK) continues to provide personal health counselling and call-centre services to foreign students of the University free in the 2014-2015 term.

- Free call-centre services are available every day between 07.00 and 19.00. After the caller has proven their right for the services, our English speaking operator will help in answering health related questions

- Pay 24-hour English speaking GP's service available

- Pay clinical examinations are available and arranged for students on individual demand and if justified. SEK associate personally escorts the patient to the clinic and helps with the necessary administrative procedures.

**The green colour plastic UNICard which enables students to use the services has to be validated every year!**

Existing cards are validated at the SEK office (1094 Budapest, Tompa u. 26/b. Please, double check the address before visiting the office by phone: +36 1 327-0452) after registration at the Foreign Students' Secretariat.

**PLEASE, BRING YOUR OLD CARD WITH YOU FOR VALIDATION!**

# UNIMed Health Insurance

## blue colour card

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### Insurance

Students of the 1-5 years attending the courses in English are entitled to enlist the UNIMed health insurance. Furthermore, all our students have the opportunity to request UNIMed Health Insurance. Students with this insurance are given a blue card with their names and validity date indicated in it. The maximum insurance amount is 2 million HUF per year. For further details please, consult our webpage: [www.unicardinfo.hu](http://www.unicardinfo.hu) .

UNIMed services also include 24-hour English language assistance 7 days a week and escorting services to medical examinations.

The insurance is available at SEK (1094 Budapest, Tompa u. 26/b.) Please, double check the address before visiting the office by phone: +36 1 327-0452.

**NOTE: Students in passive status may pay for the insurance in the passive semester at the College International!**

## FREQUENTLY ASKED QUESTIONS - FAQ-s

- **What are the Foreign Students' Secretariat's office hours?**

Where: EOK (Basic Medical Science Center) 37-47 Tüzoltó utca, 1<sup>st</sup> Floor, room 1.604

Monday	1 p.m. to 3 p.m.
Tuesday	1 p.m. to 3:30 p.m.
Wednesday	closed
Thursday	9:30 a.m. to 12 p.m.
Friday	10 a.m. to 12 p.m.

Online at <http://semmelweis.hu/english/education/english-language-program/>

- **Where do I get the information and forms necessary for my studies?**

<http://semmelweis.hu/english/education/english-language-program/official-forms/>

- **How do I get my class schedule for the next term?**

<http://ora.semmelweis.hu/tervezet/>

- **How do I get my class schedule for the current term?**

<http://ora.semmelweis.hu/aktualis/>

- **How do I get my class schedule for the previous term?**

<http://ora.semmelweis.hu/regi/>

- **How many credits do I need to graduate from the Faculty of Medicine?**

360

- **How many credits do I have to take per semester?**

Please see your semester curriculum in the Calendar. The amount of the required credits are set out by each semester's curriculum under the curriculum schedule.

As a general guideline, you should as a minimum, take 30 credits on average in each term to reach the required 360 credits by the end of the 6th year.

- **How many credits do I have to earn in order to remain at school?**

Students whose cumulative credit amount falls below certain prescribed standards are dismissed from the University. Such dismissal occurs, if after completing the fourth consecutive, 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 my grade book to the Foreign Students' Secretariat?**

You must submit your index with all grades and signatures to the Foreign Students' Secretariat immediately after your last exam in the semester.



- **When can I collect my grade book from the Secretariat?**  
Following written notification from the Foreign Students' Secretariat and a few days prior to the start of the exam period.
- **Do I have to get my grade book signed for courses I got exempted from?**  
No. You do not have to get your grade book signed for subjects from which you have been exempted so please do not take your grade book to that department.
- **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 3<sup>rd</sup> year, for the internal medicine practice before the start of the 4<sup>th</sup> year and for surgery practice before the start of the 5<sup>th</sup> 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?**  
<http://semmelweis.hu/english/education/english-language-program/official-forms/>
- **When is my tuition fee due?**  
**Before registration to 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.

It is important for you to keep in mind that checking whether the tuition fee has been paid properly is your responsibility. You are recommended to contact College International each term

approximately one week before the payment deadline to find out whether the tuition fee has arrived without any problems. If this is done in advance then you should not have any further difficulties with your tuition fee.

- **What am I to do if I am late with my payment? What if my tuition fee arrived but is not complete and I received written notice on it?**

Students with tuition deficiency will be contacted by the Foreign Students' Secretariat. Following receipt of a written notice, exactly indicating the missing amount, you will be required to make a cash transfer at any MKB Bank branch. If you are unable to initiate a cash transfer because the amount missing is significant and should be wired, then you must immediately start processing wire of the missing amount at your home bank.

If you are unsure how much you need to pay or have questions regarding financial arrangements, payment methods, etc., please contact College International at +36-1-413-3012 or [jordogh@studyhungary.hu](mailto:jordogh@studyhungary.hu)

- **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 to 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. Since bank wires take several days to reach Hungary, please contact your bank and College International before the due date to ensure that your wire will be received by the University before the deadline. 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 Nep-tun 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 15<sup>th</sup> – first semester

February 15<sup>th</sup> – second semester

**Note:** the weighted average is calculated.

Further reductions, 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.		∅

$\Sigma$  : 27 + 12 + 20 + 15 + 24 + 15 + 10 = 123

Number of credits earned in the semester: 30

Weighted average from the first semester: 123/ 30 = 4.1

- **What is the difference between weighted average and cumulative weighted average?**

The weighted average and cumulative weighted average are based on grades given for each course taken and the number of credit hours specified for those courses over the specified period of time (one term for weighted average; more or all terms for cumulative weighted average). The difference between the two is that *weighted average* is calculated for one semester of the year and *cumulative weighted average* is based on two or more semesters of the individual.

