UNIVERSITY OF SZEGED

Faculty of Medicine
Faculty of Dentistry
Faculty of Pharmacy

Where knowledge and challenge meet

CURRICULUM
2014/2015
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BRIEF HISTORY OF THE UNIVERSITY OF SZEGED

Before the 12th century, intellectual and scholarly life concentrated in the monasteries. With the growing professionalisation of society in the 12th and 13th centuries, demand increased for educated professionals. The universities appeared in Europe from the 11th-12th century. Medieval universities were established for the study of arts, law, theology and medicine. Universities were not defined by location and space but by individuals banded together as a corporation. The end of the medieval period signalled the arrival of modern universities where teaching and research met.

In 1581, following the establishment of universities in other regions of Central and Eastern Europe, István Báthory, the Prince of Transylvania, issued a founding document for a higher educational institute in Kolozsvár (Cluj-Napoca). The Jesuit Academy (Societatis Jesu Academia Claudiopolitana) was organized with two faculties, the Faculty of Philosophy and the Faculty of Theology. The academy was meant to have the rank of a university from the beginning; Prince Báthory endowed the institute with the right to confer baccalaureate and master's degrees on its students. At that time, the university held a unique place in the intellectual activity of Hungary; it was the only institute for higher education in Hungary.

The academy was soon closed due to religious and political turmoil, but the Jesuits re-established it and the institute gained more stability and prestige in the 17th century.

From 1753, according to a decree passed by the Holy Roman Empress and Queen of Hungary and Bohemia, Maria Theresia, the institute functioned as a university, where teaching was carried out in German. She was one of the most significant proponents of enlightened absolutism; her educational reforms were highly lauded. 1774 saw not only the introduction of mandatory education but also the start of change for the University of Kolozsvár. After the Society of Jesus had been abolished, Maria Theresia entrusted the Piarists with the reorganization of the institute. As a result of the restructuring—in addition to the Faculties of Theology and Arts—two new faculties were established, the Faculty of Law (1774) and the Faculty of Medicine-Surgery (1775).

Later on, these faculties served as the basis for the Hungarian Royal University of Kolozsvár, which was founded by King Francis Joseph I and the Hungarian Parliament in 1872. In 1881, the university was renamed after the king and bore his name until 1940.

In 1919, the university had to leave its founding place and after a brief stay in Budapest, found new home in Szeged. From 1921 until 1940 the Ferenc József Tudományegyem (Francis Joseph University) gained more and more prestige. When in 1940 the university was divided and part of it moved back to Kolozsvár, the remaining staff and students, the laboratories and the library were reorganized. The university took the name of Miklós Horthy, who was a former Governor of Hungary. The first rector of this institute was Albert Szent-Györgyi, who received the most prestigious award of sciences in 1937, the Nobel-price, for his research conducted at the university.

After World War II the institute assumed the name University of Szeged. In 1951 the Faculty of Medicine formed an independent institution under the name Medical University of Szeged. The pharmacy training was started as an independent faculty (separate from the medical faculty) in 1957, and the Division of Dentistry as part of the Faculty of Medicine in 1962. The English-Language Program for foreign students was established in 1985. From 1999 there is also a German-Language Program at the Faculty of Medicine. In 1987 the University assumed the name of its former Biochemistry Professor, Dean of the Faculty of Medicine, Rector, and Nobel Prize Laureate, Albert Szent-Györgyi who was first to isolate vitamin C, extracted from paprika.

In 2000 the Albert Szent-Györgyi Medical University became again an integrated part of the University of Szeged. The Faculty of Medicine and the Faculty of Pharmacy functioned as the Albert Szent-Györgyi Medical and Pharmaceutical Center until July 2007. In the year 2004 the English-language dentistry program was launched and the Faculty of Dentistry was founded in January 2007.

The faculties obtain their basis for education by running a high-level clinical and research work. The task of the faculties is represented by three different fields: education, research-work, and prevention-treatment.

The University of Szeged is one of the most distinguished universities in Hungary and is proud to be considered as the intellectual successor of the University of Kolozsvár founded in 1581.
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<th>Research consultant</th>
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</tr>
<tr>
<td>Department of Pharmaceutical Technology</td>
<td>Dr. Erzsébet Csányi</td>
</tr>
<tr>
<td>Department of Pharmacodynamics and Biopharmacy</td>
<td>Dr. Eszter Ducza</td>
</tr>
<tr>
<td>Department of Pharmacognosy</td>
<td>Dr. Katalin Veres</td>
</tr>
<tr>
<td></td>
<td>+36 62/541-977</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:ducza@pharm.u7szeged.hu">ducza@pharm.u7szeged.hu</a></td>
</tr>
<tr>
<td></td>
<td>+36 62/546 451</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:veres@pharm.u7szeged.hu">veres@pharm.u7szeged.hu</a></td>
</tr>
</tbody>
</table>
ACADEMIC CALENDAR
Faculty of Medicine
Faculty of Dentistry
Faculty of Pharmacy
2014/2015

ACADEMIC PERIODS

1st semester
Education period: September 01 – December 06, 2014
Examination period: December 08 – December 23, 2014 and January 05 – January 24, 2015
Repeat examination period: January 26 – January 31, 2015
Winter break: December 24, 2014 – January 04, 2015 (School is closed: No exams.)
Holidays: October 23, 2014 and November 01, 2014

2nd semester
Education period: February 02 – May 16, 2015
Examination period: May 18 – June 27, 2015
Repeat examination period: June 29 – July 04, 2015
Spring break: April 07-April 11, 2015
Holidays: April 06, 2015 and May 01, 2015

For other important dates and deadlines please check the relevant Info Sheet, our website or the Clerkship Guide.
1. **Tuition fees**

Fees are subject to change in case the students' academic progress does not follow the suggested study plan. Minimum tuition fee can be determined by the Academic Board.

<table>
<thead>
<tr>
<th>Fee of attending three or more compulsory subjects/Hungarian Language/Latin Language</th>
<th>100% of one semester's tuition fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fee of attending two compulsory subjects/Hungarian Language/Latin Language</td>
<td>60% of one semester’s tuition fee</td>
</tr>
<tr>
<td>Fee of attending one compulsory subject/Hungarian Language/Latin Language</td>
<td>40% of one semester’s tuition fee</td>
</tr>
<tr>
<td>Exam course fee</td>
<td>570 USD/course</td>
</tr>
<tr>
<td>Fee of Compulsory Elective Courses/Elective Courses/Physical Education (in case of attending one or two compulsory courses/Hungarian Language/Latin Language)</td>
<td>5% of one semester’s tuition fee/course</td>
</tr>
</tbody>
</table>

Payment can be made the following ways:
- by transfer
- by cash: you have to pick up a slip at the Foreign Students’ Secretariat in order to be able to pay in cash at the MKB Bank.
- by check: the checks have to be handed in at the Foreign Students' Secretariat.

2. **Procedural fees**

Repeat examination fee
- on the first occasion: HUF 1 000
- on the second occasion: HUF 1 500

Procedural fee for further requests (Deans’ permission): HUF 3 000

Fee for improving a successful examination: HUF 500

State Board Examination fee: USD 300

Fee for repeating the State Board examination: USD 250

Fee for repeating the Thesis defense
- on the first occasion: HUF 7 500
- on the second occasion: HUF 15 000
- procedural fee for further requests: HUF 15 000

3. **Administrative fees**

- loss of the index book and providing a duplicate
  - first occasion: HUF 5 000
  - further occasions: HUF 10 000
- transcript: HUF 400/semester
- certificate: HUF 300
- syllabus: HUF 400/year
- ETR Late course registration (only possible in the week after the course registration deadline): HUF 5 000/subject
- missing other deadlines: HUF 10 000 in the first week, after that additional HUF 2000/week
Fees are subject to change. For updates please check the relevant Info Sheet.
1.) Registration: Students have to register for each semester in order to have an active student status. Students who are not registered properly are not entitled to attend the classes. **LATE REGISTRATION IS NOT POSSIBLE.**

Registration requirements:
- Tuition fee has to be credited to the University's bank account in full before registration.
- ETR registration form (to be signed at the Secretariat)
- Valid residence permit. Please check in the ETR (under MY DATA/PERSONAL DATA/IDENTIFIERS) whether you have submitted a copy of your valid residence permit. If it was renewed recently please present the original and a copy to the Secretariat.
- Valid health insurance (If it was renewed recently please present the original and a copy to the Secretariat. If you contract the Generali Providencia insurance you do not have to bring a copy).
- Index book *(with all signatures and grades)*
- Summer practice evaluation sheet (if required)
- **NEW!** Paid repeat examination ticket
- **NEW!** Valid Medical Fitness Certificate (completed medical check-up by the University Doctor) You will be notified via e-mail in case any part of the medical check up has been found insufficient!

2.) Payment of the tuition fee: The deadline of payment is always specified in the information sheets distributed to the students before the beginning of the upcoming semester. Proof of payment has to be submitted to the Secretariat. Students have to make sure that the exact amount of the tuition fee is credited to the University's account until the deadline. Late payment is not possible.

3.) ETR course registration: Students have to sign up for their courses in the ETR (computer-based academic system) each semester. Students failing to meet this requirement are not entitled to attend the classes. The number of course registrations in a subject is limited: one course can be registered 3 times during the period of studies. Make sure you sign up for all your courses (both the lectures and practices, examination courses, physical education - 2 semesters required).

4.) Residence permit
Details: [http://szegedmed.hu/residence_permit_info](http://szegedmed.hu/residence_permit_info)

5.) Health Insurance

All students must have a valid health insurance during their stay in Hungary.
*Details: [http://www.szegedmed.hu/insurance](http://www.szegedmed.hu/insurance)*

6.) Attendance of classes: If the absence does not exceed 15% of the total number of classes, students are not obliged to provide a certificate justifying the absence. If the absence falls between 15 and 25% of the total number of classes, students may only make up for the missed classes if they provide a certificate. The departments have the right to refuse the acceptance of a semester if the student missed more than 25% of the practicals and did not make up for the absences.

7.) Obligation to report changes to the Secretariat: If there is a change in your personal data (address, e-mail address, telephone number etc.) you are required to notify the Secretariat and correct the data in the ETR. If you have to leave Szeged for a longer period of time during the lecture period due to substantial reasons (hospitalization, extraordinary family issues), you need to request permission in writing. Applications have to be handed in at the Foreign Students’ Secretariat.

8.) General information regarding the examinations:

General information before you sign up for your exams:
- One course can be taken 3 times during your studies (3 exams/semester).
- All exams including date, time and place is posted in the ETR. Make sure to arrive for your exam on time with your index book.
- Exam dates can be postponed before the ETR closes the registration *(usually* 24 hours before the date of the exam. Clicking the course code, one can determine the closing of registration.) However, it is your duty to secure another date and time for your exam when you make changes.
• Students not showing up on an exam will lose one chance unless their absence is justified. Documents justifying the absence have to be presented at the Department concerned. To get the ticket to your next examination, please see the fee schedule below.
• A successful examination can be improved only in one subject / semester and only with the permission of the Program Director. The requests have to be handed in at the Foreign Students’ Secretariat.

In order to receive your index book for the exam period you have to meet all the following requirements:
• Paid tuition fee, valid matriculation, valid health insurance, and valid visa/residence permit.
• Please note that Hungarian law (2007. II. Törvény) requires Non-EU Students to be fully covered under a health insurance plan or be able to cover the expenses of their health care. EU citizens are supposed to register with BÁH upon their arrival and submit a photocopy of their health insurance (2007. I. Törvény)

Please make sure to register for all your exams at the beginning of the exam registration period.
Index book can be picked up from the Secretariat upon signing a consent form.
Students are required to return their index book to the Secretariat upon finishing their exams.

Procedures for unsuccessful exams:
• Repeated exam can be scheduled at the earliest by the 3rd day following the unsuccessful exam. Repeat exam cheques are available at the Secretariat. Fees have to be paid at the post office and slips have to be returned to the Secretariat in order to get repeat tickets. The repeat ticket has to be presented at the Department before starting the examination. The current fee schedule is:
• Unsuccessful exams can be repeated 2 times during the exam period. Upon request, a repeated exam can be taken before a committee. The exam committee is appointed by the Department Chair. Repeated exams with committee can be scheduled only for exam dates announced in the ETR.
• 3rd repeat chance can be granted to those who have only one exam left. (In these cases the chances should be decreased by one when students sign up for the course for the 3rd time). Request have to be handed in at the Foreign Students’ Secretariat.
• In case of even one unjustified absence in an examination the student will not be entitled to any further equities and exceptional permissions in any subject in the respective examination period (e.g. 3rd repeat examination chance).
• In the repeat examination period only repeated exams can be taken. First examinations – even with a former absent registration – cannot be taken in the repeat examination week!
• In exceptional cases (hospitalization, extraordinary family issues) further examination chances can be requested from the Dean. Examinations granted as an exceptional equity can be taken only till the end of second week following the repeat examination period. Supporting documents must be attached to the application.

Please take into consideration that all matters not regulated in the Study and Examination Regulations will be evaluated on individual basis by the Academic Board (eg. 4th course registration)!

Further details are available in the relevant Info Sheet.
**EXPRESSIONS**

**Compulsory Elective Subject** (including Behavioral Science Subjects – only for medical students): There is a given number of credit points that has to be acquired in Compulsory Elective Subjects in the certain modules. One can choose freely from the subjects offered, however it is strongly recommended to follow the Suggested Study Plan.

**Compulsory Subject:** It is obligatory to take the subject in the module given.

**Contact hours:** Contact hours are the units of time required for a teacher to present subject material and to assess a student’s performance. Contact hours include lectures, seminars, practical demonstrations, consultation hours and assessment.

**Course requirement:** The course requirement defines the precondition of a certain course. The course requirement can either be a subject or an examination requirement. In case of the subject requirement a course can be signed up for only if the examination defined in the course requirement has been completed successfully. In case of the examination requirement the examination of a course can only be taken if the examination defined in the course requirement has been completed successfully.

**Credit:** Credits are standard measurement of a student’s accepted study time. One credit equals thirty hours of study time.

**Credit transfer:** Is a procedure accorded by the University of Szeged Code of Study and Examination Regulations, whereby a partial or full exemption can be given from completing one or more subjects by acknowledging previously completed subjects and thereby award the appropriate number of credit points.

**Criteria Subject:** Completion of criteria subjects is a precondition for entering the next module or receiving the diploma after finishing the final year (Physical Training, Summer Practices, Hungarian Language). Criteria subjects have no credit allocated to.

**Elective Subject:** There is a given number of credit points that has to be acquired in the certain modules. One can chose freely from the subjects offered, however it is strongly recommended to follow the Suggested Study Plan.

**Examination course:** If one cannot pass an examination successfully in the semester given, the examination can be repeated in the next examination period if the Department concerned announces it in the given semester and you get permission from the Academic Board. This means that the student will be exempted from fulfilling the requirements of the semester (classes do not have to be attended). An examination course can be taken only once in a certain subject.

**Suggested study plan:** the order and timing of subjects offered to students enabling them to obtain qualification within a specified period of time.

**Grading system**

*Five-grade system*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>excellent</td>
</tr>
<tr>
<td>4</td>
<td>good</td>
</tr>
<tr>
<td>3</td>
<td>accepted</td>
</tr>
<tr>
<td>2</td>
<td>passed</td>
</tr>
<tr>
<td>1</td>
<td>failed</td>
</tr>
</tbody>
</table>
Faculty of Medicine
I. STRUCTURE OF STUDIES

In the academic year 2014/2015, first year students follow the new Curriculum / Suggested Study Plan of University of Szeged, Faculty of Medicine.

In order to obtain the Doctor of Medicine diploma, students need to acquire a minimum of 360 credits (by fulfilling the study and examination requirements of the subjects listed in the suggested study plan). In the final year, students, furthermore, have to complete the Final (State Board) Examination which consists of writing and defending a thesis, passing a complex written test and an oral patient examination (theoretical and practical part).

The order of taking the courses is set in the suggested study plan which is designed for completing medical studies within 12 semesters (6 years). **It is highly recommended to take the courses according to the Suggested Study Plan.**

**Teaching is performed in 3 modules:**
- Basic & Pre-Clinical Module (1st, 2nd, 3rd year)
- Clinical Module (4th, 5th year)
- Final Module (6th year)

**Types of courses:**
- Compulsory Courses
- Compulsory Elective Courses
- Elective Courses
- Criteria Subjects

**Credits to be acquired:**

<table>
<thead>
<tr>
<th></th>
<th>Basic &amp; Pre-Clinical Module (semesters 1-6)</th>
<th>Clinical Module (semesters 7-10)</th>
<th>Final Module (semesters 11-12)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compulsory Courses</td>
<td>145</td>
<td>104</td>
<td>60</td>
</tr>
<tr>
<td>Compulsory Elective</td>
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<td>45</td>
<td></td>
</tr>
<tr>
<td>Courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Courses</td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Criteria Subjects</td>
<td>Physical Education, Hungarian Language,</td>
<td>Hungarian Language, Summer</td>
<td></td>
</tr>
<tr>
<td>(no credits)</td>
<td>Summer Practice</td>
<td>Practice</td>
<td></td>
</tr>
</tbody>
</table>

All the requirements of a module have to be fulfilled in order to enter the next module.
II. SPECIAL RULES FOR BEHAVIORAL SCIENCE SUBJECTS

In the fourth year (7th semester), students have to take a final examination which covers the knowledge, skills and attitudes learned during the seven previous semesters. The precondition for taking the examination is the earlier acquisition of 13 credits from the subjects below. However, it is recommended to complete all Behavioral Science Subjects (15 credits).

Recommended schedule for acquiring 13 credits:

- 8 credits for compulsory subjects:
  - Introduction to Psychology, basics of nursing
  - Communication skills
    (2 credits, year 1, spring semester)
  - Medical Ethics
    (3 credits, year 3, spring semester)
  - Medical Psychology I.
    (2 credits, year 3, spring semester)
  - Medical Psychology II.
    (1 credit, year 4, fall semester)

- 5 credits for compulsory elective subjects. You can choose from the following courses:
  - Introduction to Medicine
    (2 credits, year 1, fall semester)
  - Medical Sociology
    (2 credits, year 2, fall semester)
  - Medical Anthropology
    (1 credit, year 2, spring semester)
  - Gerontology
    (2 credits, year 3, spring semester)

- Criteria subject:
  - Doctor-Patient Communication
    (0 credit, criteria subject; year 4, fall or spring semester)
I. Structure of Studies

Students have to complete 4 modules in order to obtain the Doctor of Medicine diploma.

All the requirements of a module have to be fulfilled in order to enter the next module:

- acquisition of the required credits
- completion of Criteria Subjects:
  - 2 semesters of Physical Training till the end of the 12th semester (It is recommended to complete it in the Basic Module)
  - Summer practices (Nursing, Internal Medicine, Surgery)
  - 8 semesters of Hungarian Language

Behavioral Science Subjects:

In the fourth year (7th semester) students have to take a final examination which covers the knowledge, skills and attitudes learned during the seven previous semesters. The precondition for taking the examination is the earlier acquisition of 10 credits from the subjects below. However, it is recommended to complete all Behavioral Science Subjects (13 credits).

Recommended schedule for acquiring 13 credits:

- 8 credits for compulsory subjects:
  - Introduction to Psychology, basics of nursing (0 credit, year 1, spring semester)
  - Communication skills (3 credits, year 1, spring semester)
  - Medical Ethics (2 credit, year 3, spring semester)
  - Medical Psychology I. (2 credits, year 3, spring semester)
  - Medical Psychology II. (1 credit, year 4, fall semester)

- 5 credits for compulsory elective subjects. You can choose from the following courses:
  - Introduction to Medicine (2 credits, year 1, fall semester)
  - Medical Sociology (2 credits, year 2, fall semester)
  - Medical Anthropology (1 credit, year 2, spring semester)
  - Gerontology (2 credits, year 3, spring semester)

  + Doctor-Patient Communication (0 credit, criteria subject; year 4, fall or spring semester)

II. Modules:

1. Basic Module

In the Basic Module (years 1-2, semesters 1-4) one has to acquire 117 credits in order to enter the Pre-Clinical module.

Credits have to be acquired according to the following scheme:

Required credits:

- Compulsory Subjects (94 credits)
- Compulsory Elective Subjects (17 credits)
- Elective Subjects (6 credits)
- Criteria Subjects (Nursing Summer Practice – to be completed after the 2nd semester, 4 semesters of Hungarian Language)

It is also recommended to complete 2 semesters of Physical Education in the Basic Module.
Preconditions for enrollment to the forthcoming semesters:

- The compulsory courses in the **second semester** have examination requirements. This means one can take the examination of the second semester course only if the examination of the first semester subject (defined in the examination requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Examination requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy II.</td>
<td>Anatomy I.</td>
</tr>
<tr>
<td>Medical Chemistry II</td>
<td>Medical Chemistry I.</td>
</tr>
<tr>
<td>Medical Physics II</td>
<td>Medical Physics I.</td>
</tr>
<tr>
<td>Medical Biology II</td>
<td>Medical Biology I.</td>
</tr>
</tbody>
</table>

  The first semester courses might be taken as examination courses in the second semester, if the Department concerned announces it in the given semester and if you get permission from the Academic Board. This means that the student will be exempted from fulfilling the study requirements (classes do not have to be attended). An examination course can be taken only once in a certain subject. If one fails to complete an examination course both the study and examination requirements have to be completed in the proper semester (the whole course has to be repeated by attending the lectures and practices).

- The compulsory courses in the **third semester** have subject requirements. This means one can attend a third semester course only if the examination of the second semester (defined in the subject requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy III.</td>
<td>Anatomy II.</td>
</tr>
<tr>
<td>Biochemistry I</td>
<td>Medical Chemistry II</td>
</tr>
<tr>
<td>Physiology I.</td>
<td>Medical Chemistry II</td>
</tr>
</tbody>
</table>

  In this case the failed examination of the second semester can be repeated as an examination course in the semester when it is announced by the Department concerned.

- The compulsory courses in the **fourth semester** have examination requirements. This means one can take the examination of the fourth semester course only if the examination of the third semester (defined in the examination requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Examination requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy IV.</td>
<td>Anatomy III.</td>
</tr>
<tr>
<td>Biochemistry II</td>
<td>Biochemistry I.</td>
</tr>
<tr>
<td>Physiology II</td>
<td>Physiology I.</td>
</tr>
</tbody>
</table>

  For further conditions see the requirements of the second semester.

### 2. PRE-CLINICAL MODULE

In the **Pre-Clinical Module (year 3, semesters 5-6)** one has to acquire **56 credits** in order to enter the Clinical module.

**Credits have to be acquired according to the following scheme:**

**Required credits:**

- Compulsory Subjects (45 credits)
- Compulsory Elective Subjects (8 credits)
- Elective Subjects (3 credits)
- Criteria Subjects (Internal Medicine Summer Practice – to be completed after the 6th semester, 2 semesters of Hungarian Language)
Preconditions for enrollment to the forthcoming semester:

- The compulsory courses in the second semester have subject requirements. This means one can take the second semester course only if the first semester course has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiology II.</td>
<td>Pathophysiology I.</td>
</tr>
<tr>
<td>Microbiology and Immunology II.</td>
<td>Microbiology and Immunology I.</td>
</tr>
<tr>
<td>Pathology II.</td>
<td>Pathology I.</td>
</tr>
<tr>
<td>Internal Medicine I.</td>
<td>Clinical Diagnostics I.</td>
</tr>
</tbody>
</table>

If one fails to complete the first semester course both the study and examination requirements have to be completed in the proper semester (the whole course has to be repeated).

3. CLINICAL MODULE

In the Clinical Module (years 4-5, semesters 7-10) one has to acquire 132 credits in order to enter the Final module.

Credits have to be acquired according to the following scheme:

Required credits:
- Compulsory Subjects (106 credits)
- Compulsory Elective Subjects (18 credits)
- Elective Subjects (8 credits)
- Criteria Subjects (Surgery Summer Practice – to be completed after the 8th semester, 2 semesters of Hungarian Language, Doctor-Patient Communication)

Preconditions for enrollment to the forthcoming semester:

You can find the subject requirements in the suggested study plans for the certain semesters.

4. FINAL MODULE – CLERKSHIP YEAR

In the Final Module (year 6, semesters 11-12) one has to acquire 60 credits in order to be eligible to sit for the State Board Examination.
### MEDICINE

#### BASIC AND PRE-CLINICAL MODULE

**2014/2015 1st year, 1st (fall) semester (9001AK_N_2013)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department</th>
<th>Head of Department</th>
<th>Hours/week: Theory</th>
<th>Hours/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOK-KUA011</td>
<td>Anatomy, Histology and Embryology I.</td>
<td>Dept. of Anatomy</td>
<td>Prof. András Mihály</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>5</td>
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</tr>
<tr>
<td>AOK-KUA012</td>
<td>Dissection Practice I.</td>
<td>Dept. of Anatomy</td>
<td>Prof. András Mihály</td>
<td>-</td>
<td>3</td>
<td>Term Mark(S)</td>
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<td>P:AOK-KUA011</td>
</tr>
<tr>
<td>AOK-KUA013</td>
<td>Anatomy Seminar</td>
<td>Dept. of Anatomy</td>
<td>Prof. András Mihály</td>
<td>-</td>
<td>2</td>
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<td>P:AOK-KUA012</td>
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<tr>
<td>AOK-KUA041</td>
<td>Basic Life Support</td>
<td>Dept. of Traumatology</td>
<td>Prof. Endre Varga</td>
<td>-</td>
<td>2</td>
<td>Term Mark(S)</td>
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<tr>
<td>AOK-KUA051</td>
<td>Medical Physics and Statistics I.</td>
<td>Dept. of Med. Physics and Informatics</td>
<td>Prof. Ferenc Bari</td>
<td>3</td>
<td>-</td>
<td>Examination</td>
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<tr>
<td>AOK-KUA052</td>
<td>Medical Physics and Statistics I.</td>
<td>Dept. of Med. Physics and Informatics</td>
<td>Prof. Ferenc Bari</td>
<td>-</td>
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<tr>
<td>AOK-KUA061</td>
<td>Medical Chemistry I.</td>
<td>Dept. of Med. Chemistry</td>
<td>Prof. Gábor Tóth</td>
<td>3</td>
<td>-</td>
<td>Examination</td>
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<tr>
<td>AOK-KUA062</td>
<td>Medical Chemistry I.</td>
<td>Dept. of Med. Chemistry</td>
<td>Prof. Gábor Tóth</td>
<td>-</td>
<td>3</td>
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<td>P:AOK-KUA061</td>
</tr>
<tr>
<td>AOK-KUA071</td>
<td>Cell Biology and Molecular Genetics I.</td>
<td>Dept. of Med. Biology</td>
<td>Prof. Zsolt Boldogkői</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>4</td>
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</tr>
<tr>
<td>AOK-KUA072</td>
<td>Cell Biology and Molecular Genetics I.</td>
<td>Dept. of Med. Biology</td>
<td>Prof. Zsolt Boldogkői</td>
<td>-</td>
<td>2</td>
<td>Signature</td>
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<td>P:AOK-KUA-071</td>
</tr>
<tr>
<td>AOK-KA1311</td>
<td>Basics in Molecular Biology</td>
<td>Dept. of Med. Biology</td>
<td>Prof. Zsolt Boldogkői</td>
<td>1</td>
<td>-</td>
<td>Evaluation(S)</td>
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</tr>
<tr>
<td>AOK-KA1801</td>
<td>Biostatistical Calculations</td>
<td>Dept. of Med. Physics and Informatics</td>
<td>Prof. Ferenc Bari</td>
<td>-</td>
<td>2</td>
<td>Term Mark(S)</td>
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<td></td>
</tr>
<tr>
<td>AOK-KA1891</td>
<td>Cytomorphology and Microtechnics</td>
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### MEDICINE

#### BASIC AND PRE-CLINICAL MODULE

**2014/2015 2nd year, 3rd (fall) semester (9001AK_N_2013)**

**Compulsory Subjects**

- AOK-KUA017 Anatomy, Histology and Embryology III.
- AOK-KUA018 Dissection Practice III.
- AOK-KUA019 Histology Practice II.
- AOK-KUA021 Biochemistry I.
- AOK-KUA022 Biochemistry I.
- AOK-KUA031 Medical Physiology I.
- AOK-KUA032 Medical Physiology I.

**Compulsory Elective Subjects**

- AOK-KA351N Medical Physiology (Seminar) I.
- AOK-KA1631 Biochemistry Seminar I.
- AOK-KA871 Molecular Cytology and Histology.
- AOK-KA631 Medical Sociology.

**Elective Subjects**

- AOK-KA1771 Body Development and Diseases and a Molecular Biological Background.
- AOK-KA99031 Animal Experiments in Medicine.

**Criteria Subjects**

- AOK-KUA253 Hungarian Language III.*
- XT0011-PHE Physical Education (P.E.)**

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### MEDICINE

### BASIC AND PRE-CLINICAL MODULE

**2014/2015 2nd year, 4th (spring) semester (9001AK_N_2013)**

#### Compulsory Subjects

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* The completion of the course is obligatory in the semester given.
** One has to complete 2 semesters of Physical Education until the end of the 5th year.
# Suggested Study Plan

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* The completion of the course is obligatory in the semester given.
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### MEDICINE

#### PRE-CLINICAL MODULE

**2014/2015 3rd year, 6th (spring) semester**

**Compulsory Subjects**

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**Compulsory Elective Subjects**

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### SUGGESTED STUDY PLAN

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## Suggested Study Plan

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### Medicine

#### Clinical Module

**2014/2015 5th year, 9th (fall) semester**

**Compulsory Subjects**
### Compulsory Elective Subjects in the Clinical Module, fall semester (semester 7 and 9)

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<th>Course Code</th>
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<td>Dept. of Foreign Lang.</td>
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### Compulsory Elective Subjects in the Clinical Module, only semester 9

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### Elective Subjects in the Clinical Module, only semester 9

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<td>Biophysics of Hearing, Objective and Subjective Audiometry</td>
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### Elective Subjects in the Clinical Module, fall semester (semester 7 and 9)

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<td>Dept. of Obstetrics and G.</td>
<td>Prof. Attila Pál</td>
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<td>AOK-KA1201</td>
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<td>Dept. of Obstetrics and G.</td>
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## SUGGESTED STUDY PLAN

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<td>Dr. Széll Mártá</td>
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<td>Microsurgery</td>
<td>Inst. of Surgical Research</td>
<td>Prof. Mihály Boros</td>
<td>total 8</td>
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<td>SR: Basic Surgical Skills</td>
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<td>AOK-KA1452K</td>
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<td>Inst. of Surgical Research</td>
<td>Prof. Mihály Boros</td>
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<td>Dept. of Biochemistry</td>
<td>Prof. László Dux</td>
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<td>Maxillofacial Surgery Clinic</td>
<td>Prof. József Piffkó</td>
<td>1 -</td>
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<td>Maxillofacial Surgery Clinic</td>
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<td>Hrs/week: Practice</td>
<td>Form of exam</td>
<td>Credit</td>
<td>Course Requirement (SR=Subject requirement; ER=Examination requirement; P=Parallel Completion)</td>
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<td>AOK-KA1062</td>
<td>Pharmacology Cases II.</td>
<td>Dept. of Pharmacology</td>
<td>Prof. András Varró</td>
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<td>Dept. of Public Health</td>
<td>Dr. Edit Paulik</td>
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<td>AOK-KA1571</td>
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<td>Dept. of Aviation and Space Medicine</td>
<td>Prof. Andor Grósz</td>
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<td>AOK-KA1582</td>
<td>The Language of Effective Doctor-Patient Communication II.</td>
<td>Dept. of Foreign Lang.</td>
<td>Dr. Éva Demeter</td>
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<td>Term Mark(5)</td>
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<td>The Language of Effective Doctor-Patient Communication I.</td>
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<td>AOK-KA1211</td>
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<td>Department of Clinical Microbiology</td>
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<td><strong>Elective Subjects in the Clinical Module, spring semester (semester 8 and 10)</strong></td>
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<td>AOK-KA1331</td>
<td>Multidisciplinary care of breast cancer</td>
<td>Dept. of Oncology</td>
<td>Prof. Zsuzsanna Kahán</td>
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<td>AOK-KA1851</td>
<td>Modern Complex Therapy of Malignant Diseases</td>
<td>Dept. of Oncology</td>
<td>Prof. Zsuzsanna Kahán</td>
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<td>AOK-KA1861</td>
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<td>Dept. of Oncology</td>
<td>Prof. Zsuzsanna Kahán</td>
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<td>AOK-KA911K</td>
<td>Chemical Misconceptions</td>
<td>Dept. of Med. Chemistry</td>
<td>Prof. Gábor Tóth</td>
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<td>-</td>
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<td>AOK-KA1831</td>
<td>Illicit Drug Use</td>
<td>Dept. Of Psychiatry</td>
<td>Prof. János Kálmán</td>
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<td>-</td>
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<td>Medical History Taking in Hungarian</td>
<td>Dept. Of Foreign Lang.</td>
<td>Dr. Eva Demeter</td>
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# SUGGESTED STUDY PLAN

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<th>Course Code</th>
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<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement; P=Parallel Completion)</th>
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<td>AOK-KA901</td>
<td>Internal Medicine</td>
<td>1st Department of Internal Medicine</td>
<td>Dr. György Ábrahám</td>
<td>9 weeks*</td>
<td>Comprehensive Exam</td>
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<tr>
<td>AOK-KA902</td>
<td>General Practice</td>
<td>Department of Surgery</td>
<td>Prof. György Lázár</td>
<td>1 week*</td>
<td>Signature</td>
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<td>AOK-KA941</td>
<td>Surgery</td>
<td>Department of Surgery</td>
<td>Prof. László Vécsei</td>
<td>9 weeks*</td>
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<td>AOK-KA921</td>
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<td>Prof. János Kálmán</td>
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<td>AOK-KA931</td>
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<td>Prof. Attila Pál</td>
<td>4 weeks*</td>
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<td>AOK-KA951</td>
<td>Obstetrics and Gynaecology</td>
<td>Department of Obstetrics and Gynaecology</td>
<td>Dr. Csaba Berecki</td>
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<td>AOK-KA911</td>
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<td>AOK-KA912</td>
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<td>AOK-KA973</td>
<td>State Board Examination - oral part</td>
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<td>AOK-KA974</td>
<td>State Board Examination - practical part</td>
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*1 week = 30 hours
The internships should be accomplished principally at the clinics and hospitals of the University, however they can also be accomplished abroad, provided the students submit the acceptance letter of the clinic/hospital and have the permission of the Department concerned before starting the practice. The accomplishment of the practices must be verified officially to the Secretariat as the precondition for starting the next practice.

Two practices can be accomplished continuously and the final examinations can be taken in the week following the accomplishment of the practices. In the sixth year interns can be assigned to duty service as physicians.

If the student fails an examination, it must be repeated together with the half of the practice period. The next practice can be started only following a successful examination.

If the student fails to submit the thesis by the deadline given - or fails to submit it by the deadline of postponement (permission for postponement is given by the Program Director), his/her internships and examinations must be suspended.

The State Board Examination consists of: Test (Multiple Choice Questions), Oral examination (theory) and Practical examination (bedside examination).

**Fees:**

<table>
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<th>Period of practice</th>
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<tr>
<td>• Obligatory fee *</td>
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<tr>
<td>• All practices are spent at the University of Szeged (40 weeks)</td>
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<td>• 1 extra week of practice at the University of Szeged</td>
<td>290 USD</td>
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<tr>
<td>• 1 extra month of practice at the University of Szeged</td>
<td>1160 USD</td>
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<td>State Board Examination fee</td>
<td>300 USD</td>
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* Students can complete half of the practices abroad. This amount entitles them to complete half of the practices (20 weeks) at the University of Szeged without additional costs.
** Students can complete more than half of the practices abroad, provided they have the permission of the Program Director before starting the practice.

Payments have to be made before starting the practice, but latest before the final examination of the subject concerned.

Further details are available in the relevant Clerkship Guide.
**COMPULSORY PRACTICES IN SUMMER**

**Summer practice:**
1st, 3rd and 4th year students are required to complete a four-week compulsory summer practice in a hospital or clinic which must be accredited by the country concerned. At the completion of the practice an “Evaluation form” should be filled in, signed, stamped and sent directly from the hospital/clinic or submitted by the student in a sealed envelope. (The form can be downloaded from our website). A “Letter of Acceptance” issued by the hospital/clinic, furthermore a certificate that the hospital/clinic is accredited by the country concerned has to be presented at the Foreign Students’ Secretariat **until May 06, 2014**.

**Fees if the practices are performed in Hungary:**
- Nursing practice: 500 USD
- Internal Medicine practice: 1000 USD
- Surgery practice: 1000 USD.

Students should register for completing a practice at least one month before its beginning. Practice fee must be paid before starting the practice.

**4th year medical students** have to perform a four-week Nursing practice.

**Departments at the University of Szeged:**
- 1st Department of Internal Medicine
- 2nd Department of Internal Medicine
- Obstetrics and Gynecology Department
- Department of Surgery
- Neurosurgery Department
- Neurology Department
- Psychiatry Department
- Pediatrics Department
- Ophthalmology Department
- Oto-Rhino-Laryngology and Head-Neck Surgery Department
- Urology Department
- Pulmonology Department
- Traumatology Department

**3rd year medical students** have to perform a four-week Internal Medicine practice.

**Departments at the University of Szeged:**
- 1st Department of Internal Medicine
- Division of Endocrinology
- 2nd Department of Internal Medicine

**4th year medical students** have to perform a four-week Surgery practice.

**Departments at the University of Szeged:**
- Department of Surgery

**INTERIM PRACTICE**

**4th year medical students** have to complete a three-day Obstetrics and Gynaecology Delivery-Room Practice in one semester.
Department of Anatomy, Histology and Embryology Department

1. Gene expression in the mammalian central nervous system.
   Prof. Dr. Andras Mihaly

2. Role of animal experiments in research of diseases of the central nervous system
   Dr. Endre Dobo, PhD

Department of Nuclear Medicine

1. Up to date Nuclear Medicine investigations in neurology and psychiatry
   Dr. László Pávics Professor of Nuclear Medicine

2. Experimental validation of new radiopharmaceuticals
   Dr. László Pávics Professor of Nuclear Medicine

3. Radiation safety in Nuclear Medicine
   Dr. Teréz Séra physicist

4. New Nuclear Medicine investigations in oncology
   Dr. Miklós Papós associate professor

Department of Clinical Microbiology

1. Specially selected topics dealing with sexually transmitted infections. Dr. habil Judit Deák

2. Specially selected topics dealing with tropical diseases. Diagnostic problems, epidemiology, and therapy. Dr. habil Judit Deák

3. Antibiotic resistance development in a selected pathogen. Dr. habil. DSc. Elisabeth Nagy

4. Anaerobic infections. Diagnostics and therapy. Dr. Edit Urbán Ph.D.

5. Role of anaerobic bacteria in oral infections. Dr. Edit Urbán Ph.D.

6. Clostridium difficile-associated infections. Dr. Gabriella Terhes Ph.D.
Department of Otolaryngology and Head & Neck Surgery

1. Pathogenesis and treatment of laryngeal tumors
2. Pathophysiology and treatment of vocal cord functional disorders

Department of Behavioural Sciences

1. Behavioral science approach to smoking
   Dr. Bettina Pikó associate professor

2. Cultural medicine: theory and examples
   Dr. Bettina Pikó associate professor

3. Prevention of addictions
   Dr. Bettina Pikó associate professor

4. Stress and anxiety in modern medicine
   Dr. Bettina Pikó associate professor

Department of Otolaryngology and Head & Neck Surgery

Biophysics of hearing. Objective and subjective audiometry
   Dr. Kiss József Géza

Surgical treatment for laryngeal carcinoma and quality of life (QOL)
   1st semester, years 4-5
   Prof. Czigner Jenő

Department of Forensic Medicine

1. Illegal drug use
   Dr. Antia Reka Tóth

2. Laboratory investigation of drug abuse
   Dr. László Institoris

3. The role of alcohol in traffic
   Prof. Tibor Varga

4. Forensic point of DNA investigations
   Dr. Bernadett Csányi

5. Evaluation of permanent disability
   Dr. Beáta Havasi

6. Problems of the health legislation
   Dr. Éva Kereszty

7. Death detection in the clinical practice
   Dr. Éva Kereszty

2nd Department of Internal Medicine

Prognostic factors in multiple myeloma
   Szabolcs Modok, MD, PhD

Pharmacologic and interventional treatment of atrial fibrillation
   Dr. Róbert Pap
Atrial flutter after open heart surgery  
Dr. Attila Makai

Long-term efficacy of slow pathway ablation for atrioventricular nodal reentrant tachycardia  
Dr. László Sághy

Heart failure and pacemaker therapy  
Dr. Gábor Bencsik

1st Department of Medicine

Dr. Péter Hegyi and Dr. Zoltán Rakonczay
1. The regulation of pancreatic ductal HCO3- secretion.  
2. The role of pancreatic ducts in the process of acute pancreatitis.  
3. Acid secretion from human gastric glands.  
4. The regulation of human intestinal ion secretion.  
5. Characterisation of lacrimal gland epithelial cells.  
6. Viral transfection of epithelial cells.

Department of Pharmacology and Pharmacotherapy

1/ The mechanisms of action of antiarrhythmic drugs.  
Tutor: Dr. András Varró

2/ Cellular electrophysiology of the cardiac muscle.  
Tutor: Dr. András Varró

3/ Mechanism of the antiarrhythmic effect of preconditioning. Role of endogenous substances.  
Tutor: Dr. Ágnes Végh

4/ Investigation of antiarrhythmic mechanism in rat models.  
Tutor: Dr. István Leprán

5/ Potassium channel and cyclic nucleotide mediated vasodilation in isolated blood vessels.  
Tutor: Dr. János Pataricza

6/ Cellular electrophysiological techniques.  
Tutor: Dr. László Virág and Dr. Norbert Iost

7/ Patomechanisms of congestive heart failure  
Tutor: Dr. István Baczkó

8/ Intra-and extracellular regulatory mechanisms of electric activity in human cardiac atrium.  
Etiology and pathomechanism of atrial fibrillation.  
Tutor: Dr. Ottó Hálá

9/ Regulation of the Ca2+ homeostasis in isolated cardiac cells.  
Tutor: Dr. András Tóth

10/ Cellular mechanism leading to ischemia/ reperfusion in jury in cardiac tissue.  
Tutor: Dr. András Tóth

11/ Review of the literature: A selected topic in pharmacology.  
Tutor: Dr. István Leprán

Department of Medical Informatics

1. Oscillation mechanics of the human respiratory system  
Prof. Zoltán Hantos

2. Computer analysis of lung sounds
3. Studies on regulation of cerebral blood flow  
Prof. Ferenc Bari

4. Experimental models for cortical spreading depression  
Dr. Eszter Fazekas

5. Computer aided modelling in Pharmacy and Medicine  
Dr. János Karsai

6. Investigation of the role of enviromental factors in aetiology of childhood cancers  
Dr. Tibor Nyári

7. Investigation of the role of human papilloma virus in cervical carcinoma  
Dr. Tibor Nyári

8. Application of biostatistical methods to medical data  
Dr. Krisztina Boda

Institute of Surgical Research

1. Pathomechanism of small bowel ischemia-reperfusion. Monitoring of microcirculatory changes with intravital videomicroscopy and OPS technique  
Prof. Mihály Boros, M.D., Ph.D., D.Sc.

2. Biological activity of phospholipids in inflammatory diseases  
Prof. Mihály Boros, M.D., Ph.D., D.Sc.

3. Protective effects of biological gases in circulatory disorders  
Prof. Mihály Boros, M.D., Ph.D., D.Sc.  
Dr. József Kaszaki, Ph.D.

4. Neuroprotection in the enteral nervous system  
Dr. József Kaszaki, Ph.D.

5. Examination of microcirculation under septic conditions  
Dr. József Kaszaki, Ph.D.

6. Assessment of hemodynamic and biochemical consequences of experimental pericardial tamponade  
Dr. József Kaszaki, Ph.D.

7. Examination of macro- and microhemodynamic consequences of volume therapy in circulatory shock  
Dr. József Kaszaki, Ph.D.

8. Examination of mechanical parameters of the lung under normal and pathologic conditions  
Dr. József Kaszaki, Ph.D.  
Prof. Zoltán Hantos, Ph.D., D.Sc., Department of Medical Physics and Informatics

9. Assessment of biochemical and microcirculatory consequences of disorders of the locomotor system using intravital videomicroscopy and OPS technique  
Dr. Andrea Szabó, M.D., Ph.D.

10. Assessment and treatment of biochemical and microcirculatory consequences of urogenital diseases  
Dr. Andrea Szabó, M.D., Ph.D.

11. Assessment and treatment of the oral surgical complications of chronic bisphosphonate
exposure
Dr. Andrea Szabó, M.D., Ph.D.

Department of Pathophysiology
Student research program consultant: Dr Miklós Jászberényi, MD, PhD
telephone number: 62-545-993
E-mail: jm@patph.szote.u-szeged.hu, jaszberenyi.miklos@med.u-szeged.hu

Programs:

1. Tutors:
   Professor Dr Gyula Szabó, MD, PhD, DSc head of the department

Topics:
1. Computer based education of pathophysiology (usage of internet in medical education)
2. The investigation of specific opiate ligands in animal experiments
3. Elected subject from pathophysiology

2. Tutors:
   Professor Dr Gyula Szabó, MD, PhD, DSc head of the department
   Julianna Szakács, MD

Topics:
1. The effect of neuropeptides on experimental drug tolerance and dependence
2. Elective subject from pathophysiology

3. Tutors:
   Professor emeritus Gyula Telegdy, MD, PhD, DSc, member of the Hungarian Academy of Sciences
   Ágnes Adamik, MSc; Tanaka Masaru MD, PhD

Topics:
1. The effects of neuropeptides on behavioral and cognitive processes
2. Examination of behavioral and cognitive processes in the rat
3. The effects of neuropeptides on thermoregulatory processes
4. The role of neuropeptides in the organization of cognitive processes

4. Tutor:
   Professor emeritus Gyula Telegdy, MD, PhD, DSc, member of the Hungarian Academy of Sciences

Topics:
1. The role of nitric oxide in the organization of cognitive processes
2. The investigation of the anxiogenic-anxiolytic effects of neuropeptides

5. Tutors:
   Professor Dr Gyula Szabó, MD, PhD, DSc head of the department
   Zsófia Mezei, MD, PhD

Topics:
1. Role of the mediators in the pathogenesis of the cardiovascular diseases.
2. Role of the mediators in the pathogenesis of the neurodegenerative disorders.
3. Role of the mediators in the pathogenesis of the diabetes mellitus.

6. Tutors
   Professor emeritus Gyula Telegdy, MD, PhD, DSc, member of the Hungarian Academy of Sciences
   Professor Gyula Szabó, MD, PhD, DSc head of the department
   Miklós Jászberényi, MD, PhD
   Zsolt Bagosi, MD, PhD
   Krisztina Anna Csabafi, MD

Topics:
1. The effects of neuropeptides on the hypothalamic-pituitary-adrenal axis
2. The investigation of anxiolytic and antidepressant effects of neuropeptides
3. The investigation of the thermoregulatory, cardiac and behavioral effects of neuropeptides
4. The interaction between neuropeptides and addictive drugs
5. The interaction between neuropeptides and neurotransmitters
6. The action of neuropeptides in the development of Alzheimer’s disease
7. The action of neuropeptides in different animal models of psychiatric disorders
**Recommended textbooks for first year medical students**

It is recommended to purchase the latest edition of the following textbooks!

**ANATOMY, HISTOLOGY AND EMBRYOLOGY**

**Obligatory:**
- Sadler: Langman's Medical Embryology, with Simbryo CD, Lippincott Williams & Wilkins
- Kiernan: Barr’s The Human Nervous System, International Student Edition, Lippincott Williams & Wilkins
- Snell, Richard S.: Clinical Anatomy, Lippincott Williams & Wilkins
- Sobotta Atlas of Human Anatomy, Volume 1, (Latin Edition), Lippincott Williams & Wilkins

**Recommended:**
- Gartner, LP, Hiatt, JL: Concise Histology, Saunders Elsevier, 2011

**CELL BIOLOGY AND MOLECULAR GENETICS**


**FIRST AID**

- Brent, Karren: First Aid for Colleges and Universities, Brady Morton Series

**INTRODUCTION TO MEDICINE**


**INTRODUCTION TO PSYCHOLOGY, BASICS OF NURSING**

- Atkinson and Hilgard: Introduction to psychology. Andover, Wadsworth Cengage Learning, 2009

**MEDICAL CHEMISTRY**

**Obligatory:**
- Ebbing-Hart: General Chemistry /Organic Chemistry, Houghton Mifflin Company

**Recommended:**
- Harold Hart: Organic Chemistry (A Short Course), Houghton Mifflin Company, Boston
- P. Gergely: Organic and Bioorganic Chemistry for Medical Students, University Medical School of Debrecen,

**MEDICAL PHYSICS AND STATISTICS**


**MEDICAL DICTIONARIES**

- Mosbey's: Mosbey's Medical, Nursing and Allied Health, Mosbey
- Stedmans: Medical Dictionary, Williams and Wilkins
## Recommended textbooks for second year medical students

### ANATOMY, HISTOLOGY AND EMBRYOLOGY

**Obligatory:**
- Sadler: Langman’s Medical Embryology, with Simbryo CD, Lippincott Williams & Wilkins
- Kiernan: Barr’s The Human Nervous System, International Student Edition, Lippincott Williams &
- Snell, Richard S.: Clinical Anatomy, Lippincott Williams & Wilkins
- Sobotta Atlas of Human Anatomy, Volume 1, (Latin Edition), Lippincott Williams & Wilkins

**Recommended:**
- Kyung Won Chung: Gross Anatomy, Lippincott Williams & Wilkins
- Sobotta Atlas of Human Anatomy, Volume 1 (Head, Neck, Upper Limb), English Text with English Nomenclature, Lippincott Williams & Wilkins
- Sobotta Atlas of Human Anatomy, Volume 2 (Trunk, Viscera, Lower Limb), English Text with English Nomenclature, Lippincott Williams & Wilkins
- Sobotta Atlas of Human Anatomy, 2 Volume Set, English Text with English Nomenclature, Lippincott Williams & Wilkins
- Tömöl Teréz: Topographic Anatomy, Medicina Könyvkiadó Rt.