- **What if I can't attend an exam or class at the time scheduled?**

Students are required by university regulations to present written justification stating the reasons of their absence. Upon returning to school after an absence, students should report to the department's office and present a doctor's note, if their absence was caused by medical reasons. Excuses not provided within 3 days after the missed exam or class will result in the absence being marked as an unexcused absence.

It should be noted that the student will be recorded absent even if s/he is absent for a valid reason such as sickness. In the case of absence with a valid reason, an official document that proves the reason of absence should be provided. The department has the right to reject any document of questionable credibility. If you are sick and cannot take the exam or class, you should telephone your tutor immediately and leave a message for the department office even if this is not the first day of your absence.

- **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 (4000 HUF)

If you choose to pay by check please visit the Foreign Students' Secretariat to collect your check. The check must be paid at the post office.

- **Do I have to pay for exams?**

Students have to pay for their second and third retake exam (3<sup>rd</sup> and 4<sup>th</sup> exam) for a given subject. Please see „Extra curricular fees“ in the Calendar

- **How do I order a check for my 3<sup>rd</sup> or 4<sup>th</sup> 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“.

You can choose to pay your retake exam fees online via the Neptun system or by check. To pay online you will have to select 'Payment by credit card' from the two payment options offered to you.

If you choose to pay by check please visit the Foreign Students' Secretariat to collect your check. The check must be paid at the post office, the check stub is to be presented on site prior to the exam.

- **Should I go directly to the department when applying for an exemption?**

Yes, except in case of Physical Education, summer practices and First Aid. Physical education medical certificates and certificates/degree proving the completion of summer practices/first aid course must be submitted to the Foreign Students' Secretariat by registration to both semesters each year. For a physical education exemption you must also submit a letter of request describing your problem in a few words and apply for a permission to be exempted from the subject. The request letter must be addressed to the Foreign Students' Secretariat.

For other subjects you must first get a blank exemption form from the Foreign Students' Secretariat. Then, you must show the form and certificate of your previous studies to the competent department, which will be reviewed before granting an exemption from the subject. You need to get your exemption form signed and stamped at the department.

**Important:** the teacher must indicate the grade for the subject on the form. After having the form completed and stamped, you have to return it to the Foreign Students' Secretariat for processing. If everything is OK with the form, your registrar will enter the given grade into the Neptun system and indicate it in your grade book. If you successfully complete the above, you have no further obligations regarding that particular subject.

Approved exemptions must be submitted to the Foreign Students' Secretariat by the start of the semester!

- **Can I be 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 evi-

dence 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 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 4<sup>th</sup> try once a year (the 3<sup>rd</sup> retake), which may be used exclusively in 1 chosen subject. After using this 4<sup>th</sup> exam opportunity in one subject, the student shall not have a 4<sup>th</sup> try in any other subjects; they also will not be granted “special permission” for a 5<sup>th</sup> opportunity. Please count your remaining exam opportunities carefully! For example, if you use 2 exam opportunities for Chemistry in the 1<sup>st</sup> semester (1 exam and 1 retake), you will only have 1 remaining opportunity for a retake in the following semester (plus the one extra 4<sup>th</sup> 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. 3<sup>rd</sup> and 4<sup>th</sup> 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 and your grade book is submitted to the Foreign Students' Secretariat with all results. It is the department's responsibility to upload the exam results to the Neptun system.

Transcript requests must be made in writing. To make your request, you may stop by the Foreign Students' Secretariat or send it via e-mail. You can indicate in your request if you would like us to forward the transcript to your email address. Processing of transcript requests takes approximately 5 business days. However, during certain times of the year there will be a slight delay, 2-3 days, due to the heavy volume of requests. The fee for the transcript must be paid for prior to the issuance of the transcript(s). Please be sure to allow sufficient processing time for your request.

**Please note:** the university may discontinue or suspend this service at any time without notice if the fee for the transcript is not paid.

## STUDENT COUNSELLING

The Institute of Behavioural Sciences at 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](mailto:studentcounselling@net.sote.hu)

Home page: <http://behsci.hu/health/student-counselling>

Institute of Behavioural Sciences

Nagyvárad tér 4, 20th floor,

1089 Budapest

Appointments are available between Monday and Friday (16-20 o'clock) upon request (via mail)

## **ERASMUS Program**

<http://semmelweis.hu/english/education/erasmus/>

### **Office Hours and Contacts**

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#### **Office Hours**

Monday:	9 a.m. – 12 p.m.
Tuesday:	1 p.m. – 3 p.m.
Wednesday:	9 a.m. – 12 p.m.
Thursday:	1 p.m. – 3 p.m.
Friday:	CLOSED

For the efficient and continuous work of the office, we kindly ask that you respect our office hours! In case of an urgent matter, please contact the ERASMUS office either by phone or email, in order to obtain a personal appointment.

#### **Address**

H-1085 Budapest, Üllöi út 26. Room 202

#### **Contact Information**

Ms. Katalin F. Tóth

ERASMUS Institutional Coordinator

Tel: (+36 1) 459-1500, ext. 55827

Fax: (+36 1) 459-1588

Email: [erasmus@semmelweis-univ.hu](mailto: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](mailto:erasmus@semmelweis-univ.hu)

# SEMMEWEIS ALUMNI

<http://alumni.semmelweis.hu/eng/semmelweis-alumni>

## Mission Statement

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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

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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/>

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)

<http://semmelweis.hu/english/student-life/clubs-and-organisations/students-scientific-association/>

A unique feature of Hungarian universities is that undergraduate students have the opportunity to be involved in top-level scientific research starting in their undergraduate years. To facilitate this, students maintain their own organisation, the Students' Scientific Association (in Hungarian: Tudományos Diákkör – TDK). TDK activities, which include organising scientific conferences, are overseen by the TDK Council.

During the last ten years, the number of students involved in scientific research has grown twofold, while the number of lecturers attending TDK conferences has increased threefold. Currently, over 1000 Semmelweis University students pursue science in addition to their regular studies, more than 400 of whom present their research results at the annual TDK conferences.

The University's students often receive great honours at national and international conferences and many of them publish scientific research articles in international journals as either first or co-authors. Each year, the ten best graduating students receive the "Outstanding TDK Student of Semmelweis University" distinction.

It is pleasing to see that the University is attracting ever more students who had started doing research during their high school years. To encourage the continuation of this practice, the TDK Council promotes the involvement of students in scientific research from their very first year at university.

The TDK Council also promotes close contacts with fellow TDK organisations abroad. Students are sent to international TDK conferences and cooperate with the Hungarian Medical Students' International Relations Committee (HuMSIRC), through whom longer study tours can be organised.

## TALENT SUPPORT PROGRAM OF THE SEMMELWEIS UNIVERSITY

To support the talented and gifted students the Senate of the Semmelweis University initiated a Talent Support Program named after the former professor of our University, Ödön Kerpel-Fronius.

Participants of the program will be recruited after a personal assessment interview of the students on the Excellency List organized by the Talent Support Council of the University.

The Excellency List contains not more than the best 5% of the students of the university.

Application for the inclusion in the Excellency List is possible by filling in the Application Form, which can be downloaded from the [kerpel.sote.hu/kivalosagi\\_listara\\_kerules\\_szabalyrendszer](http://kerpel.sote.hu/kivalosagi_listara_kerules_szabalyrendszer) or [kerpel.sote.hu/kivalosagi\\_lista](http://kerpel.sote.hu/kivalosagi_lista) web-sites.

Applications should be sent electronically to the [tehetsegpont.se@gmail.com](mailto: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.

## NOTE

# FACULTY OF HEALTH SCIENCES



*Faculty of Health Sciences*

## Brief History of the Faculty of Health Sciences

The University's second largest Faculty is the Faculty of Health Sciences. The Faculty started its first academic year in 1975 with the aim of training highly accomplished, skilled, committed and open-minded health care professionals. This was the first higher-level school in Hungary that trained dietitians, health visitors, physiotherapists, public health and epidemiology inspectors, vocational teachers and paramedics. During the past years both the structure of education and the curriculum have undergone changes in the spirit of modernization. The Faculty continuously expands the range of its Hungarian and English language training programmes. The Faculty offers study rooms, lecture halls, specialist laboratories, demonstration rooms and a public library that are all equipped with state-of-the-art technology, as well as a great variety of active student life and a motivating environment to prospective students. Following graduation, students of the Faculty can immediately be involved in different areas (ex.: health care, tourism, education, sociology) and they are able to improve their close and broad environment.

## Facts and Figures

The Faculty of Health Sciences celebrated its 40th anniversary in 2015. Since its foundation, more than 23000 students graduated from the Faculty and today about 3500 students are studying at this institution. The Faculty is very proud of its library containing more than 50000 volumes.

During the last four decades the Faculty has developed extensive international relations, and as a result we have connections with about 50 higher educational institutions throughout Europe, Asia and America. More than 30 students and 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 200 students participate in our programme there. The scale of our international relationship is growing on a daily basis and we accept several groups of students from different countries 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

Mailing address: H-1085 Budapest, Üllői út 26.

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**

Phone: +(36-1)486-5912

– Head of Dean's Office

e-mail: kakuk.m@se-etk.hu

**Ms. Noémi Bárdos**

Phone: +(36-1)486-5910

– Secretary

e-mail: bardos.noemi@se-etk.hu

**Dr. Péter Kanizsai**

Phone: +(36-1)486-5843

– Head of International Affairs

e-mail: kanizsai.peter@se-etk.hu

**Ms. Virginia Berger**

Phone: +(36-1)486-5917

– Administrator of International Affairs

e-mail: berger.virginia@se-etk.hu

**Ms. Ágnes Szabó**

Phone: +(36-1)486-5845

– Coordinator of Short, Intensive Training Programs

e-mail: agnes.szabo@se-etk.hu

### Foreign Students' Secretariat

**Mrs. Anna Frim**

Phone: +(36-1)486-5916

Fax: +(36-1)486-5913

– Coordinator of the English Programmes

e-mail: dora.anna@se-etk.hu

room: 129

**Mr. Árpád Leel-Őssy**

Phone: +(36-1)486-5905

Fax: +(36-1)486-5913

– Coordinator

e-mail: leel.ossy.arpad@se-etk.hu

room: 129

**Ms. Éva Sütő**

Phone: +(36-1)486-5909

Fax: +(36-1)486-5913

– International Coordinator

e-mail: suto.eva@se-etk.hu

room: 129

**Mr. Mátyás Magyaros**

Phone: +(36-1)486-5909

Fax: +(36-1)486-5913

– Administrator

e-mail: magyaros.matyas@se-etk.hu

room: 129

## Information about the B.Sc. and M.Sc. programmes

### Training system

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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

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#### 1. Nursing and Patient Care BSc Programme

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**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 physically disabled patients with movement therapy and manual techniques 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. They can 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 post-natal period and during gynaecological diseases. 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.