### BIOCHEMISTRY, BIOCHEMISTRY SEMINAR

**Obligatory:**

**Recommended for 1st semester:**
- W. J. Marshall, S. K. Bangert
  Clinical Chemistry
  ISBN:9780723434559

- P.C. Champe, R. A. Harvey
  Lippincott’s Illustrated Reviews Biochemistry

- J.W. Baynes, M. H. Dominiczak
  Medical Biochemistry

### BIOCHEMICAL BASICS OF PREVENTIVE MEDICINE
- Janet Christian and Janet Greger: Nutrition for Living, Addison-Wesley

### CARDIAC ELECTROPHYSIOLOGY AS A BASIC PROPERTY OF CARDIAC FUNCTION

### MATHEMATICAL AND STATISTICAL MODELLING IN MEDICINE
- Mark Woodward: Epidemiology –Study design and Data analysis, Chapman & Hall/CRC 1999
- Interesting mathematical problems in every-day life. Electronic handout in Teaching Mathematics and Statistics in Sciences HU-SRB/0901/221/088

### MEDICAL ANTHROPOLOGY
- C.G.Helman: Culture, Health and Illness, Oxford University Press
MEDICAL PHYSIOLOGY

- Arthur C. Guyton, John E. Hall: Textbook of Medical Physiology, Elsevier Science
- Walter F. Boron, Emile L. Boulpaep: Medical Physiology, Saunders Elsevier
- Fonyó Attila: Principles of Medical Physiology, Medicina Kiadó Zrt.
- Albert Szent-Györgyi Medical University, Department of Physiology, Physiology Laboratory Manual, (handout)

MEDICAL SOCIOLOGY

Recommended textbooks for third year medical students

HUNGARIAN LANGUAGE

INTERNAL MEDICINE (CLINICAL DIAGNOSTICS)
Obligatory:
or

Recommended:
- Current Medical Diagnosis and Treatment 2006, Author(s): Lawrence M. Tierney, Jr., MD; Stephen J. McPhee, MD; Maxine A. Papadakis, MD, ISBN: 0071454101, Publication date: 2005, Edition 45th

MEDICAL MICROBIOLOGY AND IMMUNOLOGY
- ABBAS et al., Cellular and Molecular Immunology, Sanders, Elsevier, 6th ed., 2007.
- Murphy et al., Janeway's Immunology, Garland Science; 7th ed., 2008.
- Practical Notes (Edited by R. Pusztai, University of Szeged, 2002)

MICROSURGERY

PATHOLOGY

PATHOPHYSIOLOGY
Textbooks
- Bayés de Luna: Basic electrocardiography: normal and abnormal ECG patterns, Blackwell Publishing, 2007,
Handouts (for practice)


MEDICAL PSYCHOLOGY

- Kent G., Dalgleish M.: Psychology and Medical Care, W.B. Saunders C.L.T.D. 1996. (compulsory)
- Andrew B. Crider: et al Psychology, Harper Collins College Publisher 1993. (recommended)

SURGERY (CLINICAL DIAGNOSTICS)


BASICS OF EMERGENCY MEDICINE


MICROSURGERY


BASIC SURGICAL SKILLS, ADVANCED SURGICAL SKILLS


BASIC IMMUNOPATHOLOGY


LABORATORY MEDICINE

Recommended textbooks for fourth year medical students

ANAESTHESIOLOGY AND OXYOLOGY
Recommended:
• Tim Craft, Jerry Nolan, Mike Parr: Critical Care, BIOS Scientific Publishers Ltd. 2009. ISBN 1-85996-2229-7

CASES IN CLINICAL MICROBIOLOGY

CHILD AND ADOLESCENT PSYCHIATRY
• Robert Goodman and Stephen Scott, Child Psychiatry, 1998

CLINICAL IMMUINOLOGY
• Spickett, Gavin: Oxford Handbook of Clinical Immunology, Oxford University Press, 2006, ISBN:019262721x

CLINICAL ONCOLOGY
• AJCC Cancer Staging Manual, 2002 Springer
• Cancer Management: A Multidisciplinary Approach, 2002 PRR Melville NY
• Principles and Practice of Radiation Oncology Editors Carlos A. Perez Luther W. Brandy., 1998 Lippincott-Raven
• The Washington Manual of Oncology. Editor Ramaswamy Gorindan, 2002 Lippincott

HUNGARIAN LANGUAGE
Obligatory:
• GYÖRFY, Mária: Mi a panasz?, Idióma Bt. Pécs, 1999, ISBN 963 04 8860 4

INTERNAL MEDICINE
Obligatory:
• Hoffbrand, Moss: Essential Haematology, Wiley, 6th edition
• The Merck Manual of Diagnosis and Therapy, Merck and Co. Inc. 2006., ISBN: 0911910182

Recommended:
• Brostoff: Clinical Immunology – An Illustrated Outline, Mosby, 1994, ISBN: 1563756641

LABORATORY DIAGNOSTICS: USE OF LABORATORY TESTS IN PRACTICE
NUCLEAR MEDICINE

OBSTETRICS AND GYNAECOLOGY

ORTHOPAEDICS

PHARMACOLOGY

PUBLIC HEALTH
Obligatory:

Recommended:

PULMONOLOGY

RADIOLOGY

SURGERY

STOMATOLOGY

TROPICAL DISEASES
Recommended textbooks for fifth year medical students

**CHILD AND ADOLESCENT PSYCHIATRY**

**CLINICAL GENETICS**
- Emery’s Elements of Medical Genetics, Mueller RF, Young ID, 11th Edition Churchill Livingstone, 2001

**CLINICAL MICROBIOLOGY**
- Peter H. Gilligan, Daniel S. Shapiro and M. Lynn Smiley: Cases in Medical Microbiology and Infectios Diseases, Publisher: Amer Society for Microbiology, Published Date: 1992, ISBN 1555810454

**CLINICAL PHARMACOLOGY**
- Oxford Textbook of clinical pharmacology and drug therapy (Eds. Grahame-Smith, Aronson), Lecture notes on clinical pharmacology (Eds. Reid, Rubin, Whiting)

**DERMATOLOGY**

**FORENSIC MEDICINE**

**INTERNAL MEDICINE**
Obligatory:

Recommended:
- Current Medical Diagnosis and Treatment 2006, Author(s): Lawrence M. Tierney, Jr., MD; Stephen J. McPhee, MD; Maxine A. Papadakis, MD, ISBN: 0071454101, Publication date: 2005, Edition 45th

**LABORATORY DIAGNOSTICS: USE OF LABORATORY TESTS IN PRACTICE**

**NEUROLOGY**
**NEUROSURGERY**

**OPHTHALMOLOGY**

**OTO-RHINO-LARYNGOLOGY**

**PAEDIATRICS**
- or
- Op Ghai: Essential Pediatrics, Fifth Edition

**PSYCHIATRY**
- or any of the following books:

**RHEUMATOLOGY**

**SURGERY**
UROLOGY

TRAUMATOLOGY
SYLLABUSES
BASIC AND PRE-CLINICAL MODULE - MEDICINE

ANATOMY, HISTOLOGY AND EMBRYOLOGY

1st semester

**LECTURE**
(2 hrs/week)

* **General anatomy**
  Terminology (planes, directions, parts of the human body)
  General osteology
  General syndesmology

* **General myology**
  General angiography
  Main branches of the aorta and SVC-IVC

* **General neurology.** Brachial and lumbosacral plexuses.

* **Functional- and clinical anatomy of the UL.**

* **Trunk anatomy**
  Anatomy of the vertebral column (bones and joints).

* **Functional anatomy of back muscles.** The thoracolumbar fascia. Anatomy of the chest wall muscles.

* **Anatomy, blood supply, lymphatics of the breast (mammary gland)**
  Diaphragm, muscles of respiration
  **Basic tissues**
  Epithelia, connective tissues.

* **Cartilage, bone tissue, ossification. Muscle tissue.**

* **Nerve tissue.** Receptors, effectors.

* **Circulatory- and respiratory anatomy**
  Anatomy, histology of the heart, pericardium.

**DISSECTION PRACTICE**
(3 hrs/week)

* **Rules, regulations of the dissection room**
  **Bones, joints of the thorax** (vertebrae, ribs, sternum)

* **Bones, joints of the upper limb**

* **Dissection of the vessels and nerves of the upper limb.**

**ANATOMY SEMINAR**
(2 hrs/week)

* **Upper limb**
  Bones and joints of the upper limb (UL).

* **Muscles of the UL.**

* **Arteries and veins of the UL.**
  Branches of the axillary artery.
  Lymph vessels of the UL.

* **Branches of the brachial plexus on the UL.**
  Nerve injuries on the UL.

* **Lower limb**
  Functional anatomy of the joints of the lower limb (LL).

  **MTO:**
  UL. Bones, joints of the thorax

* **Bones, joints of the lower limb.**

* **Muscles of the hip and pelvis.**
  Muscles of the LL.
  Fasciae of the LL.

* **Dissection of the muscles of the lower limb.**

* **Dissection of the vessels, nerves of the lower limb.**
  **23-24. October holiday**

* **Dissection of the vessels, nerves of the lower limb.**

* **Study of the bones of the trunk (vertebrae, ribs, sternum) on human samples and on radiographic pictures.**
  Dissection of the chest- and back muscles. Dissection of the intercostal space.

* **Functional anatomy of the blood vessels of the LL.**
  Lymph nodes and vessels of the LL.

* **Innervation of the LL.** Motor- and sensory nerves on the LL (nerve injuries).

* **Functional- and clinical anatomy of the LL.**

* **Functional anatomy of the abdominal wall: muscles, fasciae.** Inguinal canal, rectus sheath, hernia canals.

**Skull**

Bones of the skull. Sutures and joints. The concept of viscerocranium and neurocranium.
| * Anatomy, histology of the nasal cavity and paranasal sinuses. | Structure of the abdominal wall, abdominal muscles, rectus sheath, inguinal canal. | External and internal cranial basis: bony structures and contents. |
| * Anatomy, histology of the trachea and the bronchial tree. | 2.MTO: Skull, LL, Trunk anatomy. | Discussion of the topics of the semester: tutorial on the radiological images (UL, LL, trunk, skull). |

### 2nd semester

<table>
<thead>
<tr>
<th>LECTURE (2 hrs/week)</th>
<th>DISSECTION PRACTICE (3 hrs/week)</th>
<th>MICROSCOPY PRACTICE (2 hrs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alimentary System</strong></td>
<td><strong>Thoracic Cavity, Cardiovascular and Respiratory System</strong></td>
<td><strong>Kidney (HE)</strong></td>
</tr>
<tr>
<td>The anatomy and histology of the oral cavity; teeth, large salivary glands, and the tongue.</td>
<td>The anatomy of the mediastinum. Dissection of the superior mediastinum.</td>
<td>Trachea (HE)</td>
</tr>
<tr>
<td>* The anatomy and histology of the, pharynx and the oesophagus. The anatomy of the peritoneum.</td>
<td>The anatomy of the heart and the pericardium.</td>
<td>Esophagus (HE)</td>
</tr>
<tr>
<td>* The anatomy and histology of the stomach, small intestine, large intestine and the rectum. The topography, anatomy and histology of the spleen.</td>
<td>Removal and dissection of the lungs and the bronchial tree. Dissection of the posterior mediastinum and the intercostal space.</td>
<td>Skin (HE)</td>
</tr>
<tr>
<td>* The anatomy, blood circulation and histology of the liver and the gall bladder. The anatomy and histology of the pancreas.</td>
<td>The anatomy of the nasal cavity, nasopharynx and the paranasal sinuses. The anatomy of the larynx.</td>
<td>Ear (Orcein)</td>
</tr>
<tr>
<td>* Blood supply, lymphatic drainage and innervation of the organs of the abdominal cavity. Topography of the abdominal organs.</td>
<td>Practical assessment: Anatomy of the thoracic cavity, mediastinum, heart, and the respiratory system. (nasal cavity, larynx, trachea and lungs)</td>
<td>Bone (ground section)</td>
</tr>
<tr>
<td><strong>Urogenital System</strong></td>
<td>Abdominal Cavity and the Digestive System</td>
<td>Enchondral ossification (HE)</td>
</tr>
<tr>
<td>Gross anatomy, blood supply and histology of the kidney. Anatomy and histology of the ureter, urinary bladder and the urethra.</td>
<td>Abdominal regions, abdominal situs and projection of the viscera. Opening of the abdominal cavity, inspection of the viscera. Dissection of the lesser and</td>
<td>Aorta (resorcin-fuchsin)</td>
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<td>Histology of the digestive system I. Lip (HE)</td>
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<tr>
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<td>Dorsum linguae (HE)</td>
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<td>Circumvallate papilla (HE)</td>
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<td>Parotid gland (HE)</td>
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<td>Submandibular gland (HE)</td>
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<td>Histology of the digestive system II. Esophagus (HE)</td>
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<td>Cardia (HE)</td>
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<td>Fundus, corpus (HE)</td>
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<td>Duodenum (HE)</td>
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<td>Jejunum (HE)</td>
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<td>Jejunum (PAS)</td>
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<td>Ileum (HE)</td>
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</tbody>
</table>
* The anatomy and histology of the male genital organs.
The anatomy and histology of the female genital organs.

Dissection of the stomach, the small and large intestines.
Examination of the liver and the pancreas.
Dissection of the hepatoduodenal ligament.
Dissection of the retroperitoneum: kidneys, ureters, posterior abdominal wall.

**Practical assessment:**
Anatomy of the alimentary tract and the abdominal cavity.

* The anatomy of the male and female perineum.
Topography of the lesser pelvis.

**Lesser Pelvis and Perineum**
Dissection of the scrotum, testis and epididymis.
Topography of the male pelvis.
Dissection of the female genital organs.
Topography of the female pelvis.

**Practical assessment:**
Anatomy of the lesser pelvis and urogenital organs

* Histology of the immune system and lymphoid organs.

* **Blood, Hematopoiesis and the Lymphatic System**
Histology of the blood.
Hematopoiesis.

**Histology of the liver and the pancreas**
Liver (HE)
Liver (Kupffer-cells)
Gall bladder (HE)
Pancreas (HE)

Uropoietic system:
Kidney (HE)
Ureter (HE)
Urinary bladder (HE)
Urethra (HE)

Male genital organs I.:
Testis-epididymis(HE)
Spermatic cord(HE)
Semenal vesicle(HE)
Prostate (HE)
Penis(HE)

Female genital organs:
Ovary (HE)
Oviduct(HE)
Uterus(HE)
Uterine cervix(HE)

General recapitulation
Repetition

* The anatomy and histology of the thyroid and parathyroid glands.
The endocrine pancreas and the enteroendokrin system.

* The suprarenal gland, and the endocrine cells of the gonads.
Histology of the diffuse neuroendocrine system.

General recapitulation
Repetition

**Practical assessment:**
Histology of the urogenital system
Histology of the liver and the pancreas

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**3rd semester**

**LECTURE**
(2 hrs/week)

* Fine structure of the grey matter of the spinal cord.
Tracts of the white matter.

**DISSECTON PRACTICE**
(3 hrs/week)
Rules, regulations of the dissection room.
CNS.
Opening of the skull, removal of the brain, duplicatures of the dura mater, meningeal spaces. Vertebral canal preparation, meninges of the

**HISTOLOGY PRACTICE**
(2 hrs/week)
General information, rules and regulations.
Blood smear (MGG)
Red bone marrow (HE)
Thymus (HE)
* Fine structure of the medulla oblongata, pons, mesencephalon. Reticular formation.

Spinal cord, spinal cord preparation. Hemispheres, gyri, sulci, lateral ventricles. Circle of Willis, blood supply of the hemispheres. Lymphnode (HE) Spleen (HE) Palatine tonsill (HE) Root of the tongue (HE)

* Synaptology, histology of the cerebellum. Neuroanatomy of the cerebellar motion regulation.

Anatomy of the diencephalon, III. ventricle, FLECHSIG’s section, internal capsule, basal ganglia. Brainstem, IV. ventricle, romboid fossa. Exit of the cranial nerves (brainstem, skull).

CNS SEMINAR:
Cross-sections of the brainstem I., classification of cranial nerve nuclei CNS SEMINAR:
Cross-sections of the brainstem II., brainstem nuclei. Branchings of the cranial nerves.

* Diencephalon:
fine structure of the thalamus and the hypothalamus. Neurosecretion.

Basal ganglia, extrapyramidal system.


CNS SEMINAR:
Summary of the ascending and descending pathways. Sensory nerve ending (HE) Sensory nerve ending (Ag) Spinal cord (HE) Cerebellum (HE) Neocortex (HE)


1.MTO:
CNS.


HEAD and NECK
Muscles of mastication- and facial expression. Muscles of the neck.

Skin (HE) Hairy skin (HE)


Arteries, veins, lymphatics of the head, neck

Cervical plexus, skin innervation of the head & neck

Placenta (HE) Mammary gland (HE)

* Anatomy, histology of the external and middle ear. Anatomy of the inner ear: osseous, membranaceous labyrinth.

Topography of the head & neck. Dissection of the paranasal sinuses. Mediansagittal section of the head & neck.

Repetition

MTO:
Blood, haemopoiesis, lymphatic system, nervous system, endocrine system, sense organs, skin, mammary gland, placenta Histology consultation for the anatomy final exam

* Organ of Corti: fine structure of the crista, maculae. Auditory, vestibular pathways.

Ovulation, fertilisation. Cleavage, blastocyst, implantation, formation of the placenta.

Topography of the cranial base, orbita, tympanic cavity.

Developement of the embryo: gastrulation and neurulation. Developement of the amnion and the yolk sac. The folding of the embryo.
The formation of the branchial apparatus: blood and nerve supply, derivatives. Summary of the main points of the embryonal and fetal periods.

Dissection room consultation for the final exam

Histology consultation for the anatomy final exam

MTO Retake.

**BIOCHEMISTRY**

3rd semester

**LECTURE**

(3 hrs/week)

* Proteins and bioenergetics: structure and function of proteins, thermodynamics of living systems
* Enzymology: enzyme classes, coenzymes, characterisation of enzymes, isoenzymes, multienzyme systems

* Enzymology: molecular mechanism of catalysis, enzyme kinetics, modulation and regulation of enzyme activity
* Carbohydrate metabolism: Digestion and absorption of carbohydrates, glycolysis, gluconeogenesis, pyruvate dehydrogenase enzyme complex
* Carbohydrate metabolism: glycogen metabolism, pentose phosphate cycle and glucuronide shunt
* Carbohydrate metabolism: Fructose and galactose metabolism, glycoproteins, regulation of blood glucose level, diabetes mellitus
* Lipid metabolism: Digestion and absorption of lipids, lipoprotein metabolism, lipid mobilisation, oxidation of fatty acids, ketone bodies
* Lipid metabolism: Synthesis of fatty acids, synthesis of triacyl glycerols and sphingolipids, cholesterol and steroid metabolism
* Amino acid metabolism: Digestion and absorption of proteins, catabolism of amino acids, fate of amino group, urea cycle
* Amino acid metabolism: catabolism of amino acids, fate of carbon skeleton of amino acids, one-carbon units, glutathione
* Synthesis of hem and porphyrine, enterohepatic circulation of hem degradation products
* Nucleotide metabolism: synthesis and degradation of purine and pirimidine nucleotides, salvage pathways, synthesis of deoxyribonucleotides

* Citric acid cycle: steps and regulation of the cycle, relationship between the cycle and other metabolic pathways
* Mitochondrial transport systems, mechanism of respiratory chain and oxidative phosphorylation

**PRACTICE**

(2 hrs/week)

General information, work safety and laboratory work

Substrate specificity and temperature optimum of amylase enzyme activity

Determination of protein concentration

Seminar: proteins and enzymes*

Assay of activity of alkaline phosphatase

Determination of glucose-6-phosphatase enzyme activity

Seminar: lipid metabolism*

MTO

4th semester

**LECTURE**

* Proteins and bioenergetics: structure and function of proteins, thermodynamics of living systems

* Enzymology: enzyme classes, coenzymes, characterisation of enzymes, isoenzymes, multienzyme systems

* Enzymology: molecular mechanism of catalysis, enzyme kinetics, modulation and regulation of enzyme activity

**SEMINAR**

**PRACTICE**

General information, work safety, principles of lab work

Determination of protein concentration

Substrate specificity and temperature optimum of amylase enzyme activity

Consultation
* Carbohydrate metabolism: Digestion and absorption of carbohydrates, glycolysis, pyruvate dehydrogenase enzyme complex, gluconeogenesis

<table>
<thead>
<tr>
<th>Seminar</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Carbohydrate metabolism: Fructose and galactose metabolism, glycogen metabolism, pentose phosphate cycle and glucuronide shunt</td>
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<tr>
<td>* Carbohydrate metabolism: regulation of blood glucose level, glycoproteins</td>
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<tr>
<td>Lipid metabolism: Eicosanoids, digestion and absorption of lipids, lipoprotein metabolism</td>
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<tr>
<td>Lipid metabolism: lipid mobilisation, oxidation of fatty acids, ketone bodies, diabetes mellitus</td>
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<tr>
<td>Lipid metabolism: Synthesis of fatty acids, synthesis of triacyl glycerols and phospholipids, sphingolipids, cholesterol and steroid metabolism</td>
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<tr>
<td>* Amino acid metabolism: Digestion and absorption of proteins, catabolism of essential amino acids, fate of amino group, urea cycle</td>
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<td>* Citric acid cycle: steps and regulation of the cycle, relationship between the cycle and other metabolic pathways</td>
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<tr>
<td>* Mitochondrial transport systems, mechanism of respiratory chain and oxidative phosphorylation</td>
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<tr>
<td>* Nucleotide metabolism: synthesis and degradation of purine and pyrimidine nucleotides, salvage pathways, synthesis of deoxyribonucleotides</td>
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</table>

Curriculum 2014/2015

<table>
<thead>
<tr>
<th>SEMINAR</th>
<th>Activity</th>
</tr>
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<tbody>
<tr>
<td>(proteins, enzymes)</td>
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<tr>
<td>Assay of activity of alkaline phosphatase</td>
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<tr>
<td>(carbohydrate metabolism)</td>
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<tr>
<td>Determination of glucose-6-phosphatase activity</td>
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<td>1st MTO</td>
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<tr>
<td>Determination of triacyl glycerol and cholesterol</td>
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<td>2nd MTO</td>
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<tr>
<td>Investigation of the oxygen consumption of isolated mitochondria</td>
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<td>Nucleotide metabolism</td>
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<tr>
<td>Determination of uric acid concentration</td>
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</tbody>
</table>
CELL BIOLOGY AND MOLECULAR GENETICS

1st semester

LECTURE
(2 hrs/week)
* Structure and operation of the cell
* The DNA
* Transcription, translation & proteins
* Mutation & jumping genes
* Bacterial genetics
* Genetic regulation in eukaryotes
* Mendelian and non-Mendelian genetics
* Epigenetics
* Genes and traits
* Genetic diseases
* Evolution
* Cytoskeleton & membrane processes
* Molecular biology of viruses
* Frontiers of molecular and cell biology

PRACTICE
(2 hrs/week)
* Handling of technical devices
* Microscopy-1
* DNA and RNA purification
* Genetic exercises
* Separation techniques
* Lac operon & consultation

2nd semester

LECTURE
(2 hrs/week)
* Human genome
* Genetically modified organisms & cloning
* Cell cycle & tumor formation
* Molecular medicine
* Cell signalling-1
* Cell-signalling-2
* Cell communication & tissue differentiation
* Genetic regulation of ontogenesis
* Neural communication & consciousness
* Molecular biology of sensation
* Immunogenetics
* Molecular evolution
* Genetics of behaviour
* Genetic disease of brain and psyche

PRACTICE
(2 hrs/week)
* Molecular cloning
* PCR & DNA sequencing
* Detection of DNA and RNA
* DNA and protein chips, DNA finger printing
* Genetic exercises
* Reporter genes & consultation

FIRST AID AND RESUSCITATION

1st semester

PRACTICE
(2 hrs/week)
* The unresponsive patient. Terms of position. Extrication of the injured patient (Rautek manoeuvre).
* BLS (one-person CPR, two-person CPR)
* Obstructed airway emergencies. Heimlich manoeuvre.
* Paediatric basic life support.
* Bleeding (haemorrhage). Bleeding from an artery, from a vein. General procedures for controlling bleeding. Direct and indirect pressure. Arterial pulse points.
* Recognition of patients with shock condition. Body positioning for preventing shock.


MEDICAL CHEMISTRY

1st semester (14 weeks)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE (3 hrs/week)</th>
<th>SEMINAR (1 hr/week)</th>
<th>PRACTICE (2 hrs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>States of matter. Gas laws and Avogadro’s law. Properties of liquids, dependence of phase changes on pressure and temperature. Properties of solids, types of crystalline lattice. Homogenous and heterogeneous systems. Colloids. Solutions. Types of solutions. The solution process. Ways of expressing concentration. Colligative properties. Osmosis and its biological importance.</td>
<td>Metals and nonmetals and their compounds. Complexes. Summary of inorganic chemical reactions.</td>
<td>During weeks 5 to 12 students work in rotation and conduct one of the following experiments each week:</td>
</tr>
<tr>
<td>Topic</td>
<td>Summary</td>
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<tr>
<td>LeChatelier's principle.</td>
<td>Osmosis.</td>
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<tr>
<td>Electrolytic dissociation, strong and weak electrolytes.</td>
<td>V) Quantitative determination of Fe(II)-content by permanganometric titration measuring the redox potential.</td>
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<tr>
<td>Acid-base concepts.</td>
<td>VI) Complexometric determination of calcium and magnesium.</td>
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<td>Equilibrium in electrolytes, pH and pOH. Acid-base ionization</td>
<td>VII) Photometric determination of iron.</td>
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<tr>
<td>equilibrium. Salts.</td>
<td>VIII) Photometric determination of glucose.</td>
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<tr>
<td>Solubility of electrolytes.</td>
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<tr>
<td>Hydrolysis of salts.</td>
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<tr>
<td>Acid-base titration.</td>
<td>Acid-base concepts. Simple pH calculations.</td>
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<td>Buffers and their biological importance.</td>
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<tr>
<td>Thermochemistry. Basic terms. First, second and third laws of</td>
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<td>thermodynamics.</td>
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<td>8. Entropy and disorder. Change in Gibb's free energy and</td>
<td>Buffers, calculations involving buffers.</td>
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<td>spontaneity of a reaction. Electrochemistry. Oxidation-reduction</td>
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<td>reactions. Electrical work and free energy change.</td>
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<td>electrodes, measurement of pH. Electrolysis. Reaction kinetics.</td>
<td>potential.</td>
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<tr>
<td>Rate, order, molecularity and mechanism of reactions. Complex</td>
<td>Balancing redox reaction equations.</td>
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<td>chemical reactions. Catalysis. Enzymes as biocatalysts.</td>
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<td>reactions: substitution, addition, and elimination. Types of</td>
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<td>Vitamin A. The photochemistry of vision. Polarization in organic</td>
<td>Unsaturated hydrocarbons: alkenes and alkynes.</td>
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<td>compounds: inductive and conjugation effects. Structure of</td>
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<td>conjugated dienes. Absorption of light, color compounds.</td>
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<td>its derivatives.</td>
<td>Weeks 12 and 14: make-up laboratory practicals.</td>
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<tr>
<td>compounds: alcohols, enols and phenols. Classification, nomenclature</td>
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<td>and chemical properties of alcohols. Some important</td>
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alcohols. Organics halogen compounds.
Esters of alcohols formed with inorganic acids. Alcohols and phenols.

2nd semester (14 weeks)

**WEEK** | **LECTURE** | **SEMINAR** | **PRACTICE**
--- | --- | --- | ---
- detection of the double bond
- electrophilic substitution of aromatic compounds
- reactions of alcohols
Modeling of chirality.

- reactions of amines
- reactions of oxo compounds
- acidity and basicity of organic compounds

3. | Six-membered heterocycles with one heteroatom: nicotinamide, flavonoids. Six-membered heterocycles with two heteroatoms: pyrimidines, barbituric acid and barbiturates. Purines. Uric acid. Oxo compounds. Structure of the carbonyl group. Chemical reactions of aldehydes and ketones: addition and condensazion reactions. | Amines. | During weeks 4 to 11 students work in rotation and conduct one of the following experiments each week:
I) Complexometric determination of calcium and magnesium.
II) Photometric determination of iron.
III) Photometric determination of glucose.
IV) Kinetic examination of the hydrolysis of an ester.
V) Polarimetric determination of sugar.
VI) Quantitative determination of a protein by photometric method.


<table>
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<tr>
<th>Section</th>
<th>Content</th>
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MEDICAL PHYSICS AND STATISTICS

1st semester

Lecture
(2+1 hours a week)

Practice/Seminar
(2 hours a week)
Paired t-test, two-sample t-tests.
Assumptions. F test for testing equality of variances.
Thermal interaction between the human body and its environment. Temperature, its measurement, heat, heat transport. Statistical errors, the increase of Type I error, ANOVA models
Principles of fluid mechanics.
Models of linear and nonlinear regression. The significance of the correlation coefficient, hypothesis tests for the coefficients of regression line.
Physics of biological membranes, diffusion, osmosis.
Nonparametric tests using ranks.
Thermodynamic aspects of transport processes.
Contingency table, observed and expected frequencies, degrees of freedom, the chi-square test, assumptions. Special case: a 2x2 table. Odds ratio, relative risk.
Bioelectric phenomena: interpretation of resting membrane potential, changes in membrane potential in response to stimuli, action potential.
Diagnostic tests.
Electricity and magnetism in biological processes and diagnostics.
Survival analysis, life tables, Kaplan-Meier method.
Signal, signal processing, visualization.
Summary, case-studies.

Characterising sound waves: frequency, loudness, power.

Blood pressure measurement: Korotkoff-sounds, oscillometric method. Hydrostatic pressure of blood column.

Evaluation of the blood pressure measurement results

Make up practicals

2nd semester

Lecture
(2+1 hours a week)
Introduction. Therapeutic and diagnostic procedures.
Fundamentals of quantum mechanics.
Atomic physics. Atomic spectra.
Electromagnetic radiation. Luminescence.
Radiation basics, dosimetry.
Measuring dose. Absorption, scattering, reflection, interaction with matter.
Spectroscopy (optical, with an outlook to general spectroscopy).
Principles of LASER. Medical applications of lasers, laser – matter interaction.
Practical application of radioactive isotopes. Particle accelerators in the medical practice.
Radiological protection.
Medical imaging techniques: ultrasound, CT, MRI/NMR, PET, infrared diagnostics.

Practice/Seminar
(2 hours a week)
Electrophysiology II. ECG period / frequency, frequency spectrum, filtering. Unipolar and bipolar leads. Differential amplification.
Pulmonary function: flow and volume of inhaled and exhaled air (spirometry)
Measurement of the focal distance of optical lenses, visual acuity.
Electrodermal activity
**Physical basis of therapeutic methods:** laser -, light -, radio -, heat – therapy, therapeutic use of electricity. 
Physical methods in physiological research: microscopy (optical -, scanning -, electron -) mass spectrometry 
Molecular and cellular diagnostics: sedimentation, electrophoretic methods, flow cytometry 
Biophysics of the senses: vision, hearing. Relationship between stimulus and sensation.

**MEDICAL PHYSIOLOGY**
3rd semester

<table>
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<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tr>
<td>(6 hrs/week)</td>
<td>(2 hrs/week)</td>
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<tr>
<td>Blood tests: hematocrit (micro-, macro-), determination of hemoglobin concentration (Drabkin), erythrocyte sedimentation rate by Westergren, differential count (leukocytes), osmotic resistance of red blood cells, prothrombin time, blood groups (AB0, Rh), red blood cell count, white blood cell count, thrombocyte count (Fischer-Germer), reticulocyte count.</td>
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<tr>
<td>Blood tests: hematocrit (micro-, macro-), determination of hemoglobin concentration (Drabkin), erythrocyte sedimentation rate by Westergren, differential count (leukocytes), osmotic resistance of red blood cells, prothrombin time, blood groups (AB0, Rh), red blood cell count, white blood cell count, thrombocyte count (Fischer-Germer), reticulocyte count.</td>
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<tr>
<td>* Heart physiology.</td>
<td>* Heart physiology.</td>
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<tr>
<td>Studies of the circulatory system I.: video, in situ registration of the activity of the heart in the frog, effects of electrical and thermal stimulations of the heart, Stannius' ligatures, summation, all or none law, Goltz reflex.</td>
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<tr>
<td>Studies of the circulatory system II. Effects of ions (adrenaline, acetylcholine, atropine) on the heart, in the isolated rat heart preparation (Langendorf perfusion). The human circulatory and respiratory system: ECG, peripheral pulse, characteristics of the radial pulse, palpation over the chest, auscultation over the heart and lungs, the effects of physical exercise on circulation, spirometry, determination of inspiratory and expiratory pressures, effects of breathing on the circulation, cold pressor test, blood pressure measurement.</td>
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<tr>
<td>* Osmoregulation, volumen regulation.</td>
<td>* Osmoregulation, volumen regulation.</td>
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<td>* Respiration physiology.</td>
<td>* Respiration physiology.</td>
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* pH regulation.
* Gastrointestinal physiology.
* Thermoregulation.
* Sport/work physiology.

4th semester

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<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tr>
<td><strong>(4hrs/week)</strong></td>
<td><strong>(2 hrs/week)</strong></td>
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<tr>
<td>* CNS, introduction, transmitters</td>
<td>General information. Video (GI tract, liver). Collection of gastric juice, test meal (principle)</td>
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<tr>
<td>* Adrenal cortex. Thyroid gland</td>
<td>Pregnancy tests.</td>
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<tr>
<td>* Pancreas</td>
<td>Thorn's test (principle).</td>
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<tr>
<td>* Parath. gland Ca2+, adrenal medulla</td>
<td>The effect of insulin on blood glucose level.</td>
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</table>
* Emotions, limbic system
* Speech, hemispherical lateralization. Learning

HUNGARIAN LANGUAGE

1st semester

PRACTICE (4 hrs/week)
* Getting acquainted: Who are you? Where are you from? Conjugation of the verb ‘to be’, subject form of the personal pronouns.
* What is where in Szeged? Asking questions. Question words, existential sentences. Define and indefinite articles.
* Meeting students. The conjugation of verbs: present indefinite conjugation, singular forms. Cardinal numbers: telephone numbers and prices.
* Going shopping. The accusative form of nouns.
* Revision of grammar and vocabulary.
* Going to the cinema. Telling the time. Making an appointment. Plural forms of the verb (indefinite present tense). The postposition ‘előtt’.
* TEST 1
* A Sunday out: museum, theatre. The plural form of nouns and adjectives. Expressing possibility. The infinitive form.
* Buying cinema tickets. Practising the present tense indefinite conjugation. Some adverbial suffixes: -ba/-be (to, into), -ban/-ben (in)
* In a restaurant. Ordering a meal. Further adverbial suffixes: -hoz/-hez/-höz (to), -nál/-nél (at)
* General revision.
* TEST 2
* Oral tests

2nd semester

PRACTICE (4 hrs/week)
* My family: possessive suffixes, genitive structure.
* I have a...: Possessives+ case endings. Expressing possession.
* What is your friend like: describing people. Calendar, dates.
* Revision
* TEST 1
* Students life: review of indefinite conjugation. Transitive and intransitive verbs.
* Definite conjugation.
* Daily routine: verbal prefixes.
* Weather and seasons.
* General revision.
* TEST 2
* Preparation for the oral exam.
* Oral tests

3rd semester

PRACTICE (4 hrs/week)
* General revision.
* A weekend trip to Budapest. The comparative and superlative form of adjectives. Travelling by train. Sightseeing.
* Travelling abroad: revision of case endings and postpositions. Noun formation.
At the doctor's: kell, lehet, szabad, tilos. Suffix szor/szer/ször. Body parts.

Revision

TEST 1

Where were you in the summer: past tense conjugations.


Revision of grammar and vocabulary.

Revision of grammar and vocabulary.

TEST 2

Preparation for the oral exam

Oral tests

4th semester

PRACTICE

(4 hrs/week)

Services: possessive suffixes in the plural. At the pharmacy.

Private conversations: personal pronouns with case endings. Hat/het.

Revision of past and present tense conjugation.

Questions and question words.

Word order and complex sentences.

Grammar exercises and reading comprehension tasks.

TEST 1

Practising role-play and picture description.

Practising role-play and picture description.

Grammar exercises and reading comprehension tasks.

Grammar exercises and reading comprehension tasks.

Words originating from the same root (kezd, kezdődik etc.)

Revision of grammar and vocabulary.

Practising role-play and picture description.

LATIN

1st semester

PRACTICE

(2 hrs/week)

The role of the Latin language in medicine. Pronunciation. Groups of nouns - typical forms.


2nd declension. Examples from anatomy. Prepositions.

The verb.

Miscellaneous exercises on the covered subjects.

Mid-term test.


3rd declension nouns + adjectives ending in -us, -a -um.

Adjectives ending in -is, -e, -ns. Adjective formation.

Noun + adjective use (examples from anatomy).

Cardinals, their use. Clinical and pathological diagnoses.

Miscellaneous exercises on the covered subjects.

Final test.

Evaluation.

2nd semester

PRACTICE

(2 hrs/week)

Revision. Picking topics for weekly student presentations.

4th declension. Greek prefixes.

5th declension. Greek suffixes.

Comparison of adjectives. Examples from anatomy, pathology, physiology, clinical subjects.

Verbs in medicine, in medical prescription. Imperative. Greek elements in medicine.
BIOCHEMICAL BASICS OF PREVENTIVE MEDICINE

4th semester

LECTURE
(2 hrs/week)

* Introduction to preventive medicine (importance of nutrition, physical activity and stress in the development of „civilization diseases“)
* Biochemistry of oxidative stress and its importance in physiological and pathological processes (formation of free radicals and their effects)
* Antioxidant mechanisms (vitamins, vitaminlike substances, enzymes and their cofactors involved in antioxidant protection)
* Stress adaptation of the heart (early and late preconditioning)
* General importance of balanced nutrition (macro- and micronutrients, alimentary fibers; additives)
* Pathobiochemistry of atherosclerosis and possibilities of prevention
* Role of oxidative stress in respiratory diseases
* Role of free radicals and antioxidant protective mechanisms in physiological and pathological brain function
* Background and prevention of obesity, metabolic syndrome and diabetes mellitus
* Altered requirements for nutrients in physiological and pathological conditions; diets (theory and practice)
* Sport biochemistry: general importance of physical activity (oxidative stress and role of antioxidants; changes in blood plasma parameters)
* Psychological stress, oxidative stress, and importance of stress management
* Biochemical basics of preventive medicine in the light of the most recent medical literature (interactive seminar and test)
* Biochemical basics of preventive medicine in the light of the most recent medical literature (interactive seminar and test)

BIOCHEMISTRY SEMINAR

1st semester

LECTURE
(2 hrs/week)

* Characterization of proteins (protein structure, folding, chaperones, and central role of heat shock proteins)
* Enzimology (molecular mechanism of enzyme action, regulation of enzyme activity, enzyme classes, isoenzymes, coenzymes)
* Carbohydrate metabolism (alternative pathways, metabolism of galactose and fructose, patobiochemical aspects, glucuronic acid shunt)
* Carbohydrate metabolism (regulation of carbohydrate metabolism, regulation of blood glucose level, glucoproteins)
* Lipid metabolism (metabolism of phospholipids and sphyngolipids, detailed characterization of fatty acids, eikazoids)
* Lipid metabolism (metabolism of cholesterol and its derivative, transport of cholesterol, cardiovascular risk factors)
* Amino acid metabolism (N balance in human body, specialized products derived from amino acids)
* Amino acid metabolism (inherited disorders affecting amino acids and their diagnostics)
* Nucleic acid metabolism (drugs influencing nucleotide metabolism and patobiochemical aspects)
* Consultation.
* Citric acid cycle (central role in the metabolism, connection to other metabolic pathways)
* Terminal oxidation and oxidative phosphorylation
* Summary of metabolism

2nd semester

**LECTURE**
*(2 hrs/week)*

* General information
* Biochemistry of blood (pathobiochemistry of plasma proteins and biochemical background of blood coagulation)
* Biochemistry of blood (ion determination and blood-gas analysis)
* Inherited metabolic disorders
* Pathobiochemical aspects of connective tissue.
* Pathobiochemical aspects of adhesion receptors and cytoskeleton.
* Biochemical background of risk factors of cardiovascular diseases.
* Biochemistry of vision.
* Pathobiochemistry and diagnostics of liver.
* Pathobiochemistry and diagnostics of diabetes mellitus.
* Signaling
* Biochemistry of nutrition
* Molecular biology diagnostics
* Exam

**BIOINORGANIC CHEMISTRY**

2nd semester

**LECTURE**
*(1 hr/week)*

* Copper and its compounds. Copper-metalloenzymes and their role: cytochrome oxidase, superoxide dismutase, amine oxidases. Hemocyanin. Problems in the metabolism of copper.
* Halogens and their compounds. Biological role of fluoride ion, fluoroapatite. Biological role of chloride ions, chloride transport. Medical usage of iodine and its compounds.
* Phosphorus and its poisoning effect. Phosphoric acids. The role of high-energy phosphate bonds in the
energy production of cells.

CARDIAC ELECTROPHYSIOLOGY AS A BASIC PROPERTY OF CARDIAC FUNCTION

4th and 8th semester

LECTURE AND PRACTICE
(2 hrs/week)
* Introduction.
* Basic principles of electrophysiology, the impulse propagation in the heart I.
* Basic principles of electrophysiology, the impulse propagation in the heart II.
* The action potential of myocytes and the ionic channels determining the action potential I.
* The action potential of myocytes and the ionic channels determining the action potential II.
* Methods and techniques in cardiac electrophysiology.
* Electro-mechanical coupling in the heart I.
* Genetic background of ion-channel disturbances in the heart.
* Electro-mechanical coupling in the heart II.
* The mechanism of developing cardiac arrhythmias
* Electrophysiological changes after the disturbances in blood supply to the myocardium.
* Experimental methods and clinical relevance to investigate cardiac arrhythmias.
* Investigational techniques in cardiac cellular electrophysiology
* Practical and consultation

CYTOMORPHOLOGY AND MICROTÉCHNICS

1st semester, 3rd and 5th semester

LECTURE
(2 hrs/week)
* Intracellular compartmentalization. Structure of the cell membrane. The endomembranes. Membrane dynamics (membrane fusion and fission).
* Membrane modifications: cell surface modification (microvilli, stereocilia, cilia), coupling structures (belt-, spot-, hemidesmosome), impermeable junction (tight junction), communication junctions (gap junction, chemical synapse).
* The cell cycle. Growth and division of the cell. Mitotic and meiotic cell divisions.
* The endomembranes: endoplasmic reticular systems, Golgi complex. Targeted intracellular transport of proteins. The vesicular transport and secretion
* Mitochondria: general characteristics and types.

* Cyto- and histotechnics I. Nuclear / chromatin staining methods. Light- and electron microscopic enzyme histochemical methods.
* Cyto- and histotechnics II. Light- and electron microscopic immunocytochemical and –histochemical methods.
* Scanning electron microscopic techniques (freeze-etching, freeze-fracturing, etc.).

INTRODUCTION TO ANALYTICAL CHEMISTRY
**1st semester**

**LECTURE**
*(1 hr/week)*

- Definition of quantitative and qualitative analysis. Application of analytical chemistry: environment protection, clinical diagnosis, pharmacology, bioanalysis.
- SI Units, prefixes and base units. Types of concentration of solutions. Methods of analytical error calculation.
- Sensitivity of analytical methods. Definition. Sensitivity of different analytical methods.
- Gravimetry. Definition, steps, example. Advantages and drawbacks of gravimetric analysis.
- Volumetric analysis (titrimetry). Definition. Possible reactions, examples. Indication of the end-point of titration. Standardized solution.

**INTRODUCTION TO INFORMATICS**

**1st semester**

**LECTURE**
*(1 hr/week)*

Why do we learn and teach medical informatics?
The information system of the health.
History of computing hardware. (From the mechanical devices to supercomputers).
Software. The operating system, viruses.

Computer networks, internet, data protection.
Development and integration of software application. Data presentation, documents handling, spreadsheets, data analysis and reports.
Internet browsers, search engines, metadata, web documents, Web 2.0
Virtual reality. Telemedicine.

Integrated IT support of scientific research.
Data and information in health care. Health care data types: text, signs, images, sounds, videos, codes, medical code systems.
Integrated hospital information systems. (Database and standards). Digital medical image communication systems and standards (PACS, DICOM).
Digital medical images, basic image processing.
New trends in medical informatics. Advanced

**PRACTICE**
*(2 hrs/week)*

Hardware and software environment (login, rights, sharing resources) of the practice. ETR CooSpace.
Creating presentation: IT in health care.
Examination of medical data with spreadsheets (validation, sorting, filtering).
Evaluation of medical data with spreadsheets (calculations).
Evaluation of health information (functions, sub-total tables).
Health data presentation (tables, charts, graphs, images).

1st practical test

Literature reference; well-known databases and queries.

Documents

Formatting large documents templates and styles.

Advances document editing, embedding tables, graphs and images.

2nd practical test

Conclusion remarks and discussion of practical marks.
INTRODUCTION TO MEDICINE

1st semester

LECTURE/PRACTICE
(1 hr/week)/(1 hr/week)

* Health Philosophy and Behavioral Medicine I. Modern concept of health and disease
* Health Philosophy and Behavioral Medicine II. What influences health? The development of disease: Causal models
* Health Philosophy and Behavioral Medicine III. Stress, coping, culture and lifestyle
* Preventive Medicine and Public Health I. Community diagnosis. Describing health problems
* Preventive Medicine and Public Health II. Analyzing health problems. Risk perception and risk communication
* Preventive Medicine and Public Health III. Basic theories of prevention and health education. The role of screening in prevention
* History of medicine I. Earliest medicine, antique times
* History of medicine II. Medicine in Middle Ages, Renaissance, Enlightenment
* History of medicine III. Science and technology in the 19th-20th centuries
* Medical Ethics I. The Hippocratic oath
* Medical Ethics II. Ethics, morality and ethical theories
* Medical Ethics III. Basic principles of bioethics
* WRITTEN TEST EXAM

INTRODUCTION TO PSYCHOLOGY, BASICS OF NURSING

2nd semester

LECTURE
(1 hr/week)

* General prelude, the attitude, point of view of the curse, what is psychology, the relation between psychology and medicine. The necessity and traits of self-evaluation (self-image, assertive attitude, games people play, and it's solution)
* Block in basic and biological elements of psychology (Sensation and perception). The psychology of social interactions (Basic elements of perception: people, schemas, stereotypes, attributions, the point of view of individual psychology)
* The psychology of social interactions (Basic elements of social behavior – the effect of people's presence on human achievement, human groups and roles, the human mass's symptom)
* The psychology of social interactions (submission, diffusion of responsibility, conformity to the great mass, the effect of minority on the majority)
* General psychology (attention, memory, imagination, human consciousness, thinking)
* Motivation (human needs, sexual-, human arousal)
* Human values (The base of values - cognition, exploration, self-respect and respecting people), The born-out syndrome (how to protect our mental health and harmony)
* Emotions (the evolution of them, theories of

COMMUNICATION SKILLS (PRACTICE)
(2 hrs/week)

* Introduction, technical details
* Basic elements of communication
* Factors which disturb the communicational process I.
* Factors which disturb the communicational process II.
* Verbal communication I.
* Verbal communication II.
* Factors which disturb the communicational process III.
* Nonverbal communication I.
* Nonverbal communication II.
* Cultural presentation I.
* Cultural presentation II.
*Discussion
their functioning, the mechanism of facial feedback, and its practical utility)
* The personality (definitions, theories, the role of nature and nurture)
* The psychology of human development (The importance, sections, approaches of it)
* The mechanism of human behavior, the possibilities to take effect on it. Basic element of learning processes (Respondent or classical conditioning, Instrumental conditioning, complex – observational, and cognitive-behavioral – learning, and its practical utility)
* Summary of practical utilities of psychology – Questions and answers

**MEDICAL ANTHROPOLOGY**

4th semester

**PRACTICE**

(1 hr/week)
* Introduction to cultural and medical anthropology
* Cultural anthropology of anatomy and physiology (lay beliefs)
* Medical anthropology of stress and stress-related disease
* Medical anthropology of pain and nutrition
* Medical anthropology of sexuality and gynecology
* Cultural aspects of health care
* Medical anthropology of death and dying

**MEDICAL SOCIOLOGY**

3rd semester

**PRACTICE**

(2 hrs/week)
* What is sociology? Theories and perspectives in sociology.
* Role of behavioural sciences and medical sociology in medical education. Development, division, research fields of medical sociology.
* The medical profession.
* Professional socialisation among medical students.
* Gender differences among medical students in their professional socialisation. Role conflicts between family and professional roles.
* Illness behaviour. Going to the doctor.
* Sociology of disability.
* Labelling and stigma. Illness as deviance, primary, secondary deviance.
* Deviance behaviours. Theories of deviance: biological, physical, psychological, sociological theories.
* Stratification and class. Social mobility. Social causes of illness, social patterns of illness (social aetiology of disease).
* Families and intimate relationships. The life-course.
* Practice of medical sociological research methods. Strategy and research methods of medical sociology.

**MOLECULAR CYTOLOGY AND HISTOLOGY**

1st semester

**LECTURE**

(2 hrs/week)
* Connective tissue fibers: types, synthesis, occurrence in various organs and in the basement membrane. Staining of connective tissue fibers for routine histology and pathology.
* Muscle tissue: light- and electron-microscopical properties, and molecular composition. Endocrine function of muscle tissue.
* The teeth, the major salivary glands and the tongue: functional histology and electron-microscopical features. Innervation of salivary glands.
* The stomach and the intestines: light- and electron-microscopical properties, and microcirculation. Immune system of the alimentary tract.
* The liver, the bile system and the pancreas: functional histology and electron-microscopical features. Microcirculation and lymphatics of the liver. Innervation of the liver and the pancreas.