### Qualification

Midwife

### Dietetics

A dietitian is a person with a qualification in Nutrition & Dietetics recognized by national authority(s). The dietitian applies the science of nutrition to the feeding and education of groups of people and individuals in health and disease. The scope of dietetic practice is such that dietitians may work in a variety of settings and have a variety of work functions.

**Administrative Dietitian:** a dietitian who focuses and works primarily within food service management with responsibility for providing nutritionally adequate, quality food to individuals or groups in health and disease in an institution or a community setting.

**Clinical Dietitian:** a dietitian who has responsibility for planning, education, supervision and evaluation of a clinically devised eating plan to restore the client/patient to functional nutritional health. Clinical dietitians can work in primary care as well as in institutions.

**Public Health or Community Dietitian:** a dietitian directly involved in health promotion and policy formulation that leads to the promotion food choice amongst individuals and groups to improve or maintain their nutritional health and minimizes risk from nutritionally derived illness. (Definition of International Congress of Dietetic Associations – ICDA and The European Federation of the Associations of Dietitians - EFAD)

### Qualification

Dietitian

## Paramedics BSc Programme

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Graduates are able to perform professional and secure medical interventions in emergency care, provide emergency care in case of mass diseases, accidents and in disasters. On the scene, paramedics familiarise themselves with the nature of the emergency, examine the patient, and suggest a 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

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**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



### 3. Medical Laboratorial Diagnostic Imaging Analysis Programme

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**Specialized programmes:** Optometry (Hungarian, English), Medical Diagnostic Analysis (Hungarian)

#### Optometry BSc Programme

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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 Laboratory and Diagnostic Imaging Analyst (Optometrist)

#### Medical Diagnostic Analysis BSc Programme

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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 Laboratory and Diagnostic Imaging Analyst (Medical Diagnostic Analyst)

### 4. Health Care Management BSc Programme

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**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

## II. Master of Science (MSc) Programmes

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### Physiotherapy MSc Programme

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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, act as leaders in hospital units of physiotherapy, apply fundamental regulations and quality control principles in the management of health institutions and private enterprises. The promotion of health education on local, community, national and international levels also belongs to the tasks of a physiotherapist.

#### Qualification

Physiotherapist

#### Languages

Hungarian, English

### Nursing MSc Programme

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Master's level nurses characterise the health status of the population, formulate problems, priorities and aims in public health. They conduct research and analyse technical literature, interpret the results of modern statistical methods, perform tasks of organisation and management related to the nursing process. They are able to perform human resource management tasks related to nursing. Planning budget and writing tenders, planning, realising and evaluating programmes, and establishing co-operation between institutions and individuals belong to the tasks of nurses, too. The health care professionals are acquainted with the role and the possibilities of the improvement of health sciences in the life of society, and they are able to characterise the health status of the population. Master's level nurses formulate problems, priorities and aims in public health, they take part in solving the scientific problems of nursing, in finding new and constructing ideas about the profession and in the promotion of their practical usage.

#### Qualification

Nurse

#### Languages

Hungarian, English

### Nutritional Sciences MSc Programme

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Nutritionists develop quality food, functional food, food supplements, special nutrients, eco products and organic food. They develop food industrial innovations, determine food qualities considering hygienic aspects, take part in professional and counselling tasks in the field of nutrition sciences and catering. Master-level dietitians determine the composition of food and diets for healthy people and those with different diseases, perform innovative research and development work preferred by the support system of the European Union. Master's level dietitians are able to understand and solve professional problems assertively, come up with reform ideas, and carry out innovative activities. The

nutrition specialist plans and compiles healthy diets in the field of health industry, wellness, medical tourism and hotel industry. Nutritionists promote the achievements of nutrition science in order to improve public health figures, work as highly-qualified nutritionists, researchers, advisors and health educators.

#### **Qualification**

Nutritionist

#### **Language**

Hungarian

### **Teacher of Each of Health Sciences and Health Care Msc Training Programme**

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The graduates of the training programme are able to educate people how to follow a healthy lifestyle, detect harmful effects on health originating from bad social circumstances, unfavourable environment or from the followed lifestyle (drug consumption, alcoholism), moreover, they are able to plan, organize and implement prevention programs. Teachers of health sciences and health care give support in forming a lifestyle according to the current state of health and through the most effective methods of pedagogy. During their work, graduates demonstrate positive example.

#### **Qualification**

Teacher of Each of Health Sciences and Health Care

#### **Language**

Hungarian

## **III. Postgraduate specialist training courses**

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- 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)

## **Programmes planned to be launched**

#### **BSc programme**

Nursing and Patient Care BSc Programme

Specialized programme: Voice, Speech and Swallowing Therapist (Hungarian)

#### **MSc programme**

Expert in Youth Health Promotion MSc Programme (Hungarian)

## DEPARTMENTS

### INSTITUTE OF APPLIED HEALTH SCIENCES

#### Department of Nursing

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##### Address

H-1088 Budapest, Vas u. 17., room 152  
Mailing address: H-1085 Budapest, Üllői út 26.  
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 Rajti  
Phone: +(36-1)486-5836 e-mail: rajti.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 through 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 nee-

dles-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

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### Address

H-1088 Budapest, Vas u. 17., room 144  
Mailing address: H-1085 Budapest, Üllői 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

Ms. Eszter Borján  
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

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### Address

H-1088 Budapest, Vas u. 17., room 305  
 Mailing address: H-1085 Budapest, Üllői út 26.  
 Phone: +(36-1)486-5980  
 Fax.: +(36-1)486-5981  
 E-mail: [fizioterapia@se-etk.hu](mailto:fizioterapia@se-etk.hu)  
 Website: [etk.semmelweis.hu](http://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](mailto: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 lasted for two years, the duration of studies increased to four years only in 2000.