MOLECULAR DEVELOPMENTAL BIOLOGY

4th semester

**LECTURE**
(2 hrs/week)
* The molecular developmental aspect of medical biology
* General mechanisms of embryonic development
* The formation of body pattern (polarity, segment polarity, body domains) and appendix development
* Seminary (lectures 1-3)
* Cell movement and body formation in vertebrates, neural development
* The formation of the epiderm and its renewal from stem cells. Sensory epithel, airway system, gut and liver development.
* Seminary (lectures 5,6)
* Blood vesels and endothel cells, multipotent stem cells, blood cell renewal. Fibroblasts and their transformations. The movement and muscle types. The origin a nd potency of stem cells.
* Seminary (lecture 8)
* The cancer as a microevolutionary process.
* Tumor formation and its molecular background
* Seminary (lecture 10,11)
* The molecular biology of nutrition and life span
* Seminary (lecture 13)

NEUROCYTOLOGY

2nd semester

**LECTURE**
(2 hrs/week)
* History: discovery of the neuron and glial cells, neuron theory, the discovery of synapses and synaptic transmission
* Immunohistochemistry, in situ hybridization: pheno- and genotyping of neurons and glial cells
* The cytology of glial cells: astrocytes, oligodendrocyte, microglia, ependyma and choroid epithelium, Schwann cells, myelin sheath
* The morphology of the blood-brain barrier: ultrastructure of cerebral vessels, the regulation of cerebral circulation
* The structure of the neuron: axontransport, dendrite-transport, neurosecretion and neuroresorption
* Basic neuropathological processes: chromatolysis, Wallerian degeneration, hypoxia, neuronal damage
* The ultrastructure and types of synapses: chemical and electric synapses, types of vesicle, transmitters and receptors, the mechanism of the exocytotis of the synaptic vesicles
ANIMAL EXPERIMENTS IN MEDICINE

3rd, 4th, 5th, 6th, 7th, 8th, 9th or 10th semester

LECTURE
(2 hrs/week for 11 weeks)

* Introduction, general information. The theoretical background, history and significance of animal experiments in research. Animal models in biomedical research
* Ethical aspects and legal regulation of animal experiments
* Keeping, care, handling and transport of experimental animals. Biology, microbiological quality and diseases of the most frequently used laboratory mammals
* Euthanasia
* Planning and evaluation of experiments. Processing and analysis of experimental data. Statistical methods.
* Methods and animal models of circulation research
* Methods and animal models of microcirculation research
* Methods and animal models of neurobiological research
* Animal models in immunobiology

OUTBRED, INBRED AND GENETICALLY MODIFIED ANIMALS, CLONING

Written test exam

BODY DEVELOPMENT AND DISEASES - A MOLECULAR BIOLOGICAL BACKGROUND

4th semester

LECTURE
(2 hrs/week)

* The general mechanisms of animal development. Siamese twins, embryo deformities
* The formation of body pattern (polarity, segment polarity, homeotic genes), organ formation and appendages. Molecular base of appendage abnormalities
* Cell movements and body formation of vertebrates. The formation of body axis (situs inversus totalis).
* The neural development. The axonal growth cone, formation of the visual and auditory map, formation and processing of the synapse.
* The formation of the epidermis and its renewal from stem cells. Definition of stem cells, types of stem cells, use for therapies.
* The sensory epithelial development. Molecular evidence for renewal of connections between olfactory neurons and the bulb. The characteristics of renewal of auditory neurons and retinal neurons.
* The airways and the gut development. The mucociliary escalator and its connection with situs inversus. The renewal of intestine epithelial layer. The connection between the size of the liver and the whole body.
* Blood vessels and endothelial cells, the molecular drive of angiogenesis, VHL syndrome and hemangioblastoma.
* Renewal by multipotent stem cells: blood cell formation. Pathological migration of crista neuralis cells.
* Genesis, modulation and regeneration of skeletal muscle. Muscle size and quality, myopathies with functional defects, secondary muscle defects.
* Fibroblasts and their transformations: the connective-tissue cell family. Leptins and obesity, bone abnormalities, achondroplasia.
* Stem-cell origin and engineering, the main questions of stem cell therapy, the special renewal of the heart and brain.
* Cancer as a micro evolutionary process, features making cancer diagnosis problematic.
* The molecular base of cancer formation, the character of tumour cell formation, the definition of tumour, the contradictory nature of tumour stem cell.
* Nutrition and life span, the rules of proper nutrition, the likely genetic background of metabolic syndrome,
genes influencing life span.

## MATHEMATICAL AND STATISTICAL MODELLING IN MEDICINE

### 4th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tr>
<td>(1 hr/week)</td>
<td>(1 hr/week)</td>
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<tr>
<td>* Discrete (Poisson–) and continuous (exponential, Weibull–, normal and t-) distributions</td>
<td>Discrete (Poisson–) and continuous (exponential, Weibull–, normal and t-) distributions</td>
</tr>
<tr>
<td>* Ratios, proportions and rates in epidemiology</td>
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<tr>
<td>* Conditional probability, testing proportions: the relative difference</td>
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</tr>
<tr>
<td>* One- and Two-way ANOVA</td>
<td>One- and Two-way ANOVA</td>
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<tr>
<td>* Repeated measurement ANOVA</td>
<td>Repeated measurement ANOVA</td>
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<tr>
<td>* Nonparametric ANOVA. Kruskall-Wallis, Jonckheere-Terpstra and Nemenyi tests</td>
<td>Nonparametric ANOVA. Kruskall-Wallis, Jonckheere-Terpstra and Nemenyi tests</td>
</tr>
<tr>
<td>* Logistic and Poisson regression models (ROC curves)</td>
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<tr>
<td>* Harmonic trend and seasonality (Edward and Walter-Elwood test, logistic regression and Cosinor method)</td>
<td>Harmonic trend and seasonality (Edward and Walter-Elwood test, logistic regression and Cosinor method)</td>
</tr>
<tr>
<td>* Area under curve methods</td>
<td>Area under curve methods</td>
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<tr>
<td>* Non-linear regression models (Michaelis-Menten kinetics, RIA, Scatchard plots)</td>
<td>Non-linear regression models (Michaelis-Menten kinetics, RIA, Scatchard plots)</td>
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<tr>
<td>* Internal and external quality control methods</td>
<td>Internal and external quality control methods</td>
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<tr>
<td>* Decision and cost-effectiveness analysis with probabilities.</td>
<td>Exam</td>
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## MOLECULAR MEDICINE

### 5th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tr>
<td>(1 hr/week)</td>
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<tr>
<td>* Molecular genetic and cell biology methods in diagnosis and therapy.</td>
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<tr>
<td>* Diagnostic methods based on immunological techniques (RIA, ELISA, Western blot analysis, immunocytology, citotoxicity tests, etc.).</td>
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<tr>
<td>* Diagnostic methods based on nucleic acid hybridization (Northern and Southern analysis, in situ hybridization, DNA chip technology, etc.).</td>
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<tr>
<td>* Diagnostic methods based on specific endonuclease activity (fragment length polymorphism, pedigree analysis, etc.).</td>
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<tr>
<td>* Gene sequencing and analysis, genomic and proteomic techniques. Cell and tissue culture methods.</td>
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<tr>
<td>* Gene therapy, viral vectors, DNA-liposome complexes.</td>
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<tr>
<td>* Molecular markers in human disorders. Biomarkers for neurological and psychiatric disorders.</td>
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<tr>
<td>* Molecular interactions between pathogens and host.</td>
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</table>

## MICROBIOLOGY I.

### 4th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
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<tbody>
<tr>
<td>(3hrs/week)</td>
<td>(2 hrs/weeks)</td>
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</table>
General Characteristics of viruses, viral replication, antiviral therapy
Structure of viruses and classification
* Herpesviridae
* Papilloma and polyoma viruses
* Poxviridae, Rhabdoviridae
* Orthomyxoviridae, Paramyxoviridae
* Retroviridae
* Picornaviridae
* HIV
* Reoviridae, Astroviridae, Coronaviridae

Preparation of bacterial smear. Simple and Gram staining.
Ziehl-Neelsen, Schaffer-Fulton and Neisser staining
Methods of sterilization. Sterility testing
Methods for counting bacteria.
Methods for disinfection
Serological reactions I. (precipitation, CFT)
Serological reactions II.
Agglutination, ELISA.
Laboratory methods for detection of cellular immunity
MTO
Bacteriophages, Molecular methods
Virology I. Cultivation of viruses
Virology II. Quantification of viruses
Virology III.
HAG, ELISA, IF
Neutralization test
Antimicrobial susceptibility testing
Consultation

**Immunology I.**

**4th semester**

**LECTURE**

*(2hrs/week)*

* Introduction to immunology. Basic principles
* Phagocytic cells, phagocytosis. Innate immunity
* The structure and activation of the complement system
* Ontogeny of B cells. Antigen recognition
* B cell activation. Humoral immune response
* Ontogeny of T cells. Antigen recognition
* Major histocompatibility complex (MHC)
* Antigen processing
* Cytokines I.
* Cytokines II.
* Hypersensitivity reactions
* Tumor immunity
* Transplantation immunity
* Tolerance, autoimmunity
# SYLLABUSES
## PRE-CLINICAL MODULE - MEDICINE

### CLINICAL DIAGNOSTICS I. – INTERNAL MEDICINE

#### 5th semester

**LECTURE**

**Basics of Haematology**

*(2 hrs/week)*

- Case history, documentation
- Inspection, palpation
- Percussion, auscultation
- Fever, pulse, blood pressure
- Heart sounds
- Electrocardiography
- Electrocardiography
- Echocardiography
- Modern cardiological investigative methods
- Abdominal sonography
- Modern gastroenterological investigative methods
- Physical examination in ophthalmology
- Physical examination in neurology
- Consultation

**PRACTICE**

*(2 hrs/week)*

- General introduction and guide to the practicals in internal medicine
- Documentation, taking history
- Elements of physical examination: practical aspects of inspection, palpation
- Elements of physical examination: practical aspects of percussion and auscultation
- Elements of physical examination: feeling pulse, checking blood pressure, taking temperature
- Listening to the heart and chest
- Basic aspects of electrocardiography. Developing skills in PE
- Practical electrocardiography. Developing skills in PE
- Practical electrocardiography. Developing skills in PE
- Abdominal sonography
- Practical echocardiography. Developing skills in PE
- Practical echocardiography. Developing skills in PE
- Abdominal sonography
- Physical examination in neurology. Developing skills in PE
- Consultation

### CLINICAL DIAGNOSTICS II. – SURGERY

#### 6th semester

**Lecture**

- The origins and development of surgery
- Observation and documentation of surgical patients
- The shock. Basic mechanism and clinical profile
- The circulatory shock
- The basis of fluid and electrolyte therapy in surgical patients
- Blood transfusion
- Bleeding and haemostasis
- The significance and role of asepsis and antisepsis in the practice of surgery
- Surgical infections. Modern antibiotic treatment
- Types of wounds and the basic principles of wound healing
- Perioperative complications
- Parenteral feeding
- Surgical oncology
- The possibilities and practice of organ transplantation
- Video demonstration of surgical procedures

**Practice/Seminar**

- Demonstration and investigation of surgical patients
- Demonstration and investigation of surgical patients
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- Demonstration and investigation of surgical patients
ETHICS IN MEDICINE

6th semester

LECTURE/PRACTICE
(1 hr/week)/(2 hrs/week)
* Introduction to Medical Ethics. Laws and Morals
* Basic Ethical Theories, Principles of Bioethics.
* Informed Consent
* Moral dilemmas in reproductive medicine. Family planning
* Reproductive medicine (cont.)
* Moral aspects of pediatrics
* Ethical aspects of medical genetics
* Surgery. Pain. Transplantation from living donors
* Euthanasia – a non – medical approach
* AIDS
* Cloning
* Research on human subjects. Patients’ rights and health care system
* Consultation

INTERNAL MEDICINE I.

6th semester

LECTURE
(4 hrs/week)
* Esophageal disorders
* Peptic ulcer disease
  Functional dyspepsia
* Gastrointestinal hormones
  Gastric Cancer
* Chronic hepatitis
  Cirrhosis of the liver I.
  (etioloogy, symptoms)
* Cirrhosis of the liver II
  (complications, therapeutical options)
* Diseases of the biliary system I
* Diseases of the biliary system II
  Acute pancreatitis
  Chronic pancreatitis
  Pancreatic cancer
* Pathomechanisms of
  Inflammatory Bowel Disease
  Crohn’s disease and Ulcerative Colitis
* Tumors of the large intestine
  Malabsorption syndrome
  Irritable Bowel Syndrome
  Diabetes mellitus (etioloogy,

PRACTICE
(2 hrs/week)
* Problem oriented evaluation of the symptoms of patients with esophageal disorders
* Practical aspects of the functional evaluation of patients with esophageal disorders (esophageal manometry, 24 h pH-metry, evaluation of the biliary reflux)
* Upper gastrointestinal endoscopy
* Symptomatic evaluation of the liver patient.
  Problem oriented laboratory investigation of the liver patient.
* Symptoms of biliary obstruction, investigative methods for patients with biliary obstruction (symptoms, biochemistry, ultrasonography, ERCP)
  Symptoms of patients with acute pancreatitis
  Diagnostic work up of patients with chronic pancreatitis and pancreatic cancer
  Diagnostic work up of patients with CU and Crohn’s disease.
  Early identification of patients with colorectal cancer. Diagnostic methods.
  Symptoms of malabsorption, maldigestion, Diagnostic workup: Hydrogen, c13 urea and starch breath tests
MEDICAL PSYCHOLOGY I.

6th semester

LECTURE/PRACTICE
(1 hr/week)/(1 hr/week)

* Lecture:
  1. Introduction: Medical psychology and border areas
  2. The psychological process of becoming ill
  3. Stress, in the light of evolution
  4. Coping with stress and illness
  5. Patients' representations and beliefs about illness
  6. The role of personality in the changes of health status
  7. The influences of gender and age on health behaviors
  8. Psychological aspects and management of pain
  9. Chronic illness and social support
 10. Hospitalization
 11. The prevention and management of burnout among health professionals
 12. Adherence in the patient–physician relationship

* Practice:
  1. Patient-centered medicine, Biopsychosocial approach to illness
  2. Understanding the Whole Person
  3. Skill lab practice
  4. Enhancing the Patient-Doctor Relationship, CLASS modell
  5. Finding Common Grund
  6. Being realistic, Burnout prevention

MICROBIOLOGY AND IMMUNOLOGY

5th semester

LECTURE
(3 hrs/week)

* Introduction to microbiology.
  Characterization and classification of bacteria.
  Structure of bacteria. Growth and nutrition of bacteria.

* Introduction to immunology. Basic Principles.
  Ontogeny of T cells. Antigen recognition.
  Major histocompatibility complex (MHC)
  Ontogeny of B cells. Antigen recognition.
  B cell activation. Humoral immune response
  Antigen processing. MHC I, MHC II.

* Phagocytic cells, phagocytosis. Innate immunity.
  The structure and the activation of the complement system.

PRACTICE
(2 hrs/week)

* Introduction to microbiology.
  Laboratory safety. Aseptic techniques.
  Wet-mount preparation
  Preparation of bacterial smear.
  Simple and Gaim staining.
  Ziehl-Neelsen, Schaffer-Fulton and Neisser staining
  Culture media.
  Preparation of blood agar.
  Methods of sterilization. Sterility Testing
  Colony Morphology
  Handling bacterial cultures
- Hypersensitivity reactions
  - Microbiology antigens.
- Transplantation and immunity.
  - Tolerance, autoimmunity.
- Immune response against pathogens
  - Tumor immunity.
- Cytokines I.
  - Cytokines II. Adhesion molecules.
  - Pathogenesis of bacterial infection
- Staphylococcus.

- Antimicrobial chemotherapy I.
- Antimicrobial chemotherapy II.
- Streptococcus.
- Neisseria.
- E.coli.
- Shigella, Proteus.
- Microbial genetics
  - Consultation

6th semester

**LECTURE**

(3 hrs/week)

* Brucella. Listeria Yersinia. Francisella.
  - Human pathogenic Salmonellae
  - Burkholderia, Pseudomonas
* Anaerobic bacteria.
* Corynebacterium
* Mycobacterium, Legionella
  - Bordetella, Haemophilus
* Treponema, Leptospira, Borrelia
  - Bacillus
* Mycoplasma, Chlamydia.
  - Rickettsia.
* General characteristics of viruses, viral replication, antiviral chemotherapy.
  - Structure of viruses and classification
* Herpesviridae
  - Papilloma and ployma viruses
* Orthomyxoviridae, Paramyxoviridae
  - Togaviridae, adenoviridae
* Retroviridae, HIV
  - Poxviridae, Rhabdoviridae
* Hepatitis viruses, Flaviviridae
  - Slow viruses.

**PRACTICE**

(2 hrs/week)

* Safety rules,
  - Yersinina, Salmonellae, Shigellae
* Pseudomonas, Camplyobacter,
  - Heliobacter
* Listeria, Bacillus
* Mycobacterium, Haemophilus
* Corynebacterium, Bordetella
* Bacteroides. Clostridium. Mycoplasma.
  - Leptospira.
* Bacteriophages. Molecular methods
* Clinical bacteriology
* Vaccination
* Virology I. Cultivation of viruses
  - Signs of Viral Replication
* Virology II.
  - Quantification of viruses
  - Virus serology (HAG, ELISA, IF)
  - Neutralization test
* Bunyaviridae, Filoviridae, Arenaviridae,
  - Parvoviridae
* Protozoa, helminthes.
* Mycology
### PATHOLOGY

#### 5th semester

<table>
<thead>
<tr>
<th>LECTURE (3 hrs/week)</th>
<th>SEMINAR (1 hour/week)</th>
<th>PRACTICE (2 hrs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Pathology of inflammation I. Pathology of inflammation II. Pathology of inflammation III. Pathology of inflammation IV. Tissue repair. Wound healing.</td>
<td>Pathology of inflammation</td>
<td>Histopathology of degeneration/Autopsy</td>
</tr>
<tr>
<td>* Diseases of the lung I. Diseases of the lung II. Diseases of the lung III. Oral pathology Gastrointestinal pathology</td>
<td>Nephropathology</td>
<td>Repetition/Autopsy</td>
</tr>
<tr>
<td>* Diseases of the lung I. Diseases of the lung II. Diseases of the lung III. Oral pathology Gastrointestinal pathology</td>
<td>Diseases of the lung</td>
<td>Autopsy/Repetition</td>
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<tr>
<td>6th semester</td>
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<tr>
<th>LECTURE (2 hrs/week)</th>
<th>SEMINAR (1 hr/week)</th>
<th>PRACTICE (3 hrs/week)</th>
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<tbody>
<tr>
<td>* Gastrointestinal pathology.</td>
<td>Gastrointestinal pathology.</td>
<td>Histopathology of the</td>
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<tr>
<td>Pathology of the liver.</td>
<td>Pathology of the liver.</td>
<td>cardiovascular system/Autopsy Histopathology of the respiratory tract/Autopsy Histopathology of the gastrointestinal system/Autopsy Histopathology of the liver and pancreas/Autopsy</td>
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<tr>
<td>Pathology of the biliary tract and pancreas.</td>
<td>Pathology of the biliary tract and pancreas.</td>
<td>Histopathology of the biliary tract/Autopsy Pathology of the biliary tract and pancreas/Autopsy Pathology of the pancreas/Autopsy</td>
</tr>
<tr>
<td>Pathology of soft tissue tumours. Pathology of the bones, joints and muscles.</td>
<td>Pathology of soft tissue tumours. Pathology of the bones, joints and muscles.</td>
<td>Histopathology of the soft tissue/Autopsy Pathology of the bones, joints and muscles/Autopsy</td>
</tr>
<tr>
<td>Endocrine pathology I.</td>
<td>Endocrine pathology</td>
<td>Haematohistopathology/Autopsy Histopathology of the urogenital tract/Autopsy</td>
</tr>
<tr>
<td>Endocrine pathology II.</td>
<td>Endocrine pathology</td>
<td>Histopathology of the bones, joints and muscles/Autopsy</td>
</tr>
<tr>
<td>Pathology of female genital system I.</td>
<td>Pathology of female genital system I.</td>
<td>Histopathology of the female genital tract/Autopsy</td>
</tr>
<tr>
<td>Pathology of female genital system II. Breast pathology.</td>
<td>Pathology of female genital system II. Breast pathology.</td>
<td>Histopathology of the female breast/Autopsy Endocrine histopathology/Autopsy</td>
</tr>
<tr>
<td>Neuropathology I.</td>
<td>Neuropathology</td>
<td>Repetition/Autopsy</td>
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<tr>
<td>Neuropathology II.</td>
<td>Neuropathology</td>
<td>Repetition/Autopsy</td>
</tr>
<tr>
<td>Immune pathology</td>
<td>Immune pathology.</td>
<td>Immune pathology.</td>
</tr>
<tr>
<td>Pathology of male genital system.</td>
<td>Pathology of male genital system.</td>
<td>Repetition/Autopsy</td>
</tr>
<tr>
<td>Haematopathology I.</td>
<td>Haematopathology</td>
<td>Repetition/Autopsy</td>
</tr>
<tr>
<td>Haematopathology II.</td>
<td>Haematopathology</td>
<td>Repetition/Autopsy</td>
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**PATHOPHYSIOLOGY**

5th semester

**LECTURE**

*(3 hrs/week)*

* Introduction to Pathophysiology; Basics of ECG

* Inflammation I.: Definition, causes and forms of inflammation. Mediators of acute inflammation.

* Inflammation II.: Cellular elements of acute inflammation. Regulation and outcome of acute inflammation.

* Inflammation III.: Chronic inflammation. Local and generalized reactions of inflammation: fever, inflammatory pain.


* Endocrinology I.: Diseases of hypothalamus, adenohypophysis, thyroid, and adrenal (cortex and medulla) glands.

**PRACTICE/SEMINAR**

*(2 hrs/week)*


Review of physiologic background of normal ECG. Registration and analysis of ECG Determination of spirometric parameters. (Lecture topic of the 1st week).

Seminar: Inflammation I. (Lecture topic of the 2nd week).

Seminar: Inflammation II. (Lecture topic of the 3rd week).

Seminar: Inflammation III. (Lecture topic of the 4th week).

Seminar: Pathophysiology of leukocytes I.: Immunology Arrhythmias I. (Lecture topic of

Arrhythmia II.: Bradyarrhythmias and blocks.

Starvation and obesity. Diabetes mellitus I: definition, diagnosis and classification.

Diabetes mellitus II: Type 1 and 2 diabetes mellitus pathogenesis and consequences. Hypoglycemia.

Arrhythmia III.: Tachyarrhythmias.

Cardiovascular system I.: Pathophysiology of plasma lipoprotein metabolism. Atherosclerosis (development and consequences).

Cardiovascular system II.: Pathophysiology and ECG of acute coronary syndromes: angina pectoris, myocardial infarction, sudden ischemic death.

Cardiovascular system III.: Hypertension (essential & secondary) development, risk factors and consequences. Congenital heart diseases I.

Cardiovascular system IV.: Congenital heart diseases II. Adaptation of the heart, hypertrophy. Mitral, aortic stenosis and regurgitation. Compensated and decompensated heart function, left, right and combined heart failure.


6th semester

LECTURE
(3 hrs/week)


Pathophysiology of kidney diseases II.: Major glomerular diseases: nephrotic and nephritic syndrome, RPGN, asymptomatic and chronic GN. Chronic renal failure. Tubular transport diseases. Pathophysiology of salt-water balance I. hyper- and hyponatremia

Seminar: Endocrinology I. (Lecture topic of the 6th week).

Seminar: Endocrinology II. Arrhythmias II. (Lecture topic of the 7th week).

Seminar: Starvation, obesity Diabetes mellitus (Lecture topic of the 8th week).

Seminar: Diabetes mellitus, hypoglycemia. Arrhythmias III. (Lecture topic of the 9th week).

Seminar: Cardiovascular system I. (Lecture topic of the 10th week).

Seminar: Cardiovascular system II. ECG: Myocardial ischemia, injury and infarction (Lecture topic of the 11th week).

Seminar: Cardiovascular system III. (Lecture topic of the 12th week). ECG: Hypertrophy and repetition of ECG

Seminar: Cardiovascular system IV. (Lecture topic of the 13th week).

PRACTICE/SEMINAR
(2 hrs/week)

Safety regulations.

Seminar: Thermoregulation. (Please download and study the material from our website or coospace, before class).

Seminar: Kidney diseases I., Pathophysiology of salt-water balance I. (Lecture topic of the 1st week)

In the practice room:
Investigation of urine and renal function: proteinuria, hematuria, pyuria, hemoglobinuria, ketone bodies, urobilinogen, urine sediment
* **Pathophysiology of salt-water balance II.** Volume excess, development of edemas. Changes of potassium, calcium, magnesium, phosphate, chloride and trace elements under pathological conditions; ECG signs of electrolyte disturbances.  

**Seminar:** Pathophysiology of salt-water balance I (Lecture topic of the 2nd week)  
**In the practice room:** Investigation of urine and renal function: proteinuria, hematuria, pyuria, hemoglobinuria, ketone bodies, urobilinogen, urine sediment and casts.

* **Pulmonary diseases I:** Abnormal breathing patterns, dyspneas. Obstructive pulmonary diseases: CODP, asthma bronchiale, cystic fibrosis, bronchiectasis, bronchiolitis acuta.  

**Seminar:** Pathophysiology of pulmonary diseases II (Lecture topic of the 3rd week)

* **Pulmonary diseases II:** Restrictive pulmonary diseases, hypoxias, disorders of pleura, pulmonary edema, hypertension, embolisation, hypoxic conditions, respiratory failure. Cor pulmonale.  

**Seminar:** Pathophysiology of pulmonary diseases I. (Lecture topic of the 4th week).


**Seminar:** Pathophysiology of pulmonary diseases II. (Lecture topic of the 5th week).

* **Gastrointestinal diseases I.:** Nausea, vomiting, dysphagia. Abnormalities of gastric juice secretion, peptic ulcer.

**Seminar:** Disturbances of acid-base metabolism (Lecture topic of the 6th week).

* **Gastrointestinal diseases II.:** Diseases of absorption, diarrhea, constipation: Irritable bowel syndrome. Intestinal obstruction. Acute and chronic pancreatitis.

**Seminar:** Gastroenterology I. (Lecture topic of the 7th week).


**Seminar:** Gastroenterology II. (Lecture topic of the 8th week).

* **Pathophysiology of leukocytes II.:** Leucopenia. Proliferative diseases: reactive and malignant diseases (leukemias, lymphomas).

**Seminar:** Pathophysiology of liver diseases (Lecture topic of the 10th week).

* **Red blood cell diseases I.:** Anemias - ineffective erythropoiesis, blood loss, hemolysis.

**Seminar:** Pathophysiology of leucocytes II. (Lecture topic of the 11th week)

* **Hemostasis:** Bleeding disorders (platelet, vascular, clotting factor disturbances), thrombosis and embolism.

**Seminar:** Anemias (Lecture topic of the 12th week).  
**In the practice room:** Determination of WBC, RBC, platelet, eosinophyl and reticulocyte count. Staining and analysis of blood smear.

* **Pathophysiology of the CNS I.:** Multiple sclerosis, neurodegenerative diseases: Alzheimer’s, Parkinson’s and Huntington’s disease. Circulatory diseases of the CNS.

**Seminar:** Hemostasis (Lecture topic of the 13th week).  
**In the practice room:** Determination of WBC, RBC, platelet, eosinophyl and reticulocyte count. Staining and
* **Pathophysiology of the CNS II:** Cerebral edema. Pain, headaches, seizures and epilepsy.

**Seminars:** Pathophysiology of the CNS. (Lecture topic of the 14th week).

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**HUNGARIAN LANGUAGE**

5th semester

**PRACTICE**  
(2 hrs/week)

* Introduction to the course. The name of various clinical departments, the medical and nursing staff working there. Revision of the Present Tense.
* Introduction to history taking. The parts of the case history. Asking and answering questions concerning present condition and pain: location, type, and duration, aggravating and relieving factors. Yes/No questions.
* Asking the patients about previous hospitalisation and operations, major health problems, childhood diseases and vaccination. Revision of the Past Tense. Wh-questions.
* Taking family and social history. Revising family relations, marital status, harmful habits (e.g. smoking, uncontrolled alcohol consumption, illegal drugs, excessive caffeine intake). Revising numbers and measurements.
* Practising basic doctor-patient situations: role-play, history taking. Asking about presenting symptoms/present complaints, past history, family and social history.
* Asking the patient about dizziness, sweating, nausea or vomiting. Revision of Adjectives and Adverbs. Practising the Comparative and the Superlative.
* Interviewing the patient about dyspnoea, cough and sputum. Revision of the Future Tense. Mid-term test.
* Questions and answers concerning heart complaints and oedema of the legs. Revision of the Definite and Indefinite Articles.
* Practising doctor-patient situations: role-play, history taking. Briefing simple English case histories in Hungarian.
* Asking the patient about appetite, stools and urine. Revision of Modifiers and Quantifiers, and the vocabulary concerning food and drinks.
* Questioning the patient about changes in his/her temperature. Questions about having fever, measuring fever and decreasing high temperature. Revising the vocabulary concerning the main parts of the body.
* General instructions to patients during physical examination. The polite way of giving instructions. Revision of the Imperative Voice.
* The most common conditions and diseases in Internal Medicine in Hungary: diseases of the digestive, cardiovascular and respiratory systems.
* Practising doctor-patient situations: role-play, history taking. Briefing English case histories taken from the field of Internal Medicine in Hungarian. Final tests (written and oral).

6th semester

**PRACTICE**  
(2 hrs/week)

* The type of drugs/medicines. Internally and externally administered drugs. Vocabulary expansion concerning forms of medicines and their containers.
* The effect of drugs. Most common adverse effects. Explaining to patients how to take the prescribed medicines. General instructions.
* Practising doctor-patient communication: role-play, history taking and giving advice to patients concerning medication. Reading simple Hungarian case histories taken from the field of Internal Medicine.
* Surgery. Interviewing the patient at the Surgery Department. General and more specific questions. Parts of the digestive tract.
* The most common problems of the digestive tract. Role-play, history taking of patients with analysis of blood smear.

* Interviewing patients with complaints referring to herniation. Chronic conditions in the colon: tumours of the large intestine and rectum. Sending patients for further investigations. Vocabulary concerning basic imaging techniques. Mid-term test.

* Practising doctor-patient communication at the Surgery department: role-play, history taking and discussing possible surgical intervention with the patient. Revising the Conditional Mood. Briefing simple English case histories taken from the field of Surgery in Hungarian.

* Interviewing patients who suffer from problems of the thyroid gland.


* Discussing the most common vascular problems. Interviewing patients with hypertension, vasoconstriction and varicose veins. Giving instructions concerning life style and medication. Discussing and arguing with patients.

* Acute cases of the vascular system: embolism and thrombosis. Interviewing patients presenting with symptoms of embolism and thrombosis. Management of acute cases.

* Patients at the Traumatology department. Home, road and sports accidents. Asking patients about conditions caused by accidents. Explaining medical procedures and giving advice to patients.

* Practising doctor-patient communication: role-play, history taking and giving advice to patients concerning treatment and medication. Reading simple Hungarian case histories taken from the field of Surgery and Traumatology.

* Revision. Practising doctor-patient situations that can emerge in the Internal Medicine, Surgery and Traumatology department. Interviewing and examining patients, sending them for further investigations, giving advice on diet, life style and medication. Final tests (written and oral).

**ADVANCED SURGICAL SKILLS**

5th, 6th, 7th, 8th, 9th or 10th semester

**LECTURE**

(2 hrs/week)


**PRACTICE**

(4 hrs/gr./every 2nd week)

Scrubbing. Basic knotting and suturing techniques.

Advanced suturing techniques. Would closure techniques with multiple layers. Enterotomy. Intestinal anastomosis


Advanced forms of surgical hemostasis and suturing techniques on a large animal model. Tracheostomy. Laparotomy
Minimally invasive surgery I. Technical background. Equipments and instruments. Robotic and fetoscopic surgery


Written test exam

BASICS OF EMERGENCY MEDICINE
6th semester

LECTURE
(2 hrs/week)


* Monitoring of oxygenation and hypoxia. Inadequate external respiration, O₂ transport, internal respiration. Hypoxemia, tissue hypoxia, subcellular hypoxia (etiology, pathophysiology, clinical signs and symptoms). Tissue oxygenation and wound healing. Clinical assessment of tissue hypoxia. Diagnostic assessment of oxygen delivery, extraction, requirement and consumption. Monitors of hypoperfusion-associated hypoxia and tissue oxygenation (tissue oxymeter, Clark electrode, near

PRACTICE
(4 hrs/gr./every 2nd week)


infrared spectroscopy); organ perfusion (macrocirculation: angiography and flowmetry; microcirculation: intravital microscopy, orthogonal polarization spectral imaging) and mucosal pCO₂ (clinical tonometry). Blood acid-base status, blood gas analysis. Extracorporeal membrane oxygenation

* Written test exam


**MICROSURGERY**

* General information. introduction to microsurgery (1 hrs)
* Indications of microsurgery. Personal and technical conditions of microsurgery. Asepsis in microsurgery (2 hrs)
* Clinical applications of microsurgery (2 hrs)
* The operating microscope (1 hr)

**PRACTICE**

* Appropriate posture at the operating microscope and the adjustment of the microscope. Movement coordination of the hands: interlacing threads under microscope (1 hr)
* Tying basic microsurgical knots under macroscopic and microscopic conditions (2 hrs)
* Basic suturing techniques, sutures of vessels and nerves (2 hrs)
* Stitching and tying knots with microsurgical instruments on rubber gloves (3 hrs)
* Stitching and tying knots with microsurgical instruments on rubber gloves (2hrs)
* Suture of tubes (3 hrs)
* Suture of tubes (3 hrs)
* End-to-end anastomosis of rat carotid artery ex vivo (3 hrs)
* End-to-end anastomosis of rat carotid artery ex vivo (3 hrs)

**MOLECULAR MEDICINE**


**5th semester**

**Lecture**  
(2 hrs/week)  
* Molecular genetic and cell biology methods in diagnosis and therapy.  
* Diagnostic methods based on immunologic techniques (RIA, ELISA, Western blot analysis, immunocytochemistry, citotoxicity tests, etc.).  
* Diagnostic methods based on nucleic acid hybridization (Northern and Southern analysis, in situ hybridization, DNA chip technology, etc.).  
* Diagnostic methods based on specific endonuclease activity (fragment length polymorphism, pedigree analysis, etc.).  
* Gene sequencing and analysis, genomic and proteomic techniques, cell and tissue culture methods.  
* Antisense pharmacology. Small interfering RNA. Molecular chaperons.  
* Gene therapy, viral vectors, DNA-liposome complexes.  
* Molecular markers in human disorders.  
* Biomarkers for neurologic and psychiatric disorders.  
* Molecular interactions between pathogens and host.  
* Stem cell therapy. Embryonal and adult stem cells.  
* In vitro differentiation of stem cells to the desired phenotype. Transfection of stem cells.  
* Regulation of cell cycle and cell differentiation. Regulation of transcriptional and translational control of gene expression.  
* Telomerase-directed molecular therapy.  
* Bioinformatic and computer-assisted methods in diagnosis and therapy: functional genomics and proteomics.

**6th semester**

**Lecture**  
(2 hrs/week)  
* Introduction to laboratory medicine  
  Preanalytical processes, test requesting, sampling, common preanalytical errors  
  Analytical processes: quality control, traceability of measurements, precision, biological variation, reference range, point of care testing.  
  Postanalytical processes: interpretation of results, sensitivity, specificity, predictive values, pre- and post-test probability, clinically significant change values, alarming or critical values, evidence based laboratory medicine  
* Visit at the Department of Laboratory Medicine  
* Acid-base balance disorders  
* Laboratory diagnosis of coagulation disorders  
  Basic coagulation tests, monitoring of anticoagulant therapy, testing for congenital and acquired thrombophilias  
* Laboratory diagnosis of sodium and water metabolism  
  Hypo- and hypernatremia: causes and differential diagnosis, SIADH, diabetes insipidus, laboratory diagnosis of oedema. Effect of diuretics on sodium and water balance, disorders of osmolar regulation  
* Disorders of potassium metabolism  
  Hypo-, and hyperkalemia: causes and differential diagnosis, diagnostic algorithms and treatment  
* Laboratory diagnosis of liver diseases  
* Endocrinology I.  
  Laboratory diagnosis of disorders of endocrine regulation. Diseases of hypothalamus, hypophysis, thyroid and parathyroid glands.  
* Endocrinology II.  
* Laboratory diagnosis of disorders of the adrenal gland and the reproductive system  
* Laboratory diagnosis of disorders of lipid metabolism  
* Laboratory diagnosis and monitoring of diabetes mellitus  
* Laboratory diagnosis of renal diseases
Laboratory tests of glomerular and tubular functions, laboratory diagnosis of proteinuria, acute and chronic renal failure, nephrosis syndrome, differentiation of distal and proximal renal tubular acidosis.

Laboratory diagnosis of myocardial infarction and acute coronary syndrome.


**BASICSURGICAL SKILLS**

5th semester

**LECTURE**
*(2 hrs/every 2nd week)*


**PRACTICE**
*(2 hrs/gr./every 2nd week)*


* Basic surgical instruments, suture materials, textiles. Scrubbing, gowning and gloving. Scrub preparation and draping of the surgical site. Tying surgical knots (hand and instrument knots).

* Basic surgical instruments, suture materials, textiles. Scrubbing, gowning and gloving. Scrub preparation and draping of the surgical site. Tying surgical knots (hand and instrument knots).

* Tying surgical knots. Knotting under tension and in cavities.

* Tying surgical knots. Knotting under tension and in cavities.

* Skin incision, handling bleeding, closing wounds in
Curriculum 2014/2015


* Draining of wounds. Knotting with an instruments using the Suture Tutor program

* Skin incision, handling bleeding, closing wounds in separate layers with sutures or with wound clips. Draining of wounds. Knotting with an instruments using the Suture Tutor program


* Basics of minimally invasive surgery. Components of the laparoscopic tower, laparoscopic instruments. Eupractic movements, handling of laparoscopic instruments, knotting

* Basics of minimally invasive surgery. Components of the laparoscopic tower, laparoscopic instruments. Eupractic movements, handling of laparoscopic instruments, knotting

Practical Exam

BASIC IMMUNOPATHOLOGY

6th semester

LECTURE
(2 hrs/every 2nd week)

* General informations. Introduction to immunopathology. Transplantation immunology: transplantation antigens, allogeneic recognition, effector mechanisms of graft rejection

* Histocompatibility testing. Immunological investigations before and after transplantation.

* Immunosuppressive therapy

* Immunology of organ transplantation. Immunology of bone marrow transplantation: graft-versus-host disease. Xenogeneic transplantation

* Reproductive immunology


* Immunological tolerance. Self tolerance: central and peripheral tolerance. Mechanisms of T and B cell tolerance

* Pathomechanisms of autoimmunity: failure of self tolerance, genetic factors, role of infections and other factors; effector mechanisms. Systemic and organ specific autoimmune diseases

* Written test exam

CEREBRAL BLOOD FLOW AND METABOLISM

5th semester

LECTURE
(2 hrs/week)

* Introduction – requirements-general view

* Methods for investigation of cerebral blood flow and metabolism

* The physiology of the cerebrovascular smooth muscle

* Regulation of the cerebrovascular tone * the role of the endothelium

* Regulation of the cerebrovascular tone * the neural components

* Regulation of the cerebrovascular tone * the metabolic components
* Blood supply and basal metabolic processes in the brain
* The neurovascular coupling
* The transport to the brain-the blood brain barrier
* The blood supply of the dura mater cerebri
* The regulation of the cerebral blood flow in the neonate
* Ageing and cerebral blood flow
* Basic pathomechanism of the stroke
* Exam

**GERONTOLOGY**

**6th semester**

**LECTURE/PRACTICE**

*(1 hr/week, 1 hr/week)*

* General principles of geriatric medicine
* History taking with elderly patients
* Physical examination
* Mental status examination
* Evaluation of functional capacity in him elderly
* Laboraty examination
* Progressive constriction of each organ systems
* Intellectual impairment
* Immobility
* Iatrogenic drug reactions
* Community of care
* Quality of life and therapeutic objectives
* Legal and ethical issues
* Care of the dying patient
**ANAESTHESIOLOGY AND OXYOLOGY**

9th semester (Basics, anaesthesiology)

**LECTURE/PRACTICE**

(2 hrs/week, 1 hr/week)

1. Introducing anaesthesiology and intensive therapy
2. Applied physiology – I. Breathing, oxygen therapy
3. Applied physiology – II. Circulation, circulation management
4. Applied physiology – III. Acid-base balance, blood-gas analysis
5. Monitoring airway, circulation, sleep in the operating room
6. Methods of air flow management
7. Fluid therapy – fluid resuscitation
8. Assessment of operation hazards, preoperative preparation
9. Respirator, respiratory system
10. General anaesthesia, anaesthetics
11. Regional anaesthesia, local anesthetics
12. Postoperative patient care, postoperative complications, significance of PACU
13. Postoperative and acute analgesia

10th semester (acute care, intensive therapy)

**LECTURE/PRACTICE**

(2 hrs/week, 1 hr/week)

1. Theory of sudden death and resuscitation (BLS, ALS)
2. Methods of invasive hemodynamic measurement
3. The respirator
4. Infection, infection control
5. Severe sepsis, septic shock
6. Acute respiratory dysfunction and ARDS
7. Acute metabolic dysfunction and their treatment
8. Recognition and treatment of acute cardiovascular diseases
9. Low GCS, coma, brain death
10. Basics of clinical nutrition
11. Main aspects in the acute treatment of polytraumatized patient
12. Acute treatment of intoxicated patient
13. Chronic pain, pain clinic
14. Recognition and acute treatment of multi-organ dysfunction
CLINICAL ONCOLOGY

7th semester

LECTURE
(2 hrs/week)

6-Sep  Cancer etiology, epidemiology. Tumor prevention  Prof. Dr. Zsuzsanna Kahán
13-Sep  The basics of Radiotherapy  Dr. Elemér Szil
20-Sep  The importance of pathology and diagnostic imaging in oncology; AJC/UICC TNM system  Prof. Dr. Zsuzsanna Kahán
27-Sep  Practical aspects of Radiotherapy  Dr. Elemér Szil, Dr. Katalin Hideghéty
4-Oct  Medical therapies: chemotherapy, endocrine therapy, biological therapies  Prof. Dr. Zsuzsanna Kahán
11-Oct  Supportive, palliative therapy and the holistic approach; psychooncology  Prof. Dr. Zsuzsanna Kahán
18-Oct  Breast cancer and gynecological malignancies  Dr. Katalin Hideghéty
25-Oct  The complex therapy of head and neck, oesophagus and gastric cancers  Dr. Anikó Maráz
8-Nov  The complex therapy of liver, pancreas and colorectal tumors  Dr. Zoltán Varga
15-Nov  Genitourinary malignancies  Prof. Dr. Zsuzsanna Kahán
22-Nov  Lung cancer and mesenchymal tumors  Dr. Anikó Maráz
23-Nov  Central nervous system, childhood and skin malignancies  Dr. Katalin Hideghéty
29-Nov  Multidisciplinary team-work  Prof. Dr. Zsuzsanna Kahán
6-Dec  Multidisciplinary team-work  Prof. Dr. Zsuzsanna Kahán
13-Dec  EXAM

DERMATOLOGY

9th semester

LECTURE
(3 hrs/week)

*  Introduction. The anatomy and physiology of the skin. Types of skin lesions.

*  Basic immunopathologic reactions. Urticaria. Drug allergy.

*  Atopic dermatitis. Contact dermatitis and other eczematous reactions. Viral diseases.

*  Bacterial diseases with cutaneous involvement. Fungal diseases with cutaneous involvement.


*  AIDS. Scabies, pediculosis. Tropical skin diseases.


PRACTICE
(2 hrs/week)

Examination of patients with dermatological diseases. Case presentations.
Primary and secondary lesions. Case presentations.
Special tools and techniques in Dermatology (Wood-lights, diascopy, dermoscopy) Case presentations.
Special tests in Dermatology I. In vitro and in vivo (skin) tests in allergic disorders. Case presentations.
Special tests in Dermatology II. Diagnosis of infectious diseases. Case presentations.
Special tests in Dermatology. Diagnosis and treatment of STD. Case presentations.
Special tests in Dermatology III. Diagnosis of autoimmune diseases. Case presentations.
* Disorders of collagen and tissue. Vasculitis, purpuric conditions. Topical therapy in Dermatology. Case presentations.

**FORENSIC MEDICINE**

**9th semester**

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
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<tr>
<td>1. Introduction. Essential law</td>
<td>Time of death Changes after death</td>
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<tr>
<td>2. -</td>
<td>How to fill out a death certificate?</td>
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<tr>
<td>3. What to do with a dead body? Recommendation on autopsy rules</td>
<td>Autopsy</td>
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<tr>
<td>4. -</td>
<td>Hystology (vitality signs)</td>
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<tr>
<td>5. Types of injuries I. (blunt force, sharp object injuries)</td>
<td>Classification of wounds</td>
</tr>
<tr>
<td>6. -</td>
<td>Autopsy</td>
</tr>
<tr>
<td>7. Types of injuries II. (heat, cold, shot wounds)</td>
<td>Scene investigation, sample collection</td>
</tr>
<tr>
<td>8. -</td>
<td>Toxicology</td>
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<tr>
<td><strong>Fall break</strong></td>
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<tr>
<td>10. Midterm demonstration (written)</td>
<td>Autopsy</td>
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<tr>
<td>Scientific session</td>
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<tr>
<td>11. Forensic psychiatry</td>
<td>Poisoning</td>
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<td>12.</td>
<td>Suicide</td>
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<tr>
<td>13. Forensic aspects of alcohol consumption</td>
<td>Autopsy</td>
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<tr>
<td>14.</td>
<td>Consultation</td>
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<tr>
<td>15. Asphyxia, drowning</td>
<td>Supplementary practice</td>
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</tbody>
</table>

**FORENSIC MEDICINE**

**10th semester**

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2 hrs/every second week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>1. Traffic accidents I.</td>
<td>Hystology (sudden death in adults)</td>
</tr>
<tr>
<td>2. -</td>
<td>Toxicology</td>
</tr>
<tr>
<td>3. Traffic accidents II.</td>
<td>Autopsy</td>
</tr>
<tr>
<td>4. -</td>
<td>Malpractice</td>
</tr>
<tr>
<td>5. Forensic aspects of drug abuse</td>
<td>Reconstruction of accidents and criminal cases</td>
</tr>
</tbody>
</table>
6. - Autopsy
7. Medical duties in relation to custody Midterm demonstration
8. - Visit in the county jail
9. Social insurance systems Use of DNA in forensic medicine
10. Spring break
11. Identification of the living and of the dead Autopsy
12. - Identification
14. - Autopsy
15. Consultation Autopsy

**INTERNAL MEDICINE**

**7th semester**

<table>
<thead>
<tr>
<th>LECTURE (5 hrs/week)</th>
<th>PRACTICE (2 hrs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Echocardiography</td>
<td>Methods in echocardiography, reading an echocardiographic record.</td>
</tr>
<tr>
<td>* Infective endocarditis. Tumors of the heart</td>
<td>Taking the case history the physical examination.</td>
</tr>
<tr>
<td>* Hypertension in cardiology aspect. Aortic dissection</td>
<td>Performing percussion, auscultation.</td>
</tr>
<tr>
<td>* Aortic stenosis + Aortic incompetence.</td>
<td>Performing percussion, auscultation.</td>
</tr>
<tr>
<td>* Mitral stenosis + Mitral incompetence</td>
<td>Performing percussion, auscultation.</td>
</tr>
<tr>
<td>* Rheumatic fever. Myocarditis and pericarditis</td>
<td>The physical findings of rheumatic fever and inflammatory diseases.</td>
</tr>
<tr>
<td>* Adult congenital heart diseases</td>
<td>Performing percussion, auscultation.</td>
</tr>
<tr>
<td>* Hypertrophic and dilatative cardiomyopathy: diagnosis and treatment</td>
<td>Performing percussion, auscultation. The physical findings of cardiomyopathies.</td>
</tr>
<tr>
<td>* Electrocardiography</td>
<td>Reading ECG records.</td>
</tr>
<tr>
<td>* Cardiac arrhythmias</td>
<td>Reading ECG records learning modern antiarrhythmic treatment and procedures.</td>
</tr>
<tr>
<td>* Ischemic heart diseases</td>
<td>Non invasive and invasive technics in the diagnosis of ischemic heart disease.</td>
</tr>
<tr>
<td>* Invasive diagnostic and therapeutic methods in cardiology</td>
<td>Non invasive and invasive technics in the diagnosis of ischemic heart disease.</td>
</tr>
<tr>
<td>* Restrictive and obliterator cardiomyopathy. Chronic heart failure</td>
<td>Performing percussion, auscultation. The physical findings of cardiomyopathies and chronic heart failure.</td>
</tr>
<tr>
<td>* Pulmonary embolism. Pulmonary hypertension.</td>
<td>Physical findings of pulmonary embolism and hypertension.</td>
</tr>
<tr>
<td>* Cardiac rehabilitation</td>
<td>Possibilities in rehabilitation program.</td>
</tr>
<tr>
<td>* Special cardiac conditions: women, athletics, elders. Cardiac risk stratification in non cardiac surgery</td>
<td>Non invasive and invasive technics in cardiology.</td>
</tr>
<tr>
<td>* Revascularization in cardiac surgery</td>
<td>Visiting at operation theatre.</td>
</tr>
<tr>
<td>* Basic hematology</td>
<td>Evaluation of laboratory data</td>
</tr>
<tr>
<td>* Anemias</td>
<td>Inspection of patients with anaemia</td>
</tr>
<tr>
<td>* Anemias. Hemolytic anemia</td>
<td>Microscopic evaluation of red cells morphology</td>
</tr>
<tr>
<td>* Pancytopenias</td>
<td>Bone marrow smears examination, physical signs of pancytopenic patients</td>
</tr>
<tr>
<td>(Myelodysplastic syndromes. Aplastic anemia)</td>
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<tr>
<td>* Acut leukemia</td>
<td>Examination of blood and bone marrow smears with acute leukemias</td>
</tr>
<tr>
<td>* Stem cell transplantation</td>
<td>Discussion of indications for stem cell transplantation</td>
</tr>
<tr>
<td>* Myeloproliferative diseases</td>
<td>Palpation of spleens and enlarged livers</td>
</tr>
<tr>
<td>* Malignant lymphomas.</td>
<td></td>
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<tr>
<td>(Classification, Hodgkin disease)</td>
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</tr>
<tr>
<td>* Aggressive lymphomas</td>
<td>Examination of blood and bone marrow smears with lymphomatic infiltration</td>
</tr>
<tr>
<td>* Malignant lymphomas.</td>
<td>X ray consultation, physical examinations</td>
</tr>
<tr>
<td>(Indolent lymphomas, multiple myeloma)</td>
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<tr>
<td>* Coagulation abnormalities.</td>
<td>Bleeding manifestations</td>
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<tr>
<td>(Thrombophilias)</td>
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</table>

8th semester

**LECTURE**

*(5 hrs/week)*

* Esohpageal disorders
  Problem oriented evaluation of the symptoms of patients with esophageal disorders
* Peptic ulcer disease
  Practical aspects of the functional evaluation of patients with esophageal disorders ( esophageal manometry, 24 h pH-metry, evaluation of the biliary reflux)

Functional dyspepsia
* Gastrointestinal hormones
  Upper gastrointestinal endoscopy
* Gastric Cancer
  Symptomatic evaluation of the liver patient. Problem oriented laboratory investigation of the liver patient.
* Chronic hepatitis
  Symptoms of biliary obstruction, investigative methods for patients with biliary obstruction (symptoms, biochemistry, ultrasonography, ERCP)
* Cirrhosis of the liver I.
  (etiology, symptoms)
  Symptoms of patients with acute pancreatitis
* Cirrhosis of the liver II
  (complications, therapeutical options)
  Symptoms of patients with acute pancreatitis
* Diseases of the biliary system I
  Acute pancreatitis
  Diagnostic work up of patients with acute pancreatitis
* Diseases of the biliary system II
  Chronic pancreatitis
  Diagnostic work up of patients with chronic pancreatitis and pancreatic cancer
* Pancreatic cancer
  Pathomechanisms of Inflammatory Bowel Disease
  Diagnostic work up of patients with CU and Crohn’s disease.
* Crohn’s disease and Ulcerative Colitis
  Tumors of the large intestine
  Early identification of patients with colorectal cancer. Diagnostic methods.
* Malabsorption syndrome
  Symptoms of malabsorption, maldigestion, Diagnostic workup: Hydrogen, c13 urea and starch breath tests
* Irritable Bowel Syndrome
  Diabetes mellitus (etiology, classification)
  Practical aspects of the diagnosis and therapy of patients with diabetes mellitus; the patient education.
* Complications of diabetes mellitus
  Therapy of diabetes mellitus
  Dyslipoproteinemias
  Hyperuricemia, gout
  Practical aspects of insulin therapy. Treatment of dyslipoproteinemias
### 9th semester

**LECTURE (2 hrs/week)**
- Pathophysiology and diagnosis of infectious diseases.
- Infections of the respiratory organs.
- Infections of the gastrointestinal tract.
- Neuroinfections.
- Hepatitis.
- AIDS.
- Sepsis.
- Prevention of infectious diseases.