## Profile

The Department's aim is to train physiotherapists who can be valuable members of a health care team of prevention, care and rehabilitation. The undergraduate programme for physiotherapy consists of 240 credits, which corresponds to the requirements of a Bachelor's degree. After that there is a Master Programme for another 90 credits in 3 semesters.

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.

## Education

The physiotherapy BSc programme comprises eight, and the MSc programme comprises 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 during the 7th semester (two to four weeks), and in the 8th semester (15 weeks) at a variety of medical centres. And the programme comprises an independent graduate project corresponding to 20 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.

## **Biomechanical Lab**

The University established a new 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. And to 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:** Ms. Virág Labanné Csík  
Phone: +(36-1)486-5850 e-mail: csikv@se-etk.hu



## Department of Dietetics and Nutrition Sciences

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### Address

H-1088 Budapest, Vas u. 17., room 39  
 Mailing address: H-1085 Budapest, Üllői út 26.

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 dietitians while providing courses on nutritional sciences and dietotherapy for other health professionals educated at the Faculty. Accordingly, 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. In the 2009/2010 academic year a new training program, the Master of Nutrition and Food Sciences was launched. Students are taught by experienced teachers who are recognized as experts in the field of nutrition and food technology as well as in research methodology. Duration of the training is 4 semesters with a total number of 120 ECTS. Graduate students can be employed in different areas of public health nutrition and nutritional research fields. Postgraduate training programmes are also available for dietitians. Graduating as masters of nutrition and food sciences allows students to continue their studies at PhD level at Semmelweis University Doctoral School in the Health Sciences Researches programme. The Department of Dietetics and Nutrition Sciences has collaborative partnership with the European Federation of the Associations of Dietitians (EFAD).

## Research

The Department has been involved in several projects sponsored by, for example, the EU: the "Ageing Nutrition" project (2004-06, organised by the Department), the "PORCROW" project (2004-06), furthermore, the Department participated as partner institution in the thematic network called DIETS1, „Dietitians Improving the Education and Training Standards (2006-09)" and DIETS2, 'Dietitians ensuring education, teaching and professional quality' (funded by the EACEA 2010-13). The Department is involved in the preparation of the Hungarian version of EPODE Project collaborating with the Association of Hungarian Dietitians (2014-16).

Members of the Department's staff are involved in the PhD education as tutor teachers.

### **Tutorial fields in the School of PhD Studies are:**

- 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 colour characteristic of foodstuff
- Determination of polyphenol content and antioxidant capacity in foodstuffs
- 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
- Relationship between nutritional habits, nutritional status and quality of life in adult patient with cystic fibrosis
- 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
- Kethogen diet therapy in the prophylactic treatment of migrane headache in adolescents
- 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

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### Address

H-1088 Budapest, Vas u. 17., room 148  
 Mailing address: H-1085 Budapest, Üllői út 26.  
 Phone: +(36-1)486-5840,  
 Fax: +(36-1)486-5841  
 E-mail: [oxiologia@se-etk.hu](mailto:oxiologia@se-etk.hu)  
 Web: [etk.semmelweis.hu](http://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](mailto:kanizsai.peter@se-etk.hu)  
 Dr. István Hornyák  
 Phone: +(36-1)486-5842 e-mail: [hornyaki@se-etk.hu](mailto: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”.
- Our aim is to introduce an MSc training programme targeting the intrahospital emergency care, resulting in the qualification of physician assistants, those capable health care professionals who work in the emergency departments under the supervision of the lead physician.

## **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 cardiopulmonary resuscitation
- Communication in emergency situations
- Role players and standardized patients in HiFi simulation.

# INSTITUTE FOR HEALTH PROMOTION AND CLINICAL METHODOLOGY

## Department of Family Care Methodology

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### Address

H-1088 Budapest, Vas u. 17., room 245  
Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)486-4840  
Fax: +(36-1)486-4845  
Email: csaladgondozas@se-etk.hu  
Website: etk.semmelweis.hu

### Head of Department:

Professor László Szabó, M.D., Ph.D., med. habil.

### 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

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### Address

H-1088 Budapest, Vas u. 17., room 126

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)486-4870

Fax: +(36-1)486-4861

E-mail: [epidemiologia@se-etk.hu](mailto:epidemiologia@se-etk.hu)

Website: [etk.semmelweis.hu](http://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](mailto:barcsi@se-etk.hu)

## Background

As the legal successor of the Department of Public Health, the Department of 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 has 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**

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**Address**

H-1088 Budapest, Vas u. 17., room F/9

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)486-5970

Fax: +(36-1)486-5971

E-mail: [gadok@se-etk.hu](mailto:gadok@se-etk.hu)

Website: [egtud.klinikai@se-etk.hu](http://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](mailto:gadok@se-etk.hu)

**Profile**

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**

- transmission of evidence-based, modern, medical-clinical knowledge, and familiarization with the etiology and pathomechanism of different diseases;
- enable students to recognize the signs of diseases, evaluate symptoms, and complete adequate patient care based on competences;
- to provide basic pharmacological knowledge, therapeutic possibilities and effects, side effects, therapeutic responses;
- students will 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;
- and the development of the solid approach of prevention-remedy-nursing-care-rehabilitation.

## **Participation**

- in the preparation of student-focused didactical strategies;
- in the development of new subjects and training programmes;
- in the preparation of textbooks and lecture books;
- and in special didactical and applied clinical researches.

## **Research**

- Hemostasis changes in pregnancies
- Diagnosis and therapy of thrombophilias
- The methodology of teaching clinical knowledge
- Fitting the level of higher education to the European Qualification Framework
- Development of validation processes in higher education
- Family planning, family care
- Social and cultural background of health care employees
- The support of parents expecting their first child; application of the APP model (Ph.D research)
- Family planning and maternity plans of Health Visitor and Police Officer students
- Anaesthesiology and Intensive therapy – patient security/safety, monitoring
- Clinical nutrition and its management with pharmaceutical aspects
- Risk screening, nutritional assessment, oral nutrition support, enteral and parenteral nutrition,
- Parenteral nutrition compatibility and incompatibility
- Methods of examination of TPN emulsions, physicochemical stability of TPN
- Role of nutrition team



# INSTITUTE OF HEALTH DIAGNOSTIC

## Department of Clinical Ophthalmology

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### Address

H- 1088 Budapest, Vas u. 17., room 20  
 Mailing address: H-1085 Budapest, Üllői 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

Assistant Lecturer 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 own scientific work 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 it' connection with ametropies

## Department of Imaging and Medical Instrumentation

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### Address

H-1088 Budapest, Vas u. 17., room 348  
Mailing address: H-1085 Budapest, Üllői út 26.  
Phone: +(36-1)486-5960  
Fax: +(36-1)486-5961  
E-mail: [kepalkoto@se-etk.hu](mailto:kepalkoto@se-etk.hu)  
Website: [etk.semmelweis.hu](http://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](mailto: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 picture 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, Isotope, Intervention Radiation therapy).

Students attaining the degree are able to use imaging tools to plan and fulfil 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 big teaching hospitals. Practical training takes place in the above mentioned hospitals as well. The Medical Engineering group teaches "Basics of Biophysics and Medical Technology" and "Info-Communication" to dietitian, nurse, health visitor, physiotherapist, paramedic/ambulance officer and public health supervisor students.

The Department continuously produces innovative books, images and other teaching materials necessary for the education. For this purpose the Department works in collaboration with the other 3 similar departments in the country to harmonize the teaching materials and the requirements.

An emphasized task of the Department is the graduate teaching of radiographers including the organisation of courses.

## Research

The professors of the Department have leading positions in associations of radiology, radiography and medical technology inside and outside Hungary, and they are in the editorial boards of scientific papers. The focus of the researchers is on clinical decision support, medical informatics, self-monitoring, on developing an immersive learning environment, or a virtual learning environment. Higher interest is put on emergency care systems, on the reduction of supply times and on successful cooperation with emergency departments.

Moreover, the Department joined the European Association of Radiographers.

# INSTITUTE OF BASIC HEALTH SCIENCES

## Department of Applied Psychology

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### Address

H-1088 Budapest, Vas u. 17., room 343/A  
 Mailing address: H-1085 Budapest, Üllői út 26.  
 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. Zsuzsanna Menczel  
 Phone: +(36-1)186-4920 e-mail: menczelzs@se-etk.hu  
 Ms. Mária Hoyer  
 Phone: +(36-1)486-4921 e-mail: hoyerm@se-etk.hu

### Education

Following the curriculum reform in 2013 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, social psychology
- *Profession and personality* – practical course using, on the one hand, the knowledge and techniques of different psychotherapeutic modalities, such as psychodynamic group therapy, psychodrama, family therapy and, on the other, cognitive modules such as reading and discussing profession related materials in order to enhance group cohesion and to develop personality traits necessary for each profession.
- *Psychology of Supportive Connection* – theoretical course followed by small group activity. The theoretical part includes basic knowledge of clinical and health psychology such as the history and significance of the bio-psycho-social model. The main topics are: mental health and psychotherapy, the emotional background of illness, burn-out, dying and mourning, aggression and traumas, depression and anxiety, environmental psychology, psychosomatics, development psychology, childcare, deprivation and its consequences.

### 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
- Emotion regulation processes, the contexts of empathy with burning out among paramedical students
- Emotion regulation processes, the contexts of empathy with burning out among curative specialists
- Malignant breast tumor patients and the quality of life correlations, the effect of multidisciplinary psychosocial interventions in the healing process
- The examination of social environment, defining one by way of temperament of agora and social phobia

## Department of Addictology

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### Address

H-1088 Budapest, Vas u. 17., room 325

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)486-4919

Fax: +(36-1)486-4912

E-mail: [addiktologia@se-etk.hu](mailto:addiktologia@se-etk.hu)

Web: [etk.semmelweis.hu](http://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](mailto: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

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### Address

H-1088 Budapest, Vas u. 17., room 345  
 Mailing address: H-1085 Budapest, Üllői út 26.  
 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
- A possible model of venous varicosity in rats

## Department of Social Sciences

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### Address

H-1088 Budapest, Vas u. 17., room 332

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)486-4910

Fax: +(36-1)486-4912

E-mail: [tarstud@se-etk.hu](mailto:tarstud@se-etk.hu)

Website: [etk.semmelweis.hu](http://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](mailto:h.feith@se-etk.hu)

## Background

The Department of Social Sciences belongs to the Institute of Basic Health Sciences. It has a specialised unit: the Division of Foreign Languages and Communication. The role of the Department is to support all students in preparing for their health care professions as embedded in contemporary societies. Our Department offers dominantly practice oriented knowledge – discussing general

and special health care related problems – in the fields of Sociology, Social Anthropology, History of Health Sciences, Law, Ethics, as well as Medical Economy and Management. These modules – as essentials in health care labour market – are to improve conscious employee competencies. 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. From September 2014 the Department coordinates the Health Care Management BSc in Hungarian language (with Health Tourism Management speciality). One of the main concerns of the Department is to provide adequate knowledge in the most suitable ways, therefore we devote special attention to the importance of the methodology we use in teaching. We have organized two 'Professional Day on Teaching 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

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; 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. The Department has been delegated the management committee members from Hungary for two COST Actions: HOME (Health and Social Care of Migrants and Minorities in Europe) and ADAPT (Adapting European Health Systems to Diversity). In this latter one we collaborated with the IOM in expanding the well-known MIPeX (Migrant Integration Policy Index) to the field of health care, which has just been finished recently. Our Department proudly hosted three international professional workshops on Roma health issues and three national professional days on patients' right and health tourism as well in the last 5 years.