**PRACTICE (2 hrs/week)**
- Pathophysiology and diagnosis of infectious diseases.
- Infections of the respiratory organs.
- Infections of the gastrointestinal tract.
- Neuroinfections.
- Hepatitis.
- AIDS.
- Sepsis.
- Prevention of infectious diseases.

### 10th semester

**LECTURE (2 hrs/week)**
- Diarrhea, constipation.
- Abdominal pain.
- Ascites.
- Gastrointestinal bleeding.
- Jaundice.
- Hypertension.
- Motility disorders of the GI tract.
- Differential diagnosis of the gastrointestinal motility disorders.

**PRACTICE (total 16 hrs)**
- Medical thinking, general principles of differential diagnostics.
- Differential diagnostics of diarrhea and constipation.
- Differential diagnostics in patients with abdominal pain.
- Differential diagnostics of ascites.
- Differential diagnostics of occult and manifest gastrointestinal bleedings.
- Differential diagnostics of jaundice.
- Differential diagnostics of the gastrointestinal motility disorders.
- differential diagnostics of hypertension.
- differential diagnostics of chest pain and syncope.
- differential diagnostics of edema, cyanosis, dyspnoe.
- differential diagnostics of anaemias and lymph node enlargements.
- differential diagnostics in patients with renal diseases.
- selected differential diagnostic problems, consultation.
MEDICAL PSYCHOLOGY II.
7th semester

LECTURE/PRACTICE
(1 hr/week, 1 hr/week)
* Lecture:
  1. Introduction. Outline of the course
  2. Medically unexplained symptoms – Somatisation
  3. Risk behaviors and problem health conditions
  4. Psychological aspects of general practice and family medicine
  5. Cardiovascular diseases. Psychological aspects of prevention, treatment and rehabilitation
  6. Cancer prevention and the care of cancer patients
  7. The psychological aspects of death and dying. Breaking bad news
  8. Surgery and organ transplantation. Problems of body-image in different medical conditions
  9. The role of persuasive communication and suggestion in medicine
  10. Psychological interventions and communication in pediatric care
  11. Management of communication problems and medical decision making
  12. Telemedicine and the use of the internet in health communication
  13. Psychological interventions /Short introduction to psychotherapies I
  14. Psychological interventions /Short introduction to psychotherapies II

* Practice:
  1. Psychosocial factors and family background as causes of morbidity and health risks
  2. Communication with relatives and friends of the patient. Problems with referring patients to psychiatrist, psychologist
  3. Communication with aggressive patient
  4. Psychological aspects of helping chronic patients. Patients in crisis
  5. Breaking bad news
  6. Difficulties in the medical team-work. The drawbacks of hierarchy

NEUROLOGY
9th semester

LECTURE
(1 hr/week)
* a. The organization of the sensory system. b. Pain.
* The organization of the motor system.
* Spinal cord. Neurological localization.
* Brainstem. Neurological localization.
* Cerebellum. Neurological localization.

PRACTICE
(2 hrs/week)
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
Neurological investigation related to the lecture
* a./ Parietal and occipital lobes. Neurological localization. b./ Vegetative nervous system.
* Cerebrospinal fluid. Diagnostic methods.
* Neurovascular system. Neurological localization.
* Extrapyramidal system. Neurological localization.
* a./ Electrical activity and examination of muscles and nerves
   b./ Modern neuroradiological diagnostic methods.
* Review of basic neurology knowledge

10th semester

**LECTURE**
(1 hr/week)
* Cerebrovascular disorders I.
* Cerebrovascular disorders II.
* Epilepsies. Epilepsies. Sleep disturbances.
* Muscle and motoneuron disorders.
* Neuroinflammatory disorders.
* Multiple sclerosis
* Extrapyramidal disorders I.
* Extrapyramidal disorders II.
* Intensive neurology. Tumors of the central nervous system.
* Neurorehabilitation.
* Diagnosis and treatment of headaches.
* Pathomechanism of neurodegenerative disorders.

**PRACTICE**
(1 hr/week)
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture
* Neurological investigation related to the lecture

7th semester

**LECTURE**
(3 hrs/week)
* Development and function of the placenta. Development of the fetus.
* Endocrinology of pregnancy.

**PRACTICE**
(2 hrs/week)
* Prenatal care. Obstetrical history, physical examination.
* Pregnancy tests
* Induction of labour

**OBSTETRICS AND GYNAECOLOGY**

7th semester
* Obstetrical anatomy. Diagnosis of pregnancy.

* Genital and extragenital changes during pregnancy.

* Signs of the fetal life. The mature placenta, umbilical cord, membranes and amniotic fluid.

* Intrauterine position of the fetus.

* Antenatal care and examinations.

* Normal mechanism of labour.

* Patient care during labour.

* Pharmacokinetics in pregnancy. Registration of the uterine activity.

* Diseases of the trophoblast.

* Monitoring of the fetus and placenta.

* Physiology of the uterus.

* Obstetrical ultrasonography.

* The newborn. Care and management. The puerperium.

* Abortion.

* Ectopic pregnancy.

* EPH-gestosis.

* Breech presentation and delivery.

* Multiple pregnancy.

* Premature labour.

* Management of delivery.

* Induction of labour.

* Intrauterine death.

* Postmaturity. Dysmaturity.

* Alternative delivery methods.

8th semester

**LECTURE**

*(3 hrs/week)*

* Uterine rupture, postpartal haemorrhage, abnormal puerperium.

* Causes of 3rd trimester bleeding (premature separation of the placenta, DIC, plac. praevia).

* Dysmaturity. Hyperemesis.

* Erythroblastosis fetalis.

* Dystocia (difficult labor) pelvic dystocia due to uterine dysfunction, dystocia of fetal origin, dystocia of placental origin.

* Infectious diseases and pregnancy.

* Respiratory, renal, neurologic, endocrine and metabolic diseases.

* Benign tumors of the uterus.

* Diseases of the cervix. Cancer screening.

**PRACTICE**

*(2 hrs/week)*

Gynaecological history taking, physical and pelvic examinations.

Screening methods for cervical cancer: cytology.

Screening methods for cervical cancer: colposcopy.

Curettage, cervical biopsy, electrocauterisation, conisation.

Female infertility, diagnostic procedures.

Infertility study of the male partner.

Labor procedures of infertility.

Conception control.

Endoscopy.
* Medical complications during pregnancy. (Heart, haematologic, gastrointestinal diseases.) Vaginal surgical procedures.
* Genetic disorders. Adolescent gynaecology.
* Climacteric. Psychosexual diseases.
* Ethical aspects of Obstetrics-Gynaecology.
* Endometriosis.
* Assisted fertilization in the female.
* Gynaecological endoscopy.
* Infertility of the female.
* Benign ovarian tumors.
* Malignant ovarian tumors.
* Adolescent gynaecology.
* Infertility of the male.
* Diseases of the vulva and vagina.

**OPHTALMOLOGY**

**10th semester**

**LECTURE**

(2 hrs/week)

* The eye and systemic diseases
* Essentials of anatomy and physiology, Optics and refraction
* The lids and the lacrimal system, The conjuctiva
* The cornea, The lens
* The iris, The choroid
* The retina
* The vitreous, Retinal detachment
* Optic nerve diseases, Neuroophthalmology
* Strabismus, The child with suspected eye disease
* Glaucoma, The Sclera, the orbita
* Acute painless visual disturbance, Chronic loss of vision
* Chronic ocular unease, The acute red eyes
* Ocular injuries
* Ophthalmology through on the world

**PRACTICE**

(2 hrs/week)

General Practical
General Practical
General Practical
Angiography and laser therapy
Pediatric ophthalmology
Contact lens
Ultrasound in ophthalmology
Elektrophysiology
MTO
Eximer laser surgery
General Practical
General Practical
General Practical
General Practical

**ORTHOPAEDICS**

**7th semester**

**LECTURE**

(2 hrs/week)

* Field of orthopaedics, history. Diagnosis and treatment of orthopaedic disorders.
* Disorders of the spine in childhood. Scoliosis. General affections of the skeleton
* Congenital deformities and disabilities
* Disorders of the foot (congenital club foot, pes planovalgus)
* Arthritis, osteomyelitis, tuberculous arthritis
* Bone tumors

**PRACTICE**

(2 hrs/week)

The course of the examination of the patients with locomotor system diseases. Diagnostic means. X-ray demonstration. Case report.
Examination of the neck and cervical spine. Disorders of the neck and cervical spine. X-ray demonstration. Case report.
Examination of the trunk and spine. Disorders of the trunk and spine. X-ray demonstration. Case report.
Examination of the scoliosis. Diagnostic means. X-ray demonstration. Case report.
Examination of the shoulder and elbow. Disorders of the shoulder and elbow. X-ray demonstration. Case report.
Examination of the forearm, wrist and the hand. Disorders of the forearm, wrist and the hand. X-ray demonstration. Case report.
Examination of the hip regio. Disorders of the hip. Messuring the
* Infections and degenerative disorders of the spine. Spondylolysis, spondyloisthesis.

* Disorders of the neck and upper limbs

* Congenital dislocation and dysplasia of the hip

* Other hip disorders in childhood (Perthes disease, slipped upper femoral epiphysis. Transient arthritis of the hip.)

* Osteoarthrosis of the hip. Idiopathical necrosis capitis femoris.

* Disorders of the knee.

* Neuromuscular diseases, general affections of the skeleton

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**OTO-RHINO-LARYNGOLOGY**

9th semester

**LECTURE** (2 hrs/week)

* Oto-rhino-laryngology in medicine.

* History of oto-rhino-laryngology.

* Anatomy and physiology of the ear.

* Diseases of the external ear and their treatment.

* Acute inflammation of the middle ear.

* Complications of acute otitis media.

* Non-suppurative diseases of the middle ear.

* Chronic otitis media. Complications of chronic otitis media.

* Reconstruction of the hearing mechanism.

* Anatomy of the inner ear. The vestibular and cochlear system.

* Examination of hearing and the vestibular system.

**PRACTICE** (3 hrs/week)

Examination of the osteoarthritis of the hip and of the knee. X-ray demonstration. Case report.


Examination of the leg, ankle and foot. Disorders of the leg, ankle and foot. X-ray demonstration. Case report.


Examination equipment in oto-rhino-laryngology.

Practice in use of forehead mirror and ear speculum.


* Diseases of the inner ear: toxic damage to the ear, inflammatory and vascular lesions of the inner ear. Acoustic trauma. Meniere's disease.
* Diseases of the inner ear: acoustic neuroma, temporal bone fractures.

* Anatomy of the nose and nasal sinuses.
* Diseases of the external nose and the nasal cavity.
* Sinusitis. Treatment and complications. Fractures of the sinuses.

* Haemorrhage from the nose. Tumors of the nose and paranasal sinuses.
* Anatomy of the pharynx. Diseases of the nasopharynx.

* Adenoid hyperplasia. Benign and malignant nasopharyngeal tumors.
* Acute and chronic inflammatory diseases of the pharynx.
* Acute and chronic tonsillitis. Peritonsillar abscess and complications.
* Indications of tonsillectomy. Tumors of mesopharynx.
* Functional anatomy of the larynx. Acute and chronic diseases of the larynx.
* Injuries of the larynx. Paralysis of the larynx.
* Tumors of the hypopharynx and the larynx.
* Classifications of malignant laryngeal tumors.
* Treatment of laryngeal tumors.
* Diseases of the oesophagus and the inferior respiratory tract.
* Differential diagnosis of neck nodes.

PEDIATRICS

9th semester

**LECTURE**

*(3 hrs/week)*
* The ill child and his doctor
* The interview, The problems, Mortality
* Genes
* Chromosomes and chromosome abnormalities, Common autosomal abnormalities, Common sex chromosome abnormalities, Single gene (Mendelian) inheritance, Multifactorial (polygenic) inheritance, Recent advances in molecular genetics, Genetic counselling
* Fetus

**PRACTICE**

*(2 hrs/week)*
* History taking, Iatrogenic infections
* Examination of the child and infant, Rickets, tetany
* Newborn, preterm and small for dates infants
* O2, incubator, mechanical ventilation
* Paediatric surgery: malformations
* Periconceptional medicine, The placenta, Examination of the fetus, Drugs which cross the placenta, Fetal transplacental infections, Infections acquired during passage through the birth canal, Maternal immunoglobulins

* Newborn

* Routine examination of the newborn, Birth injuries, Birth asphyxia, Size at birth, Respiratory problems in the newborn, Jaundice in the newborn, Gastrointestinal problems, Neural tube anomalies, Cleft lip and palate, Neonatal infections, Neonatal convulsions and jitters

* Nutrition

* Breast feeding, Artificial feeding, Feeding problems, Nutritional deficiencies, Malnutrition, Obesity

* Infection

* Measles, Rubella, Mumps, Chicken pox (Varicella), Herpes simplex infections, Glandular fever, Kawasaki disease (mucocutaneous lymph node syndrome), Erythema infectiosum (5th disease), Roseola infantum (Exanthema subitum), Hand, foot and mouth disease, Hepatitis A (infectious jaundice), Poliomyelitis, Diphtheria, Pertussis (whooping cough), Scarlet fever, Tuberculosis, Malaria, Human immunodeficiency virus, Immunisation, Immune deficiency

* Hazards

* Injuries, Burns and scalds, Drowning, Choking, Poisoning, Other hazard

* Airways and lungs

* Upper respiratory tract infections, Upper airway obstruction, Lower respiratory tract infections, Cystic fibrosis, Asthma

* Heart

* Acyanotic lesions with a left to right shunt, Atrial septal defect (Ostium secundum), Atrial septal defect (Ostium primum), Ventricular septal defect, Patent ductus arteriosus, Pulmonary hypertension, Obstructive lesions, Aortic stenosis, Coarctation of the aorta, Hypoplastic left heart, Pulmonary stenosis, Cyanotic heart disease, Fallot tetralogy, Transposition of the great arteries, Cardiac arrhythmias, Subacute bacterial endocarditis, Rheumatic fever, Hypertension Hyperlipoproteinaemia

* Gut

* Acute abdominal pain, Recurrent abdominal pain, Gastroenteritis, Malabsorption, Chronic diarrhoea, Intestinal parasites, Constipation, Liver disease, Liver enzyme deficiencies

* Urinary tract and testes

* Renal function tests, Urinary tract malformations, Urinary tract infections, Haematuria, Acute nephritic syndrome, Nephrotic syndrome, Renal tubular disorders, Acute renal failure, Chronic renal failure, The testes, The prepuce

* Blood

* Iron deficiency anaemia, Aplastic anaemia, Haemolytic anaemias, Bleeding disorders

**10th semester**
LECTURE/PRACTICE
(2 hrs/week, 2 hrs/week)
* Malignancy
* The management of children with cancer, Acute leukaemia, Lymphomas, Neuroblastoma, Brain and spinal tumors, Soft tissue sarcomas, Renal tumors, Germ cell tumors, Bone tumors, Other tumors, Histiocytic disorders
* Growth
* Head growth, Height and weight, Short stature, Excessive height
* Endocrine
* Puberty, Disorders of sexual differentiation, Adrenal glands, Thyroid, Parathyroid glands, Diabetes, Hypoglycaemia
* Skin
* Rashes of early infancy, Atopic eczema, Infections and infestations, Congenital skin lesions, Other common skin disorders
* Bone and joint
* Arthritis, Osteomyelitis, Normal postural variations, Scoliosis, Hip disorders, Knee disorders, Talipes (clubfoot), Genetic bone and joint disorders, Bone tumors and allied disorders
* Brain, cord, nerve, muscle
* Intracranial infection, Encephalitis, Epilepsy and convulsions, Neuromuscular disorders, Headache, Ataxia, Cerebral palsy
* Vision, hearing, speech
* Hearing, Speech and language
* Mental handicap
* The identification and treatment of mentally handicapped children, Mentabiotic and other cerebral degenerative disorders, Specific treatment and general management
* Emotions and behavior
* Brain disorders, The interaction between the child and his world, Behavioral problems, Emotional disorders, Management, The maltreatment of children

PHARMACOLOGY
7th semester

LECTURE
(3 hrs/week)
* Pharmacokinetics II: Distribution.
* Cholinolytic drugs. Sympathomimetic drugs.
* Smooth muscle relaxants. Treatment of asthma bronchiale.
* Local anaesthetics. Antiinflammatory drugs. Glucocorticoids.
* Chemotherapy I. Cell wall synthesis inhibitors. Protein synthesis inhibitors.

PRACTICE
(2 hrs/week)
* Receptor theory.
* Computer Lab: Drug-receptor interactions.
* Computer Lab: Pharmacokinetics.
* Computer Lab: Repeated drug administration.
* MTO: General pharmacology.
* Computer Lab: Parasympathetic nervous system.
* Computer Lab: Sympathetic nervous system.
* Computer Lab: Skeletal muscle and smooth muscle relaxants.
* MTO: Autonomic nervous system.
* MTO-GPH Discussion
* MTO: Autonomic nervous system - Discussion.
* Chemotherapy III. Macrolid-antibiotics. Chemotherapy of neoplastic diseases.
* Chemotherapy IV: Antiviral and antifungal agents. Treatment of protozoon infections (malaria).

To recapitulate: Chemotherapy.

8th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>(4 hrs/week)</th>
<th>PRACTICE</th>
<th>(2 hrs/week)</th>
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</thead>
<tbody>
<tr>
<td>* Pharmacology of general anaesthesia. Opioid analgetics.</td>
<td></td>
<td>To recapitulate: General anaesthesia.</td>
<td></td>
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<tr>
<td>* Antidepressants. Antiparkinson drugs. Central muscle relaxants.</td>
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<td>Therapy of AMI.</td>
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<tr>
<td>* Antiarrhythmic drugs.</td>
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<td>To recapitulate: CNS</td>
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<tr>
<td>* Antianginal drugs.</td>
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<td>MTO: CNS.</td>
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<tr>
<td>* Diuretic drugs. Pharmacotherapy of hyperlipoproteinemias.</td>
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<td>Computer lab - CVS</td>
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<tr>
<td>* Cardiotonics.</td>
<td></td>
<td>Therapy of migraine.</td>
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<tr>
<td>* Anthypertensive drugs. Drugs acting on the blood.</td>
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<td>Therapy of anaemias.</td>
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<tr>
<td>* Stroke (prevention and treatment). Diabetes mellitus. Hyperthyreosis.</td>
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<td>MTO: CVS.</td>
<td></td>
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<tr>
<td>* Hormones. Vitamines.</td>
<td></td>
<td>Discussion - CVS.</td>
<td></td>
</tr>
<tr>
<td>* Drugs that influence the GIT. Toxicology I.</td>
<td></td>
<td>Principles of immunopharmacology.</td>
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<tr>
<td>* Toxicology II.</td>
<td></td>
<td>Prepare for the final exam.</td>
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</tbody>
</table>

* Toxicology of doping.

PSYCHIATRY

9th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>1 hr/week</th>
<th>PRACTICE</th>
<th>1hr/week</th>
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</thead>
<tbody>
<tr>
<td>* The psychiatric examination</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Psychodynamic aspects of mental disturbances</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Psychopathology of perception and affect</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Pathology of cognitive and psychomotor functions</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Biological foundation of psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<td>* Principles of social psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Behavioural approach to psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Genetic and neurochemical concepts in psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Affective (mood) disorders: depression</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Mania and bipolar affective disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Cyclothymia and dysthymia</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Clinical aspects of schizophrenia</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Etiology and therapy of schizophrenia</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Paranoid disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
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10th semester

<table>
<thead>
<tr>
<th>LECTURE (2 hrs/week)</th>
<th>PRACTICE (1 hr/week)</th>
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</thead>
<tbody>
<tr>
<td>* Organic mental disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Dementia states</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Psychoactive substance abuse</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Psychosomatic diseases</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Psychosexual disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Personality disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Anxiety states. Neurosis I.</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Anxiety states. Neurosis II.</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Psychotherapeutic methods</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Psychopharmacologic treatments</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Child and adolescent psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Sleep disorders</td>
<td>Psychiatric patient examination related to the lecture</td>
</tr>
<tr>
<td>* Geriatric psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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<tr>
<td>* Ethics and law in psychiatry</td>
<td>Psychiatric patient examination related to the lecture</td>
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</table>

PUBLIC HEALTH

7th semester

<table>
<thead>
<tr>
<th>LECTURE (2 hrs/week)</th>
<th>PRACTICE (2 hrs/week)</th>
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</thead>
<tbody>
<tr>
<td>* The history of preventive medicine and public health. The levels of prevention. The global health situation; priorities in global health. Measuring health status of a population; the theoretical basis of demography.</td>
<td>Requirements of the semester.</td>
</tr>
<tr>
<td>* The theoretical basis of epidemiology.</td>
<td>Introduction into public health and demography. Demographic indexes and their use.</td>
</tr>
<tr>
<td>* Epidemiology of chronic diseases – metabolic and musculoskeletal diseases.</td>
<td>The role of screening in the prevention of selected chronic diseases. Students’ presentations.</td>
</tr>
<tr>
<td>* Epidemiology of chronic diseases – gastrointestinal and respiratory diseases.</td>
<td>Practical aspects of the prevention of selected chronic conditions. Students’ presentations.</td>
</tr>
<tr>
<td>* HOLIDAY</td>
<td>General epidemiology of infectious diseases.</td>
</tr>
<tr>
<td>* Epidemiology of mental disorders, suicide and accidents.</td>
<td>Sterilization, disinfection (hand hygiene), disinsection, deratisation.</td>
</tr>
<tr>
<td>* Epidemiology of health care associated infections (infection control, nosocomial surveillance).</td>
<td>Practical aspects of vaccination. Students’ presentations.</td>
</tr>
</tbody>
</table>
* Epidemiology of infectious diseases: airborne diseases.

* Epidemiology of infectious diseases: enteric diseases, toxicoinfections.

* Epidemiology of infectious diseases: hematogenic, cutaneous, and sexually transmitted diseases.

* Epidemiology of infectious diseases: zoonoses and transmissible spongiform encephalopathies

PUBLIC HEALTH

8th semester

LECTURE

(2 hrs/week)

* Health influencing factors – life style, environment, health care, genetics.


* Food quality and safety.

* Epidemiology of smoking.

* Epidemiology of alcohol and drug consumption.

Role of physical activity in the prevention of chronic diseases.

* Human ecology; global warming; air pollutants and their effects on human health (indoor and outdoor).

* Water pollutants and their effects on human health. Sewage, soil pollutions, waste management.

* General toxicology. Toxicology of metals, solvents and gases.

* Toxicology of persistent organic pollutants, plastics and agrochemicals.

* Occupational health. Occupational safety, accident prevention. Occupational diseases caused by physical exposures

* Occupational diseases caused by biological, ergonomic and psychosocial exposures. Health effects of dusts, occupational pneumoconiosis.

* Structure and operation of health systems I. – general aspects

* Structure and operation of health systems II. – health and health care in the family

PRACTICE

(2 hrs/week)

Requirements, questionnaire.

Basics of nutrition, measuring nutritional status.

Dietary guidelines, healthy nutrition. Treatment of obesity.

The role of diet in the prevention of diet-related diseases; special dietary requirements of certain chronic diseases I. (Students’ presentations)

The role of diet in the prevention of diet-related diseases; special dietary requirements of certain chronic diseases II. (Students’ presentations)

Health promotion in various settings (community, workplace, school)

Environmental epidemiology: examining health damaging effects of air pollution

Environmental epidemiology: examining health damaging effects of surface and drinking water pollution.

Case studies about health effects of certain chemicals.

Practical aspects of occupational health.

Health effects of workplace-related exposures. Occupational hazards in health care (case studies).

Visiting factory.

Quality improvement in health care.

Quality improvement methods according to steps of PDCA.

Consultation.
(mother, infant, child, adolescent, elderly).

### PULMONOLOGY

#### 7th semester

<table>
<thead>
<tr>
<th>LECTURE <strong>(1 hr/week)</strong></th>
<th>PRACTICE <strong>(2 hrs/week)</strong></th>
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</thead>
<tbody>
<tr>
<td>* COPD (Chronic bronchitis. Emphysema.)</td>
<td>Characteristic X-ray findings.</td>
</tr>
<tr>
<td>* Respiratory function. Spirometry.</td>
<td>Chronic bronchitis. &quot;Pink pufflers&quot; and &quot;blue bloaters&quot;.</td>
</tr>
<tr>
<td>* Asthma bronchiale</td>
<td>Diagnosis of asthma bronchiale. Aspecific provocation tests, skin test, IgE.</td>
</tr>
<tr>
<td>* Malignant neoplasm of lung</td>
<td>Bronchoscopy, Thoracoscopy, mediastinoscopy.</td>
</tr>
<tr>
<td>* Diseases of pleura</td>
<td>Aetiology of pleural effusions. Aspiration of the pleural effusion. Laboratory findings.</td>
</tr>
<tr>
<td>* Pulmonary thromboembolism, cor pulmonale chronicum</td>
<td>X-ray findings in tuberculosis.</td>
</tr>
<tr>
<td>* Tuberculosis</td>
<td>Sputum examination in tuberculosis. Tuberculin test. Treatment.</td>
</tr>
<tr>
<td>* Respiratory failure. Sleep apnoea syndrome.</td>
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</tbody>
</table>

### RADIOLOGY

#### 7th semester

<table>
<thead>
<tr>
<th>LECTURE <strong>(1 hr/week)</strong></th>
<th>PRACTICE <strong>(1 hr/week)</strong></th>
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</thead>
<tbody>
<tr>
<td>* Imaging diagnostics: role, development, present and future</td>
<td>Imaging diagnostics: role, development, present and future</td>
</tr>
<tr>
<td>* Conventional radiology</td>
<td>Conventional radiology</td>
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<tr>
<td>* Contrast agents</td>
<td>Contrast agents</td>
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<tr>
<td>* Ultrasound</td>
<td>Ultrasound</td>
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<tr>
<td>* Computed tomography and magnetic resonance imaging</td>
<td>Computed tomography and magnetic resonance imaging</td>
</tr>
<tr>
<td>* Interventional radiology</td>
<td>Interventional radiology</td>
</tr>
<tr>
<td>* Gastroenterology I. (esophagus, stomach, duodenum)</td>
<td>Gastroenterology I.</td>
</tr>
<tr>
<td>* Gastroenterology II. (mesenteric small bowels large intestine)</td>
<td>Gastroenterology II.</td>
</tr>
<tr>
<td>* Joints</td>
<td>Joints</td>
</tr>
<tr>
<td>* Bones</td>
<td>Bones</td>
</tr>
<tr>
<td>* Chest I. (lung)</td>
<td>Chest I. (lung)</td>
</tr>
<tr>
<td>* Chest II. (mediastinum)</td>
<td>Chest II. (mediastinum)</td>
</tr>
<tr>
<td>* Heart and peripheric vessels</td>
<td>Heart and peripheric vessels</td>
</tr>
</tbody>
</table>
**8th semester**

**LECTURE**

(1 hr/week)

* Radiology of the breasts and female reproductive system
* Radiology of the liver
* Radiology of the biliary tract
* Radiology of the pancreas & spleen

* Neuroradiology I. (image modalities, congenital anomalies and vascular lesions of the head)
* Neuroradiology II. (Tumours, infections, trauma of the head)
* Neuroradiology III. (Spinal diseases)
* Pediatric radiology
* Radiology of the kidneys & the urinary tract
* Radiology of the retroperitoneal space
* Radiology of the pelvis and the male reproductive organs
* Radiological aspects of emergency
* Radiological aspects of trauma

**PRACTICE**

(1 hr/week)

Radiology of the breasts
Radiology of the liver
Radiology of the biliary tract
Radiology of the pancreas & spleen
Neuroradiology I.
Neuroradiology II.
Neuroradiology III.
Pediatric radiology
Radiology of the kidneys & the urinary tract
Radiology of the retroperitoneal space
Radiology of the pelvis and the male reproductive organs
Radiological aspects of emergency
Radiological aspects of trauma

**STOMATOLOGY**

**7th semester**

**LECTURE/PRACTICE**

(1 hr/week, 2 hrs/week)

* Disorders of development of the teeth and related tissues dental caries prevention
* Diseases of dental pulp, and treatment of dental caries
* Periapical periodontitis and severe infections
* Extraction of teeth and related problems. Injuries to teeth and supporting tissues
* Periodontal diseases
* Cysts of the maxillo-facial region
* Oral diseases
* Systemic diseases in relation to dentistry
* Benign tumors, praecancerous lesions
* Malignant tumors
* Maxillo-facial traumatology
* Prosthetic dentistry and disorders of temporomandibular joints
* Treatment of malignant tumors
* Rehabilitation following maxillo-facial-surgery

**SURGERY**

**7th semester**

**LECTURE**

(2 hrs/week)

* Benign of the breast
* Surgery of the breast cancer

**PRACTICE**

(2 hrs/week)

The syllabus of the practicals are synchronized with the lectures.

The patients examinations and the discussion of the symptoms and illnesses follow the topics of the lectures.
* Surgery of the abdominal wall
* Surgery of the mediastinum
* Surgery of the thorax
* Surgery of the lung cancer
* Vascular surgery
* Cardiac Surgery
* Test

8th semester

**LECTURE** (2 hrs/week) **PRACTICE** (2 hrs/week)
* Surgery of the pancreas I. The syllabus of the practicals are synchronized with the lectures.
* Surgery of pancreas II. The patients examinations and the discussion of the symptoms and illnesses follow the topics of the lectures.
* Benign diseases of the oesophagus The practicals take place in the Department of Surgery.
* The malignant disease of oesophagus
* Gastric surgery. Malignant disease
* Gastric surgery. Benign disease
* Surgery of gallbladder and biliary ways
* Surgery of the liver
* Surgery of the spleen
* Bleeding of the GI tract
* Benign diseases of the colon and rectum
* Malignant diseases of the colon and rectum
* Proctology, the care of patients wearing of intestinal stoma
* Test

9th semester

**LECTURE** (1 hr/week) **PRACTICE** (1 hr/week)
* Endocrine surgery I. The syllabus of the practicals are synchronized with the lectures.
* Endocrine surgery II. The patients examinations and the discussion of the symptoms and illnesses follow the topics of the lectures.
* Ileus The practicals take place in the Department of Surgery.
* Peritonitis
* Appendicitis
* Minimal invasive surgery
* Surgerical immunology
* Organ Transplantation
* Test

TRAUMATOLOGY

10th semester

**LECTURE** (2 hrs/week) **PRACTICE** (2 hrs/week)
Curriculum 2014/2015


* Fractures and dislocations about the ankle and foot.

* Politraumatization and multiple injuries. First aid and transportation. Priorities in polytrauma. Primary and secondary treatment of fractures.


* UROLOGY

10th semester

<table>
<thead>
<tr>
<th>LECTURE (1hr/week)</th>
<th>PRACTICE (2hrs/week)</th>
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<tbody>
<tr>
<td>Urolithiasis.</td>
<td>Catheters and endoscopic instruments.</td>
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<td>Incontinency.</td>
<td>Endoscopy.</td>
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<tr>
<td>Urotraumatology.</td>
<td>Percutaneous epicystostomy and nephrostomy.</td>
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<tr>
<td>Acute and chronic renal failure.</td>
<td>ESWL.</td>
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</table>
**DOCTOR-PATIENT COMMUNICATION**

**7th or 8th semester**

The aim of the subject:
Students attain the skills needed for doctor-patient consultation and for selecting from the appropriate consultation models.
By the end of the course students will be aware of the importance of doctor-patient communication and its critical points.
They should acquire the ethical principles of doctor-patient communication and they should be able to integrate them into their consultation behaviour. Students should know the ethical and communication methods of commitment to providing medical information.
They should be able to carry out a 10-minute doctor-patient consultation, and afterwards to analyse and evaluate their performance from the video recording at a group meeting. They should be able to elaborate a medical case.

**HUNGARIAN LANGUAGE**

**7th semester**

**PRACTICE**
(3 hrs/week)
* Gynaecology. The external and internal female genital organs. Revising the Possessive Structure.
* The most frequent complaints and diseases in the field of gynaecology. Practising basic doctor-patient situations: role-play, history taking in Gynaecology.
* Asking the patient about her menstruation cycle and history. Revision of Wh-questions.
* Patient examination at the Department of Obstetrics and Gynaecology. General and specific instructions to patients. Sending the patient for further investigations.
* Practising basic doctor-patient situations: role-play, history taking in Obstetrics and Gynaecology. Revising the Indefinite Pronouns.
* Practising doctor-patient communication: role-play, history taking and giving advice to patients concerning treatment and medication.
* Urology. The most common conditions and diseases in the field of Urology: cystitis, kidney stones, pyelonephritis.
* Patient examination in Urology. Giving instructions and sending the patient for further investigations. Revising Adverbs of Manner.
* Practising doctor-patient situations: role-play, history taking in Urology.
* Briefing English case histories taken from the field of Urology in Hungarian. Final tests (written and oral).
* Pulmonology. The structure of the respiratory system. Revising the name of body parts.
* The most frequent abnormal conditions and diseases in Pulmonology. Revising the vocabulary of breathing problems, coughing and sputum.
* History taking, patient examination and specific instructions in the field of Pulmonology.
* Practising doctor-patient communication: role-play, history taking and examination of patients with respiratory problems. Giving advice to patients concerning medication. Reading simple Hungarian case histories taken from the field of Pulmonology and Urology.

**8th semester**
**PRACTICE**

(3 hrs/week)

* Neurology. Parts of the nervous system. Revising Time Clauses.
* Some diseases of the nervous system. Most frequent patient complaints at the Neurology Department. Symptoms and signs of certain neurological conditions.
* Practising doctor-patient communication at the Neurology Department: role-playing history taking and discussing possible treatment methods with the patient. Revising the Conditional Mood.
* Briefing simple English case histories taken from the field of Neurology in Hungarian.
* Final exam practice: written.
* Final exam practice: oral.
* Paediatrics. Locomotor, cognitive, emotional and social development. The most important milestones.
* Paediatrics. Asking the child’s parents about symptoms and signs. Giving advice concerning treatment options. Revising the Auxiliary Verbs.
* The most common paediatric problems. Discussing and arguing with parents. Revising vocabulary in connection with delivery and breast feeding.
* Acute cases in the field of paediatrics. Interviewing parents presenting their child with accidents, meningitis or febrile convulsion. Management of acute cases.
* Practising doctor-patient communication: role-play, history taking and giving advice to patients’ parents concerning treatment and medication. Reading simple Hungarian case histories taken from the field of Paediatrics. Explaining medical procedures and giving advice to patients.
* General revision. Practising doctor-patient dialogues in all covered medical fields.
* Revision. Practising doctor-patient situations that can emerge at medical and surgical departments. Interviewing and examining patients, sending them for further investigations, giving advice on diet, life style and medication. Final test.

**ADVANCED BIOSTATISTICS**

8th, 10th semester

**LECTURE**

(1 hr/week)

* Introduction: summary of basic biostatistics
* Nonparametric methods for two ore more dependent or independent data
* Multiple linear regression, linear models
* Comparison of several independent group-means: two-way ANOVA
* Two-way ANOVA with interaction
* Comparison of several related group-means: repeated measures ANOVA
* Summary
* Diagnostic tests. Specificity, sensitivity, PPV, NPV, Accuracy
* Biostatistical methods in epidemiology, relative risk, odds ratio
* Logistic regression: equation, use, meaning
* Logistic regression: ogisticcc accuracy ROC curve

**PRACTICE**

(1 hr/week)

The mean concepts of ogisticcccs. Statistical computer systems.

The choice of the appropriate statistical method and its evaluation

Data sets with several independent variables (i.e., risc factors)

Data sets and problems when two-way ANOVA is appropriate

Understanding the concept of interaction

Data sets and problems for repeated measurements ANOVA

TEST I: solving two problems, main results and interpretation

Calculation of the diagnostic measures

Calculation of RR and OR by hand and by computer. Comparison of methods.

Simple logistic regression problem soving by computer program

Examples from the medical literature: the use of ogistic regression to find risc factors of an illness.
Multivariate methods: discriminant analysis
Examples from the medical literature: decision making by computer

Multivariate methods: cluster analysis
Examples from the medical literature: classification of cases or variables

Summary
TEST II: solving two simple problems, main results and interpretation.

**BASIC BIOSTATISTICS**

*7th, 9th semester*

**LECTURE**
(1 hr/week)
- Data definition, types of data, displaying data. Sample characteristics.
- Probability, random variables and their types, distributions.
- Binomial, Poisson, uniform and normal distribution and their properties.
- Statistical estimation, confidence intervals.
- Testing hypotheses, significance. One-sample t-test.
- Paired and Independent samples t-tests.
- Errors in hypothesis tests
- Comparing the mean of several groups: one-way analysis of variance.
- Relationship between continuous variables, correlation, linear regression.
- Relationship between categorical variables: the chi-square test for independence.
- The use of 2x2 tables in diagnostic tests. The chi-square-test for goodness of fit.
- Nonparametric methods.
- Summary

**PRACTICE**
(1 hr/week)
- Bar chart, histogram. Calculation of the mean and standard deviation.
- Calculation of ogisticc. The use of a computer program.
- The use of statistical tables – standard normal distribution.
- Calculation of the confidence interval for a population mean. The use of the t-table.
- Practice of one-sample t-test using experimental data.
- Practice of t-tests using experimental data. The meaning of significance, p-value.
- Independent t-tests and one-way ANOVA. Multiple comparisons.
- Scatterplot, trend-line in EXCEL. http://www.ruf.rice.edu/~lane/stat_sim/reg_by_eye
- Evaluation of a 2x2 table by hand calculation and by computer
- Calculation of sensutitivy, specificity, positive and negative predictive value.
- Statistical tests on ranks.
- TEST II.

**CASES IN CLINICAL MICROBIOLOGY**

*8th or 10th semester*

**LECTURE**
(2 hrs/week)
- How to take samples for microbiology? Cases will be discussed where these procedures have a great influence on the outcome of the laboratory investigations and the fate of the patient.
- Upper and lower respiratory infections. Causative agents in different age groups. Cases will be discussed with community-acquired and nosocomial pneumonia. How to select appropriate antibiotic treatment empirically? The value of microbiological tests.
- Upper and lower urinary tract infections. Differences in antibiotic resistance of pathogens causing urinary tract infections. Pitfalls in the laboratory tests.
- Differences in gastrointestinal diseases caused by bacteria, viruses and parasites. The possibilities of the laboratory diagnosis and treatment
- Infection or colonization. How to distinguish them through laboratory tests? Cases caused by fungi will
be discussed. Systemic or local fungal infections? Difficulties in laboratory tests
* Nosocomial infections. Nosocomial epidemics. Which methods are suitable to diagnose the spread of nosocomial pathogens in a hospital environment? Cases involved in nosocomial epidemics will be discussed, together with the measures that can be taken to stop the spread of nosocomial pathogens.
* Neuroinfections and joint infections. The main pathogens causing these kind of infections, and how to diagnose them will be discussed. Direct and indirect methods to reach a microbiological diagnosis and special aspects in the selection of antibiotic treatment will be discussed through the cases.
* Infections of immunosuppressed patients. Special aspects of infections of haematology patients will be discussed. The role of facultative and non-pathogenic bacteria in infections of immunosuppressed patients and the problems in the laboratory diagnosis of such clinical situations will be discussed through the cases.
* Sexually transmitted diseases and their consequences. Classical and newly recognized sexually transmitted infections (STI) and sexually transmitted diseases (STD). Diagnostic possibilities. Sexual abuse of children and adolescents. How to choose antibiotic treatment? How can we recognise HIV infected and AIDS patients. Cases caused by STI and STDs.
* Infections caused by anaerobic bacteria. Diagnostic problems and how to take samples to be able to isolate anaerobic pathogens will be discussed? Special aspects of clostridial infections as well as cases where anaerobic bacteria were involved will be discussed together with the special aspects of antibiotic treatment of such cases.
* Sepsis and its consequences. How blood culture techniques help in the diagnosis of sepsis. Determination of false-positive and false-negative blood cultures and the sensitivity and specificity of this technique will be discussed through clinical cases. Treatment options selecting the best antibiotic should be determined. Antibiotics. How to use antibiotics in prophylaxis and in treatment? The spread of antibiotic resistance worldwide, in different countries, and in hospitals/wards. Development of resistance to special antibiotics during patient therapy. Cases demonstrating the consequences of the correct and incorrect choice of antibiotics during treatment will be discussed.
* How to take samples in virus infections? Which laboratory tests can help in their diagnosis? Cases caused by viruses and their differential diagnostics will be discussed. Emerging and re-emerging viral infections. Prevention and treatment of viral infections. Possibilities of antiviral therapies.
* How to use molecular biological methods in routine clinical microbiological diagnostics? The value of these methods? Quality control problems. Cases will be discussed where molecular techniques can be helpful in the diagnosis.
* Cases caused by parasites and their clinical diagnosis and laboratory detection will be discussed.

CHILD AND ADOLESCENT PSYCHIATRY
8th or 10th semester

LECTURE
(2hr/week)
* Introduction
* Assessment, formulation
* Classification
* Psychological examinations
* Normal child development, risk and protective factors in childhood psychiatric disorders
* Conduct disorder
* Juvenile delinquency, School non-attendance
* Hyperactivity / ADHD
* Emotional disorders: Anxiety disorders I. Separation anxiety, Generalized anxiety
* Anxiety disorders II. Specific phobias, Social anxiety, Panic disorder
* Anxiety disorders III. PTSD
* Anxiety disorders IV. OCD
* Affective disorders
* Cognitive Behavior Therapy for depression-PASCET
* Suicide and deliberate self- harm
* Pervasive developmental disorders
* Psychoses of childhood and adolescence
* Eating disorders
* Enuresis
* Encopresis,
* Tic disorders, Tourette’s syndrome
* Selective mutism
* Behavior therapy-case presentation (SM)
* Speech and learning disorders
* Mental retardation
* Psychosomatics disorders-Recurrent abdominal pain, chronic fatigue syndrome, conversion disorder
* The child and adolescent in hospital
* Maltreatment of children
* Consultation
* Exam

**CLINICAL GENETICS AND CLINICAL GENOMICS**

**10th semester**

**LECTURE**
(2 hrs/week)
* Genetics in medicine. Human genome, epigenome. Genome programs, postgenomic era.
* Epigenetic control of gene expression. Genomic imprinting, X chromosome inactivation, tissue specific imprinting.
* Teratogenesis. Teratogens in clinical praxis.
* Dominant and recessive pattern of inheritance in clinical praxis.
* Genetic counseling, genetic screening. Ethical considerations. Genetic law. Local aspects in EC, U.S. and Hungary
* Genetics therapy. Stem cell therapy. Artificial chromosome.
* Pharmacogenetics, pharmacogenomics.
* Cancer genetics and genomics.
* Clinical Genomics. Changing paradigm in common disease.
* The significance of genomic knowledge in the diagnosis, therapy and prevention of human diseases.
* Summary. Assessment of the semester.

**CLINICAL IMMUNOLOGY**

**8th, 10th semester**

**LECTURE**
(2 hrs/week)
* The structure and the functions of the immune system. The biological significance of the self recognition.
* Methods for clinical immunological investigations.
* Immune-mediated tissue damage. The role of cytokines.
* Immunology of allergic diseases.
* Autoimmunity - Health and disease. The autoimmune diseases.
* Immunohaematology.
* Connective tissue disorders and joint diseases.
* Organ specific autoimmune diseases.
* Immundeficiencies. The immunology of HIV infection.
* Tumor immunology.
* Neuroimmunology.
* Immune manipulation.

**CLINICAL PHARMACOLOGY**

**8th or 10th semester**

**LECTURE**
(2 hrs/week)
* Introduction into clinical pharmacology. Historical background.
* The basic principles of pharmacokinetics.
* The basic principles of pharmacodynamics
* The basic principles of pharmacogenetics.
* Drug interactions and side-effects.
* The basic principles of biostatistics.
* The evaluation of preclinical data.
* The principles of GCP (Good Clinical Practice)
* The ethical and authoritative legislation of clinical drug trials.
* The principles of human phase studies (Phase I-II.)
* The principles of human phase studies (Phase III-IV.)
* Bioequivalence studies.
* Industrial drug research and development.
* Visit to the human Phase I. Unit at the I. Dept of Internal Medicine.

INTRODUCTION TO AVIATION AND SPACE MEDICINE
7th or 9th semester

* The history, subject, position and role of aviation and space medicine in medical sciences.
* The effects of short- and long-range flights from the passenger's point of view.
* The basics of aerodynamics. The composition, layers and main physical properties of the atmosphere.
* Pressure oxygen breathing. Motion sickness in aviation.
* The adverse effects of changes in baropressure on the human body. The effect of reduction in partial oxygen pressure on the human body, its importance in aviation.
* The pilots' lifestyle, nutrition and sports.
* The medical qualification of pilots and parachuters.
* The psychophysiological characters of the pilot's personality. The fatigue and overload of aircrews.
* The effects of noise and vibration on the human body during flight.
* Spatial alertness in flight, flight illusions.
* The physiological effects of space flight on the human body. The basic principles of astronaut selection and training.
* Decompression sickness

THE CLINICAL BASICS OF AVIATION AND SPACE MEDICINE
8th or 10th semester

* The aeromedical qualification system in civilian and military practice.
* Functional diagnostic examinations in practical aviation medicine.
* Aeromedical problems in pulmonology and gastroenterology.
* The cardiological aspects of aviation medicine.
* Excess temperature in aviation.
* Neurological and psychiatriical problems in aviation medicine.
* Ophhtalmology in aviation medicine.
* Emphasized aeromedical issues in oto-rhino-laryngology.
* The comparison of experiences gained in the MiG-29 and the Gripen.
* The issues of alcoholism in aviation medicine.
* Rheumatological aspects of aviation.
* The medical background of the International Space Station (ISS). Medical care during long-term space flights.
* Energy drinks in aviation?
TUTORIAL (2 hours/week): Solving and discussing clinical cases

* Introduction to laboratory diagnostics
* Visit at the Department of Laboratory Medicine
* Acid-base balance disorders: diagnosis and treatment of acute cases, combined acid-base disorders, discussion of complex cases
* Disorders of water, sodium and potassium balance: diagnosis and treatment of osmoregulatory defects and hypo-, and hyperkalaemia and -natraemia
* Bone and calcium metabolism: Causes of hypo- and hypercalcaemia, diagnostic algorithms
* Laboratory diagnosis of renal diseases: Managing patients with acute and chronic renal failure, diagnosis of impaired glomerular and tubular function. Differential diagnosis of proteinuria
* Laboratory diagnosis of diabetes mellitus: diagnosis and treatment of acute cases, problems with the laboratory monitoring of long-term outcomes
* The role of laboratory in oncology: tumor markers and their use in practice
* Case presentations in endocrinology – a case oriented approach: Functional tests and diagnostic algorithms in the investigation of endocrine abnormalities
* Laboratory diagnosis of coagulation disorders: Cases on the diagnosis of thrombo-embolic events (DVT, PE, congenital thrombophilias, lupus anticoagulant and anti-phospholipid syndrome) and bleeding disorders
* Haematology cases: differential diagnosis of anaemia, diagnosis of monoclonal gammopathies, use of flow cytometry in haemat-oncology
* Therapeutic drug monitoring: Role of TDM in patients treated with lithium, digoxin, antibiotics and immunosuppressive medications.
* Toxicology: Cases on drug overdose and ingestion of toxic substances.

NEUROSURGERY

10th semester

LECTURE
(1 hr/week)
* Introduction to neurosurgery. History, main topics, diagnostic procedures.
* Head injury. Head trauma, biomechanics, skull fractures, early and late complications, management, outcome.
* Tumors of the CNS. Increased intracranial pressure, brain oedema, signs and symptoms of space-occupying lesions.
* Supratentorial tumors.
* Axial-tumors, tumors of the posterior fossa.
* Tumors of the spine and spinal cord, metastatic tumors.
* Subarachnoid bleeding, cerebral aneurysms, early and late surgery, arteriovenous malformations cavernomas of the brain, venous anomalies.
* Spinal trauma. Biomechanics, acute pathology, early and late surgery versus conservative treatment, peripheral nerve injuries.
* Cervicobrachial syndromes. Herniation of the intervertebral disc in the cervical region, cervical spondylosis, narrowed spinal canal, surgical versus conservative therapy.

PRACTICE
(1 hr/week)
Material of the lectures in practice.
Material of the lectures in practice.
Material of the lectures in practice.
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Material of the lectures in practice.
Material of the lectures in practice.
Material of the lectures in practice.
Lectures 2014/2015

* Lumbar syndromes. Low back pain, lumbar disc prolaps, spondylosis of the lumbar region, failed back syndrome.
* Congenital anomalies. CSF circulatory disturbances, hydrocephalus, meningoceles, Chiari-malformation, pediatric neurosurgery.
* Main topics of functional neurosurgery

Exam

NUCLEAR MEDICINE

7th semester

Lecture

(1 hr/week)

* Nuclear medicine physics
  History
  Basic principles of nuclear physics and radiation biology
* Instrumentation of nuclear medicine
  Radiation detector systems
  Gamma camera
  Single photon emission computed tomography
  Positron emission computed tomography (PET), PET/CT
* Radiopharmacology
  Tracer principle
  Production of radionuclides
  Radiopharmaceutical chemistry
* Nuclear medicine in disorders of bones and joints
  Bone scintigraphy
  Joint scintigraphy
  Bone marrow scintigraphy
  Complementary investigations of the bones and joints
* Nuclear cardiology I.
* Nuclear cardiology II.
  Radionuclide ventriculography (RNV) at rest
  RNV during stress
  ECG-gated RNV with SPECT
  Miscellaneous nuclear cardiological methods
* Nuclear medicine investigations of the respiratory system
  Lung perfusion investigation
  Lung ventilation investigations
  Diagnosis of pulmonary embolism
* Nuclear medicine in gastroenterology
  Hepatobiliary scintigraphy
  Differential diagnostics of focal liver lesions
  Scintigraphy of the salivary glands
  Oesophagus passage study
  Gastric motility study
  Gastrointestinal bleeding site detected by radioisotopes
  Meckel's diverticulum detection
  Investigations of intestinal inflammations
  Investigations in malabsorption (Schilling test)
* In vitro nuclear medicine assays with radionuclides
  Principles of immunoassays
  Clinical applications of immunoassays
* Endocrinological aspects of nuclear medicine
  Thyroid scintigraphy
  Parathyroid scintigraphy
  Adrenal scintigraphy
  Neuroendocrine tumor imaging techniques
* Nuclear medicine in urogenital disorders
  Static renal scintigraphy
Dynamic studies
Vesicoureteric reflux study
Evaluation of renal transplants
Scrotum scintigraphy
Radionuclide hysterosalpingography

* Nuclear medicine of the central nervous system (CNS)
  Brain angioscintigraphy and blood-brain barrier scintigraphy
  Cerebrospinal fluid scintigraphy
  Brain SPECT studies
  Neuroreceptor SPECT
  Brain tumors evaluated by SPECT
  Brain PET studies

* Nuclear oncology
  Tumour markers
  Tumour-affirin radiopharmaceuticals and their applications
  Oncological aspects of bone marrow scintigraphy
  Scintigraphy of the lymphatic system, sentinel lymph node detection
  Oncological aspects of PET, PET/CT and SPECT/CT studies

* Nuclear medicine in therapy
  Thyroid disorders treated with radioisotopes
  Radiosynovectomy
  Palliative treatment of bone metastases
  Possibilities in radioimmunotherapy
  Neuroendocrine tumours treated with 131-I-MIBG
  32-P treatment in polycythaemia vera

**ORAL AND MAXILLOFACIAL SURGERY**
8th and 10th semester

**LECTURE**
(2 hrs/week)

04 Sept. Cardiac risk patients in dental practice  Prof. József Piffkó
11 Sept. Antibiotics in dentistry and oral surgery  Dr. Renáta Varga
18 Sept. Internal medicine questions in dental practice  Prof. Judit Méray
25 Sept. Dental treatment of patients with bleeding disorders  Dr. Zoltán Raskó
02 Oct. Dental treatment of patients following radio/chemotherapy  Dr. Renáta Varga
09 Oct. Maxillary sinus diseases and their management  Dr. Zoltán Raskó
16 Oct. Stomato-oncological screening  Dr. Róbert Paczona
30 Oct. Differential diagnosis of neck masses  Dr. Róbert Paczona
06 Nov. Differential diagnosis of facial pain  Dr. Róbert Paczona
13 Nov. Head and neck skin tumors  Prof. József Piffkó
20 Nov. Odontogenic tumors  Dr. Renáta Varga
27 Nov. Sedoanalglesia  Prof. József Piffkó
04 Dec. Written exam  Dr. Renáta Varga

**SOCIAL AND HEALTH POLICY**
8th, 10th semester

**LECTURE**
(2 hrs/week)

* Introduction to health policy. The influence of international organisations (WHO, World Bank etc.) on national health policies.
* Health and health policy in the European Union.
* The basic principles of health care systems.
* Health care services in selected European countries.
* Health care services in North American countries.
* Quality assurance in health care.
* Human resource management in health care.
  Introduction to social policy. The aim and task of social policy. The basic values and principles of social policy.
* Social policy in welfare states.
* The structure and function of social policy in the European Union. Social policy in developing countries.
* Poverty, deprivation, patterns of inequalities.
* Social policy of high-risk populations I. (immigrant, ethnicity, unemployed).
* Social policy of high-risk populations II. (disabled, chronic disease, elderly).
* The evaluation of the social and health care reforms from the beginning of ’90s – world tendencies (Final evaluation).

THE LANGUAGE OF EFFECTIVE DOCTOR-PATIENT COMMUNICATION I.

7th or 9th semester

**PRACTICE**

**(2 hrs/week)**

* An introduction to physician – patient communication 1
  An overview of communication.
  Identifying the elements that make up communication

* An introduction to physician – patient communication 2
  The patient centered approach: patient friendly language in history taking, instructing patients during examinations and discussing treatment options.

* Gastroenterology 1
  Receiving patients: greeting them and putting them at ease.
  Introducing yourself as the attending physician and explaining your role.

* Gastroenterology 2
  The presenting complaint. Encouraging patients to describe their problems in their own words.

* Gynecology and obstetrics 1
  Asking for history of menstruation
  Encouraging withdrawn patients to speak

* Gynecology and obstetrics 2
  Taking obstetric history: previous pregnancies, complications, deliveries, asking for present complaints

* Orthopedics
  Patient’s past medical history. Discussing family medical history.
  Taking effective notes during the interview.

* Endocrinology
  Explaining medical terminology to a patient
  Updating patient notes

* Surgery 1
  Giving results: explaining results to patients, giving a prognosis

* Surgery 2
  Planning surgical treatment: explaining treatments/ surgical interventions to a patient, discussing options

* Surgery 3
  Describing benefits and side effects, negotiating treatment
  Informed decision making

* Pulmonology
  Delivering bad news
  Writing concise and accurate notes

* Dental care
  Preparing and reassuring the patient during the examination.
  Negotiating the treatment.

* Test/exam

THE LANGUAGE OF EFFECTIVE DOCTOR-PATIENT COMMUNICATION II.

8th or 10th semester

**PRACTICE**

**(2 hrs/week)**

* Cardiology
  Enquiring about patient’s social history. Asking about life-style and environmental health

* Anesthesiology and intensive care
  Anesthesiological assessment of a patient
  Describing types of anesthesia
  Postoperative care

* Oncology
  Educating and counseling patients and their families
  Revision of the written documentation of patient care

* Dermatology
  Discussing treatment options Showing sensitivity and respect to patients
* Pediatrics 1  Communicating with children and adolescents. Establishing and developing rapport with a child.
* Psychology  Encouraging withdrawn patients to speak. Calming aggressive or angry patients.
* Neurology 1  Reassuring a patient or relative. Showing empathy.
* Neurology 2  Techniques for communicating with patients with neurological problems. Language to show sensitivity.
* Rheumatology  Encouraging patients to express their fears and concerns. Giving a prognosis.
* Oto-rhino-laryngology  Summarizing and structuring the interview.
* Ophthalmology  Handling complaints.
* Urology  Encouraging patients to express their fears and concerns. Advising on lifestyle.
* Test/exam

**TROPICAL DISEASES**

*8th or 10th semester*

**LECTURE**

*(2 hrs/week)*
* Diarrhea caused by protozoa: entamoebiasis, cryptosporidiosis, giardiasis, and diseases caused by *Isospora*, *Balantidium*, and *Capillaria*. Pathogenesis, clinical and laboratory diagnosis, and therapy.
* Arthropod-borne infections caused by various bacteria, rickettsia, and spirochetes in tropical areas. Distribution of various vectors which may influence the emergence of a disease. Plague, tularemia, endemic typhus, spotted fevers, and ehrlichiosis, etc. Clinical and laboratory diagnosis, and therapy.
* Tuberculosis, leprosy, and other bacterial infections with special emphasis on tropical areas. (meningitis caused by *N. meningitidis*, anthrax, tetanus, and rhinoscleroma). Clinical and laboratory diagnosis. Differences in clinical picture in the tropical areas compared to other countries. Therapy.
* SARS, avian flu, rabies, West Nile virus- and other rare viral infections characteristic in some tropical countries. Slow viruses. Clinical picture, pathogenesis, and diagnostic possibilities.
* Malaria, schistosomiasis. Causative agents, distribution of vectors, pathogenesis, clinical and laboratory diagnosis, and therapy.
* Leishmaniasis, and trypanosomiasis (Chagas' disease). Clinical symptoms, epidemiology, pathogenesis, and laboratory diagnosis.
* Sexually transmitted infections and diseases. Differences in the presentation of various bacterial and viral STDs in tropical areas. Pathogenesis, clinical and laboratory diagnosis. AIDS in Africa and in other undeveloped countries. Clinical symptoms, epidemiology, laboratory diagnosis, and therapy. AIDS-related infections and therapy.
* Case discussions of diseases frequently seen in tropical areas or in patients having journeys in tropical areas, with active involvement of the students in solving the diagnostic and/or therapeutic problems. 1. Laboratory seminar with demonstration of diagnostic procedures in the Institute of Clinical Microbiology 1.

**RHEUMATOLOGY**
The course „Rheumatology” covers the whole spectrum of musculoskeletal diseases including the immune-mediated internal medical systemic inflammatory diseases. The aim of the course is to provide a more detailed and practical overview of various types of arthritis and systemic autoimmune diseases, in addition to the limited topics covered within the clinical immunology section of the Internal Medicine course. The immunological basis of the diseases, novel treatment paradigms, the principles of immunosuppressive therapy, the innovative biological therapies, and the systematic diagnostic work-up of patients with arthritis, and other immune-mediated manifestations, such as Raynaud’s phenomenon, skin, renal, pulmonary, neurological, etc. involvements typical of systemic autoimmune diseases are detailed within the course „Rheumatology”. The topics are delivered in lectures and practicals at the Department of Rheumatology.

* Introduction into rheumatology (basics, history, immunopathological principles)
* Rheumatoid arthritis – therapeutic principles, new paradigms, biological therapies
* Systemic lupus erythematosus, antiphospholipid syndrome.
* Practical
* Systemic sclerosis (scleroderma), Mixed connective tissue disease (MCTD).
* Systemic vasculitides (terminology, general overview of the clinical spectrum)
* ANCA-associated vasculitides
* Polymyalgia rheumatica, giant cell arteritis, Takayasu arteritis
* Practical
* Spondyloarthritides (ankylosing spondylitis, psoriatic arthritis, reactive arthritis, enteropathic arthritis)
* Consultation

CARDIAC ELECTROPHYSIOLOGY AS A BASIC PROPERTY OF CARDIAC FUNCTION

LECTURE AND PRACTICE (2 hrs/week)

* Introduction.
* Basic principles of electrophysiology, the impulse propagation in the heart I.
* Basic principles of electrophysiology, the impulse propagation in the heart II.
* The action potential of myocytes and the ionic channels determining the action potential I.
* The action potential of myocytes and the ionic channels determining the action potential II.
* Methods and techniques in cardiac electrophysiology.
* Electro-mechanical coupling in the heart I.
* Genetic background of ion-channel disturbances in the heart.
* Electro-mechanical coupling in the heart II.
* The mechanism of developing cardiac arrhythmias
* Electrophysiological changes after the disturbances in blood supply to the myocardium.
* Experimental methods and clinical relevance to investigate cardiac arrhythmias.
* Investigational techniques in cardiac cellular electrophysiology
* Practical and consultation
Faculty of Dentistry
For the complete suggested study plan visit the ETR website.

Students have to acquire a total of 300 credits 5 modules in order to obtain the Doctor of Dental Medicine diploma.

All the requirements of a module have to be fulfilled in order to enter the next module:

- acquisition of the required credits
- completion of Criteria Subjects:
  - 2 semesters of Physical Training
    (It is compulsory to complete it in the first year)
  - Dentist-Patient Communication (in the 5th semester)
  - Preclinical Course of Prosthodontics and Gnathology Examination
    (in the 6th semester)
  - Prosthodontics and Implantology (in the 10th semester)
  - Operative Dentistry and Endodontics (in the 10th semester)
  - Pediatric Dentistry and Orthodontics (in the 10th semester)
  - Oral Surgery (in the 10th semester)
  - Periodontology (in the 10th semester)
  - Summer practices
  - 8 semesters of Hungarian Language
  - 1 semesters of Latin Language for Dental Students

MODULES:

1. Basic Module (years 1-2, semesters 1-4)

In the Basic Module one has to acquire a minimum of 80 credits in order to enter the Pre-Clinical module.

It is recommended to acquire 100 credits according to the following scheme:

- Compulsory Subjects: 80 credits
- Compulsory Elective Subjects: 10 credits recommended in the basic module
- Elective Subjects: 6 credits recommended in the basic module
- Criteria Subjects (summer practice in Nursing, summer practice in Odontotechnology, 4 semesters of Hungarian Language)
  It is compulsory to complete 2 semesters of Physical Education in the first year.

2. Pre-Clinical Module (year 3, semesters 5-6)

In the Pre-Clinical Module one has to acquire a minimum of 52 credits in order to enter the Clinical Module.

It is recommended to acquire 60 credits according to the following scheme:

- Compulsory Subjects: 52 credits
- Compulsory Elective Subjects: 5 credits recommended in the preclinical module
- Elective Subjects: 3 credits recommended in the preclinical module
- Criteria Subjects (Dentist-Patient Communication, Preclinical Course of Prosthodontics and Gnathology Examination, 2 semesters of Hungarian Language, Dental Surgery Summer Practice)

3. Dental Clinical Module (year 4, 5 semesters 7-10)

In the Dental Clinical Module one has to acquire a minimum of 83 credits

4. General Clinical Module (year 4, 5 semesters 7-10)

In the General Clinical Module one has to acquire a minimum of 25 credits
• Criteria Subjects (summer practice in Basic Treatment in Dental Medicine, 2 semesters of Hungarian Language, Prosthodontics and Implantology, Operative Dentistry and Endodontics, Pediatric Dentistry and Orthodontics, Oral Surgery, Periodontology)

6. Compulsory Elective Subjects

One has to acquire a minimum of **25 credits** until the 10th semester.

7. Elective Subjects

One has to acquire a minimum of **15 credits** until the 10th semester.

8. State Board Examination

A student is entitled to sit for the State Board Examination if he/she has fulfilled all the study and examination requirements of the Dental Medicine Program.

In order to certify the completion of the ten-semester education period of the Dental Medicine Program, student has to fulfill all the study and examination requirements according to the Curriculum by obtaining minimum 280 credits. The thesis has to be submitted and defended in the 10th semester. The credit number obtained at a successful defense of the thesis is 20 credits.

**Conditions of issuing the Diploma of Major of Dental Medicine:**

- Obtaining minimum 300 credits
- Completion of all parts of the State Board Examination:
  - Successful defense of the thesis
  - Completion of the written test, the practical and the oral part of the patient examination

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**Structure of Studies curriculum 9002AK_N**

For the complete suggested study plan visit the ETR website.

Students have to acquire a total of **300 credits** 5 modules in order to obtain the Doctor of Dental Medicine diploma.

All the requirements of a module have to be fulfilled in order to enter the next module:

- acquisition of the required **credits**
- completion of **Criteria Subjects**:
  - 2 semesters of **Physical Training**
    (It is recommended to complete it in the Basic Module)
  - **Dentist-Patient Communication** (in the 5th semester)
  - **Preclinical Course of Prosthodontics and Gnathology Examination**
    (in the 6th semester)
  - **Prosthodontics and Implantology** (in the 10th semester)
  - **Operative Dentistry and Endodontics** (in the 10th semester)
  - **Pediatric Dentistry and Orthodontics** (in the 10th semester)
  - **Oral Surgery** (in the 10th semester)
  - **Periodontology** (in the 10th semester)
  - **Summer practices**
  - 8 semesters of **Hungarian Language**
  - 2 semesters of **Latin Language**
MODULES:

1. Basic Module (years 1-2, semesters 1-4)

In the Basic Module one has to acquire a minimum of **84 credits** in order to enter the Pre-Clinical module.

It is recommended to acquire 100 credits according to the following scheme:

- Compulsory Subjects: 84 credits
- Compulsory Elective Subjects: **10 credits recommended in the basic module**
- Elective Subjects: **6 credits recommended in the basic module**
- Criteria Subjects (summer practice in Nursing, summer practice in Odontotechnology, 4 semesters of Hungarian Language)
  - It is recommended to complete 2 semesters of Physical Education in the Basic Module.

2. Pre-Clinical Module (year 3, semesters 5-6)

In the Pre-Clinical Module one has to acquire a minimum of **46 credits** in order to enter the Clinical Module.

It is recommended to acquire 54 credits according to the following scheme:

- Compulsory Subjects: 46 credits
- Compulsory Elective Subjects: **5 credits recommended in the preclinical module**
- Elective Subjects: **3 credits recommended in the preclinical module**
- Criteria Subjects (Dentist-Patient Communication, Preclinical Course of Prosthodontics and Gnathology Examination, 2 semesters of Hungarian Language, Dental Surgery Summer Practice)

4. Dental Clinical Module (year 4, 5 semesters 7-10)

In the Dental Clinical Module one has to acquire a minimum of **85 credits**

5. General Clinical Module (year 4, 5 semesters 7-10)

In the General Clinical Module one has to acquire a minimum of **25 credits**

- Criteria Subjects (summer practice in Basic Treatment in Dental Medicine, 2 semesters of Hungarian Language, Prosthodontics and Implantology, Operative Dentistry and Endodontics, Pediatric Dentistry and Orthodontics, Oral Surgery, Periodontology)

6. Compulsory Elective Subjects

One has to acquire a minimum of **25 credits** until the 10th semester.

7. Elective Subjects

One has to acquire a minimum of **15 credits** until the 10th semester.

8. State Board Examination

A student is entitled to sit for the State Board Examination if he/she has fulfilled all the study and examination requirements of the Dental Medicine Program.

In order to certify the completion of the ten-semester education period of the Dental Medicine Program, student has to fulfill all the study and examination requirements according to the Curriculum by obtaining minimum 280 credits. The thesis has to be submitted and defended in the 10th semester. The credit number obtained at a successful defense of the thesis is 20 credits.
Conditions of issuing the Diploma of Major of Dental Medicine:

- Obtaining minimum 300 credits
- Completion of all parts of the State Board Examination:
  - Successful defense of the thesis
  - Completion of the written test, the practical and the oral part of the patient examination

II. PRECONDITIONS FOR ENROLLMENT TO THE FOR THE COMING SEMESTERS: CURRICULUM 9002AK_N

- The compulsory courses in the second semester have examination requirements. This means one can take the examination of the second semester course only if the examination of the first semester subject (defined in the examination requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Examination requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy, Histology and Embryology II.</td>
<td>Anatomy, Histology and Embryology I.</td>
</tr>
<tr>
<td>Medical Chemistry II.</td>
<td>Medical Chemistry I.</td>
</tr>
<tr>
<td>Medical Physics and Statistics II.</td>
<td>Medical Physics and Statistics I.</td>
</tr>
<tr>
<td>Cell Biology and Molecular Genetics II.</td>
<td>Cell Biology and Molecular Genetics I.</td>
</tr>
</tbody>
</table>

The first semester courses can be taken as examination courses in the second semester. This means that the student will be exempted from fulfilling the study requirements (classes do not have to be attended). An examination course can be taken only once in a certain subject. The fee of the course is 570 USD. If one fails to complete an examination course both the study and examination requirements have to be completed in the proper semester (the whole course has to be repeated).

- The compulsory courses in the third semester have subject requirements. This means one can attend a third semester course only if the examination of the second semester (defined in the subject requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy, Histology and Embryology III.</td>
<td>Anatomy, Histology and Embryology II.</td>
</tr>
<tr>
<td>Biochemistry I.</td>
<td>Medical Chemistry II.</td>
</tr>
</tbody>
</table>

In this case the failed examination of the second semester can be repeated as an examination course in the semester when it is offered by the Department concerned.

- The compulsory courses in the fourth semester have examination requirements. This means one can take the examination of the fourth semester course only if the examination of the third semester (defined in the examination requirement) has been completed successfully:

<table>
<thead>
<tr>
<th>Course</th>
<th>Examination requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy, Histology and Embryology IV.</td>
<td>Anatomy, Histology and Embryology III.</td>
</tr>
<tr>
<td>Biochemistry II.</td>
<td>Biochemistry I.</td>
</tr>
<tr>
<td>Physiology for dental students II.</td>
<td>Physiology for dental students I.</td>
</tr>
</tbody>
</table>

Further conditions of requirements are in the complete study plan visit the ETR website.
Students who intend to perform the compulsory summer practice abroad should have a “Letter of acceptance” issued by the hospital where the student wishes to complete the practice has to be presented at the Foreign Students’ Secretariat. Deadline for presenting it: May 06, 2014. Official detailed certificate on the accomplishment of the practice has to be submitted subsequently, otherwise students cannot register for the next semester.

**Fees if the practices are spent in Hungary:** The fee for Nursing practice is 500 USD, for Odontotechnology is 600 USD, for Oral Surgery practice is 600 USD and for Basic Treatment in Dental Medicine is 800 USD. Practice fee must be paid before starting the practice.

**Practices are spent in Hungary** *(Deadline for presenting the application: March 31, 2014.)*:

**1st year dental students** have to perform a practice in Nursing of two weeks.

**Faculty of Dentistry:**

Department of Oral Surgery  
Period of time: from July 7, 2014 to August 1, 2014

**2nd year dental students** have to perform a practice in Odontotechnology of two weeks.

**Faculty of Dentistry:**

Department of Prosthodontics and Oral Biology  
Period of time: from July 7, 2014 to August 1, 2014

**3rd year dental students** have to perform a practice in Oral Surgery of four weeks.

**Faculty of Dentistry:**

Department of Oral Surgery  
Period of time: from July 7 2014 to August 29, 2014

**4th year dental students** have to perform a practice in Basic Treatment in Dental Medicine of four weeks.

**Faculty of Dentistry:**

Department of Prosthodontics and Oral Biology and Department of Operative and Esthetic Dentistry  
Period of time: from July 7, 2014 to August 01, 2014
## SUGGESTED STUDY PLAN for 9002AK_N_2013 Study Plan

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
</thead>
</table>

### DENTISTRY

**BASIC MODULE (semesters 1-4)**

#### Compulsory Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOG-MA011</td>
<td>Anatomy for Dental Students 1</td>
<td>Department of Anatomy</td>
<td>Prof. András Mihály</td>
<td>2</td>
<td>Examination</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>FOG-MA012</td>
<td>Anatomy for Dental Students 1</td>
<td>Department of Anatomy</td>
<td>Prof. András Mihály</td>
<td>-</td>
<td>-</td>
<td>1</td>
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<tr>
<td>FOG-MA111</td>
<td>Biology for Dental Students 1</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>Prof. János Minárovits</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>2</td>
</tr>
<tr>
<td>FOG-MA112</td>
<td>Biology for Dental Students 1</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>Prof. János Minárovits</td>
<td>1</td>
<td>-</td>
<td>Evaluation (5)</td>
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</tr>
<tr>
<td>FOG-MA081</td>
<td>Physics for Dental Students 1</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>Prof. János Minárovits</td>
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<td>-</td>
<td>Examination</td>
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</tr>
<tr>
<td>FOG-MA082</td>
<td>Physics for Dental Students 1</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>Prof. János Minárovits</td>
<td>1</td>
<td>-</td>
<td>Evaluation (5)</td>
<td>1</td>
</tr>
<tr>
<td>FOG-MA101</td>
<td>Chemistry for Dental Students 1</td>
<td>Department of Medical Chemistry</td>
<td>Prof. Gábor Tóth</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>2</td>
</tr>
<tr>
<td>FOG-MA102</td>
<td>Chemistry for Dental Students 1</td>
<td>Department of Medical Chemistry</td>
<td>Prof. Gábor Tóth</td>
<td>-</td>
<td>Total 30</td>
<td>Term Mark (5)</td>
<td>2</td>
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<tr>
<td>FOG-MA071</td>
<td>First Aid and Resuscitation</td>
<td>Department of Traumatology</td>
<td>Prof. Endre Varga</td>
<td>-</td>
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<tr>
<td>FOG-MA061</td>
<td>Introduction to Dentistry</td>
<td>Department of Orthodontics and Pediatric Dentistry</td>
<td>Dr. Emil Segatto</td>
<td>1</td>
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<tr>
<td>FOG-MA062</td>
<td>Introduction to Dentistry</td>
<td>Department of Orthodontics and Pediatric Dentistry</td>
<td>Dr. Emil Segatto</td>
<td>-</td>
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<td>Term Mark (5)</td>
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</tr>
</tbody>
</table>

#### Criteria Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOG-MA221</td>
<td>Latin Language for Dental Students</td>
<td>Department of Foreign Languages</td>
<td>Dr. Éva Demeter</td>
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<tr>
<td>FOG-MA231</td>
<td>Hungarian Language 1</td>
<td>Department of Foreign Languages</td>
<td>Dr. Éva Demeter</td>
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<tr>
<td>XT0011-PHE</td>
<td>Physical Education*</td>
<td>Sport Center</td>
<td>Andrea Bőrcs Hézsőné</td>
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<td>Signature</td>
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#### Compulsory Elective Subjects

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<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOG-MAC011</td>
<td>Introduction to Medicine</td>
<td>Dept.of Behavioural Sciences</td>
<td>Dr. Katalin Barabás</td>
<td>1</td>
<td>-</td>
<td>Evaluation (5)</td>
<td>1</td>
</tr>
<tr>
<td>FOG-MAC012</td>
<td>Introduction to Medicine</td>
<td>Dept.of Behavioural Sciences</td>
<td>Dr. Katalin Barabás</td>
<td>-</td>
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<td>Term Mark (5)</td>
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</tr>
<tr>
<td>FOG-MAC071</td>
<td>Dental Prevention in Children</td>
<td>Department of Orthodontics and Pediatric Dentistry</td>
<td>Dr. Emil Segatto</td>
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<td>-</td>
<td>Evaluation (5)</td>
<td>1</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course</td>
<td>Department and Head of Department</td>
<td>Hrs/week Theory</td>
<td>Hrs/week Practice</td>
<td>Form of exam</td>
<td>Credit</td>
<td>Course Requirement (SR=Subject requirement; ER=Examination requirement)</td>
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<tr>
<td>FOG-MAC041</td>
<td>Smoking prevention in Dental practice</td>
<td>Department of Oral Surgery</td>
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<tr>
<td>FOG-MAE211</td>
<td>Responses of the Living Cell to the environment</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>2</td>
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<td>Evaluation (5)</td>
<td>2</td>
<td></td>
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<tr>
<td>FOG-MAE041</td>
<td>Reflecting on a locality: Communication, Culture and Social Change in Szeged</td>
<td>Faculty of Arts, Department of Communication and Media Studies</td>
<td>2</td>
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<td>Evaluation (5)</td>
<td>2</td>
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<tr>
<td>FOG-MAE151</td>
<td>Hungarian Cultural History: the Visual Arts in an European Context</td>
<td>Faculty of Arts, Hungarian Studies Program</td>
<td>2</td>
<td>-</td>
<td>Evaluation (5)</td>
<td>2</td>
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<tr>
<td>FOG-MAE161</td>
<td>Hungarian History 1000-1848</td>
<td>Faculty of Arts, Hungarian Studies Program</td>
<td>2</td>
<td>-</td>
<td>Evaluation (5)</td>
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<tr>
<td>FOG-MAE171</td>
<td>Hungarian Literature</td>
<td>Faculty of Arts, Hungarian Studies Program</td>
<td>2</td>
<td>-</td>
<td>Evaluation (5)</td>
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<tr>
<td>XA0021</td>
<td>General Elective Subjects</td>
<td>University of Szeged</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
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<td></td>
</tr>
<tr>
<td>XN0211</td>
<td>SZTE Language Courses</td>
<td>University of Szeged</td>
<td>-</td>
<td>2</td>
<td>Term Mark (5)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*One has to complete 2 semesters Physical Education until the end of the 1st year*
## DENTISTRY

### 2014/2015 1st year spring, 2nd semester

#### Compulsory Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOG-MA013</td>
<td>Anatomy for Dental Students 2</td>
<td>Department of Anatomy</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>2</td>
<td>ER: Anatomy I. lec.</td>
</tr>
<tr>
<td>FOG-MA014</td>
<td>Anatomy for Dental Students 2</td>
<td>Department of Anatomy</td>
<td>-</td>
<td>3</td>
<td>Term Mark (5)</td>
<td>3</td>
<td>SR: Anatomy I. prac.</td>
</tr>
<tr>
<td>FOG-MA113</td>
<td>Biology for Dental Students 2</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>2</td>
<td>ER: Biology 1 lec.</td>
</tr>
<tr>
<td>FOG-MA114</td>
<td>Biology for Dental Students 2</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>1</td>
<td>-</td>
<td>Evaluation (5)</td>
<td>1</td>
<td>ER: Biology 1 sem.</td>
</tr>
<tr>
<td>FOG-MA083</td>
<td>Physics for Dental Students 2</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>2</td>
<td>-</td>
<td>Examination</td>
<td>2</td>
<td>ER: Physics 1 lec.</td>
</tr>
<tr>
<td>FOG-MA084</td>
<td>Physics for Dental Students 2</td>
<td>Department of Oral Biology and Experimental Dental Research</td>
<td>1</td>
<td>-</td>
<td>Evaluation (5)</td>
<td>1</td>
<td>ER: Physics 1 sem.</td>
</tr>
<tr>
<td>FOG-MA103</td>
<td>Chemistry for Dental Students 2</td>
<td>Department of Medical Chemistry</td>
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<td>-</td>
<td>Examination</td>
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<td>ER: Chemistry I. lec.</td>
</tr>
<tr>
<td>FOG-MA104</td>
<td>Chemistry for Dental Students 2</td>
<td>Department of Medical Chemistry</td>
<td></td>
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<td>Total 30</td>
<td>Term Mark (5)</td>
<td>2</td>
</tr>
<tr>
<td>FOG-MA051</td>
<td>Dental Instruments</td>
<td>Department of Oral Surgery</td>
<td>1</td>
<td>-</td>
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</tr>
<tr>
<td>FOG-MA052</td>
<td>Dental Instruments</td>
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#### Criteria Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department and Head of Department</th>
<th>Hrs/week: Theory</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement (SR=Subject requirement; ER=Examination requirement)</th>
</tr>
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<tbody>
<tr>
<td>FOG-MA201</td>
<td>Nursing Practice</td>
<td>Department of Oral Surgery</td>
<td></td>
<td>Signature</td>
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#### Compulsory Elective Subjects

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*One has to complete 2 semesters Physical Education until the end of the 1st year*
# Suggested Study Plan for 9002AK_N Study Plan

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## Dentistry

### Basic Module (Semesters 1-4)

**2014/2015 2nd year fall, 3rd semester**

#### Compulsory Subjects

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**Compulsory Elective Subjects**

- **FOG-MAE031** Animal Experiments in Medicine
  - Institute of Surgical Research
  - Prof. Mihály Boros
  - Total 22 Hrs
  - Evaluation (5)
  - Credit 3

- **FOG-MAE032** Animal Experiments in Medicine
  - Institute of Surgical Research
  - Prof. Mihály Boros
  - Total 20 Hrs
  - Signature
  - Credit 0

- **FOG-MAE041** Reflecting on a locality: Communication, Culture and Social Change in Szeged
  - Faculty of Arts, Department of Communication and Media Studies
  - Dr. Bertalan Pusztai
  - 2 Hrs
  - Evaluation (5)
  - Credit 2

- **FOG-MAE151** Hungarian Cultural History: the Visual Arts in an European Context
  - Faculty of Arts, Hungarian Studies Program
  - Prof. György Szőnyi
  - 2 Hrs
  - Evaluation (5)
  - Credit -

- **FOG-MAE161** Hungarian History 1000-1848
  - Faculty of Arts, Hungarian Studies Program
  - Prof. György Szőnyi
  - 2 Hrs
  - Evaluation (5)
  - Credit -

- **FOG-MAE171** Hungarian Literature
  - Faculty of Arts, Hungarian Studies Program
  - Prof. György Szőnyi
  - 2 Hrs
  - Evaluation (5)
  - Credit -

- **XA0021** General Elective Subjects
  - University of Szeged
  - SZTE
  - 2 Hrs
  - Examination
  - Credit 2

- **XN0211** SZTE Language Courses
  - University of Szeged
  - SZTE
  - 2 Term Mark
  - Credit 2

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*One has to complete 2 semesters Physical Education until the end of the 1st year*
### DENTISTRY

#### BASIC MODULE (semesters 1-4)

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*One has to complete 2 semesters Physical Education until the end of the 1st year*
## DENTISTRY
### Pre-Clinical Module

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# DENTISTRY
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### Compulsory Subjects
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- FOJ-KA202: Advanced Imaging Techniques in Dentistry
- FOJ-KA223: Pharmacology II.
- FOJ-KA224: Pharmacology II.
- FOJ-KA233: Pathophysiology II.
- FOJ-KA234: Pathophysiology II.
- FOJ-KA243: Pathology and Oral Pathology II.
- FOJ-KA244: Pathology and Oral Pathology II.
- FOJ-KA263: Preclinical Course of Prosthodontics II.
- FOJ-KA264: Preclinical Course of Prosthodontics II.
- FOJ-KA273: Preclinical Course of Operative Dent. II.
- FOJ-KA274: Preclinical Course of Operative Dent. II.
- FOJ-KA361: Preclinical Course of Operative Dent. preliminary exam
- FOJ-KA281: Preclinical Course of Oral Surgery
- FOJ-KA282: Preclinical Course of Oral Surgery
- FOJ-KA322: Public Health II.
- FOJ-KA323: Public Health II.

### Criteria Subjects
- FOJ-KA342-Dent: Dentist - Patient Communication
- FOJ-KA331: Oral Surgery Summer Practice
- FOJ-KA351: Preclinical Course of Prosthodontics and Gnathology
- FOJ-KA166: Hungarian Language VI.
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## DENTISTRY

### CLINICAL MODULE (semester 7-10)

(General Clinical Module: 30 credits, Dental Clinical Module: 95 credits)

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### 2014/2015 4th year fall, 7th semester

**Compulsory Subjects in the General Clinical Module**

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# DENTISTRY
## CLINICAL MODULE

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### Compulsory Subjects in the General Clinical Module

- **FOG-KA461** Oto-Rhino-Laryngology
  - Department of Otolaryngology and Head & Neck Surgery
  - Prof. László Rovó
  - Hrs/week: Theory - 2, Practice - 0
  - Form of exam: Examination
  - Credit: 3

### Compulsory Subjects in the Dental Clinical Module

- **FOG-KA616** Prosthodontics III.
  - Department of Prosthodontics
  - Dr. Zoltán Baráth
  - Hrs/week: Theory - 6, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 3
  - Course Requirement: SR: Prosthodontics preliminary exam

- **FOG-KA646** Operative Dentistry III.
  - Department of Operative and Esthetic Dentistry
  - Dr. Antal Márk
  - Hrs/week: Theory - 4, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 2

- **FOG-KA683** Oral Surgery III.
  - Department of Oral Surgery
  - Prof. Katalin Nagy
  - Hrs/week: Theory - 2, Practice - 0
  - Form of exam: Evaluation (5)
  - Credit: 1

- **FOG-KA684** Oral Surgery III.
  - Department of Oral Surgery
  - Prof. Katalin Nagy
  - Hrs/week: Theory - 4, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 3

- **FOG-KA633** Pediatric Dentistry II.
  - Department of Orthodontics and Pediatric Dentistry
  - Dr. Emil Segatto
  - Hrs/week: Theory - 1, Practice - 0
  - Form of exam: Evaluation (5)
  - Credit: 2
  - Course Requirement: ER: Pediatric Dentistry I.

- **FOG-KA616** Prosthodontics III.
  - Department of Prosthodontics
  - Dr. Anette Stájer
  - Hrs/week: Theory - 6, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 3
  - Course Requirement: SR: Prosthodontics preliminary exam

- **FOG-KA646** Operative Dentistry III.
  - Department of Operative and Esthetic Dentistry
  - Dr. Zoltán Baráth
  - Hrs/week: Theory - 4, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 2

- **FOG-KA683** Oral Surgery III.
  - Department of Oral Surgery
  - Prof. Katalin Nagy
  - Hrs/week: Theory - 2, Practice - 0
  - Form of exam: Evaluation (5)
  - Credit: 1

- **FOG-KA684** Oral Surgery III.
  - Department of Oral Surgery
  - Prof. Katalin Nagy
  - Hrs/week: Theory - 4, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 3

- **FOG-KA634** Pediatric Dentistry II.
  - Department of Orthodontics and Pediatric Dentistry
  - Dr. Emil Segatto
  - Hrs/week: Theory - 4, Practice - 0
  - Form of exam: Term Mark (5)
  - Credit: 2

- **FOG-KA621** Orthodontics I.
  - Department of Orthodontics and Pediatric Dentistry
  - Dr. Emil Segatto
  - Hrs/week: Theory - 1, Practice - 0
  - Form of exam: Examination
  - Credit: 2

- **FOG-KA622** Orthodontics I.
  - Department of Orthodontics and Pediatric Dentistry
  - Dr. Emil Segatto
  - Hrs/week: Theory - 2, Practice - 0
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### DENTISTRY

### CLINICAL MODULE

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#### Compulsory Subjects in the General Clinical Module

- FOG-KA617 Prosthodontics IV. Department of Prosthodontics Dr. Anette Stájer - 6 Term Mark (5) 3 SR: Prosthodontics
- FOG-KA647 Operative Dentistry IV. Department of Operative and Esthetic Dentistry Dr. Zoltán Baráth - 6 Term Mark (5) 3 SR: Operative Dentistry III. pr.
- FOG-KA635 Pediatric Dentistry III. Department of Orthodontics and Pediatric Dentistry Dr. Emil Segatto - 3 Term Mark (5) 2 ER: Pediatric Dentistry II. lect.
- FOG-KA623 Orthodontics II. Department of Orthodontics and Pediatric Dentistry Dr. Emil Segatto 1 - Evaluation (5) 2 ER: Orthodontics I. lect.
- FOG-KA624 Orthodontics II. Department of Orthodontics and Pediatric Dentistry Dr. Emil Segatto 1 - 2 Term Mark (5) 1 -
- FOG-KA678 Periodontology IV. Department of Periodontology Dr. Laczkó Dr. Turzó Kinga 1 - Signature 0 ER: Periodontology III. lect.
- FOG-KA679 Periodontology IV. Department of Periodontology Dr. Laczkó Dr. Turzó Kinga - 3 Term Mark (5) 2 SR: Periodontology III. lect., pr.
- FOG-KA712 Dental Implantology II. Department of Oral Surgery Prof. Katalin Nagy - 2 Term Mark (5) 2 ER: Dental Implantology I. lect.

#### Criteria Subjects

- FOG-KA617 Prosthodontics IV. Department of Prosthodontics Dr. Zoltán Baráth 1 - 6 Term Mark (5) 3 SR: Prosthodontics III. pr.
- FOG-KA647 Operative Dentistry IV. Department of Operative and Esthetic Dentistry Dr. Márk Antal 1 - 6 Term Mark (5) 3 SR: Operative Dentistry III. pr.
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<td>XA0021</td>
<td>General Elective Subjects</td>
<td>University of Szeged SZTE</td>
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<td>XN0211</td>
<td>SZTE Language Courses</td>
<td>University of Szeged SZTE</td>
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<td>Term Mark(5)</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Faculty</td>
<td>Professor</td>
<td>Total</td>
<td>Evaluation</td>
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<tr>
<td>FOG-KAE031</td>
<td>Animal Experiments in Medicine</td>
<td>Institute of Surgical Research</td>
<td>Prof. Mihály Boros</td>
<td>22</td>
<td>3</td>
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</tbody>
</table>

**State Board Examination**

<table>
<thead>
<tr>
<th>Component</th>
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<th>Professor</th>
<th>Total</th>
<th>Evaluation</th>
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</thead>
<tbody>
<tr>
<td>Thesis</td>
<td>Faculty of Dentistry</td>
<td>Prof. Katalin Nagy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written Test</td>
<td>Faculty of Dentistry</td>
<td>Prof. Katalin Nagy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Examination - Oral exam</td>
<td>Faculty of Dentistry</td>
<td>Prof. Katalin Nagy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Examination - Practical exam</td>
<td>Faculty of Dentistry</td>
<td>Prof. Katalin Nagy</td>
<td></td>
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</tr>
</tbody>
</table>

State Board Examination: 20 - Thesis

State Board Examination: 0 - Thesis

State Board Examination: 0 - Thesis
Recommended textbooks for first year dental students

For the textbooks of the medical basic module subjects check the medical recommended textbooks (pg: 56.)

DENTAL ANATOMY

DENTAL INSTRUMENTS

COMMUNICATION IN DENTISTRY

Recommended textbooks for second year dental students

ETHICS IN MEDICINE
- World Medical Association (WMA, http://www.wma.net/e/about/index.htm )
- WMA Ethics Manual (http://www.wma.net/e/ethicsunit/resources.htm )
- WMA Policy (http://www.wma.net/e/policy/b3.htm )
- The Declaration of Genecva (http://www.cirp.org/library/ethics/geneva/ )
- The Declaration of Helsinki (http://www.fda.gov/oc/health/helsinki89.html )

DENTAL MATERIALS AND TECHNOLOGY

ORAL BIOLOGY

MEDICAL PSYCHOLOGY

Recommended textbooks for third year dental students

For the textbooks of the medical pre-clinical module subjects check the medical recommended textbooks (pg: 58.)

PHARMACOLOGY

HUNGARIAN LANGUAGE
- Putz Mónika: Magyar fogorvosi szaknyelv, Semmelweis Egyetem, Bp.2006
- Győrffy Mária: Mi a panasz? PTE, Pécs 2003

PRECLINICAL COURSE OF ORAL SURGERY

PRECLINICAL COURSE OF PROSTHODONTICS
GENERAL AND DENTAL RADIOLOGY
  • White, SC, Pharoah, MJ: Oral Radiology Principles and Interpretation, 2009, Mosby, St. Louis

BIO- AND ALLOPLASTIC MATERIALS IN DENTISTRY

PRECLINICAL COURSE OF OPERATIVE DENTISTRY

GNATOLOGY
  • Wheeler’s Dental Anatomy, Physiology and Occlusion
  • Klineberg_Jagger Occlusion and Clinical Practice, Wright 2004.
  • Thomas- Tatenoi: Die gnathologische Okklusion, Quintessenz 1982.
  • Stuart: Full Mouth Waxing Technique, Quintessence 1984.

DENTIST-PATIENT COMMUNICATION

ADVANCED IMAGING TECHNICS IN DENTISTRY
  • White, SC, Pharoah, MJ: Oral Radiology Principles and Interpretation, 2009, Mosby, St. Louis

PATHOPHYSIOLOGY
  Textbooks
  • Gayton and Hall: Textbook of Medical Physiology 12th ed. 2011
  • Damjanov: Pathophysiology, Elsevier (Saunders title), 2008,
    ISBN: 978-1-4160-0229-1
    ISBN- 0071621679/9780071621670
  • Silbernagl, Lang: Color Atlas of Pathophysiology, George Thieme Verlag, 2000,
    ISBN: 9780865778665/9783131165510
  • Goldman, Schafer: Goldman’s Cecil Medicine, 24th ed., Elsevier (Saunders title), 2012,
    ISBN: 978-1-4377-2788-3
  • Longo, Fauci, Kasper, Hauser, Jameson, Loscalzo: Harrison’s Principles of Internal Medicine, 18th ed.,

Handouts (for practice)

PUBLIC HEALTH
Recommended textbooks for fourth and fifth year dental students

OPERATIVE DENTISTRY

ESTHETIC DENTISTRY

ENDODONTICS

PROSTHODONTICS

ORAL SURGERY

ORAL MEDICINE

INFECTION CONTROL IN DENTISTRY

DENTAL DIAGNOSTICS AND TREATMENT PLANNING
- Content of the lectures
- Relating parts of recommended dental books

DENTAL BIOMETRY AND EVALUATION OF RESEARCH RESULTS
- J.A. von Fraunhofer and J.J. Murray: Statistics in Medical, Dental and Biological Studies,TRI-MED BOOKS LTD. First published 1976

PEDIATRIC DENTISTRY
- Richard J. Mathewson; Robert E. Primosh: Fundamentals of pediatric dentistry-Quintessence

PERIODONTOLOGY

DENTAL IMPLANTOLOGY
- Myron Nevins, James T. Mellonig: Implant Therapy
DENTAL IMPLANTOLOGY (IN PROSTHODONTICS)
- Hubertus Spiekermann: Implantology
- Myron Nevins, James T. Mellonig: Implant Therapy
- Hubertus Spiekermann: Implantology
- Misch CE: Dental Implant Prosthetics
- Content of the lectures

ORTHODONTICS
- TEXTBOOK OF ORTHODONTICS by Samir Bishara, DDS, BDS, Dortho, MS, Professor, Department of Orthodontics, University of Iowa, College of Dentistry, Iowa City, IA
- Bibliography & ordering Information, Hardcover, 592 pages, publication date: MAR-2001, Imprint: SAUNDERS

DISEASES OF TEMPOROMANDIBULAR SYSTEM

TREATMENT OF TRAUMATIC DENTAL INJURIES IN CHILDHOOD

DENTAL TREATMENT OF ELDERLY PEOPLE AND PATIENTS WITH SPECIAL NEEDS

FORENSIC MEDICINE

ESTHETICS OF THE FACE

HUNGARIAN LANGUAGE
- Putz Mónika: Magyar fogorvosi szaknyelv, Semmelweis Egyetem, Bp.2006
- Győrffy Mária: Mi a panasz? PTE, Pécs 2003

DERMATOLOGY
  ISBN:0632037148
SYLLABUSES
BASIC MODULE - DENTISTRY

For the syllabus of the general basic module subjects check the medical syllabus (pg.: 65).