## Division of Foreign Languages and Communication

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### Address

H-1046 Budapest, Erkel Gyula u. 26., room 113

Mailing address: H-1085 Budapest, Üllői út 26.

Phone: +(36-1)369-2694

Fax: +(36-1)231-0268

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)231-0168/119 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.

From September 2011 our division functions as a teaching practice venue for teacher trainees of Hungarian as a foreign language of Károli Gáspár University of the Reformed Church of Hungary.

All our courses are supplemented by textbooks/seminar notes compiled by our teachers and an on-line language learning program specially designed for teaching Health Care Terminology and Language for Healthcare Purposes.

The Faculty is a test venue for the state accredited Professional Language Certification (PROFEX).

The members of the Division also take part in the work of various professional associations, such as the Hungarian Association of Applied Linguists and Language Teachers and the National Association of Teachers and Researchers of Languages for Specific Purposes (SZOKOE).

### Research

The Division's research interests include the origins of the functional approach in Hungarian linguistics, linguistic identity, and exploring the terminological awareness of health science students.



# SCHOOL OF PH.D. STUDIES



*School of  
Ph.D. Studies*

## 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 regular 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 Pharmacy is 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 Tímár**

President of the Doctoral Council

## President of the Doctoral Council

**Dr. József Tímár**

**II. Department of Pathology**

1091 Budapest IX., Üllői 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

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## President of the Doctoral Student's Union

**dr Szilárd Szanyi**

E-mail: dhok@phd.semmelweis-univ.hu

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## Doctoral Secretariat

Office: Budapest, VIII., Üllői út 26. ground floor 9.

Phone: (36-1) 266-2343, (36-1) 266-7483

Fax: (36-1) 317-4888

Krisztina Tölgyesi-Lovász	Head	tolgyesi_lovasz.krisztina@phd.semmelweis-univ.hu (36-1) 459-1500/55373
Hilda Marton	Educational assistant	Hilda.marton@phd.semmelweis-univ.hu (36-1) 459-1500/55242
Anita Marosfalvi	Financial assistant	marosfalvi.anita@phd.semmelweis-univ.hu (36-1) 459-1500/55162
Zsuzsa Kalmár	Educational Assistant	kalmar.zsuzsa@phd.semmelweis-univ.hu (36-1) 459-1500/55287
Dorottya Komlósy	Educational Assistant	komlosy.dorottya@phd.semmelweis-univ.hu (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

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<b>Dr. János Tímár</b>	<b>President</b>
<b>Dr. János Rigó</b>	Vice-President
<b>Dr. György Bagdy</b>	Vice-Rector for Scientific Affairs
<b>Dr. László Rosivall</b>	Ph.D. School of Basic Medicine
<b>Dr. Tivadar Tulassay</b>	Ph.D. School of Clinical Medicine
<b>Dr. Béla Noszál</b>	Ph.D. School of Pharmaceutical Sciences
<b>Dr. István Bitter</b>	Ph.D. School of Mental Health Sciences
<b>Dr. Bereczki Dániel</b>	János Szentágothai Doctoral School of Neurosciences
<b>Dr. József Mandl</b>	Ph.D. School of Molecular Medicine
<b>Dr. Ilona Kovalszky</b>	Ph.D. School of Pathological Sciences
<b>Dr. György Losonczy</b>	Representative of Faculty of Medicine
<b>Dr. Gábor Varga</b>	Representative of Faculty of Dentistry
<b>Dr. Kálmán Magyar</b>	Representative of Faculty of Pharmacy
<b>Dr. Péter Gaál</b>	Representative of Faculty of Health and Public Services
<b>Dr. Gyula Domján</b>	Representative of Faculty of Health Sciences
<b>Dr. Zoltán Benyó</b>	President of the Educational Board
<b>Dr. János Rigó</b>	President of the Quality Control and Evaluation Board
<b>Dr. István Nagy</b>	President of the Committee of Disciplinary Procedures (János Szentágothai Doctoral School of Neurosciences)
<b>Dr. Iván Forgács</b>	Faculty of Health Sciences
<b>Dr. Péter Tamás Sótónyi</b>	Szent István University, Faculty of Veterinary Science
<b>Dr. Péter Szolgay</b>	Pázmány Péter
<b>Dr. László Kopper</b>	1st Dept. of Pathology and Experimental Cancer Research
<b>Dr. Emil Monos</b>	Institute of Human Physiology and Clinical Experimental Research
<b>Dr. Károly Rácz</b>	2 <sup>nd</sup> Dept. of Internal Medicine
<b>Dr. Szilárd Szanyi</b>	President of the Doctoral Students' Union

## Permanent Committees of the Doctoral Council

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### 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

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**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

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**President: Dr. István Antal**

E-mail: antal.istvan@pharma.semmelweis-univ.hu

## University School of Ph. D. Studies

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**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