DENTAL INSTRUMENTS

1st semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(1 hr/week)</td>
</tr>
<tr>
<td>* 1. Introduction to the Szeged Dental School</td>
<td>8. Dental Instruments used in operative dentistry, endodontics</td>
</tr>
<tr>
<td>* 2. History of Dentistry (Stone age – Greco-Roman Dentistry)</td>
<td>9. X-ray machine, Orto-pan tomogram</td>
</tr>
<tr>
<td>* 3. History of Dentistry (Greco-Roman Dentistry – Western Dentistry)</td>
<td>10. Dental instruments used in prosthetic dentistry</td>
</tr>
<tr>
<td>* 4. History of Dentistry (Western Dentistry – today)</td>
<td>11. Dental Instruments used in orthodontics and children dentistry and periodontology, oral hygiene instruments</td>
</tr>
<tr>
<td>* 5. Fully equipped dental surgery</td>
<td></td>
</tr>
<tr>
<td>* 6. Visiting a private dental practice</td>
<td></td>
</tr>
<tr>
<td>* 7. Dental instruments used in oral surgery</td>
<td></td>
</tr>
<tr>
<td>* 1.0 Introduction to the Szeged Dental School</td>
<td>12. Exam</td>
</tr>
<tr>
<td>* 2.0 History of Dentistry (Stone age – Greco-Roman Dentistry)</td>
<td>13. Semester overview</td>
</tr>
<tr>
<td>* 3.0 History of Dentistry (Greco-Roman Dentistry – Western Dentistry)</td>
<td>14. Consultation</td>
</tr>
<tr>
<td>* 4.0 History of Dentistry (Western Dentistry – today)</td>
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</tbody>
</table>

DENTAL ANATOMY

1st semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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</thead>
<tbody>
<tr>
<td>(2 hours/week)</td>
<td>(1 hour/week)</td>
</tr>
<tr>
<td>* 1. The object and importance of Dental Anatomy. Biomimetics</td>
<td>1. Tooth structure - drawing exercise in 2D and 3D, study of pulpal sections</td>
</tr>
</tbody>
</table>
CHEMISTRY FOR DENTAL STUDENTS

1st semester (14 weeks)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE (2 hrs/week)</th>
<th>SEMINAR (1 hr/week)</th>
<th>PRACTICE (2 hrs/week – 8 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Properties of the most important nonmetals and their compounds. Biological importance and usage. Formation and physiological effects of free radicals.</td>
<td>Metals and their compounds. Complexes. Metathesis reactions.</td>
<td>During weeks 5 to 9 students work in rotation and conduct one of the following experiments each week:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I) Quantitative determination</td>
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<tr>
<td>Topic</td>
<td>Description</td>
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<td>-------</td>
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<tr>
<td></td>
<td>Solutions. Continuation of practicing simple chemical calculations.</td>
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<td></td>
<td>of Fe(II)-content by permanganometric titration measuring the redox potential. VII) Photometric determination of iron.</td>
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<tr>
<td></td>
<td>Simple pH calculations. Buffers, calculations involving buffers.</td>
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<tr>
<td></td>
<td>Oxidation-reduction reactions. Voltaic cells.</td>
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<td></td>
<td>Weeks 10 and 11: make-up laboratory practicals.</td>
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<tr>
<td></td>
<td>Brief summary of chemical thermodynamics and reaction kinetics.</td>
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<tr>
<td></td>
<td>Types of organic chemical reactions. Saturated hydrocarbons: alkanes and cycloalkanes.</td>
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<td>No practice these weeks.</td>
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</table>


2nd semester (14 weeks)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURE</th>
<th>SEMINAR</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Three-dimensional structure of molecules: constitution, configuration and conformation. Optical isomerism. Enantiomers, racemates. Configuration: D-L and R-S systems. Molecules with more than one chiral centers. Diastereomers.</td>
<td>1 hr/week</td>
<td>(2 hrs/week – 8 weeks)</td>
</tr>
<tr>
<td></td>
<td>Fire and safety precautions. Requirements for completion of the semester. Summary of organic chemical reactions. Chirality, optical isomerism.</td>
<td></td>
<td>No practice these weeks.</td>
</tr>
<tr>
<td>4.</td>
<td>Oxo compounds. Structure of the carbonyl group. Chemical reactions of aldehydes and ketones: addition and condensation reactions. Enol-oxo tautomerism and aldol dimerization of o xo compounds. The role of these reactions in biochemical processes. Oxidation and reduction reactions. Important o xo compounds: quinones, coenzyme Q and vitamin K.</td>
<td>Heterocyclic compounds.</td>
<td>During weeks 4 to 8 students work in rotation and conduct one of the following experiments each week:</td>
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<tr>
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<td></td>
<td>I) Determination of pKₐ of a known concentration weak acid solution through the preparation of different buffers.</td>
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<tr>
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<td></td>
<td></td>
<td>II) Quantitative determination of Fe(II)-content by permanganometric titration</td>
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</tbody>
</table>
unsaturated carboxylic acids. Fatty acids.


III) Photometric determination of iron.
IV) Polarimetric determination of sugar.
V) Quantitative determination of a protein by photometric method.
VI) Quantitative determination of vitamin C content by bromatometric titration.

Carboxylic acids. Substituted carboxylic acids.

Peptides and proteins.

Bioorganic chemistry: some chemical reactions of proteins and carbohydrates.

Monosaccharides.

Di- and polysaccharides.

Weeks 10 and 11: make-up laboratory practicals.

**INTRODUCTION TO MEDICINE**

**1st semester**

**LECTURE** (1 hr/week) and **PRACTICE** (1 hr/week)

- Health Philosophy and Behavioral Medicine I. Modern concept of health and disease Health Philosophy and Behavioral Medicine II. What influences health? The development of disease: Causal models

**COMMUNICATION IN DENTISTRY**

**2nd semester**

**LECTURE**

(1 hour/week)

- 1. General prelude, the attitude, point of view of the curse, what is psychology, the relation between psychology and medicine. The necessity and traits of

**PRACTICE**

(2 hours/week)

- 1. Introduction, technical details
self-evaluation (self-image, assertive attitude, games people play, and it's solution)

2. Basic elements of communication

The psychology of social interactions (Basic elements of social behavior – the effect of people's presence on human achievement, human groups and roles, the human mass's symptom)

3. Factors which disturb the communicational process I.

The psychology of social interactions (Basic elements of perception of people, schemas, stereotypes, attributions, the point of view of individual psychology)

3. Factors which disturb the communicational process II.

* 2. Block in basic and biological elements of psychology (Sensation and perception). The psychology of social interactions (Basic elements of perception of people, schemas, stereotypes, attributions, the point of view of individual psychology)

* 3. The psychology of social interactions (Basic elements of social behavior – the effect of people's presence on human achievement, human groups and roles, the human mass's symptom)

* 4. The psychology of social interactions (Submission, diffusion of responsibility, conformity to the great mass, the effect of minority on the majority)

* 5. General psychology (Attention, memory, imagination, human consciousness, thinking)

5. Verbal communication I.

* 6. Motivation (human needs, sexual-, human arousal)

6. Verbal communication II.

* 7. Human values (The base of values - cognition, exploration -, self-respect and respecting people), the born-out syndrome (how to protect our mental health and harmony)

7. Factors which disturb the communicational process III.

* 8. Emotions (The evolution of them, theories of their functioning, the mechanism of facial feed-back, and it's practical utility)

8. Nonverbal communication I.

* 9. The personality (definitions, theories, the role of nature and nurture)

9. Nonverbal communication II.

* 10. The psychology of human development (The importance, sections, approaches of it)

10. Cultural presentation I.

* 11. The mechanism of human behavior, the possibilities to take effect on it. Basic element of learning processes (Respondent and classical conditioning, and it's practical utility)

11. Cultural presentation II.

* 12. The mechanism of human behavior, the possibilities to take effect on it. Basic element of learning processes (Complex –observational, and cognitive-behavioral – learning, and it's practical utility)

12. Discussion

* 13. Summary of practical utilities of psychology – Questions and answers

13. Test

* 14. Free consultation – Questions and answers

14. Closing
SOCIAL POLICY FOR DENTAL STUDENTS

2nd semester

LECTURE
(1 hr/week)

* Introduction to social policy. The aim and task of social policy.
* The basic values and principles of social policy
* Social policy in welfare states
* Social policy in the European Union I.
* Social policy in the European Union II.
* Social policy in developing countries
* Poverty, deprivation, patterns of inequalities
* Social policies toward families. Connections between demographics and social policy
* Social policy of high-risk populations I. (immigrant, ethnicity)
* Social policy of high-risk populations II. (unemployed, homeless)
* Social policy of high-risk populations III. (disabled, chronic diseased)
* Social policy of high-risk populations IV. (elderly)
* The role of civil society, non-profit and non-governmental organizations in social policy
* The future of social policy at international level. Final evaluation

NURSING PRACTICE (SUMMER PRACTICE)

2nd semester

Students may perform the emergency ambulance practice out of the University (in their country) at a dental emergency ambulance. In this case they have to submit an acceptance letter from the head of the chosen surgery. Students have to submit a certificate about the practice, containing a short evaluation.

2 x 35 hours (dental emergency ambulance) in July and August according to the group arrangement.

Detailed description of the practice requirements:
Getting to know the work of the Emergency Ambulance:
- Observing the administrative tasks in connection with patient examination. (assignments, computerized patient admission, ambulance diary, patient records)
- Procedure and practice of making a diagnosis
- Getting to know and practicing the duties related to patient examination.
- Observing the examination of X-ray results, and diagnosis making.
- Getting to know the procedure of patients referral to certain departments.

DENTAL MATERIALS AND TECHNOLOGY

3rd semester

LECTURE
(2 hrs/week)

PRACTICE
(1 hr/week)
1. Introduction to dental materials science.
Importance of dental material knowledge in dentistry. History of dental materials.
International standards for materials used in dentistry (ISO, DIN etc.). Classification of dental materials based on structure and utilization

2. Types, classifications and applications of impression materials
Presentation of elastic impression materials

3. Examining, treating and preventive methods used in dentistry from technological point of view.
Die materials and methods of model preparation

4. Burs and polishing instrument in dentistry.

5. Basic physical properties of materials.
Test methods for materials in dental material science

6. Polymers used in dentistry (1st part).
Practical aspects of polymers used in dentistry (2nd part)

Artificial teeth (acrylic and ceramic)

8. Filling materials and adhesive technologies. Dental cements and endodontic materials


10. Investment, investment materials, metal casting. Processing of surfaces of dental appliances, polishing

11. Amalgam. Allergic reactions to dental materials

12. Writen Test

13. Materials used for porcelain-fused-to-metal restorations. All-ceramic systems, composition, characteristics, processing

14. Course-evaluation

1-2. Carving a premolar and an upper central incisor tooth in plaster (white)

3-4. Impression materials in practice
(impression gypsum products in practice, take impression from a coin, demonstration and use putty and wash materials)

5-6. Making impression with alginate on manikin, casting impression with gypsum. Basing the cast, five pointed trimming

7-8. The use of burs, cutting and polishing instruments

9-10. Dental polymers in practice (Pattern resin, preparing different forms: cube and cone etc.)

11-12. Waxes (bite registration on manikin, demonstration of waxes). Carving a central incisor and a molar in wax


MEDICAL PSYCHOLOGY

3rd semester
LECTURE/PRACTICE (10 hr/week)/(10 hr/week)
I. The place of psychology in dentistry: biopsychosocial perspective, compliance
II. Managing patient's anxiety
III. Clinical interviews, informing patients
IV. Positive suggestions in dentistry
V. Changing patient's behaviour, persuasive communication
VI. Dental psychosomatics

ETHICS IN MEDICINE

3rd semester
LECTURE (1 hr/week) and PRACTICE (1 hr/week)
1. Introduction, basic moral concepts
2. Morals and law, short history of ethics
3. Basic ethical theories and principles of bioethics
4. Health and illness, informed consent
5. Abortion
6. Aids
7. Euthanasia and suicide
8. Impaired infants
9. Animal experimentation
10. Cloning
11. Transplantation
12. Patients’ rights
13. Justice in medicine and public health

ORAL BIOLOGY
4th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tr>
<td>(1 hour/week)</td>
<td>(1 hour/week)</td>
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</table>
* 1. The chemical composition of bone and teeth | 1. The chemical composition of bone and teeth              |
* 2. The microstructure of teeth. The enamel,   | 2. The bone and teeth mineralization. The                  |
    the dentine and the cementum               | trace elements in the teeth.                              |
    tissues. Trace elements in teeth           |                                                           |
* 4. The periodontium                         | 4. The periodontium                                       |
* 5. The mastication, the deglutition and the  | 5. The mastication, the deglutition and the speech        |
    speech                                      |                                                           |
* 7. The dental pulp                          | 7. The dental pulp                                        |
* 8. The biochemistry of fluoride ion          | 8. Research methods in dentistry                          |
* 9. The pharmacology and the toxicology of   |                                                           |
    the fluoride ion. The detrimental effects  |                                                           |
    of fluoride on teeth                        |                                                           |
* 10. The taste and the olfaction             | 10. The taste and the olfaction                           |
* 11. The microbial flora of the mouth in     | 11. The microbial flora of the mouth in health and        |
    health and diseases                        | diseases                                                  |
* 12. The saliva and the salivary glands      | 12. The saliva and the salivary glands                    |
* 13. The calcium metabolism of bones and     | 13. The calcium metabolism of bones and teeth             |
    teeth                                       |                                                           |

DENTAL BIOMETRY AND EVALUATION OF RESEARCH RESULTS
4th/6th/8th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(1 hr/week)</td>
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</tbody>
</table>
* 1. The importance and applications of       | 1. Acquisition and representation of experimental data.   |
    to Mathematics, Part I.                     | Representation of functions, different types of           |
    (definition of functions, different type of  | determinations and analysis                              |
    determinations and analysis)                |                                                           |
* 2. Introduction to Mathematics, Part II.    | 2. Examples for variables, populations, probability,      |
    (set theory, combinatorics). Populations,  | discrete probability distribution                         |
    probability, discrete variables and        |                                                           |
    probability distributions                   |                                                           |
    3. Continuous variables and frequency      | 3. Examples for continuous variables and distributions.   |
    distributions.                              | Normal distributions. Frequency distribution and           |
    Normal distribution and the standard       | preparing a histogram                                     |
    normal distribution. Parameters of         |                                                           |
    distribution: arithmetic mean, median,     |                                                           |
    mode, standard deviation, variance,        |                                                           |
    standard error of the mean                  |                                                           |
* 4. Theoretical background of tests of       | 4. Determination of parameters of distribution (arithmetic|
    significance: null hypothesis, level of   | mean, median, mode, standard deviation, variance,         |
    significance, degree of freedom, possible  | standard error of the mean).                               |
    errors                                      |                                                           |
5. Parametric tests. Verification of normality. Student’s \( t \)-test for paired samples
6. Student’s \( t \)-test for unpaired samples and the F-test for variances
7. Written test (I.)
8. Analysis of variance (ANOVA-test)
9. Non-parametric methods (Wilcoxon, Mann-Whitney U-test etc.)
10. Analysis of discrete variables: \( \chi^2 \) - test and Fisher exact test (contingency table)
11. Linear regression and the \( t \)-test of correlation. Linearization
12. Written test (II.)
13. Statistical analysis and data analysis in other statistical programs (Statistica 11)

**ODONTOTECHNOLOGY (summer practice)**

4th semester

2 x 35 hours (Odontotechnology) in July according to the group arrangement.

**Detailed description of the practice requirements:**

1. **week**
   1. **day** – Drawing of teeth, carving teeth in wax (upper first incisor with root)
   2. **day** – Drawing of teeth (praemolars and molars), carving teeth in wax (lower praemolar with root)
   3. **day** – Carving teeth in plaster, learn to use handpieces and burs
   4. **day** – Carving teeth in plaster, learn to use handpieces and burs
   5. **day** – Use of impression materials on manikin. Making study casts, bite registration. Mounting the casts in the articulator – demonstration

2. **week**
   1. **day** – Students laboratory: Mounting the casts in the articulator based on Bonwill triangle. Preparation of resin teeth, embedding them in plaster
   2. **day** – Students laboratory: Mounting the casts in the articulator for gnathology practice, mixing and polishing base plate acrylic material. Visiting the dental technical laboratory (2 groups from 8.00 am, 2 groups from 10.00 am)
   3. **day** – Students laboratory: Mounting the casts in the articulator for gnathology practice, mixing Pattern Resin, shaping a premolar tooth with burs in resin. Surgery: making a lower jaw alginate impression from each other, making a cast.
   4. **day** – Students laboratory: making resin teeth, mounting resin teeth in gypsum block, mixing self curing acrylate, shaping a premolar tooth with burs in resin.
   5. **day** – Students laboratory: Power point presentation about a dental technical technical procedure with own photos taking in the laboratory. Evaluation of model mounting.

In the 2\(^{nd}\) week students visit a dental technical laboratory in small groups (watch metal casting, ceramic works, model preparation, etc.) and make documentation about a technical procedure, which is presented in the last day of the summer practice. Pictures from the internet are not accepted!

**Conditions of accepting the practice for those who spend the practice outside the University**

Those students who don’t come to the Dental Faculty Students Laboratory for the practice, have to bring a certification from the head of the laboratory, where they stay for the practice, in which he/she declares that the student spent two weeks in the lab and fulfilled the above mentioned tasks.

This statement must arrive to the Dean’s Office of the Dental Faculty till **20. August 2013**.

Students have to show their work prepared by themselves in the first week of Preclinical Course of Prosthodontics

- An upper middle incisor with root carved in wax, coronal size about 2-3cm
- A lower premolar with root carved in wax, coronal size about 2-3cm
- An upper premolar carved in white plaster (only coronal part)
- A lower molar carved in white plaster (only coronal part)
- A power point presentation about a dental technical procedure (4-7 slides) with photos made by the student. Pictures from the internet are not accepted! The presentation will be assessed; the mark will be counted among the results of the Preclinical Course of Prosthodontics. This is also a condition of accepting this course.

**MEDICAL SOCIOLOGY**

4th semester

**LECTURE**

(1 hrs/week)

* What is sociology? Theories and perspectives in sociology. Role of behavioural sciences and medical sociology in medical education.
* Development, division, research fields of medical sociology. The sociology of dentistry
* The medical profession.
* Professional socialisation among medical students.
* Gender differences among medical students in their professional socialisation. Role conflicts between family and professional roles.
* Doctor-patient interaction, models of the doctor-patient relationship. Parsons’ concept of the sick and doctor roles.
* Sociology of disability.
* Labelling and stigma. Illness as deviance, primary, secondary deviance.
* Deviance behaviours. Theories of deviance: biological, physical, psychological, sociological theories.
* Stratification and class. Social mobility. Social causes of illness, social patterns of illness (social aetiology of disease).
* Families and intimate relationships. The life-course.
* Practice of medical sociological research methods. Strategy and research methods of medical sociology.

**HUNGARIAN LANGUAGE I-IV.**

1st semester

**PRACTICE**

(4 hrs/week)

* Getting acquainted: Who are you? Where are you from? Conjugation of the verb ‘to be’, subject form of the personal pronouns.
* What is where in Szeged? Asking questions. Question words, existential sentences. Definite and indefinite articles.
* Meeting students. The conjugation of verbs: present indefinite conjugation, singular forms. Cardinal numbers: telephone numbers and prices.
* Going shopping. The accusative form of nouns.
* Revision of grammar and vocabulary.
* Going to the cinema. Telling the time. Making an appointment. Plural forms of the verb (indefinite present tense). The postposition ‘élőtt’.
* TEST 1
* A Sunday out: museum, theatre. The plural form of nouns and adjectives. Expressing possibility. The infinitive form.
* Buying cinema tickets. Practising the present tense indefinite conjugation. Some adverbial suffixes: -ba/-be (to, into), -ban/-ben (in)
* In a restaurant. Ordering a meal. Further adverbial suffixes: -höz/-hez/-höz (to), -nál/-nél (at)
* General revision.
* TEST 2
* Oral tests

2nd semester

**PRACTICE**

(4 hrs/week)
* My family: possessive suffixes, genitive structure.
* I have a...: Possessives + case endings. Expressing possession.
* What is your friend like: describing people. Calendar, dates.
* Revision
* TEST 1
* Students life: review of indefinite conjugation. Transitive and intransitive verbs.
* Definite conjugation.
* Daily routine: verbal prefixes.
* Weather and seasons.
* General revision.
* TEST 2
* Preparation for the oral exam.
* Oral tests

3rd semester

PRACTICE
(4 hrs/week)
* General revision.
* A weekend trip to Budapest. The comparative and superlative form of adjectives. Travelling by train. Sightseeing.
* Travelling abroad: revision of case endings and postpositions. Noun formation.
* At the doctor's: kell, lehet, szabad, tilos. Suffix szor/szer/ször. Body parts.
* Revision
* TEST 1
* Where were you in the summer: past tense conjugations.
* Revision of grammar and vocabulary.
* Revision of grammar and vocabulary.
* TEST 2
* Preparation for the oral exam
* Oral tests

4th semester

PRACTICE
(4 hrs/week)
* Services: possessive suffixes in the plural. At the pharmacy.
* Private conversations: personal pronouns with case endings. Hat/het.
* Revision of past and present tense conjugation.
* Questions and question words.
* Word order and complex sentences.
* Grammar exercises and reading comprehension tasks.
* TEST 1
* Practising role-play and picture description.
* Practising role-play and picture description.
* Grammar exercises and reading comprehension tasks.
* Grammar exercises and reading comprehension tasks.
* Words originating from the same root (kezd, kezdődik etc.)
* Revision of grammar and vocabulary.
* Practising role-play and picture description.
PRECLINICAL COURSE OF PROSTHODONTICS I.
5th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* 1. Topics of prosthodontics. Prosthetic appliances</td>
<td>1. Introduction the order of the laboratory order, instruments. Practicing the use of burs.</td>
</tr>
<tr>
<td>* 2. Main principles of tooth preparation</td>
<td>2. Preparation of resin teeth for veneer crown, knife edge finish line</td>
</tr>
<tr>
<td>* 4. How to avoid the harmful effects of tooth preparation</td>
<td>4. Preparation of embedded resin teeth for veneer crown, knife edge finish line.</td>
</tr>
<tr>
<td>* 5 Classification of crowns. Types and indications of different finish lines</td>
<td>5. Preparation of resin teeth int he manikin for veneer crown, knife edge finish line. Embedding removed natural tooth. WRITTEN ASSESSMENT</td>
</tr>
<tr>
<td>* 11. WRITTEN TEST</td>
<td>11. Preparation of resin teeth for partial crown (3/4) in the manikin</td>
</tr>
<tr>
<td>* 13. How to build up a destroyed tooth?</td>
<td>13. Provisional crown fabrication with prefabricated celluloid crown</td>
</tr>
<tr>
<td>14. Consultation</td>
<td>14. Provisional crown fabrication with Scutan method</td>
</tr>
</tbody>
</table>

PRECLINICAL COURSE OF PROSTHODONTICS II.

6th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(4 hrs/week)</td>
</tr>
<tr>
<td>* 1. Construction of complete crowns – Cast metal crowns, veneer crowns. (Resin faced and porcelain fused to metal crowns.)</td>
<td>1. Tooth preparation for abutment (Chamfer margin design), the students should collect one rooted teeth for modelling a post and core.</td>
</tr>
</tbody>
</table>

2. The definition of caries, histology, pathology. Diagnostics.

PRECLINICAL COURSE OF OPERATIVE DENTISTRY I.

5th semester

LECTURE

(1 hr/week)


2. The definition of caries, histology, pathology. Diagnostics.

PRACTICE

(4 hrs/week)


1. Introduction
2. Development of caries
3. Caries classification
4. Black classification and cavity preparation
5. Cavity nomenclature
6. Minimal and non-invasive preparation
7. Materials used for direct restorations
8. Amalgam filling
9. Composite filling
10. Matrix systems
14. Practical exam.

PRECLINICAL COURSE OF OPERATIVE DENTISTRY Seminar I.

5th
(1 hr/week)
11. Occlusion, articulation
12. Finishing and polishing
13. Test
14. Consultation

**PRECLINICAL COURSE OF OPERATIVE DENTISTRY II.**

**6th semester**

**LECTURE**

(1 hr/week)

* 1. Isolation in dentistry. Rubber dam. Matrix systems.
* 2. The anatomy of the pulp, and the pulp chamber.
* 3. Trepanation and access cavity. Defining the working length in the root canal. Different methods.
* 4. The aims and principles of chemomechanical treatment.
* 6. The mechanical preparation – aims, principles and methods
* 7. The chemical preparation- aims, principles and methods
* 8. Rotary instruments for root canal treatment
* 9. Temporary seal of the root canal. Calcium-hydroxide
* 10. The root canal treatment – different ways
* 11. Materials used: points and sealers
* 12. Lentulo technique and lateral condensation
* 13. Restorations after root canal treatment
* 14. Inlays

**PRACTICE**

(4 hrs/week)

3. Trepanation, access cavity. Theory and practice.
7. Chemomechanical preparation of the root canals.
PRECLINICAL COURSE OF OPERATIVE DENTISTRY Seminar II.

6th
(1 hr/week)
1. Introduction
2. Pulpal considerations
3. Macro- and microscopy of the endodontium
4. Pulpal and periapical diseases
5. RCT - indications and contraindication
6. RCT - instruments
7. Length measurement
8. RCT - materials
9. RCT - techniques
10. RCF - materials
11. RCF - techniques
12. Retreatment
13. RCT - Coronal restauration
14. Test

GNATOLOGY
5th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(3 hrs/week)</td>
</tr>
<tr>
<td>1. Introduction to Gnatology, it’s significance in dentistry. Functional units involved in mastication. Anatomical terminology of the mouth</td>
<td>1. Introduction. Instruments and materials. Marking reference lines and points on the study cast and on the mounted lower cast. Marking the centric contacts on the upper mounted cast. Cutting off the occlusal surface of the mounted lower cast. Re-tracing the markings on the occlusal surface of the lower cast</td>
</tr>
<tr>
<td>2. Morphology of osseous structures involved in mastication and the temporo-mandibular joint</td>
<td>2. Forming mandibular buccal cones. Marking reference lines and points on the mounted upper cast. Cutting off the occlusal surface of the mounted upper cast</td>
</tr>
<tr>
<td>3. Basics of occlusal anatomy of the teeth and dental-arches</td>
<td>3. Re-tracing the occlusal surface of the upper cast. Re-tracing the markings on the occlusal surface of the upper cast. Forming maxillary buccal cones. Forming the buccal ridges of mandibular buccal cusps</td>
</tr>
<tr>
<td>4. Occlusal contacts in central occlusion. Orientation in the oral cavity</td>
<td>4. Forming the buccal ridges of maxillary buccal cusps. Shaping the triangular ridges of the maxillary buccal cusps</td>
</tr>
<tr>
<td>5. Masticatory muscles, their function and innervation</td>
<td>5. Forming the mesial and distal cusp ridges of the maxillary and mandibular buccal cusps</td>
</tr>
<tr>
<td>6. WRITTEN TEST</td>
<td>6. Forming the maxillary lingual cones and the cusp ridges of the maxillary lingual cusps</td>
</tr>
<tr>
<td>7. Specific positions of the mandible</td>
<td>7. Shaping the lingual surfaces and triangular crests of the maxillary lingual cusps</td>
</tr>
<tr>
<td>8. Mandibular movements, tooth guidance. Dynamics of occlusal relationships, border-movements, mandibular movement envelope</td>
<td>8. Forming the mesial and distal marginal ridges of the maxillary posterior teeth. Building up the triangular ridges of the mandibular buccal cusps</td>
</tr>
<tr>
<td>9. The process of chewing. Occlusal relations in natural dentition</td>
<td>9. Building up the mandibular lingual cones. Forming the lingual surfaces and the triangular ridges of the mandibular lingual cusps</td>
</tr>
<tr>
<td>10. Aticulators (arcon, non-arcon types)</td>
<td>10. Forming the mesial and distal cusp ridges of the mandibular lingual cusps. Face-bow and it’s use</td>
</tr>
</tbody>
</table>
11. Mounting the casts in the articulator, articulator-programming, face-bow and its usage

12. WRITTEN TEST


14. Theories of occlusion in artificial dentition

DENTIST-PATIENT COMMUNICATION

5th, 6th semester

LECTURE, PRACTICE
(8 hrs in block)

* The significance of dentist-patient communication, introduction of consultation models. Learning the importance of basic ethical principles expected in any dentist-patient communication. Preparing for project work.

Group work I.: 7 tasks of Pendleton in consultation, situation practice, stopping an attack, the art of not saying, preparing for video-recording.

Group work II.: defining personality marks by using Myers-Briggs Type Indicator, behaviour, personal relations, stress situations, reactions, leadership style, problem solving methods.

Evaluation of the video-recordings of students’ private consultation with patients in the surgery room. Following the consultation the evaluation of the whole group according to the Pendleton rules.

GENERAL AND DENTAL RADIOLOGY

5th semester

LECTURE
(2 hrs/week)

* 1. The basics of the general radiology I.

* 2. The basics of the general radiology II.

* 3. Investigating methods of dental radiology, imaging techniques in dental radiology I. The anatomy of the teeth and jaws in the dental radiology I.

* 4. Investigating methods of dental radiology, imaging techniques in dental radiology II. The anatomy of teeth and jaws in the dental radiology II.

* 5. Investigating methods of dental radiology, imaging techniques in dental radiology III. The anatomy of teeth and jaws in the dental radiology III.

* 6. Radiographic diagnostic methods for the malpositioned teeth and eruption anomalies of the teeth. WRITTEN ASSESSMENT

* 7. Radiographic diagnostic methods in the operative dentistry

* 8. Radiographic diagnostic methods for the inflammation in jaws

* 9. Radiographic diagnostic methods for the periodontal diseases

* 10. Radiographic diagnostic methods for the dentogene sinusitis, sialolyts

* 11. Radiographic diagnostic methods in maxillo-

PRACTICE
(2 hrs/week)

1. Investigating methods of general radiology I.

2. Investigating methods of general radiology II.

3. The occlusal, panoramic, periapical bite-wing radiographs taking

4. The occlusal, panoramic, periapical bite-wing radiographs taking

5. The occlusal, panoramic, periapical bite-wing radiographs taking

6. The occlusal, panoramic, periapical bite-wing radiographs taking

7. The occlusal, panoramic, periapical bite-wing radiographs taking

8. The occlusal, panoramic, periapical bite-wing radiographs taking

9. The occlusal, panoramic, periapical bite-wing radiographs taking

10. The occlusal, panoramic, periapical bite-wing radiographs taking

11. The occlusal, panoramic, periapical bite-wing
facial traumatology  radiographs taking
* 12. Radiographic diagnostic methods for the
cysts in jaws. WRITTEN ASSESSMENT
* 13. Radiographic diagnostic methods for the
tumors in jaws

BIO- AND ALLOPLASTIC MATERIALS IN DENTISTRY
5th semester

LECTURE
(2 hrs/week)
* 1. Introduction to biomaterials science. Historical overview. Classes of biomaterials used in dentistry and
medicine
* 2. Bulk and mechanical properties of materials and investigation methods (chemical bonds and structure,
mechanical testing methods)
* 3. Surface characteristics of materials and investigation methods (contact angle, ESCA, SIMS, SEM, IRS,
STM, AFM)
* 4. Metals (stainless steels, Co-Cr alloys, Ti alloys)
* 6. Written test (I.)
* 7. Polymers, types of polymers, polymerization, mechanical and thermal properties
* 8. Ceramics, glasses and glass-ceramics (bioinert, calcium-phosphate ceramics, bioactiv glasses)
* 9. Composites and natural materials (proteins, polysaccharides, polynucleotides)
* 10. Host reactions to biomaterials and degradation of biomaterials in the biological environment
* 11. Titanium implants and biointegration. Thin films, coatings and fabrics
* 12. Written test (II.)
* 13. Testing biomaterials (in vitro, in vivo assessment and animal models). Biocompatibility and
biomechanical tests
* 14. Consultation

PATHOPHYSIOLOGY
5th semester

LECTURE

Introduction to Pathophysiology;
Inflammation I.: Definition, causes, mediators
and signs of acute inflammation. Regulation and
outcome of acute inflammation.

Inflammation II.: Chronic inflammation. Local
and generalized reactions of inflammation: fever,
inflammatory pain.

Pathophysiology of leukocytes I.: Immunology: In vivo allergic reactions,
autoimmunity, immunodeficiency.

Endocrinology I.: Disturbances of endocrine
regulation. Diseases of hypothalamus, hypophysis
and thyroid gland. Hyperparathyreoidism.

Endocrinology II.: Hypoparathyreoidism.
Diseases of adrenal (cortex and medulla) gland.

SEMINAR/PRACTICE

Safety regulations. Review of physiologic background
of circulation and normal ECG.
In the practice room: Registration and analysis of
ECG. Determination of spirometric parameters.

Seminar: Inflammation I. (Lecture topic of the 1st
week).
In the practice room: Registration and analysis of
ECG. Determination of spirometric parameters.

Seminar: Inflammation II. (Lecture topic of the 2nd
week).

Seminar: Pathophysiology of leukocytes I.: Immunology (Lecture topic of the 3rd week).

Seminar: Endocrinology I. (Lecture topic of the 4th
week).
Starvation and obesity. 
Diabetes mellitus, hypoglycemia 
Diabetes mellitus causes, types, clinical signs, 
pathogenesis and consequences. Hypoglycemia

Seminar: Endocrinology II. (Lecture topic of the 5th week).

Cardiovascular system I.: Pathophysiology of 
plasma lipoprotein metabolism. Development of 
atherosclerosis.

Seminar: Starvation and obesity. 
Disturbances of carbohydrate metabolism 
(Lecture topic of the 6th week).

Cardiovascular system II.: 
Pathogenesis and consequences of atherosclerosis. 
Primary and secondary hypertension.

Seminar: Cardiovascular system I. 
(Lecture topic of the 7th week).

Cardiovascular system III.: 
Pathophysiology and ECG of acute coronary 
syndromes: angina pectoris, myocardial infarction

Seminar: Cardiovascular system II. 
(Lecture topic of the 8th week).

Cardiovascular system IV.: 
Congenital heart diseases. 
Mitral, aortic stenosis and regurgitation. 
Compensated and decompensated heart function, 
Heart failure.

Seminar: Cardiovascular system III. (Lecture topic of 
the 9th week).

Peripheral circulatory diseases: 
Volume depletion. 
Syncope. Circulatory shock (development, stages). 
Multiple organ dysfunctions in shock.

Seminar: Cardiovascular system IV. 
(Lecture topic of the 10th week).

Pathophysiology of salt-water balance I.: 
Volume excess, hyper- and hyponatraemia, hyper- 
and hypocalcemia

Seminar: Peripheral circulatory disease 
(Lecture topic of the 11th week).

Pathophysiology of salt-water balance II.: 
Hyper- and hypokalemia, disturbances of trace 
elements and vitamins.

Seminar: Pathophysiology of salt-water balance I 
(Lecture topic of the 12th week).

Cardiovascular system V.: 
Disturbances of electrical impulse generation and 
conduction.

Seminar: Pathophysiology of salt-water balance II 
(Lecture topic of the 13th week).

6th semester

LECTURE 

Pathophysiology of kidney diseases I.: 
Proteinuria, hematuria, glycosuria, ketonuria, 
pyuria, bacteruria, polyuria, oliguria and anuria.

Pathophysiology of kidney diseases II.: 
Nephrotic and nephritic syndrome, pyelonephritis, 
kidney stones. Acute and chronic renal failure.

Pathophysiology of kidney diseases I.: 
Proteinuria, hematuria, glycosuria, ketonuria, 
pyuria, bacteruria, polyuria, oliguria and anuria.

Pathophysiology of kidney diseases II.: 
Nephrotic and nephritic syndrome, pyelonephritis, 
kidney stones. Acute and chronic renal failure.

Pulmonary diseases I: Abnormal breathing 
patterns, dyspneas. Obstructive pulmonary 
diseases: COPD, asthma bronchiale, cystic fibrosis.

Pulmonary diseases I: 
Abnormal breathing 
patterns, dyspneas. Obstructive pulmonary 
diseases: COPD, asthma bronchiale, cystic fibrosis.

Seminar: Kidney diseases I. 
(Lecture topic of the 1st week). 

In the practice room: Investigation of urine and 
renal function: proteinuria, hematuria, pyuria, 
hemoglobinuria, ketone bodies, urobilinogen, urine 
sediment and casts.

Seminar: Kidney diseases II. (Lecture topic of the 2nd week). 
In the practice room: Investigation of urine and 
renal function: proteinuria, hematuria, pyuria, 
hemoglobinuria, ketone bodies, urobilinogen, urine 
sediment and casts.

SEMINAR/PRACTICE 

Safety regulations. Seminar: Thermoregulation. 
(Please download and study the material from our 
website or coospace before class).

Seminar: Kidney diseases I. 
(Lecture topic of the 1st week). 

In the practice room: Investigation of urine and 
renal function: proteinuria, hematuria, pyuria, 
hemoglobinuria, ketone bodies, urobilinogen, urine 
sediment and casts.

Seminar: Kidney diseases II. (Lecture topic of the 2nd week). 
In the practice room: Investigation of urine and 
renal function: proteinuria, hematuria, pyuria, 
hemoglobinuria, ketone bodies, urobilinogen, urine 
sediment and casts.
Pulmonary diseases II: Restrictive pulmonary diseases (pleural disorders, pulmonary edema, embolism, hypertension), hypoxias, respiratory failure.

Seminar: Pathophysiology of pulmonary diseases I. (Lecture topic of the 3rd week).

Disturbances of acid-base metabolism: Respiratory acidosi and alkalosis. Metabolic acidosi and alkalosis.

Seminar: Pathophysiology of pulmonary diseases II. (Lecture topic of the 4th week).


Seminar: Disturbances of acid-base metabolism (Lecture topic of the 5th week).

Gastrointestinal diseases II.: Diseases of absorption, diarrhea, constipation. Intestinal obstruction. Acute and chronic pancreatitis.

Seminar: Gastroenterology I. (Lecture topic of the 6th week).


Seminar: Gastroenterology II. (Lecture topic of the 7th week).


Seminar: Pathophysiology of liver diseases (Lecture topic of the 8th week).


Seminar: Pathophysiology of leucocytes II. (Lecture topic of the 9th week).

Red blood cell diseases II.: Anemias due to blood loss, hemolysis.

Seminar: Red blood cell diseases I. (Lecture topic of the 11th week).

Hemostasis I.: Bleeding disorders (platelet disturbances).

Seminar: Red blood cell diseases II. Hemostasis I. (Lecture topic of the 12th week).

In the practice room: Determination of WBC, RBC, platelet, eosinophil and reticulocyte count. Staining and analysis of blood smear.

Hemostasis II.: Bleeding disorders (vascular, clotting factor disturbances), thrombosis and embolism.

Seminar: Hemostasis II. (Lecture topic of the 13th week).

In the practice room: Determination of WBC, RBC, platelet, eosinophil and reticulocyte count. Staining and analysis of blood smear.

Pathophysiology of the CNS I.: Multiple sclerosis, neurodegenerative diseases: Alzheimer’s, Parkinson’s and Huntington’s disease. Pathogenesis of psychiatric disorders.

Seminar: Pathophysiology of the CNS. (Lecture topic of the 14th week).

Pathophysiology of the CNS II.: Circulatory diseases of the CNS. Cerebral edema. Pain, headaches, seizures and epilepsy.

PRECLINICAL COURSE OF ORAL SURGERY

6th semester

**LECTURE**

(2 hrs/week)

* 2. Local anaesthesia in dentistry. Anatomical and pharmacological considerations
* 3. Complications of anaesthesia. Methods of local anaesthesia
* 4. Indications of tooth extraction. Simple tooth

**PRACTICE**

1 hr/week)

Practice in local anaesthesia in dentistry and tooth extraction. Related problems. 10 simple extractions, assistance to dento-aveolar surgery.
extractions
* 5. Complications of tooth removal. Normal and disturbed wound healing
* 6. Misplaced and impacted teeth
* 7. Opening of the maxillary sinus and its management
* 8. Dental inflammations
* 9. Endodontic surgery. Surgical procedures related to orthodontic treatment
* 10. Trismus
* 11. Clinicopathology of cysts
* 12. Dentoalveolar trauma
* 13. Written exam
* 14. Discussion

**ORAL SURGERY (summer practice)**

4 x 35 hours, four weeks in July/August.

**Detailed description of the practice requirements:**
Practice in local anaesthesia in dentistry and tooth extraction. Related problems. 10 simple extractions, assistance to dento-alveolar surgery.

**ADVANCED IMAGING TECHNIQUES IN DENTISTRY**

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(1 hr/week)</td>
</tr>
<tr>
<td>* 1. The basics of general radiology I. Modern imaging technics I.</td>
<td>Making of one digital image during the practices Knowledge of radiographic anatomy of the teeth and the jaws.</td>
</tr>
<tr>
<td>* 2. The basics of general radiology II. Modern imaging technics II.</td>
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<tr>
<td>* 3. Interpretation in the dento-maxillo-facial radiology</td>
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</tr>
<tr>
<td>* 4. Radiographic diagnostic methods in the operative dentistry</td>
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<tr>
<td>* 5. Modern digital imaging technics.</td>
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<tr>
<td>* 6. Modern digital imaging technics in the dental practice, Digora system</td>
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<tr>
<td>* 7. Nuclear medicine in dentistry</td>
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<tr>
<td>* 8. Radiographic diagnostic methods for the periodontal diseases</td>
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<tr>
<td>* 9. Modern imaging technics in the implantological diagnosis and in therapy</td>
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<tr>
<td>* 10. Cone Beam CT in dentistry</td>
<td></td>
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<tr>
<td>* 11. Using of lateral cephalometric projection in the dental practice</td>
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<tr>
<td>* 12. WRITTEN ASSESSMENT</td>
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<tr>
<td>* 13. The practical questions of the mobile X-ray machine’s application</td>
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</tr>
<tr>
<td>* 14. Consultation</td>
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</tbody>
</table>

**PUBLIC HEALTH**

**5th semester**

**LECTURE**

(1 hr/week)
* The history of public health. The aim and scope of public health. The levels of prevention.
* Measuring the health of a population I.
* Measuring the health of a population II.
* Measuring the health of a population III.
* Epidemiology of chronic diseases – cardiovascular diseases.
* Epidemiology of chronic diseases – tumors.
* Epidemiology of chronic diseases – respiratory and musculoskeletal diseases.
* Epidemiology of chronic diseases – gastrointestinal and metabolic diseases.
* Dental screening, effective dental prevention, health education and health promotion.
* Epidemiology of suicide and accidents.
* Epidemiology of smoking.
* Epidemiology of alcohol and drug consumption.
* Structure and operation of health systems.

PUBLIC HEALTH

6th semester

LECTURE
(1 hr/week – 7x2 hrs)

* General epidemiology of infectious diseases.
  Epidemiology of airborne and enteric diseases in dental practice.
* -

* Epidemiology of hematogenic, cutaneous, and sexually transmitted diseases in dental practice.
* -

* Epidemiology of zoonoses, transmissible spongiform encephalopathy. Epidemiology of health care associated infections.
* -

* -

* Food quality and safety.
* -

* Environmental epidemiology; sewage, soil pollutions; hazardous waste, waste management in dental office.
* -

* Occupational diseases caused by chemicals and chemical safety in dental care.

PRACTICE
(1 hr/week – 7x2 hrs)

* Sterilization, disinfection, disinsection, deratisation.
* Practical aspects of vaccination.
* Infection control and hand hygiene in dental practice.
* Dietary guidelines and the prevention of diet-related chronic diseases.
* Air pollutants, water pollutants and their effects on human health.

HUNGARIAN LANGUAGE V.

5th semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Practice/ Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Human dentition. Types of teeth</td>
<td>Vocabulary practice</td>
</tr>
<tr>
<td>2.</td>
<td>Dental Specialties</td>
<td>Word building</td>
</tr>
<tr>
<td>3.</td>
<td>Taking medical history</td>
<td>Lexical drill</td>
</tr>
<tr>
<td>4.</td>
<td>Communication in dental practice</td>
<td>Question-answer practice</td>
</tr>
<tr>
<td>5.</td>
<td>Interviewing the patient.</td>
<td>Dialogues</td>
</tr>
<tr>
<td>6.</td>
<td>Examining the patient</td>
<td>Role-play</td>
</tr>
<tr>
<td>7.</td>
<td>Written test</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Autumn break</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Basic dental instruments</td>
<td>Reading comprehension</td>
</tr>
</tbody>
</table>
10. Preventive dentistry  Role-play
11. Brushing techniques  Vocabulary practice
12. Dental floss  Lexical drill
14. Written test
15. Oral assessment

HUNGARIAN LANGUAGE VI.

6th semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Practice/ Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dental diseases</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>2.</td>
<td>Dental plaque</td>
<td>Vocabulary practice</td>
</tr>
<tr>
<td>3.</td>
<td>Periodontal diseases</td>
<td>Lexical drill</td>
</tr>
<tr>
<td>4.</td>
<td>Gingivitis</td>
<td>Word building</td>
</tr>
<tr>
<td>5.</td>
<td>Dental caries</td>
<td>Dialogues</td>
</tr>
<tr>
<td>6.</td>
<td>Restorative materials.</td>
<td>Role-play</td>
</tr>
<tr>
<td>7.</td>
<td>Written test</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Spring break</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Anaesthesia in dentistry</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>10.</td>
<td>Complications of anaesthesia</td>
<td>Vocabulary practice</td>
</tr>
<tr>
<td>11.</td>
<td>Extractions.</td>
<td>Dialogues</td>
</tr>
<tr>
<td>12.</td>
<td>Scaling techniques</td>
<td>Lexical drill</td>
</tr>
<tr>
<td>13.</td>
<td>Bleaching techniques</td>
<td>Role-play</td>
</tr>
<tr>
<td>14.</td>
<td>Written test</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Oral assessment</td>
<td></td>
</tr>
</tbody>
</table>

PHARMACOLOGY

5th semester

LECTURE
(2 hrs/week)

1. General pharmacology, pharmacodynamics
2. Pharmacokinetics
3. Adverse effects of drugs
4. Drug interactions
5. Autonomic nervous system: Introduction
6. Cholinergic and Adrenergic agonists
7. Cholinergic and Adrenergic antagonists
8. Local anaesthetics
9. Chemotherapy and Antibiotics I
10. Chemotherapy and Antibiotics II
11. Chemotherapy of viral and fungal infections
12. Non-steroidal anti-inflammatory drugs
13. Antihelmintic drugs, treatment of protozoal infections
14. Antiseptics and disinfectants
15. Agents acting on the blood

PRACTICE
(1 hr/week)

1. Prescription writing
2. Pharmacodynamic and kinetic examples
3. Computer Lab: Drug-receptor interaction
4. Examples for drug interactions
5. MTO: General Pharmacology
6. Computer Lab: Sympathomimetics
7. Computer Lab: Sympatholytics
8. Local anaesthetics in dental practice
9. MTO: Autonomic nervous system and local anaesthetics
10. Prescription writing
11. Prescription writing
12. To recapitulate chemotherapy
13. To recapitulate chemotherapy
14. Prescription writing
15. Haemostatic drugs

PHARMACOLOGY

6th semester

LECTURE
(2 HRS/WEEK)

1. Sedative-hypnotic drugs, anxiolytics
2. Opioid and non-opioid analgesics
3. General anaesthetics, antiepileptic drugs
4. Antiparkinson drugs, centrally acting muscle relaxants
5. Antidepressive drugs, Antipsychotic drugs
6. Cardiotonic drugs
7. Antiarrhythmic drugs
8. Pharmacology of atherosclerosis, antihypertensive drugs

PRACTICE
(1 HR/WEEK)

1. Drugs of convulsive types, psychostimulants
2. Consultation (opioids)
3. Prescription writing
4. Interactions with centrally acting drugs
5. MTO-CNS drugs
6. Computer Lab: CVS drugs
7. Computer Lab: CVS drugs
8. Consultation: CVS drugs
9. Antianginal drugs, diuretics
10. Treatment of diabetes and hyperthyrosis
11. Hormons, vitamins
12. Gastrointestinal pharmacology
13. Toxicology
14. Agents affecting bone mineral homeostasis
15. Introduction to immunopharmacology, steroidal drugs

### General and Systemic Pathology for Dentistry Students
5th semester

<table>
<thead>
<tr>
<th>Lecture 3 hours/week</th>
<th>Organ demonstration 1 hour/week</th>
<th>Practice 2 hours/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathology of cellular injury and death. Cellular adaptations of growth and differentiation. Postmortem changes.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the cellular injury and death</td>
</tr>
<tr>
<td>1 Calcification. Oedema, hyperaemia, congestion. Haemorrhage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrombosis. Embolism. DIC. Shock. Consequences of vascular occlusion. Infarction. Acute inflammation I. Acute inflammation II.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of degeneration</td>
</tr>
<tr>
<td>Pathology of chronic inflammation. Tissue repair. Wound healing. Immunopathology I</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of degeneration</td>
</tr>
<tr>
<td>Immunopathology II. AIDS. Pathology of transplant rejection. Neoplasia I.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the circulation</td>
</tr>
<tr>
<td>Neoplasia II. Carcinogenesis.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the circulation</td>
</tr>
<tr>
<td>Pathology of the heart II.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the tumors</td>
</tr>
<tr>
<td>--------------------------</td>
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<td>-------------------------------</td>
</tr>
<tr>
<td>Essential hypertension. Pathology of the kidney I.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the cardiovascular system</td>
</tr>
<tr>
<td>Pathology of the kidney II.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/Histology of the cardiovascular system</td>
</tr>
<tr>
<td>Pathology of the kidney III.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Tumours of the kidney. Pathology of the urinary bladder. Pathology of the lung I.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Pathology of the lung II.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Pathology of the lung III.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Tumours of the lung. Upper respiratory airway diseases.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Diseases of the oral cavity. Pathology of the oesophagus.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
<tr>
<td>Pathology of the stomach and duodenum.</td>
<td>Actual postmortem cases are presented to the students on each week</td>
<td>Autopsy/repetition</td>
</tr>
</tbody>
</table>

**Oral and Maxillofacial Pathology for Dentistry Students**

**6th semester**

**Lecture 2 hours/week**

1 Pathology of the liver. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the urinary tract |

2 Pathology of the biliary tract. Pathology of the pancreas. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the urinary tract |

3 Pathology of the bowels. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the respiratory tract |

4 Pathology of the peritoneum. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the respiratory tract |

5 Hemopathology II. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the gastrointestinal tract |

6 Hemopathology III. Neuropathology I. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the gastrointestinal tract |

7 Neuropathology II. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the hematopoetic and the lymphoid system |

8 Neuropathology III. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the hematopoetic and the lymphoid system |

9 Immunopathology. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the genital system |

10 Pathology of the male genital tract. | Actual postmortem cases are presented to the students on each week | Autopsy/Histology of the genital system |
11 Pathology of the female genital tract I.
Pathology of the breast.

12 Pathology of the female genital tract II.

13 Tumors of the soft tissue. Pathology of the bones and joints.

14 Pathology of the endocrine glands.

INTRODUCTION TO SURGERY
5th semester

Lecture 1 hour/week
* The history of Surgery
* The inspection and preparation of the surgical patient before the operation
* Blood circulation in the shock state
* Clinical Aspects of Shock
* Blood replacement and the basics of transfusion
* Asepsis and antisepsis
* Wound formation and unification, tools of haemostasis in surgery
* Types, healing and treatment of wounds
* Postoperative complications and nourishment
* Surgical infections, modern antibiosis
* Basics of surgical oncology
* Surgical demonstration
* Consultation
* Test

SURGERY
8th semester

Lecture (2 hours/week)
* The complex treatment of the breast cancer
* The Surgery of the abdominal wall
* Thoracic surgery
* The surgery of the oesophagus
* The surgery of the stomach
* The surgery if the bile system and the pancreas
* The surgery of the liver
* The surgery of the large intestine and rectum
* The surgery of the acute abdomen (appendicitis, ileus, perforations)
* Vascular surgery
* Cardiac Surgery
* Organ Transplantation
* Test

Practice (1 hour/week)
The students can comply their surgical practice at weekends divided in 5-class periods at the Outpatient Department of the Surgical Clinic. There the students can participate in examining patients, can discuss the examination process and treatments, can take part of care of wounds and in the acute surgical interventions.
ENDODONTICS
7th semester

LECTURE
(1 hr/week)
* 3. Examination of patient with endodontic problems (Anamnesis, clinical examination)
* 4. Diagnostics in endodontics
* 5. Treatment planning in endodontics
* 7. Diseases with a pulpal etiology. Gangrena Simplex et Complicata
* 8. Failures during shaping and obturation of the root canal.
* 10. Irrigation (Protocols, chemicals, instruments)
* 11. Retreatment, revision
* 12. WRITTEN DEMONSTRATION
  13. Resorption

ESTHETICS OF THE FACE

7th/9th semester

LECTURE
1. Esthetics of the face, characteristics and factors determining the smile
2. Introduction to facial anatomy and esthetics
3. Historical overview
4. Dental esthetics, pink and white harmony
5. Surgical aspects of facial surgeries
6. Prevailing of esthetic aspects during the planning process of orthognathic surgery
7. Dysgnathic surgeries
8. Developmental disorders and their treatment
9. Injuries and complications
10. Scartreatment, after care, laser therapy
11. Dermatological aspects
12. Epithesis, facial prostheses
13. Ambulatory interventions-Botox, injectable fillers, hyaluronic acid

ESTHETIC DENTISTRY I.
7th/9th semester

LECTURE
(1 hr/week)
* 1. Introduction to esthetics:
  Extra oral factors, smile line and incisal edge, red-white harmony. Planning, diagnostic wax up.
* 2. Diagnostic wax up:
  Planning, fabrication of diagnostic wax model, controlled preparation
* 3. Red-white harmony: 
optimal soft tissue esthetics and its realization
* 4. Marketing and Economy
* 5. Implant esthetics: Single implants in the front region
* 6. Magnification in dentistry
* 7. Communication and documentation: 
Methods of patient-doctor, technician-doctor communication, necessity and failures.
* 8. Adhesive post in root canal treated teeth, restorations with adhesive splinting
Esthetic restoration in root canal treated teeth, composite based direct restorations
* 9. Bleaching: 
* 10. Ceramics: 
Classification and production. Bonding or cementing, chemical relations. The surface of ceramic and its pre-treatment.
* 11. Front restorations: 
* 12. CAD/CAM: 
History, indications, failures. The way of preparation.
13. Ceramics in the molar region: 
Inlays, crowns, bridges. What, how, why, when?

ESTHETIC DENTISTRY II.
8th/10 th semester

PRACTICE
(1 hr/week)
* 1. Color theory (lecture)
* 2. Layering composite: Anatomic stratification (lecture)
* 3-4. Stratification technique (practice)
A practice on front teeth
* 5. Stratification technique („accessory“ Practice)
* 6. Shoulder preparation for full ceramic crowns (lecture)
* 7-8. Shoulder preparation for ceramic crowns (practice)
* 9. Veneers: Ceramic and composite (planning, preparation, bonding)
* 10-11. Veneer preparation
* 12. Manufacturing of temporary prostheses
* 13. Consultation

INFECTION CONTROL IN DENTISTRY
7th semester

LECTURE and PRACTICE
(Lecture 1 hr/week, practice 1 hr/week)
* 1. Introduction into infection control. Why does the dentist need infection control?
* 2. Introduction to infectious diseases
* 3. Blood-borne pathogens
* 4. Oral and respiratory diseases
* 5. Disinfection
* 6. Sterilization
* 7. Instrument processing, surfaces and equipment asepsis
* 8. Laboratory and radiology asepsis
* 9. Aseptic techniques
* 10. Protection of dental health care personnel. Immunization, protective barriers
* 11. Waste management. Managing chemicals safely in the office
* 12. Management of the office safety program. Work organization. Ergonomics
* 13. Hospital infections

**ORAL SURGERY I.**

**7th semester**

**Practice**
3 hrs/week
Practice in basic dentoalveolar surgery:
- apicectomy
- excochleation
- incision
- bone correction
Minimal requirements of semester 5 simple tooth extraction.

**ORAL SURGERY II.**

**8th semester**

**Practice**
3 hrs/week
Practice in basic dentoalveolar surgery:
- apicectomy
- excochleation
- incision
- bone correction
Minimal requirements of semester 5 simple tooth extraction.

**INTERNAL MEDICINE**

**7th semester**

**LECTURE**
(30 hrs/week)
* Examination of the heart
  Carditis, valvular heart disease
* Diagnostic methods in internal medicine
  Diagnostic methods in internal medicine
* Arrhythmias
  Ischaemic heart disease, myocardial infarction
* Acute heart failure
  Acute heart failure. Therapy
* Chronic heart failure
  Chronic heart failure. Therapy
* Hypertension
  Hypertension. Therapy
* Disorders of the peripheral arteries and veins
  Methods and specific questions of the anticoagulant therapy
* Acute respiratory insufficiency
* Chronic pulmonary disorders
  Chronic pulmonary disorders. Therapy
* Diabetes mellitus
  Diabetes Mellitus. Therapy
* Acute and chronic renal disorders
  Acute and chronic renal disorders. Therapy

**PRACTICE**
(2 hrs/week)
Examination of the heart
  Carditis, valvular heart disease
Diagnostic methods in internal medicine
  Diagnostic methods in internal medicine
Arrhythmias
  Ischaemic heart disease, myocardial infarction
Acute heart failure
  Acute heart failure. Therapy
Chronic heart failure
  Chronic heart failure. Therapy
Hypertension
  Hypertension. Therapy
Disorders of the peripheral arteries and veins
  Methods and specific questions of the anticoagulant therapy
Acute respiratory insufficiency
  Chronic pulmonary disorders
Diabetes mellitus
  Diabetes Mellitus. Therapy
Acute and chronic renal disorders
  Acute and chronic renal disorders. Therapy
<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8th semester (15 weeks)</strong></td>
<td><strong>8th semester (15 weeks)</strong></td>
</tr>
<tr>
<td><strong>LECTURE</strong></td>
<td><strong>PRACTICE</strong></td>
</tr>
<tr>
<td>(4 hrs/week)</td>
<td>Problem oriented evaluation of the symptoms of patients with esophageal disorders, functional evaluation of patients with esophageal disorders (esophageal manometry, 24 h pH-metry, evaluation of the biliary reflux)</td>
</tr>
<tr>
<td>* Esophageal disorders</td>
<td>Upper gastrointestinal endoscopy. Helicobacter tests</td>
</tr>
<tr>
<td>* Diseases of the stomach</td>
<td>Diagnostic work up of patients with CU and Crohn’s disease</td>
</tr>
<tr>
<td>* Diarrhoea, constipation</td>
<td>Symptoms of biliary obstruction, investigative methods for patients with biliary obstruction (symptoms, biochemistry, ultrasonography, ERCP)</td>
</tr>
<tr>
<td>* Inflammatory bowel diseases</td>
<td>Problem oriented laboratory investigation of the liver patient</td>
</tr>
<tr>
<td>* Disorders of the gallbladder and the biliary tract</td>
<td>Diagnostic work up of patients with acute and chronic pancreatitis</td>
</tr>
<tr>
<td>* Diseases of the liver</td>
<td>Early identification of patients with gastrointestinal cancer. Diagnostic methods</td>
</tr>
<tr>
<td>* Disorders of the pancreas</td>
<td>General aspects of the patient with endocrine diseases</td>
</tr>
<tr>
<td>* Gastrointestinal tumors</td>
<td>Thyroid diseases in daily clinical practice</td>
</tr>
<tr>
<td>* Disorders of the thyroid gland</td>
<td>Practical aspects of dealing with patients with Adrenal diseases</td>
</tr>
<tr>
<td>* Diseases of the hypophysis and the parathyroid gland</td>
<td>Physical examination of patients with rheumatoid diseases</td>
</tr>
<tr>
<td>* Disorders of the adrenal gland</td>
<td>* Degenerative, and autoimmune connective tissue disorders</td>
</tr>
<tr>
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<td>* Degenerative, and autoimmune connective tissue disorders</td>
</tr>
<tr>
<td>* Consultation</td>
<td>* Consultation</td>
</tr>
</tbody>
</table>

**ORAL MEDICINE I.**

**7th semester**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2 hrs/week)</td>
<td>(1 hr/week)</td>
</tr>
<tr>
<td>* 1. Anatomical and histological structures of the mouth</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 2. Pathology of the oral mucosa. Primary and secondary skin lesions</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 3. Patient examination: anamnesis, clinical and other examination</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 4. Developmental and genetic disorders</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 5. Physical, chemical and iatrogenic diseases</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 6. Bacterial diseases</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 7. Viral diseases</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 8. Fungal diseases</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 9. Diseases of the lip</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
<tr>
<td>* 10. Diseases of the tongue</td>
<td>Patient presentations according to the lectures’ topics.</td>
</tr>
</tbody>
</table>
* 11. Written exam
* 12. Immune-based diseases. Allergic diseases
* 13. Mucocutaneous diseases. Granulomatous mucocutaneous diseases
* 14. Consultation

**ORAL MEDICINE II.**

**8th semester**

**LECTURE**

(1 hr/week)

* 1. Oral Symptoms of the Neuroendocrine System and the Diseases of Metabolism
* 2. Oral Symptoms of the Gastrointestinal, Hepatic, Cardiovascular and Urogenital System
* 3. Diseases of the Salivary Glands
* 4. Oral Symptoms of the Blood and Blood-Forming Tissues
* 5. Oral Symptoms of the Psychological and Psychiatric Diseases
* 6. Benign Tumors of the Oral Cavity
* 7. Tumorlike Lesions of the Oral Cavity
* 8. Premalignant Lesions of the Mouth
* 10. Written Exam
* 11. Malignant Epithelial and Salivary Tumors of the Oral Cavity
* 12. Other Tumors of the Oral Cavity (Lymphomas, Sarcomas)
* 13. Therapy of the Tumors of the Oral Cavity
* 14. Consultation

**PRACTICE**

(2 hrs/week)

* Patient presentations according to the lectures' topics.

**OPERATIVE DENTISTRY I.**

**7th semester**

**LECTURE**

(1 hr/week)

* 1. Etiology of caries, the role of dental plaque
* 2. Epidemiology, risk factors, indices. The role of prevention. Digestion, fluoride.

**PRACTICE**

(6 hrs/week)

On the first practice the 4th year student has to get familiar with the office equipment. On the second practice two patients will be called, the student has to take their status and history, after that one of them will be treated on the same appointment. The data and the status of the other patient will be recorded in a notebook and the patient will be informed that he/she will be called for another appointment.

On the first practice the 5th year student will treat his/her patient from the previous year or summer practice. If there's no such a patient the student will get someone from the notebook to treat. If there's a patient a student wants to treat, he/she has to inform the assistants of the department at least two weeks before that
3. Etiology of caries, the role of diet, age, gender and habit

4. Response of the pulp to the progress of caries

5. Treatment planning

6. The methods of shade selection

7. The steps of making a posterior composite filling. (Centripetal technique, Z-technique, elastic cavity wall theory, bulk fill systems)

8. Occlusion and articulation in operative dentistry

9. The making of III. IV. Class fillings and incisal fillings.

10. Filling, veneer, inlay, partial crown, full crown. Indications and possibilities

11. Inlay

12. WRITTEN DEMONSTRATION

13. The cementation of indirect adhesive restorations

14. Consultation

practice.

The students can get extra patients from the notebook or from previously agreed patient examination at the admission office. Giving appointment, administration and any changing is the students' responsibility.

Only the points gained during the semester are considered. Points predetermined on the beginning of the semester define practical grades.

By the end of the 4th year at least one from all Black cavity types should be performed, but VI.cl.

By the end of the 5th year it's recommended to perform at least one of all the items from the previously mentioned list. Exceptions can be: core build up, fiber reinforced post, VI.cl., veneers. The lack of these treatments can be neglected if the student's points are around the minimal point line (but achieved it). Only the main practice leader can give permission for this, after consulting the practice leaders.
OPERATIVE DENTISTRY SEMINAR I.
7th semester

Aims: To help the students to increase their theoretical knowledge. The students will have a chance to get answers to their practical and theoretical questions. During the practices and lectures in most of the cases there’s not enough time for discussion and evaluation of special cases.

1. Introduction
2. Development of caries
3. Caries classification
4. Black classification and cavity preparation
5. Cavity nomenclature
6. Minimal and non-invasive preparation
7. Materials used for direct restorations
8. Amalgam filling
9. Composite filling
10. Matrix systems
11. Occlusion, articulation
12. Finishing and polishing
13. Test
14. Consultation

OPERATIVE DENTISTRY II.
8th semester

**LECTURE**
(1 hr/week)

* 1. The Perio-Endo frontier. The comparison of apical and marginal periodontitis. Contact between the pulpal space and the periodontium. Perio-Endo lesions

* 2. Focal infection


* 4. Apexification and avulsion

* 5. Endodontic treatment in high risk patients. Local and general effects of different endodontic materials.

* 6. WRITTEN DEMONSTRATION

**PRACTICE**
(5 hrs/week)

On the first practice two patients will be called, the student has to take their status and history, after that one of them will be treated on the same appointment. The data and the status of the other patient will be recorded in a notebook and the patient will be informed that he/she will be called for another appointment.

On the first practice the 5th year student will treat his/her patient from the previous year or summer practice. If there’s no such a patient the student will get someone from the notebook to treat. If a student wants to treat his/her own patient, he/she has to inform the assistants of the department at least two weeks before that practice.

The students can get extra patients from the notebook or from previously agreed patient examination at the admission office. Giving appointment, administration and any changing is the students’ responsibility.

By the end of the 4th year at least one from all Black cavity types should be performed, but VI.cl.

By the end of the 5th year it’s recommended to perform at least one of all the items from the previously mentioned list. Exceptions can be: core build up, fiber reinforced post, VI. cl., veneers. The lack of these treatments can be neglected if the student’s points are around the minimal point line (but achieved it). Only the main practice leader can give permission for this, after consulting the practice leaders.
* 8. Magnification in endodontics
* 10. Endodontic surgery II. - microsurgery
* 11. Bleaching of root canal treated teeth
* 8. WRITTEN DEMONSTRATION
* 8. Consultation

**OPERATIVE DENTISTRY SEMINAR II.**
8th semester

1. Introduction
2. Pulpal considerations
3. Macro- and microscopy of the endodontium
4. Pulpal and periapical diseases
5. RCT - indications and contraindication
6. RCT- instruments
7. Length measurement
8. RCT – materials
9. RCT – techniques
10. RCF – materials
11. RCF – techniques
12. Retreatment
13. RCT - Coronal restauration
14. Test

**PROSTHODONTICS I.**
7th semester

**LECTURE**
(1 hr/week)

* 1. Administration, health insurance system in Hungary

2. Prosthetic treatment planning. Examination of a partially edentulous patient

3. The clinical anatomy of edentulous mouth: basic definitions. Consequences of total edentulosity, state of edentulosity.
4. The clinical anatomy of the edentulous maxilla (edentulous ridge, hard and soft palate, soft palate, maxillary tuberosity, buccal space). The definition and parts of complete denture. The supportive factors of functional stability of the complete denture.
5. The clinical anatomy of the edentulous mandible I. (alveolar ridge, retromolar pad, retromylohyoid space)

**PRACTICE, SURGERY**
(4 hrs/week)

1. Dental instruments used in prosthetic dentistry, practice of impression making in the dental surgery
2. Medical and dental history of the patients, extraoral and intraoral examination, making diagnostic impression and cast
3. Planning of fixed dental prosthesis from the cast of patients
4. Tooth preparation for abutment, construction of temporary crown
5. Tooth preparation for abutment, construction of temporary crown

**PRACTICE, LABORATORY**
(3 hrs/week)

1. Practice of tooth preparation
2. Preparing 13,16 abutments with chamfer
3. Making precision and antagonist impressions
4. Making precision and antagonist impressions
5. Making section cast
6. The clinical anatomy of the edentulous mandible II. (sublingual region, buccal shelf, region of buccinator and masseter muscles). The perioral muscles.
7. The fabrication of complete dentures I. (anatomical impression and model and definitive impression and model)
8. The fabrication of complete dentures II. (assessment of the occlusal plane, the occlusal vertical dimension and the centric relation)
9. The fabrication of complete dentures III. (setting up of artificial teeth and try-in)
10. The fabrication of complete dentures IV. (Processing of denture in the dental laboratory, reocclusion)
11. WRITTEN ASSESSMENT
12. Prosthetic rehabilitation of cancer patients
13. The fabrication of complete dentures V. (insertion of denture, reocclusion, remontage, relining the denture)
14. Consultation

6. Tooth preparation for abutment, construction of temporary crown
7. Tooth preparation for abutment, construction of temporary crown
8. Making impressions
9. Making impressions and bite registration
10. Checking the metal framework in the mouth, color matching
11. Checking the fixed prosthesis in the mouth, luting with interim cement
12. Definitive cementation
13. Checking the fix prosthesis
14. Evaluation

6. Making section cast
7. Modellation wax patterns of a faced metal bridge
8. Modellation wax patterns of a faced metal bridge
9. Visiting the dental laboratory to watch investing and casting technique
10. Finishing, polishing the framework
11. Fabrication a post and core
12. Making individual trays, definitive impressions and master models for lower and upper complete dentures
13. Making wax rims and bite registration for complete denture
14. Evaluation
# PROSTHODONTICS II.

## 8th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE, Surgery</th>
<th>PRACTICE, Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(4 hrs/week)</td>
<td>(3 hrs/week)</td>
</tr>
<tr>
<td>* 1. Therapy of partial edentoulism</td>
<td>1. 1st patient: Medical and dental history of the patients, extraoral and intraoral examination, making anatomical (primary) impression and cast</td>
<td>1. Making individual trays, definitive impressions and master models for lower and upper complete dentures</td>
</tr>
<tr>
<td>* 2. Parts of removable partial denture (RPD) – base plate, saddle</td>
<td>2. Planning and drawing the borders of complete removable denture</td>
<td>2. Making wax rims and bite registration</td>
</tr>
<tr>
<td>* 4. Parts of RPD – type of clasps</td>
<td>4. Registration of the occlusal plane, the occlusal vertical dimension and the centric relation</td>
<td>4. Setting up of artificial teeth</td>
</tr>
<tr>
<td>* 5. Removable partial denture – theoretical bases</td>
<td>5. Trying-in the set-up complete dentures in the mouth</td>
<td>5. Setting up of artificial teeth</td>
</tr>
<tr>
<td>* 6. Fabrication of clasp retained RPD</td>
<td>6. Delivering the total removable dentures</td>
<td>6. Setting up of artificial teeth, MTO</td>
</tr>
<tr>
<td>* 7. Parts of RPD – precision attachments MTO – this week in another time</td>
<td>7. Review session, remontage, if needed</td>
<td>7. Trying-in procedure</td>
</tr>
<tr>
<td>* 8. Fabrication of RPD with precision attachment</td>
<td>8. 2nd patient: Medical and dental history of the patients, extraoral and intraoral examination, making anatomical (primary) impression and cast</td>
<td>8. Preparing dentures for delivery</td>
</tr>
<tr>
<td>* 11. Fabrication of hybrid prosthesis</td>
<td>11. Registration of occlusal plane, the occlusal vertical dimension and the centric relation</td>
<td>11. Planning of partial removable dentures, surveying the models</td>
</tr>
<tr>
<td>* 12. MTO (WRITTEN ASSESSMENT)</td>
<td>12. Trying-in complete dentures in the mouth</td>
<td>12. Making denture design for partial denture with metal framework</td>
</tr>
</tbody>
</table>
DENTAL DIAGNOSTICS AND TREATMENT PLANNING
8th semester

LECTURE (1 hr/week)
* 1. Case history, diagnosis in dentistry. Documentation
* 2. Decision making in dental therapy
* 3. Diagnosis and therapy in oral surgery
* 4. Diagnosis and therapy in conservative dentistry. Diagnosis and therapy in endodontics.
* 5. Diagnosis, treatment planning and therapy in stomato-oncology. Saliva diagnostic methods
* 6. Diagnosis and classification of TMD Case presentations
* 7. Diagnosis and therapy in prosthetic dentistry Case presentations
* 8. Diagnosis and therapy in pediatric dentistry and orthodontics
* 9. Diagnosis and therapy in parodontology.
* 10. Diagnosis and therapy of tooth wear. Diagnostic of tooth discoloration.
* 11. MTO (WRITTEN ASSESSMENT)

PRACTICE (1 hr/week)
1. Case history, diagnosis in dentistry. Documentation
2. Decision making in dental therapy
3. Diagnosis and therapy in oral surgery
4. Diagnosis and therapy in conservative dentistry. Diagnosis and therapy in endodontics.
5. Diagnosis, treatment planning and therapy in stomato-oncology. Saliva diagnostic methods
6. Diagnosis and classification of TMD Case presentations
7. Diagnosis and therapy in prosthetic dentistry Case presentations
8. Diagnosis and therapy in pediatric dentistry and orthodontics
9. Diagnosis and therapy in parodontology.
10. Diagnosis and therapy of tooth wear. Diagnostic of tooth discoloration.
11. MTO (WRITTEN ASSESSMENT)

PEDIATRIC DENTISTRY I.
8th semester

LECTURE (1 hr/week)
* 1. Fundamentals of pediatric dentistry
* 2. Patient management
* 3. Morphology of primary teeth
* 4. Materials in pediatric dentistry
* 5. Eruption and shedding of teeth
* 6. Cariology of primary teeth
* 7. Pulp lesions in primary teeth
* 8. Cariology of permanent teeth
* 9. Treatment of permanent teeth
* 10. Local anesthesia, pharmacology; General anesthesia and pain control for the children
* 11. Traumatic dental injuries in childhood
* 12. Radiology in pediatric dentistry
* 13. Prevention in pediatric dentistry

PRACTICE (2 hrs/week)
1. Oral assessment; screening
2. Case history, case report
3. Sealants and preventive resin restorations
4. Restorative procedures for primary teeth
5. Restorative procedures for primary teeth
6. Minimal Invasive Technic
7. Pulp therapy; pulpotomy, pulpectomy
8. Diagnostic methods
9. MTO 1.
10. Protective crown (permanent incisor) (model)
11. Stainless steel crown
12. Management of the fractured permanent incisors
13. Consultation
14. MTO II.
PERIODONTOLOGY I.
7th semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* 1. The topics of the Periodontology. Introduction to periodontal diseases</td>
<td>1. Seminar: Power driven instruments</td>
</tr>
<tr>
<td>* 2. Biochemistry and physiology of the connective tissue</td>
<td>2. Seminar: Hand instruments</td>
</tr>
<tr>
<td>* 3. Biochemistry and physiology of the bone</td>
<td>3. Phantom course: practicing the use of scalers</td>
</tr>
<tr>
<td>* 4. Dental plaque and calculus</td>
<td>4. Phantom course: practicing the use of universal curettes</td>
</tr>
<tr>
<td>* 5. Microbiology of periodontal diseases</td>
<td>5. Phantom course: practicing the use of Gracey curettes</td>
</tr>
<tr>
<td>* 7. Mechanisms of destruction of the periodontal tissues</td>
<td>7. Written and practical examination</td>
</tr>
<tr>
<td>* 8. The epidemiology of periodontal diseases</td>
<td>8. Seminar and phantom course: General guidelines for periodontal surgery: instruments, local anesthesia, periodontal dressing, suturing</td>
</tr>
<tr>
<td>* 12. Tobacco use and its relation to periodontal diseases</td>
<td>12. Examination and treatment of patient with gingivitis</td>
</tr>
</tbody>
</table>

PERIODONTOLOGY II.
8th semester

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* 3. Gingival diseases modified by other systemic conditions</td>
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<tr>
<td>* 4. The periodontal abscess. Necrotizing gingivitis.</td>
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<tr>
<td>5. Non-plaque induced inflammatory gingival lesions</td>
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<tr>
<td>6. The chronic periodontitis</td>
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<tr>
<td>7. The aggressive periodontitis</td>
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<tr>
<td>8. Periodontitis modified by systemic conditions</td>
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<tr>
<td>* 9. Basic principles of periodontal treatment</td>
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<tr>
<td>10. Treatment planing of chronic and aggressive periodontitis</td>
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</tr>
<tr>
<td>12. The use of drugs in periodontal therapy</td>
<td></td>
</tr>
</tbody>
</table>
13. The use of antiseptics in periodontal therapy

**BASIC TREATMENT IN DENTAL MEDICINE (summer practice)**
8th semester

4th year dental students have to perform a practice of four weeks (4x35 hours) in Basic Treatment in Dental Medicine.

Requirements for accepting the summer practice:
- attendance of practices
- completing the tasks given by the instructor
- pieces upper or lower total removable denture or 1 piece of partial removable denture or 1 piece of post and core with crown or 1 piece of short bridge

The summer practice is a criterium topic! Each student must fulfill it.

**SURGICAL CONSIDERATIONS IN DENTISTRY**
7th semester

**PRACTICE**
(2 hrs/week)
* Internal medicine questions in dental practice
* Antibiotics in dentistry and oral surgery
* Cardiac risk patients in dental practice
* Dental treatment of patients with bleeding disorders
* Dental treatment of patients following radio/chemotherapy
* Maxillary sinus diseases and their management
* Forensic odontology
* Differential diagnosis of neck masses
* Differential diagnosis of facial pain
* Head and neck skin tumors
* Odontogenic tumors
* Bisphosphonate induced osteonecrosis of the jaws
* Sedoanalgiesia
* Written exam

**HUNGARIAN LANGUAGE VII.**
7th semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Practice/ Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Examination of patient with endodontic problems</td>
<td>Revision</td>
</tr>
<tr>
<td>2.</td>
<td>Root canal treatment</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>3.</td>
<td>Prosthdontics</td>
<td>Vocabulary practice</td>
</tr>
<tr>
<td>4.</td>
<td>Prosthetical appliances</td>
<td>Word building</td>
</tr>
<tr>
<td>5.</td>
<td>Methods of tooth preparation</td>
<td>Lexical drills</td>
</tr>
<tr>
<td>7.</td>
<td>Written test</td>
<td></td>
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<tr>
<td>8.</td>
<td>Autumn break</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Types of crowns</td>
<td>Reading practice</td>
</tr>
<tr>
<td>10.</td>
<td>Types of prostheses</td>
<td>Lexical drill</td>
</tr>
<tr>
<td>11.</td>
<td>Types of bridges</td>
<td>Vocabulary practice</td>
</tr>
<tr>
<td>12.</td>
<td>Inlays</td>
<td>Dialogue</td>
</tr>
<tr>
<td>13.</td>
<td>Veneer crowns</td>
<td>Role-play</td>
</tr>
<tr>
<td>14.</td>
<td>Written test</td>
<td></td>
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<tr>
<td>15.</td>
<td>Oral assessment</td>
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</tbody>
</table>
**HUNGARIAN LANGUAGE VIII.**

**8th semester**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Practice/Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fixed bridges</td>
<td>Revision</td>
</tr>
<tr>
<td>2.</td>
<td>Removable partial dentures</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>3.</td>
<td>Complete dentures</td>
<td>Word building</td>
</tr>
<tr>
<td>4.</td>
<td>Dental implants</td>
<td>Lexical drill</td>
</tr>
<tr>
<td>5.</td>
<td>Orthodontic appliances</td>
<td>Dialogue</td>
</tr>
<tr>
<td>6.</td>
<td>Orthodontics for children</td>
<td>Case study</td>
</tr>
<tr>
<td>7.</td>
<td>Written test</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Spring break</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Dental care in diabetes</td>
<td>Dialogue</td>
</tr>
<tr>
<td>11.</td>
<td>Xerostomia and Halitosis</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>12.</td>
<td>Prevention of cross infections</td>
<td>Case study</td>
</tr>
<tr>
<td>13.</td>
<td>Cosmetic dentistry</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>14.</td>
<td>Revision for the written test</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Revision for the oral examination</td>
<td></td>
</tr>
</tbody>
</table>

**DERMATOLOGY**

**7th semester**

**LECTURE**

(1 hrs/week)

Skin and mucous membrane anatomy and physiology
Types of skin lesions
Skin immunology
Allergic skin reactions
Urticaria
Allergic skin diseases
Eczema
Drug allergy
Autoimmune skin diseases
Diseases of the connective tissue
Vasculitis
Vesiculobullous autoimmune skin diseases
Viral, bacterial and fungal diseases of the skin and mucous membrane
Sexually transmitted diseases
Dermatoses caused by parasites
Immunodermatologic disorders and papulo-squamous diseases
Atopic dermatitis
Psoriasis
Lichen ruber planus
Pityriasis rosea
Disorders of the vessels
Varicosity
Thrombophlebitis
Deep vein thrombosis
Postthrombotic syndrome
Leg ulcer
Disorders caused by physical agents
Artefact, combustio, congelatio
Seborrhoeic dermatoses
Acne
Rosacea
Perioral dermatitis
Alopecias
Skin tumours
Benign lesions

**PRACTICE**

(3 hrs/week)

Presentation of skin diseases
Praecancerous lesions
Cancers, melanoma malignum
Tumours of mesodermal origine
Consultation

PRACTICE MANAGEMENT IN DENTISTRY

9th semester

LECTURE
(2 hrs/week)
* 1. Career with dental certificate
* 2. Quality control in dental practice
* 3. HR in dental practice
* 4. Service area competitor analysis
* 5. Praxis marketing elements
* 6. Branding and identity
* 7. Connection between medical ethics and right
* 8. Equipment in dental surgery. Design and function in dental office
* 9. Problems of dental practice building and leading
* 10. The difficulties of the foundation of dental practice
* 11. Taxation of charges in dental office
* 12. Consultation, written demonstration

DISEASES OF TEMPOROMANDIBULAR SYSTEM

9th semester

LECTURE
(1 hr/week)
* 1. Pathology of temporomandibular system
* 2. Anatomy, normal function of temporomandibular joint and muscles, innervations
* 3. Inflammatory and degenerative thicknesses
* 4. Symptoms of TMJ dysfunction
* 5. Etiology of TMJ dysfunction
* 6. Clinical examination methods, diagnostics
* 7. Imaging methods, importance of MRI
* 8. Differential diagnostics
* 9. Conservative therapy I.: Medicaments
* 10. Conservative therapy II.: Splints
* 12. Conservative therapy IV.: Psychodiagnostic and psychotherapy
* 13. Correction of occlusion, prosthetic treatment of TMJ patients. WRITTEN ASSESSMENT
DENTAL IMPLANTOLOGY I.

9th semester

Lecture
(2 hrs/week)
* 1. Osseointegration, bone-physiology, bone-healing
* 2. History of dental implantology. Types, design of dental implants. The definition of an implant system
* 3. Prosthetic aspects of implant planning
* 4. X-ray diagnoses in implantology, CT, 3D etc.
* 5. Procedure of implant surgery
* 6. Consultation before implant surgery: indications and contraindications. Anatomical consideration of the jaws. Surgical planning
* 7. Bone augmentation procedures and different methods
* 8. Implant surgery combined with sinus elevation, bone augmentation
* 9. The dental office and the personnel requirements of dental implantology. Legal aspect of implantology, written consent
* 10. Immediate loading
* 11. Loss of implants, recall, overview
* 12. Implantology in orthodontics
* 13. Exam

DENTAL IMPLANTOLOGY II.

10th semester

Practice
(2 hrs/week)
* 1. The DenTi Implant system in implantology practice I.
* 2. The DenTi Implant system in implantology practice II.
* 3. The Straumann Implant system in implantology practice
* 4. The SGS Implant system in implantology practice
* 5. The CAMLOG Implant system in implantology practice
* 6. The Nobel Biocare Implant system in implantology practice I.
* 7. The Nobel Biocare Implant system in implantology practice II.
* 8. The Ankylos Implant system in implantology practice I.
* 9. The Ankylos Implant system in implantology practice II.
* 10. Spring Congress
* 11. The MDI Implant system in implantology practice
* 12. Written exam, Evaluation of course
* 13. Semester overview

OPERATIVE DENTISTRY III.

9th semester

Practice
(4 hrs/week)
Requirements and evaluation of operative dentistry practice

Patient management:
On the first practice the 4th year student has to get familiar with the office equipment. On the second practice two patients will be called, the student has to take their status and history, after that one of them will be treated on the same appointment. The data and the status of the other patient will be recorded in a notebook and the patient will be informed that he/she will be called for another appointment.
On the first practice the 5th year student will treat his/her patient from the previous year or summer practice. If there’s no such a patient the student will get someone from the notebook to treat. If there’s a patient a student wants to treat, he/she has to inform the assistants of the department at least two weeks before that practice.
The students can get extra patients from the notebook or from previously agreed patient examination at the admission office. Giving appointment, administration and any changing is the students’ responsibility.
Only the points gained during the semester are considered. Points predetermined on the beginning of the semester define practical grades.
Not fulfilling the following conditions results in automatical failure of the semester:
By the end of the 4th year at least one from all Black cavity types should be performed, but VI.cl.
By the end of the 5th year it's recommended to perform at least one of all the items from the previously mentioned list. Exceptions can be: core build up, fiber reinforced post, VI.cl., veneers. The lack of these treatments can be neglected if the student's points are around the minimal point line (but achieved it). Only the main practice leader can give permission for this, after consulting the practice leaders.

**OPERATIVE DENTISTRY Seminar III.**

9th semester

**Seminar**
(1 hr/week)
Current topics of operative dentistry according to contemporary scientific literature

**OPERATIVE DENTISTRY IV.**

10th semester

(6 hrs/week)

**PRACTICE**
Requirements and evaluation of operative dentistry practice

**Patient management:**
On the first practice two patients will be called, the student has to take their status and history, after that one of them will be treated on the same appointment. The data and the status of the other patient will be recorded in a notebook and the patient will be informed that he/she will be called for another appointment.
On the first practice the 5th year student will treat his/her patient from the previous year or summer practice. If there's no such a patient the student will get someone from the notebook to treat. If there's a patient a student wants to treat, he/she has to inform the assistants of the department at least two weeks before that practice. The students can get extra patients from the notebook or from previously agreed patient examination at the admission office. Giving appointment, administration and any changing is the students' responsibility.
Only the points gained during the semester are considered. Points predetermined on the beginning of the semester define practical grades.

Not fulfilling the following conditions results in automatical failure of the semester:

By the end of the 4th year at least one from all Black cavity types should be performed, but VI.cl.
By the end of the 5th year it's recommended to perform at least one of all the items from the previously mentioned list. Exceptions can be: core build up, fiber reinforced post, VI.cl., veneers. The lack of these treatments can be neglected if the student's points are around the minimal point line (but achieved it). Only the main practice leader can give permission for this, after consulting the practice leaders.

**OPERATIVE DENTISTRY Seminar IV.**

10th semester

**Seminar**
(1 hr/week)
Case studies. Comprehensive treatment planning and diagnostics

**DENTAL IMPLANTOLOGY (in Prosthodontics)**

10th semester

**LECTURE**
(2 hrs/week)

* 1. Surface properties and modifications of dental implants. Characteristics of titanium
* 2. Hands on practice on manikin
* 3. The components of an implant system. Theoretical background of implantology: osseointegration, soft tissue integration, loading
* 4. Implant-prosthetic treatment planning: alternative treatment plans. Team work, documentation. Special fields: young, old patients, smoking etc.
* 5. Implant planning with CT and guide systems
* 6. Types of implant supported prostheses, indication, conditions 1. Temporary prosthesis
* 7. Types of implant supported prostheses, indication, conditions 2. Occlusion, articulation. Abutments
* 8. Dental technical aspects of implantology. Laboratory steps of preparing fixed prosthesis
* 9. Dental technical aspects of implantology. Laboratory steps of preparing removable prosthesis
* 10. Implant retained hybrid prosthesis
* 12. Interesting and special implant prosthetic cases
* 13. Written test
* 14. Case presentations, course evaluation

**ORTHODONTICS I.**

**9th semester**

<table>
<thead>
<tr>
<th><strong>Lecture</strong></th>
<th><strong>Practice</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* 3. Malocclusions and Functional Disorders</td>
<td>3. Orthodontic Impression, Preparation of the Study Cast</td>
</tr>
<tr>
<td>* 5. Orthodontic Study Cast Analysis</td>
<td>5. Orthodontic Impression, Preparation of the Study Cast</td>
</tr>
<tr>
<td>* 6. Radiographic Analysis for Orthodontic Diagnosis</td>
<td>6. Measurements on the Orthodontic Study Casts</td>
</tr>
<tr>
<td>* 7. Treatment Plan and Documentation of Orthodontic Treatment</td>
<td>7. Orthodontic photo documentation</td>
</tr>
<tr>
<td>* 8. Removable Plate-Appliances</td>
<td>8. MTO I.</td>
</tr>
<tr>
<td>* 11. Extraroral Appliances and Auxiliary Appliances used in Orthodontics</td>
<td>11. Cephalometric Analysis of the Frontal Radiograph</td>
</tr>
<tr>
<td>14. Consultation</td>
<td>14. MTO II.</td>
</tr>
</tbody>
</table>

**ORTHODONTICS II.**

**10th semester**

<table>
<thead>
<tr>
<th><strong>Lecture</strong></th>
<th><strong>Practice</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* 2. Interceptive Orthodontics, Early Treatments</td>
<td>2. Clinical Presentation of Removable Orthodontic Appliances</td>
</tr>
<tr>
<td>* 4. Conservative Dentofacial Orthopedic Treatments in Late Childhood and Puberty</td>
<td>4. Clinical Presentation of Removable Orthodontic Appliances</td>
</tr>
<tr>
<td>* 5. Adult Orthodontics</td>
<td>5. Seminar: Fixed Orthodontic Appliances</td>
</tr>
<tr>
<td>* 6. The Role of Orthodontics in Interdisciplinary Therapy</td>
<td>6. Clinical Presentation of Fixed Orthodontic Appliances</td>
</tr>
<tr>
<td>* 7. Dentoalveolar Surgical Interventions Associated to Orthodontic Treatments</td>
<td>7. Clinical Presentation of Fixed Orthodontic Appliances</td>
</tr>
<tr>
<td>* 11. Modalities and Appliances of the Retention</td>
<td>11. Seminar: Complex Care of Children with Cleft Lip and Palate</td>
</tr>
</tbody>
</table>
* 12. Causes of the Relapse, Complications of Orthodontic Treatment

* 13. Dental and Hygienic Care of Patients Wearing Orthodontic Appliances

* 14. Consultation

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**ORAL SURGERY III.**

**9th semester**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2 hrs/week)</td>
<td>(4 hrs/week)</td>
</tr>
<tr>
<td>* 1. Principles of trauma management. Conservative treatment of facial trauma. Mandibular fractures</td>
<td>Minimal practice requirement:</td>
</tr>
<tr>
<td>* 2. Trauma: Midface, frontal skull base fractures</td>
<td>- 10 simple tooth extractions</td>
</tr>
<tr>
<td>* 3. Temporomandibular joint surgery</td>
<td>- 3 operation:</td>
</tr>
<tr>
<td>* 4. Orthognathic surgery</td>
<td>Apicectomy</td>
</tr>
<tr>
<td>* 5. Preprosthetic surgery</td>
<td>Tooth extraction by operation</td>
</tr>
<tr>
<td>* 6. Distraction osteogenesis of the facial skeleton</td>
<td>Extraction of impacted or displaced tooth</td>
</tr>
<tr>
<td>* 7. Salivary gland diseases</td>
<td>Incision (drainage) of abscess</td>
</tr>
<tr>
<td>* 8. Bisphosphonate related osteonecrosis of the jaws</td>
<td>Cystectomy</td>
</tr>
<tr>
<td>* 9. Cleft lip and palate surgery</td>
<td></td>
</tr>
<tr>
<td>* 10. Etiology and diagnosis of oral cancer</td>
<td></td>
</tr>
<tr>
<td>* 11. Scientific search engines and databases</td>
<td></td>
</tr>
<tr>
<td>* 12. Surgical management of oral cancer. Reconstruction</td>
<td></td>
</tr>
<tr>
<td>* 13. Written exam</td>
<td></td>
</tr>
<tr>
<td>* 14. Discussion</td>
<td></td>
</tr>
</tbody>
</table>

---

**ORAL SURGERY IV.**

**10th semester**

<table>
<thead>
<tr>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6 hrs/week)</td>
</tr>
<tr>
<td>Practice in basic dentoalveolar surgery:</td>
</tr>
<tr>
<td>- apicectomy</td>
</tr>
<tr>
<td>- exococheleation</td>
</tr>
<tr>
<td>- incision</td>
</tr>
<tr>
<td>- bone correction</td>
</tr>
<tr>
<td>Minimal requirements of semester 8 simple tooth extraction, 2 operations</td>
</tr>
</tbody>
</table>

---

**PEDIATRIC DENTISTRY II.**

**9th semester**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hr/week)</td>
<td>(4 hrs/week)</td>
</tr>
<tr>
<td>* 1. Diagnostic methods, oral assessment; screening</td>
<td>Diagnostic methods</td>
</tr>
<tr>
<td>* 2. Bad habits in childhood</td>
<td>Caries prevention in childhood</td>
</tr>
<tr>
<td>* 3. Caries therapy for primary teeth</td>
<td>The caries lesion and its management in children and adolescents</td>
</tr>
<tr>
<td>* 4. Oral diseases and parodontology in childhood</td>
<td>Pedodontic endodontics</td>
</tr>
<tr>
<td>* 5. Secondary diseases of caries in permanent dentition</td>
<td></td>
</tr>
<tr>
<td>* 6. Minimal invasive therapy</td>
<td></td>
</tr>
<tr>
<td>* 7. Pulp therapy for permanent teeth</td>
<td></td>
</tr>
<tr>
<td>* 8. Dental surgery in pediatric dentistry</td>
<td></td>
</tr>
<tr>
<td>* 9. Prosthetic dentistry in childhood</td>
<td></td>
</tr>
<tr>
<td>* 10. MTO</td>
<td></td>
</tr>
<tr>
<td>* 11. Traumatic injuries of primary teeth</td>
<td></td>
</tr>
<tr>
<td>* 12. Traumatic injuries of permanent teeth</td>
<td></td>
</tr>
<tr>
<td>* 13. Assessment of semester</td>
<td></td>
</tr>
<tr>
<td>* 14. Consultation</td>
<td></td>
</tr>
</tbody>
</table>
PEDIATRIC DENTISTRY III.

10th semester

Practice
(3 hrs/week)
* Diagnostic methods
  Caries prevention in child dental care
  The caries lesion and its management in children and adolescents
  Pulp therapy
  Knowledge of the materials and their usage

PERIODONTOLOGY III.

9th semester

Lecture
(1 hr/week, ie. 2 hours/fortnight)
* 1. Aim, indications and contraindications of periodontal surgery
* 2. Aim and indication of periodontal plastic surgery
* 3. Elimination of periodontal pocket: gingivectomy and gingivoplasty. Treatment of enlargement of gingiva
* 4. Periodontal surgery: access therapy
* 5. Periodontal wound healing: regeneration or reparation
* 6. GTR. Flap preparation and suturing in regenerative surgical procedures
* 7. Grafting procedures
* 8. Biomediators in regenerative procedures
* 9. Pedicle soft tissue graft in root coverage procedures
* 10. Free soft tissue graft in root coverage procedures
* 11. Gingival augmentation, crown-lengthening procedures, the deformed edentulous ridge
* 12. Electrosurgery and lasers in periodontal surgical procedures
* 13. Postsurgical care. Outcome of surgical periodontal therapy

Practice
(3 hrs/week)
Examination and treatment of patient with gingivitis or chronic periodontitis.

PERIODONTOLOGY IV.

10th semester

Lecture
(1 hr/week)
* 1. Supportive periodontal therapy
* 2. Treatment of furcation-involved teeth
* 3. Endodontics and periodontics. Treatment of dentin hypersensitivity
* 4. Occlusal therapy
* 5. Prosthetic rehabilitation of periodontitis patients. Periodontal health and restorative procedures
* 6. Orthodontics and periodontal therapy
* 7. Outcomes of periodontal therapy
* 8. The use of drugs in periodontal therapy
* 9. The use of antiseptics in periodontal therapy
* 10. Peri-implant mucositis and peri-implantitis
* 11. Treatment of risky patients I
* 12. Treatment of risky patients II
* 13. HIV-associated periodontal conditions
* 14. Consultation

Practice
(3 hrs/week)
Treatment of patient with chronic or aggressive periodontitis.
**PREVENTIVE DENTISTRY**

**9th semester**

**Lecture**
(1 hr/week)
* 1. Definitions and objectives of preventive dentistry
* 2. Definitions of dental caries and role of fluorides
* 3. The effects of diet for general health and for dental caries
* 4. Preventive measures in periodontology
* 5. Preventive strategy and the orthodontic therapy
* 6. Preventive measures in prosthodontics
* 7. Iatrogen infections in dentistry and their prevention
* 8. Aetiology of oral precancerous lesions and their prevention
* 9. Exam – giving possibilities to get suggested mark for the examination

**Practice**
(1 hr/week)

Visiting a medical department ward to maintain dental preventive instruction and motivation for in-patients

**PROSTHODONTICS III.**

**9th semester**

**Practice**
(6 hrs/week)
* 1. Medical and dental history of the patients, extraoral and intraoral examination, making diagnostic impression and cast
* 2. Medical and dental history of the patients, extraoral and intraoral examination, making diagnostic impression and cast, jaw registration
* 3. Planning of fixed/removable dental prosthesis
* 4. Tooth preparation for abutments, construction of temporary crown
* 5. Tooth preparation for abutments, construction of temporary crown
* 6. Tooth preparation for abutments, construction of temporary crown
* 7. Tooth preparation for abutments, construction of temporary crown
* 8. Precision/master impressions and jaw registration
* 9. Precision/master impressions and jaw registration
* 10. Try in of fixed part & metal framework in the mouth, shade selection
* 11. Trial insertion of waxed-up dentures
* 12. Insertion of completed denture
* 13. Review
* 14. Review

**PROSTHODONTICS SEMINAR I.**

**9th semester**

**Practice**
(1 hrs/week)
* 1. Patient case presentation and treatment planning, alternatives
* 2. Patient case presentation and treatment planning, alternatives
* 3 Patient case presentation and treatment planning, alternatives
* 4. Treatment planning and prosthetic treatment of edentoulism in children
* 5. Different types of major connectors
* 6. Patient case presentation and treatment planning, alternatives
* 7. Patient case presentation and treatment planning, alternatives
* 8. Patient case presentation and treatment planning, alternatives
* 9. Patient case presentation and treatment planning, alternatives
* 10. Patient case presentation and treatment planning, alternatives
* 11. Patient case presentation and treatment planning, alternatives
* 12. Patient case presentation and treatment planning, alternatives
* 13. Patient case presentation and treatment planning, alternatives
* 14. Evaluation
PROSTHODONTICS IV.