Programs	Co-ordinators
Biological Effects of Ionizing and Non-Ionizing Radiations	Prof. Miklós Kellermayer MD, PhD
Cardiovascular Disorders: Physiology and Clinic of Ischaemic Circulatory Diseases	Prof. Béla Merkely MD, PhD, DSc
Clinical and Experimental Cardiology/Atherosclerosis	Prof. Zoltán Prohászka MD, PhD, DSc
The Mechanisms of Normal and Pathologic	Prof. Zoltán Benyó MD, PhD, DSc
Functions of the Circulatory System Physiology and Pathophysiology of the Regulation of Fluids and Electrolyte Homeostasis	Prof. László Rosivall MD, PhD, DSc

## II. CLINICAL MEDICINE

Chairman: **Prof. Tivadar. Tulassay** MD, PhD, DSc

E-mail: [tulassay.tivadar@med.semmelweis-univ.hu](mailto:tulassay.tivadar@med.semmelweis-univ.hu)

Programs	Co-ordinators
Clinical Haematology	Prof. Tamás Masszi MD, PhD, DSc
Dental Research	Prof. Gábor Varga MD, PhD, DSc
Fetal and Neonatal Medicine	Prof. Zoltán Papp MD, PhD, DSc
Gastroenterology	Prof. Zsolt Tulassay MD, PhD, DSc
Ophthalmology	Prof. Ildikó Süveges MD, PhD, DSc
Examination of etiopatológical and genetic factors of diabetes mellitus and liver diseases and there complications	Prof. Anikó Somogyi MD, PhD, DSc
Physiology and Pathology of the Musculoskeletal System	Prof. Miklós Szendrői MD, PhD, DSc
Prevention of Chronic Diseases in Childhood	Prof. Tivadar Tulassay MD, PhD, DSc
Pulmonology	Prof. György Losonczy MD, PhD, DSc
Hormonal regulations	Prof. Károly Rácz MD, PhD, DSc
Urology	Prof. Péter Nyírády MD, PhD, DSc
Clinical and Experimental Research in Angiology	Prof. György Acsády MD, PhD, DSc
Dermatology and Venereology	Prof. Sarolta Kárpáti MD, PhD, DSc
Molecular Genetics, Pathomechanism and Clinical Aspects of Metabolic Disorders	Prof. Péter Lakatos MD, PhD, DSc
Clinical application of basic science results	Prof. Barna Vásárhelyi MD, PhD, DSc
Reproductive medicine	Prof. János Rigó MD, PhD, DSc
Otorhinolaryngology, foniatry	Dr. László Tamás, MD, PhD

## III. PHARMACEUTICAL SCIENCES

Chairwoman: **Prof. Béla Noszál** MSc, PhD, DSc

E-mail: [noszal.bela@pharma.semmelweis-univ.hu](mailto:noszal.bela@pharma.semmelweis-univ.hu)

Programs	Co-ordinators
Experimental and Clinical Pharmacology	Prof. Kálmán Magyar MD, PhD, DSc
Modern Trends in Pharmaceutical Scientific Research	Dr. István Antal MSc, PhD

**IV. MENTAL HEALTH SCIENCES**

Chairman: **Prof. István Bitter** MD, PhD, DSc  
 E-mail: bitter.istvan@med.semmelweis-univ.hu

<b>Programs</b>	<b>Co-ordinators</b>
Clinical Psychology and Psychiatry	Prof. László Tringer MD, PhD, CSc
Behavioral Sciences	Prof. József Kovács MD, CSc, DSc
Sociological and mental health approaches to resources for individuals and communities	Dr. Beáta Dávid (Pethesné) PhD

**V. NEUROSCIENCES**

Chairman: **Prof. Dániel Bereczki** MD, PhD, DSc  
 E-mail: bereczki.daniel@med.semmelweis-univ.hu

<b>Programs</b>	<b>Co-ordinators</b>
Neuromorphology and Cell Biology	Prof. Miklós Palkovits MD, PhD, DSc
Neuroendocrinology	Prof. Zsolt Liposits MD, PhD, DSc
Functional Neurosciences	Prof. E. Szilveszter Vizi MD, PhD, DSc
Clinical Neurosciences	Prof. Zoltán Nagy MD, PhD, DSc
Clinical Neurological Research	Prof. Imre Szirmai MD, PhD, DSc
Biological Psychiatry	Prof. Gábor Faludi MD, PhD, DSc

**VI. MOLECULAR MEDICINE**

Chairman: **Prof. József Mandl** MD, PhD, DSc  
 E-mail: mandl.jozsef@med.semmelweis-univ.hu

<b>Programs</b>	<b>Co-ordinators</b>
Basis of Human Molecular Genetics and Gene Diagnostics	Prof. András Falus MD, PhD, DSc
Cellular and Molecular Physiology	Prof. Erzsébet Ligeti MD, PhD, DSc
Embryology, Theoretical, Experimental and Clinical Developmental Biology	Prof. Ágoston Szél MD, PhD, DSc
Immunology	Prof. Gyula Poór MD, PhD, DSc
Pathobiochemistry	Prof. József Mandl MD, PhD, DSc



**VII. PATHOLOGICAL SCIENCES**

Chairman: **Prof. Ilona Kovalszky** MD, PhD, DSc

E-mail: kovalszky.ilona@med.semmelweis-univ.hu

<b>Programs</b>	<b>Co-ordinators</b>
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	Prof. Zsuzsanna Schaff MD, PhD, DSc
Experimental Oncology	Prof. László Kopper MD, PhD, DSc
Public Health Science	Prof. Péter Sótónyi MD, PhD, DSc
Study of the Immunbiological Effects of Micro-organisms and of their Components at Molecular and Cellular Level and in the Microorganisms	Prof. Károly Nagy MSc, PhD
Health Sciences	Prof. Gyula Domján MD, MSc, PhD

## NOTE