10th semester

Practice
(6 hrs/week)
* 1. Medical and dental history of the patients, extraoral and intraoral examination, making diagnostic impression and cast
* 2. Medical and dental history of the patients, extraoral and intraoral examination, making diagnostic impression and cast, jaw registration
* 3. Planning of fixed/removable dental prosthesis
* 4. Tooth preparation for abutments, construction of temporary crown
* 5. Tooth preparation for abutments, construction of temporary crown
* 6. Tooth preparation for abutments, construction of temporary crown
* 7. Tooth preparation for abutments, construction of temporary crown
* 8. Precision/master impressions and jaw registration
* 9. Precision/master impressions and jaw registration
* 10. Try in fixed part & metal framework in the mouth, shade selection
* 11. Trial insertion of waxed-up dentures
* 12. Insertion of completed denture
* 13. Check up
* 14. Review

TREATMENT OF TRAUMATIC DENTAL INJURIES IN CHILDHOOD

10th semester

Lecture, Seminar
(Lecture: 2 hrs/week, Seminar: 1 hr/week)
* 1. Traumatic injuries in childhood
* 2. Orofacial trauma in childhood
* 3. Injuries to the primary dentition
* 4. Crown and root fractures in the permanent teeth
* 6. Injuries to developing teeth, Endodontic management
* 7. Treatment with implants in the trauma situation
* 8. Radiographic findings
* 9. Soft tissue injuries; injuries to the supporting bone
* 10. Orthodontic Management of the Traumatized Dentition
* 11. Prevention of dental and oral injuries
* 12. Follow-up procedures and recall schedule following the various trauma types
* 13. Consultation
* 14. MTO

FORENSIC MEDICINE

9th semester

LECTURE

week (2 hrs/ every second week)
1  Introduction. Essential law.
2  Medical law – Duties of the doctor
3  Medical malpractice in dentistry
5  Autopsy
6  Classification of wounds I. (blunt force and sharp injuries)
7  Classification of wounds II. ( heat and cold injuries, shot wounds)
8  Trauma of the head, face and denture
9  Mid-term assessment
10 Medical documentation, documentation of injuries – expert opinion in dental cases
11 Autopsy
12 Accidents (traffic, sport, household)
13 Forensic aspects of alcohol and drug abuse
14 Identification of the living and of the dead
15 DNA investigations in forensic medicine
GENERAL INFORMATION REGARDING THE CREDIT SYSTEM AT THE FACULTY OF PHARMACY

I. STRUCTURE OF STUDIES

Students have to acquire 300 credits in order to obtain the Doctor of Pharmacy degree. Credits have to be acquired according to the following scheme:

Compulsory subjects: 240 credits
Compulsory elective subjects: 44 credits
   - Subjects of the ninth semester: one has to acquire min. 12 credits
   - Students have to submit a thesis in the tenth semester (10 credits)
   - 6 months of compulsory pharmacy practice, including 1 month of hospital practice (22 credits)

Elective subjects: 16 credits

Students have to obtain min. 80 credits until the end of the fourth semester.
### SUGGESTED STUDY PLAN

#### Course Code | Course | Department | Lecturer | Hrs/week: Theory | Hrs/week: Practice | Form of exam | Credit | Course Requirement
---|---|---|---|---|---|---|---|---
GYTKKA041 | Physics-Biophysics I. | Experimental Physics Department | Dr. GÁBOR LACZKÓ associate professor | 2 | - | Exam | 2 | -
GYTKKA011 | History of Pharmacy | Phramaceutical Chemistry Department | Dr. LAJOS SIMON associate professor | 2 | - | Exam | 2 | -
GYTKKA021 | Mathematics | Faculty of Science and Informatics, Bolyai Institute | Dr. JANOS KARSAI associate professor | 2 | - | Exam | 3 | -
GYTKKA022 | Mathematics | Faculty of Science and Informatics, Bolyai Institute | Dr. JÓZSEF ELLER senior research associate | - | 2 | Term Mark | 2 | -
GYTKKA031 | Informatics | Dept. of Med. Physics and Informatics | Dr. FERENC PETÁK associate professor | - | 2 | Term Mark | 2 | -
GYTKKA051 | General Chemistry | Department of Physical Chemistry and Materials Science | Dr. ARPÁD SZÚCS associate professor | 2 | - | Exam | 3 | -
GYTKKA052 | General Chemistry | Department of Physical Chemistry and Materials Science | Dr. OTTÓ BERKESI associate professor, Dr. TAMÁS KÖRTVÉLYESI associate professor | - | 4 | Term Mark | 3 | -
GYTKKA071 | Pharmaceutical Biology | Medical Genetics Department | Dr. habil. MARTA SZELL Head of Department Dr. habil. ZSUZSANNA LÁSZLÓ associate professor | 3 | - | Exam | 3 | -
GYTKKA111 | Anatomy I. | Anatomy Department | Prof. habil. ANDRÁS MIHÁLY professor, Head of Department | 2 | - | Exam | 2 | -
GYTKKA491 | English Language I. | Department of Foreign Languages | Dr. ÉVA DEMETER language teacher, Head of Department | - | 2 | Term Mark | 0 | -
GYTKKA981 | Latin Language | Department of Foreign Languages | Dr. ÉVA DEMETER language teacher, Head of Department | - | 2 | Term Mark | 2 | -
GYTKKA551 | Hungarian Language I. | Department of Foreign Languages | Dr. ÉVA DEMETER language teacher, Head of Department | - | 4 | Term Mark | 2 | -

### PHARMACY

#### 2014/2015 1st year fall, 1st semester

**Compulsory Subjects**

- **GYTKKA041** Physics-Biophysics I.
  - Department: Experimental Physics Department
  - Lecturer: Dr. GÁBOR LACZKÓ associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA011** History of Pharmacy
  - Department: Phramaceutical Chemistry Department
  - Lecturer: Dr. LAJOS SIMON associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA021** Mathematics
  - Department: Faculty of Science and Informatics, Bolyai Institute
  - Lecturer: Dr. JANOS KARSAI associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA022** Mathematics
  - Department: Faculty of Science and Informatics, Bolyai Institute
  - Lecturer: Dr. JÓZSEF ELLER senior research associate
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA031** Informatics
  - Department: Dept. of Med. Physics and Informatics
  - Lecturer: Dr. FERENC PETÁK associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA051** General Chemistry
  - Department: Department of Physical Chemistry and Materials Science
  - Lecturer: Dr. ARPÁD SZÚCS associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA052** General Chemistry
  - Department: Department of Physical Chemistry and Materials Science
  - Lecturer: Dr. OTTÓ BERKESI associate professor, Dr. TAMÁS KÖRTVÉLYESI associate professor
  - Hrs/week: Theory: 4
  - Form of exam: Term Mark
  - Credit: 3

- **GYTKKA071** Pharmaceutical Biology
  - Department: Medical Genetics Department
  - Lecturer: Dr. habil. MARTA SZELL Head of Department Dr. habil. ZSUZSANNA LÁSZLÓ associate professor
  - Hrs/week: Theory: 3
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA111** Anatomy I.
  - Department: Anatomy Department
  - Lecturer: Prof. habil. ANDRÁS MIHÁLY professor, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA491** English Language I.
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 0

- **GYTKKA981** Latin Language
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA551** Hungarian Language I.
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 4
  - Form of exam: Term Mark
  - Credit: 2

**Elective Subjects**

- **GYTKKA041** Physics-Biophysics I.
  - Department: Experimental Physics Department
  - Lecturer: Dr. GÁBOR LACZKÓ associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA011** History of Pharmacy
  - Department: Phramaceutical Chemistry Department
  - Lecturer: Dr. LAJOS SIMON associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA021** Mathematics
  - Department: Faculty of Science and Informatics, Bolyai Institute
  - Lecturer: Dr. JANOS KARSAI associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA022** Mathematics
  - Department: Faculty of Science and Informatics, Bolyai Institute
  - Lecturer: Dr. JÓZSEF ELLER senior research associate
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA031** Informatics
  - Department: Dept. of Med. Physics and Informatics
  - Lecturer: Dr. FERENC PETÁK associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA051** General Chemistry
  - Department: Department of Physical Chemistry and Materials Science
  - Lecturer: Dr. ARPÁD SZÚCS associate professor
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA052** General Chemistry
  - Department: Department of Physical Chemistry and Materials Science
  - Lecturer: Dr. OTTÓ BERKESI associate professor, Dr. TAMÁS KÖRTVÉLYESI associate professor
  - Hrs/week: Theory: 4
  - Form of exam: Term Mark
  - Credit: 3

- **GYTKKA071** Pharmaceutical Biology
  - Department: Medical Genetics Department
  - Lecturer: Dr. habil. MARTA SZELL Head of Department Dr. habil. ZSUZSANNA LÁSZLÓ associate professor
  - Hrs/week: Theory: 3
  - Form of exam: Exam
  - Credit: 3

- **GYTKKA111** Anatomy I.
  - Department: Anatomy Department
  - Lecturer: Prof. habil. ANDRÁS MIHÁLY professor, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Exam
  - Credit: 2

- **GYTKKA491** English Language I.
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 0

- **GYTKKA981** Latin Language
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 2
  - Form of exam: Term Mark
  - Credit: 2

- **GYTKKA551** Hungarian Language I.
  - Department: Department of Foreign Languages
  - Lecturer: Dr. ÉVA DEMETER language teacher, Head of Department
  - Hrs/week: Theory: 4
  - Form of exam: Term Mark
  - Credit: 2
<table>
<thead>
<tr>
<th>Criteria Subjects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XT0011-PHE</td>
<td>Physical Education*</td>
</tr>
<tr>
<td></td>
<td>Sport Center</td>
</tr>
<tr>
<td></td>
<td>Andrea Böröcz Hézsőné</td>
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</table>

* One has to complete 2 semesters of Physical Education until the end of the 5th year.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department</th>
<th>Lecturer</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>GYTKKA042</td>
<td>Physics-Biophysics II.</td>
<td>Experimental Physics Department</td>
<td>Dr. GÁBOR LACZKÓ associate professor</td>
<td>2</td>
<td>-</td>
<td>Exam</td>
<td>3</td>
<td>Physics-Biophysics I.</td>
</tr>
<tr>
<td>GYTKKA043</td>
<td>Physics-Biophysics II.</td>
<td>Experimental Physics Department</td>
<td>Dr. GÁBOR LACZKÓ associate professor</td>
<td>-</td>
<td>3</td>
<td>Term Mark</td>
<td>2</td>
<td>Physics-Biophysics I.</td>
</tr>
<tr>
<td>GYTKKA061</td>
<td>Inorganic Chemistry</td>
<td>Institute of Pharmaceutical Analysis</td>
<td>Prof. habil. GYÖRGY DOMBI professor, Head of Department</td>
<td>3</td>
<td>-</td>
<td>Exam</td>
<td>4</td>
<td>General Chemistry exam</td>
</tr>
<tr>
<td>GYTKKA091</td>
<td>Qualitative Chemical Analysis II.</td>
<td>Pharmaceutical Chemistry Department</td>
<td>Dr. TAMAS MARTINEK associate professor</td>
<td>2</td>
<td>-</td>
<td>Exam</td>
<td>3</td>
<td>General Chemistry, practice</td>
</tr>
<tr>
<td>GYTKKA092</td>
<td>Qualitative Chemical Analysis II.</td>
<td>Pharmaceutical Chemistry Department</td>
<td>Dr. LÓRÁND KISS assistant professor, Dr. ISTVÁN MÁNDITY resident</td>
<td>-</td>
<td>5</td>
<td>Term Mark</td>
<td>4</td>
<td>General Chemistry, practice</td>
</tr>
<tr>
<td>GYTKKA101</td>
<td>Quantitative Chemical Analysis I.</td>
<td>Inorganic and Analytical Chemistry Dept.</td>
<td>Dr. PETER ANTAL professor, Dr. GÁBOR GALBÁCS associate prof., Dr. PÁL SIPOS ass. prof.</td>
<td>2</td>
<td>-</td>
<td>Evaluation</td>
<td>2</td>
<td>General Chemistry, practice</td>
</tr>
<tr>
<td>GYTKKA113</td>
<td>Anatomy II.</td>
<td>Anatomy Department</td>
<td>Prof. habil. ANDRÁS MIHALY professor, Head of Department</td>
<td>2</td>
<td>-</td>
<td>Exam</td>
<td>2</td>
<td>Anatomy I. exam</td>
</tr>
<tr>
<td>GYTKKA541</td>
<td>Biostatistics</td>
<td>Dept. of Med. Physics and Informatics</td>
<td>Dr. KRISZTINA BODA associate professor</td>
<td>1</td>
<td>-</td>
<td>Exam</td>
<td>2</td>
<td>Mathematics</td>
</tr>
<tr>
<td>GYTKKA542</td>
<td>Biostatistics</td>
<td>Dept. of Med. Physics and Informatics</td>
<td>Dr. KRISZTINA BODA associate professor</td>
<td>-</td>
<td>1</td>
<td>Signature</td>
<td>0</td>
<td>Mathematics</td>
</tr>
<tr>
<td>GYTKKA531</td>
<td>First Aid and Resuscitation</td>
<td>National Ambulance Service</td>
<td>Dr. ANDREA CSERJÉS head physician</td>
<td>1</td>
<td>-</td>
<td>Signature</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>GYTKKA532</td>
<td>First Aid and Resuscitation</td>
<td>National Ambulance Service</td>
<td>Dr. ANDREA CSERJÉS head physician</td>
<td>-</td>
<td>1</td>
<td>Term Mark</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>GYTKKA492</td>
<td>English Language II.</td>
<td>Department of Foreign Languages</td>
<td>Dr. EVA DEMETER language teacher, Head of Department</td>
<td>-</td>
<td>2</td>
<td>Term Mark</td>
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<td>English Language I.</td>
</tr>
<tr>
<td>GYTKKA552</td>
<td>Hungarian Language II.</td>
<td>Department of Foreign Languages</td>
<td>Dr. EVA DEMETER language teacher, Head of Department</td>
<td>-</td>
<td>4</td>
<td>Term Mark</td>
<td>2</td>
<td>Hungarian Lang. I.</td>
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</tbody>
</table>

**Elective Subjects** *

**Criteria Subjects**
| XT0011-2PHE | Physical Education* | Sport Center | Andrea Böröcz Hézsőné | - | 2 | S | 0 | - |

* One has to complete 2 semesters of Physical Education until the end of the 5th year.
# PHARMACY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Department</th>
<th>Lecturer</th>
<th>Hrs/week: Theory</th>
<th>Hrs/week: Practice</th>
<th>Form of exam</th>
<th>Credit</th>
<th>Course Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>GYTKKA103</td>
<td>Quantitative Chemical Analysis II.</td>
<td>Inorganic and Analytical Chemistry Dept.</td>
<td>Dr. PÉTER ANTAL, professor, Dr. GÁBOR GALBÁCS, associate professor, Dr. PÁL SIPOS, associate professor</td>
<td>2</td>
<td>-</td>
<td>CE</td>
<td>4</td>
<td>Quant. Chem. Anal. I.</td>
</tr>
<tr>
<td>GYTKKA104</td>
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<td>Inorganic and Analytical Chemistry Dept.</td>
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* One has to complete 2 semesters of Physical Education until the end of the 5th year.
# PHARMACY

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* One has to complete 2 semesters of Physical Education until the end of the 5th year.
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**Elective Subject**

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*One has to complete 2 semesters of Physical Education until the end of the 5th year.*
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**Elective Subjects**

**Criteria Subjects**
One has to complete 2 semesters of Physical Education until the end of the 5th year.
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**Criteria Subjects**

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*One has to complete 2 semesters of Physical Education until the end of the 5th year.

### Elective Subjects in the years 1-4

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**Recommended textbooks for first year pharmacy students**

It is recommended to purchase the latest edition of the following textbooks!

### PHYSICS-BIOPHYSICS

**Recommended:**
- Péter Makra: *Physics-biophysics* (handout, see http://www.noise.physx.u-szeged.hu/MP/Education/PhysicsBiophysics/, also available on CooSpace)
- Péter Makra (ed): *Physics-biophysics practicals* (handout, see http://www.noise.physx.u-szeged.hu/MP/Education/PhysicsBiophysics/, also available on CooSpace)
- Damjanovich Sándor - Fidy Judit - Szöllősi János: Medical biophysics (3rd edition). Medicina Könyvkiadó Rt
- Tarján ed. *An introduction to Biophysics with medical orientation*, Budapest: Akadémiai Kiadó
- Á. Süli: *Physics for students of pharmacy* (handout)
- P. Simon: *Practical Physics* (handout)

### HISTORY OF PHARMACY
- Lajos Simon: History of Pharmacy (handout)

### MATHEMATICS

**MATHEMATICS** (available on: www.model.u-szeged.hu/Education-courses/mathematics for pharmacy students)
- Janos Karsai: Basic Math for Life Sciences (interactive presentations)
- Janos Karsai: Interactive lecture presentations for Mathematics in Pharmacy
- Janos Karsai: Exercises and problems in Mathematics (handout)
- Janos Karsai et al: Exercises for the Mathematics practical for Pharmacy students (handout)
- Krisztina Boda and Janos Karsai: Mathematics Problems, Exercises for Pharmacy students (handout)
- Tibor Asztalos: Mathematics for 1st year Pharmacy students (handout)
- Krisztina Boda and János Karsai: *Mathematics Problems, Exercises for Pharmacy students* (handout)
- Tibor Asztalos: *Mathematics for 1st year Pharmacy students* (handout)
- János Karsai: *Exercises and problems in Mathematics* (handout)
- János Karsai et al: *Exercises for the Mathematics practical for Pharmacy students* (handout)
  [www.model.u-szeged.hu/Education-courses/mathematics for pharmacy students or http://www.model.u-szeged.hu/user/karsai/math/mathgytk/math7english.html](http://www.model.u-szeged.hu/user/karsai/math/mathgytk/math7english.html)

### GENERAL CHEMISTRY
- Árpád Szűcs: *General Chemistry* (handout, PDF)
- Árpád Szűcs: *Calculations in General Chemistry* (handout, PDF)
- Árpád Szűcs: *Practices in General Chemistry* (handout, PDF)

### PHARMACEUTICAL BIOLOGY
- *Cell Biology and Molecular Genetics I.*
- *Cell Biology and Molecular Genetics II.*
- *Life* (textbook)

### ANATOMY
- András Mihály, MD, DSc: *Human Anatomy, Histology and Development*, Handout for Pharmacy Students at University of Szeged

### INORGANIC CHEMISTRY

### QUALITATIVE CHEMICAL ANALYSIS
- Vogel's *Qualitative Inorganic Analysis*, 7th ed. Longman

### QUANTITATIVE CHEMICAL ANALYSIS
- **Theory**
- **Obligatory:**
Recommended:
• D. A. Skoog, F. J. Holler and T. A. Nieman: *Principles of Instrumental Analysis*, Saunders College Publishing
• Daniel C. Harris, Quantitative chemical analysis, 7th edition
• Kellner, Mermet, Otto, Widmer: Analytical chemistry, Wiley-VCH
• J. S. Fritz and G. H. Schenk: *Quantitative Analytical Chemistry*, Allin and Bacon

Practice

Obligatory:
• G. Galbács, K. Gajda-Srantz: *Laboratory Manual for Pharmacy Students in Quantitative Analytical Chemistry* (manual in manuscript form, currently available for the students in handout form)

**BIOSTATISTICS**

- Lecture notes: [http://www.szote.u-szeged.hu/dmi/](http://www.szote.u-szeged.hu/dmi/)
- M.J. Campbell, D. Machin: *Medical Statistics*. John Wiley & Sons
- Station A Glantz: *Primer of Biostatistics*. McGraw-Hill

Recommended:
- Station A Glantz: *Primer of Biostatistics*. McGraw-Hill
- M.J. Campbell, D. Machin: *Medical Statistics*. John Wiley & Sons

**FIRST AID AND RESUSCITATION**

- Brent, Karren: *First Aid for Colleges and Universities*, Brady Morton Series

**SHORT HISTORY OF HUNGARY** (elective)

- Csorba Cs, Estők J. Karádi: *Illustrated History of Hungary*, Helikon Kiadó, 2005

**GENERAL LAWS IN CHEMISTRY** (elective)

- Lecture notes (handout)

**RADIOCHEMISTRY** (elective)

- Lecture notes (handout)

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**Recommended textbooks for second year pharmacy students**

It is recommended to purchase the latest edition of the following textbooks!

**ORGANIC CHEMISTRY**

- Dr. Árpád Molnár: *Basic Organic Chemistry I. and II.* (handout)
- Solomons-Fryhle: *Organic Chemistry*

**PHARMACEUTICAL BOTANY**

- Fahn: *Plant Anatomy*, Pergamon Press

**PHYSIOLOGY**

- Dr. Mária Dux: *Physiology Laboratory Manual* (handout)

**PHYSICAL CHEMISTRY**

- *Physical Chemistry* (handout), 1987, SZOTE
• Physico Chemical Experiments (handout), 1987, SZOTE

COLOID CHEMISTRY
Theory
Obligatory:
• Lecture notes: http://koll1.chem.u-szeged.hu/colloids/staff/zoli/Pharmacy/

Recommended:
• D. J. Shaw: Introduction to Colloid and Surface Chemistry, Butterworth-Heinemann, Oxford 4th Ed. 2007

Laboratory Practice
Obligatory:

BIOCHEMISTRY
• Pamela C. Champe, Richard A. Harvey: Lippincott’s Illustrated Reviews, BIOCHEMISTRY, 4th edition, Wolters Kluwer/Lippincott Williams&Wilkins

BASIC COMMUNICATION (elective course)
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

PRACTICAL OPTICAL SPECTROSCOPY (elective)
• Lecture notes

THE ROLE OF NUTRITION IN THE PREVENTION AND TREATMENT OF DISEASES (elective)
• Lecture notes

<table>
<thead>
<tr>
<th>Recommended textbooks for third year pharmacy students</th>
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<tbody>
<tr>
<td>It is recommended to purchase the latest edition of the following textbooks!</td>
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</tbody>
</table>

PHARMACOGNOSY
Obligatory:
• Tóth, László: Pharmacognosy I-II
• Gellért, Mária: Pharmacognosy Practice

Recommended:

PHARMACEUTICAL CHEMISTRY
• Gareth Thomas (University of Porthsmouth) Medicinal Chemistry, 2nd Edition) John Wiley &Sons Ltd
• Graham L. Patrick, An Introduction to Medicinal Chemistry, Oxford University Press

PHARMACEUTICAL TECHNOLOGY
Obligatory:
• M.E. Aulton: Aulton’s Pharmaceutics. The Design and Manufacture of Medicines, Churchill Livingstone

Recommended:
• M.J. Groves: Parenteral Technology Manual, Interpharm Press
• S. Wu-Pong, A.B.C. Yu: Applied Biopharmaceutics & Pharmacokinetics, McGraw-Hill
• Infield, I. Edafiogho: Calculations for Pharmaceutical Practice, Churchill Livingstone

MICROBIOLOGY
• Levinson: Reviews of Medical Microbiology and Immunology. Lange Med. Publ. 11th, Ed.: 2010,
• Practical Notes Edited by R. Pusztai, SZOTE, 2002
IMMUNOLOGY
• A.K. Abbas et. al.: Basic Immunology, 2nd ed. (2006-2007), ELSEVIER Saunders

PATHOPHYSIOLOGY
Textbooks
• Gayton and Hall: Texbook of Medical Physiology 12th ed. 2011
• Damjanov: Pathophysiology, Elsevier (Saunders title), 2008,
  ISBN: 978-1-4160-0229-1
  ISBN- 0071621679/9780071621670
• Silbernagl, Lang: Color Atlas of Pathophysiology, George Thieme Verlag, 2000,
  ISBN: 9780865778665/9783131165510
• Goldman, Schafer: Goldman's Cecil Medicine, 24th ed., Elsevier (Saunders title), 2012,
  ISBN: 978-1-4377-2788-3
• Longo, Fauci, Kasper, Hauser, Jameson, Loscalzo: Harrison's Principles of Internal Medicine, 18th ed.,

Handouts (for practice)

BIOPHARMACY
• Leon Shargel and Andrew Yu: Applied Biopharmaceutics and Pharmacokinetics, Appleton and Lange,
  5th edition 2004

COMMUNICATION IN PHARMACY PRACTICE (elective)
• W. N. Tindall, R. S. Beardsley, C. L. Kimberlin: Communication Skills in Pharmacy Practice,, Lippincott Williams&Wilkins, 4th Ed. 2007

COMPUTER LITERATURE (elective)
• handout provided by the university

THE HARMs OF SMOKING AND STRATEGIES TO QUIT (elective)
• Lecture notes

BIOPHARMACEUTICALS (elective)
• Lecture notes
Recommended textbooks for fourth year pharmacy students

It is recommended to purchase the latest edition of the following textbooks!

PHARMACEUTICAL ANALYSIS

PHARMACODYNAMICS

PUBLIC HEALTH

ETHICS IN PHARMACY
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

INTRODUCTION TO LAW
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

INTRODUCTION TO ECONOMICS
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

DRUG REGULATORY AFFAIRS
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

CLINICAL LABORATORY PRACTICE

PHARMACY ADMINISTRATION

Recommended textbooks for fifth year pharmacy students

It is recommended to purchase the latest edition of the following textbooks!

CLINICAL PHARMACY
Recommended:
• Clinical Pharmacy and Therapeutics by Roger Walker and Kate Whittlesea, Published by Churchill Livingstone, 4th edition 2007

PHARMACODYNAMICS

NATURAL TREATMENTS

PHARMACEUTICAL PSYCHOLOGY

QUALITY ASSURANCE
• Lecture presentations: www.pharm.u-szeged.hu/gyfi/eng

PHARMACEUTICAL CARE
• Clive Edwards, Paul Stillman: Minor Illness or Major Disease?, 4th edition, Published by Pharmaceutical Press, 2006

WARD PHARMACY (compulsory elective)
• British National Formulary 60 September 2010, Published jointly by BMJ Publishing Group Ltd and Royal Pharmaceutical Society, 2010
• BNF for Children 2010-2011, Published jointly by the British Medical Association, Royal Pharmaceutical Society, the Royal College of Paediatrics and Child Health, and the Neonatal and Paediatric Pharmacists Group, 2010

VETERINARY PHARMACY (compulsory elective)
• Steven B Kayne, Michael H Jepson: Veterinary Pharmacy, Pharmaceutical Press 2004

PHYTOTHERAPY (compulsory elective)

EVERYDAY DERMATOLOGY (compulsory elective)

5th year / Spring semester

The deadline of submitting the thesis is March 2015

Pharmacy students perform a 4-month clerkship (3 successive months in public pharmacies, 1 month can be accomplished in pharmacy, pharmaceutical factory, galenical laboratory, university department or hospital pharmacy).

Fees:
From the academic year 2005/2006 fifth year pharmacy students have to pay the whole tuition fee for the second semester of the fifth year.

INTERIM PRACTICE

Pharmacy students are required to complete a compulsory practice in a pharmacy which must be accredited by the country concerned. At the completion of the practice an evaluation form should be filled in, signed, stamped and sent directly from the pharmacy or submitted by the student in a sealed envelope. (The form can be downloaded from our website). A “Letter of Acceptance” completed by the pharmacy has to be presented at the Foreign Students’ Secretariat until May 6, 2014.

2nd year pharmacy students must perform a practice of 4 weeks in a pharmacy.

3rd year pharmacy students must perform a practice of 4 weeks in a pharmacy.

4th year pharmacy students must perform a practice of 2 months in a pharmacy (pharmacy, pharmaceutical factory, galenical laboratory, university department or hospital/clinical pharmacy).

Note: The precondition of starting the 2-month compulsory practice is completing all the courses of the first four years and acquiring 16 credits of elective subjects.

5th year pharmacy students must perform a 4-month clerkship in the second semester of the academic year. (3 successive months in public pharmacies and 1 month in a hospital/clinical pharmacy.)
PHYSICS-BIOPHYSICS

1st semester

LECTURE
Diffusion. Fick’s first law. Generalised equation of continuity. Fick’s second law. The oxygen supply of tissues

2nd semester

LECTURE

PRACTICE
Statistical evaluation of experimental data
Viscometry
Electrical conductance. Conductometry
Refractometry
Optical imaging
Optical absorption spectroscopy
Kinetics of heating and cooling
Chirality optical activity. Polarimetry
Recording time-dependent electric signals
Electronic amplifiers
Absorption of nuclear radiation
Optical emission spectroscopy

HISTORY OF PHARMACY

* Medicinal treatments and medicines in ancient societies: in prehistoric times, in Mesopotamia, Egypt, India, China, Hellas and in the Roman Empire.
* Medieval medicine. Medicine under Islam. The establishment of the first pharmacy.
* Crusades. The rise of universities (Salerno, Montpellier and other European universities).
* The first medical decree. Foundation of the first medical faculty.
* Renaissance. Art and science in the Renaissance. The time of alchemy.
* The emergence of medicinal chemistry (iatrichemistry), Paracelsus.
* The formation of the European pharmacy, foundation of pharmacies.
* The "Age of Scientific Revolution", medicine and pharmacy in the 17th century.
* Medicine and pharmacy in the 18th century. Innovation in the 18th century.
* Medicine and pharmacy in the 19th and 20th centuries. Formation of pharmaceutical industry.
* The history of medical and pharmaceutical education. History of the Hungarian pharmaceutical education and postgraduate training of pharmacists.
* Dispensatoriums, Antidotariums.
* Pharmacopoeias, national and international pharmacopoeias, Ph.Hg.VII.
* National and international standards of drugs.
* Definition and classification of drug. Expiry date. Drugs and doses. Dosage forms.
* The principles of efficacy, safety of drug use. The therapeutic index and the margin of safety.
* Naming of medical substances: Latinized and licensed (trade) names. The forms dispensation. Formula Magistrals, Normalis, Originalis, Nosocomialis. The three levels of drug production.
* Public, clinical and hospital pharmacies. The conditions of a working pharmacy. Administration work in pharmacies.

**MATHEMATICS**

**LECTURE**
* Basic concepts: sets, numbers, intervals, relations, functions. Elementary properties of functions: domain, range, graph, even/odd functions, periodicity, boundedness, monotonicity, concavity, maxima and minima.
* Compositions, one-to-one functions, inverse function.
* Elementary functions in the life sciences: Arithmetical and geometrical growth, power functions, exponential and logarithmic functions, trigonometric functions.
* Graphical study of functions and practical processes: elementary and logarithmic transformations, logarithmic plots.
* Applications of Calculus in life sciences: Intuitive concept of limits; Continuity Instantaneous growth rate, derivative: definition, general and geometrical meaning, equation of the tangent line. Second derivative, acceleration and concavity. Differentiation rules
* Applications: Relation between the growth and concavity and the derivatives, graphical and numerical study. Find maxima, minima and the maximal growth rate. Investigation processes in Pharmacy.
* Antiderivative, indefinite integral: inversion of differentiation, understanding vector fields. simple integration methods and rules
* Definite integral: geometric meaning (area under curve), and formal definition. Elementary properties and rules. The integral mean value. Simple numerical methods of integration. Area function, Newton-Leibniz formula.

**PRACTICE**
Exercises and solutions of problems in the topics of the corresponding lectures.
Applications in Pharmacy.

* Functions of two variables: graphical methods, partial derivatives and their geometrical meaning. Local minima and maxima.
* Curve fitting with the least square method, linear regression.

INFORMATICS

1st semester

PRACTICE
(2 hrs/week)
* Basic concepts of informatics in life sciences. Terminology used in informatics and computer techniques. The role of the human component.
* Local and Network drives; File and folder operations on physical and logical drives. Overview of computer architecture. Hardware and software. Problems with national languages - solutions.
* Creating formatted documents; stand-alone and shareable versions. Compatibility problems. PDF files.
* Manual and automatic text editing and formatting. The use of templates and styles.
* Simple vs. complex documents in life sciences. Tables, charts, ClipArt, WordArt, hypertext.
* Elements of desktop publishing. Paper and screen oriented versions.
* 1st practical test.
* Data types in the pharmacological sciences. Number, date, time, money, dimensions, etc.
* Practices on formulae, useful spreadsheet functions in life sciences.
* Statistical evaluation and graphical presentation of medical/pharmacological data.
* Slide presentation softwares.
* 2nd practical test.
* Computer aided measurement of bioelectrical signals. Data and image processing.
* Seeking medical/pharmacological Web-sites. Fine tuning of Internet browsers.

BIOSTATISTICS

* Data definition, types of data, displaying data. Characteristics of discrete and continuous distributions. Probability, random variables and their types, distributions. Some important distributions: binomial, Poisson, uniform and normal distribution and their properties.

GENERAL CHEMISTRY

1st semester

LECTURE
* The science of chemistry
* Chemistry as physical science. Measurements and units in chemistry.
* The language of chemistry

PRACTICE
Chemical calculations

* Stoichiometry

* States of matter

* The structure of atoms


* Atoms, electrons, the periodic table


* The chemical bond


* Molecular structure and stability

* Molecular properties and geometry. Thermochemistry.

* The properties of solutions


* Chemical equilibrium


* Acids and bases

Polyprotic acids.

* Oxidation-reduction

* Chemical kinetics
  * Rate of reaction. Reaction rate and concentration. Rate law and reaction mechanism. Reaction rate and temperature. Reaction rate and equilibrium. Catalysis.

* Coordination chemistry

INORGANIC CHEMISTRY

2nd semester


* HYDROGEN
  Its place in the periodic table, electron configuration, physical properties, ortho and para hydrogen, isotopes of hydrogen, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (hydrides).

* NOBLE GASES
  Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Their chemical properties, reactions, synthesis and use of some important compounds containing them.

* ALKALINE METALS
  Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Ammonia solution of alkaline metals. Their chemical properties, reactions, synthesis and use of some important compounds containing them (alkaline hydrides; oxides; hydroxides; halogenides; complex compounds; cryptates; biological importance).

* ALKALINE EARTH METALS
  Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Their chemical properties, reactions, synthesis and use of some important compounds containing them (calcium oxide; hydroxide; chloride; sulphate; EDTA complex; barium chloride, sulphate).

* BERYLLIUM
  Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it.

* BORON
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (borides; boron halogenides; boranes; borax; boric acid).

* MAGNESIUM
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (oxyde; carbonate; sulphate; chlorophyll; Grignard compounds).

* ALUMINIUM
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing them (oxyde; sulphate; trichloride; hydroxide; alumen).

* SILICON
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it (glasses). Its chemical properties, reactions, synthesis and use of some important compounds containing it (oxydes; silicic acid; silicates; halogenides; silicons; siloxanes).

* GERMANIUM, ARSENIC, ANTIMONY
Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Their chemical properties, reactions, synthesis and use of some important compounds containing them (arsenic oxydes; acids; antimony pentfluoride - super acids; antimony pentasulphide; bismuth nitrate).

* COPPER, SILVER AND GOLD
Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Their chemical properties, reactions, synthesis and use of some important compounds containing them (copper sulphate; halogenides; silver nitrate; silver halogenides-photochemistry; gold chlorides).

* ZINC, CADMIUM AND MERCURY
Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Their chemical properties, reactions, synthesis and use of some important compounds containing them (zinc oxyde; chloride; sulphate; metals dissolved in mercury; mercury chlorides; oxyde).

* TIN, LEAD AND BISMUTH
Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them (radiation protection). Their chemical properties, reactions, synthesis and use of some important compounds containing them (oxydes; acetate).

* TRANSITION METALS
General physical and chemical properties, electron configuration, occurrence, synthesis, use of them, important compounds (hydrides; Cr-oxydes, acids; Mn-oxydes, acids and bases; Fe-oxydes, hydroxydes, complex compounds; Ni, Pd, Pt, Rh, Ir-catalysis).

* IRON
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (iron; iron trichloride; sulphate; hemoglobin).

* RARE EARTH METALS
General physical and chemical properties, electron configuration, occurrence, synthesis, use of them, important compounds (Ce-oxydation; Sm-pharmaceutical use; Th-physical properties; U-separation of the isotopes).

* FLUORINE
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (hydrogen fluoride, fluorides- caries prevention).

* CHLORINE
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (chlorine water; acids; salts of the acids).

* BROMINE AND IODINE
Their place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of them. Solvatation of iodine. Their chemical properties, reactions, synthesis and use of some important compounds containing them (bromine water; hydrogen bromide, bromides-sedatives; oxoacids and salts; iodine solutions; pseudohalogenides; biological importance of iodine).

* OXYGEN
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Water (natural-, deionised, distilled water; physical properties; water as solvant). Its chemical properties, reactions, synthesis and use of some important compounds containing it. Substances for oxydation (peroxides, permanganates, chlorine water, iodine etc.)

* SULFUR
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it (ozone, natural, deionised and distilled water, hardness of water, hydrogen peroxide). Its chemical properties, reactions, synthesis and use of some important compounds containing it (sulfides; acids; salts and acid derivatives containing sulfur).

* NITROGEN
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (ammonia, ammonium salts; oxides; acids; hydrazine; carbamide; azides).

* PHOSPHORUS
Its place in the periodic table, electron configuration, physical properties, occurrence, synthesis and use of it. Its chemical properties, reactions, synthesis and use of some important compounds containing it (oxydes, acids, salts and their biological importance).

* CARBON
Its place in the periodic table, electron configuration, physical properties, isotopes of carbons, occurrence, synthesis and use of it (charcoal). Its chemical properties, reactions, synthesis and use of some important compounds containing it (carbides; carbon monoxide; carbon dioxide; acids; carbonates; hydrogen-carbonates; antacid substances).

**PHARMACEUTICAL BIOLOGY**

- Structure and biological functions of large macromolecules: lipids, carbohydrates, proteins, nucleic acids.
- Comparison of eukaryotic and prokaryotic cells. Organization and biological function of nuclei, endoplasmic reticulum, ribosomes, Golgi complex, secretion vesicles, mitochondria and peroxisomes.
- DNA, gene, genom epigenome and chromosomes.
- Replication and cell division.
- Mendelian genetics, dominant-recessive, sex-linked mode of inheritance. Most frequent genetic disorders linked to autosomes and X chromosomes in humans.
- Prokaryotic and eukaryotic gene expression strategies: transcription posttranscriptional processing, translation posttranslational modifications.
- Regulation of gene expression in prokaryotes and eukaryotes.
- Principles of molecular biological technics: molecular cloning, RFLP, PCR, blottings, FISH.
- The cell cycle and its regulation, cellular aging and programmed cell death.
- Molecular biology of cancer formation.
- Biology of the immune system.
- The most common signal transduction pathways and their role in cellular functions.

**ANATOMY**

**1st semester**

**LECTURE**

(2 hrs/week)

* Morphology of the cell I.
* Morphology of the cell II.
* Morphology of the cell III.
* Epithelial tissues
* Connective tissues
* Bone and cartilage
* Muscle tissues
* Nervous tissue
* The parts of the human body
* The bones of the human body
* The joints of the human body
* The main skeletal muscles
* The anatomy of the heart and large vessels
* The anatomy of the respiratory tract (nasal cavity, larynx and lungs)

**2nd semester**

**LECTURE**

(2 hrs/week)

* The anatomy of the digestive system I.
QUALITATIVE CHEMICAL ANALYSIS

* Concepts, aims and general methods. Ions.
* Classification of reactions.
* Reaction sensitivity
* Reaction specificity
* Groups of cations
  * Group 1A (hydrochloric acid sub-group): Silver(I), reaction with hydrogen sulphide, hydrochloric acid, bromides and iodides, alkali hydroxides, ammonia, chromates. Lead(II), reaction with hydrogen sulphide, chlorides, iodides, sulphates, alkali hydroxides or ammonia, chromates. Mercury(I), reaction with sulphides, chlorides, ammonia, alkali hydroxides, iodides, metallic copper.
  * Group 1B (copper sub-group): Mercury(II), reaction with sulphides, ammonia, alkali hydroxides, tin(II) chloride, iodides, metallic copper. Copper(II), reaction with sulphides, ammonia, alkali hydroxides, hexacyanoferrate(II), cyanides, iodides, metallic iron or zinc, flame coloration. Bismuth, reaction with sulphides, alkali hydroxides or ammonia, water, hydrolysis, tetrahydroxostannate(II), iodides. Cadmium(II), reaction with sulphides, alkali hydroxides, ammonia, cyanides.
* Simple analysis of cation group 1.
* Group 2 (arsenic group): Group reaction. Reagents. Arsenite arsenic(III), reaction with sulphides, silver ions, iodine, Marsh reaction, Bettendorf reaction, Gutzeit test, Sanger-Black test, heating test. Arsenate arsenic(V), reaction with sulphides, silver ions, Marsh, Bettendorf, Sanger-Black and Gutzeit reactions, magnesia mixture. Antimony(III), reaction with sulphides, water, hydrolysis, alkali hydroxides or ammonia, metallic zinc or iron, Marsh, Sanger-Black and Gutzeit test. Antimony(V), reaction with sulphides, iodides. Tin(II), reaction with sulphides, mercury(II), alkali hydroxides, metallic zinc, luminescence test. Tin(IV), reaction with sulphides, alkali hydroxides, metallic zinc, metallic iron.
* Simple analysis of cation group 2.
* Simple analysis of cation group 3.
spectrum, flame coloration.

* Simple analysis of cation group 4.


* Simple analysis of cation group 5.

* Groups of anions.


* **Group 3**: Group reaction. Chloride, reaction with silver ions, Chromyl chloride reaction, Berg reaction, oxidative agents. Bromide, reaction with silver ions, chlorine water, permanganate. Iodide, reaction with silver ions, chlorine water, iron(III) ions, oxidants.

* Cyanide, reaction with silver ions, hexacyanoferrate(II) reaction, acids (HCl), iodine or bromine. Thiocyanate, reaction with silver ions, iron(III) ions.


* Total analysis of solids for cations and anions: physical appearance, color, preliminary tests, heating, flame coloration, preparation of solution, analysis for cations and anions.


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**QUANTITATIVE CHEMICAL ANALYSIS**

**2nd semester**

**LECTURE**

* The nature, role and importance of quantitative analytical chemistry in the industry, research and medical practice. The fundamental concepts and methods of analytical chemistry.

* The measuring equipment and their calibration used in analytical chemistry. The sampling, sample treatment and preparations, techniques in component concentration and separation. Dissolving, fusion, mineralization of the samples.


**PRACTICE**

* Introduction:

  Health and accident prevention regulations.

* The use of volumetric glassware.

* Procedure of chemical analysis.


Redox equilibrium in analytical chemistry. Influencing factors on redox potential. Calculation of redox potential change during the titration, construction of titration curve. Role of induced reactions and catalysis in redox titrations. Indication methods of end-point, mechanism of indications, influencing factors on redox indicators.

Preparation and standardization of potassium permanganate solution. Direct, indirect and back titration in permanganometry.

Preparation and standardization of the titrants in cerimetry and chromatometry. Cerimetric and chromatometric determination of iron(II), hydrogen-peroxide, alcohols and organic acids. Determination of chemical oxygen demand of natural waters.


Reductometric methods titanometry, ascorbinometry.

Instrumental methods of chemical analysis, classification and importance of instrumental analysis.

Calculation of analytical results and solving of problems.

Gravimetry:

Gravimetric determination of sulfate ion in form of BaSO₄.

Gravimetric determination of and calcium ion in form of CaC₂O₄·H₂O.

Acidi- and alkaliometry:

Preparation and standardization of hydrochloric acid and sodium hydroxide standard solution.

Titration of weak acids (acetic acid).

Titration of a mixture of strong and weak acids (sulphuric and boric acid).

Determination of sodium thiosulphate (multiplying procedure).

Determination of ammonia in ammonium salts by distillation.
**Curriculum 2014/2015**

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<th>* Electrochemical methods potentiometry (membrane-type and special electrodes) and potentiometric titrations, electrolytic methods (polarography, volt-ammetric titrations), coulombmetry and measurements based on electric conductivity.</th>
<th>Determination of potassium ion by ion exchange separation.</th>
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<tr>
<td>* Separation methods of instrumental analysis. Principles and applications of gas chromatography, high performance liquid chromatography and ionchromatography. Basic principles of resonance methods (NMR, ESR) and mass spectrometry.</td>
<td>Titration of bromide ion by Volhard method (back titration). Instrumental analysis: Spectrophotometry: determination of salicylic acid Flame photometry: determination of alkaline ions</td>
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<td>* FIRST AID AND RESUSCITATION</td>
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<td>* Rautek's manoeuvre, log-roll technique, KED, paramedic-EMC-NIC introducing, helmet removing.</td>
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<td>* Unconscious patients, BLS, XBLs, AED</td>
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<td>* Unconscious patients, BLS, XBLs, AED – practice</td>
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<td>* Final examination.</td>
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<td><strong>SHORT HISTORY OF HUNGARY I –II.</strong></td>
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<td><strong>1st semester</strong></td>
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<tr>
<td>* Geography, population, political system of Hungary</td>
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<td>* Brief history of Szeged</td>
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<td>* Origin of the Hungarians, Finno-Ugric language relationship, ancient history</td>
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<td>* Early Middle Ages, foundation of the Hungarian State</td>
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<td>* Hungary as a Central European power, age of the Anjou dynasty</td>
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<td>* Age of János and Mátéás Hunyadi</td>
<td></td>
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<tr>
<td>* Written test I</td>
<td></td>
</tr>
<tr>
<td>* Art, architecture and culture in Medieval Hungary</td>
<td></td>
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<tr>
<td>* Ottoman Turkish conquest, tripartite division of Hungary</td>
<td></td>
</tr>
<tr>
<td>* Efforts to unify the country, the Principality of Transylvania</td>
<td></td>
</tr>
<tr>
<td>* Reform movements in Western Christianity, main characteristics of Christian denominations</td>
<td></td>
</tr>
<tr>
<td>* Liberation of Hungary, Rákóczi rebellion, Hungary as a part of the Habsburg Empire</td>
<td></td>
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<tr>
<td>* Written test II</td>
<td></td>
</tr>
<tr>
<td><strong>2nd semester</strong></td>
<td></td>
</tr>
<tr>
<td>* Reform era of 1825-1848, activities of Széchenyi and Kossuth</td>
<td></td>
</tr>
<tr>
<td>* Revolution and war of independence of 1848-49</td>
<td></td>
</tr>
<tr>
<td>* Compromise in 1867, formation of Austro-Hungarian Monarchy</td>
<td></td>
</tr>
</tbody>
</table>
* Brief history of Budapest
* World War I, dismemberment of Austro-Hungarian Monarchy
* Written test I
* Interwar period, Horthy regime
* Hungary in World War II
* Hungary after World War II, Hungary as a part of the Soviet block
* Revolution in 1956
* Kádár regime and its fall, elections of 1990
* Outstanding Hungarian scientists, artists, athletes of modern times
* Written test II

ENGLISH

1st semester

PRACTICE
(2 hrs/week)
* Introduction and group discussion. Interviewing: asking and answering Yes/No and Wh-questions.
* Reading comprehension: skimming texts, understanding the essence of texts. Reading and discussing articles about hot issues on diseases and their cures.
* Vocabulary expansion, reading about recent advances in pharmacology. Video watching and discussion on the same topic.
* Writing tasks: how to write an essay/composition. Briefing task: reading a longer text (n=1500) on chemistry and summarizing it in 500 words. The use of connectors in writing.
* Listening skills: listening to a recording on vitamins and their effects, note taking exercise. Practising the Passive Voice.
* Revision of the Past Simple and the Present Perfect Tenses. Presenting research methods and results. Mid-term test.
* Reading skills: preparing study notes from lengthy texts, identifying most important facts. Description, cause and effect. Understanding and memorizing definitions.
* Focussing on grammar and vocabulary expansion: CFC practice tests and health vocabulary tests.
* Video-watching: eating disorders – anorexia, bulimia and binge eating. Summarizing the film in writing and giving opinion on the topic. The use of definite and indefinite articles.
* Preparing short oral presentations on harmful habits. Arguing and defending viewpoints. Preparing for discussions. Indirect speech.
* Guided note taking. Listening to a recording on constipation and its cures. Developing patient advice leaflets from notes.
* Vocabulary and grammar revision. Practice tests. Final test.

2nd semester

PRACTICE
(2 hrs/week)
* Organizing written notes and identifying main points. Lecture notes taken from Biology. Commonly used abbreviations and their interpretation.
* Essay writing on the importance of the pharmacist in giving advice on a healthy diet. Suggestions and recommendations. The use of MUST/SHOULD/WOULD.
* Reading skills: developing faster reading and deeper understanding of read texts. Accomplishing reading comprehension tasks. CAE Reading Test.
* Vocabulary expansion: preparing word-nets concerning internally used medicines. Adjectives, Comparatives and Superlatives.
* Making use of the Internet in class: searching the Net for information on certain health issues. Presenting ideas found on the Net. Group discussion and evaluation.
* Revision of Future Tenses and expressions meaning intension and certainty in the future. Describing expected and adverse effects of drugs. Mid-term test.
* Developing awareness of proper and improper sentence constructions, grammar and vocabulary. Error spotting in essays written by group mates.
* Clear and concise writing. How to make our writing more effective? Practising short essay writing, analysing problems of English from in biology and chemistry texts. Repetition and reformulation of ideas.
* Reading and understanding Tables. Numericals, decimals, reading out numbers.
* Vocabulary expansion: English words of Greek and Latin origin in the field of Pharmacy. Prefixes and suffixes giving oppositional meaning to adjectives and adverbs.
* Listening and writing skills: listening to a recording on the drug industry and taking notes. Comparing and discussing notes. Defining and non-defining relative pronouns.
* Vocabulary and grammar revision. CAE and Medical Practice tests. Final test.

**LATIN**

1st semester

**PRACTICE**

*(2 hrs/week)*
* Simple medicine forms. Plural forms in 1st declension..Prepositions.
* Praes. Imp. Passivi. 2nd declension.
* Grammar revision excercises. Ointment, oil.
* Mid-term test. The stucture of medical prescriptions. 3rd declension - nouns.
* 4th declension.
* Herbal teas. 5th declension.
* Comparison of adjectives.
* Participles in the pharmaceutical language. Herbs and plants.
* Revision.
* Final test.
HUNGARIAN LANGUAGE

1st semester

PRACTICE
(4 hrs/week)

* Getting acquainted: Who are you? Where are you from? Conjugation of the verb 'to be', subject form of the personal pronouns.
* What is where in Szeged? Asking questions. Question words, existential sentences.
* Meeting students. The conjugation of verbs: present indefinite conjugation, singular forms. Cardinal numbers: telephone numbers and prices.
* Going shopping. The accusative form of nouns.
* Revision of grammar and vocabulary.
* Going to the cinema. Telling the time. Making an appointment. Plural forms of the verb (indefinite present tense). The postposition 'előtt'.
* TEST 1
* A Sunday out: museum, theatre. The plural form of nouns and adjectives. Expressing possibility. The infinitive form.
* Buying cinema tickets. Practising the present tense indefinite conjugation. Some adverbial suffixes: -ba/-be (to, into), -ban/-ben (in)
* In a restaurant. Ordering a meal. Further adverbial suffixes: -hoz/-hez/-höz (to), -nál/-nél (at)
* Revision
* TEST 2
* Oral tests

2nd semester

PRACTICE
(4 hrs/week)

* My family: possessive suffixes, genitive structure.
* I have a...: Possessives + case endings. Expressing possession.
* What is your friend like: describing people. Calendar, dates.
* Revision
* TEST 1
* Students life: review of indefinite conjugation. Transitive and intransitive verbs.
* Definite conjugation.
* Daily routine: verbal prefixes.
* Weather and seasons.
* General revision.
* TEST 2
* Preparation for the oral exam.
* Oral tests

BASIC COMMUNICATION (ELECTIVE COURSE)

1. Introduction, motivation
2. Definition of communication, elements and basics of interpersonal communication, Factors influencing communication
3. Belbin test, human characters and their handling
4. Movie
5. Body language
6. Active listening, I and You language
7. Summary: situations, practice
8. Verbal communication elements: assertivity, win-win communication
9. Presentation skills
QUANTITATIVE CHEMICAL ANALYSIS

3rd semester

**LECTURE**

- The nature, role and importance of quantitative analytical chemistry in the industry, research and medical practice. The fundamental concepts and methods of analytical chemistry.
- The measuring equipment and their calibration used in analytical chemistry. The sampling, sample treatment and preparations, techniques in component concentration and separation. Dissolving, fusion, mineralization of the samples.

**PRACTICE**

- Complexometry:
  - Preparation and standardization of EDTA standard solution.
  - Determination copper(II)-ion.
  - Titration of calcium- and magnesium ions in mixture.

- Permanganometry:
  - Preparation and standardization of potassiumpermanganate standard solution.
  - Titration of hydrogen-peroxide.
* Redox equilibrium in analytical chemistry. Influencing factors on redox potential. Calculation of redox potential change during the titration, construction of titration curve. Role of induced reactions and catalysis in redox titrations. Indication methods of end-point, mechanism of indications, influencing factors on redox indicators.

* Preparation and standardization of potassium permanganate solution. Direct, indirect and back titration in permanganometry.

* Preparation and standardization of the titrants in cerimetry and chromatometry. Cerimetric and chromatometric determination of iron(II), hydrogen-peroxide, alcohols and organic acids. Determination of chemical oxygen demand of natural waters.


* Reductometric methods titanometry, ascorbinometry.

* Instrumental methods of chemical analysis, classification and importance of instrumental analysis.

* Electrochemical methods potentiometry (membrane-type and special electrodes) and potentiometric titrations, electrolytic methods (polarography, voltammetric titrations), coulombmetry and measurements based on electric conductivity.


* Separation methods of instrumental analysis. Principles and applications of gas chromatography, high performance liquid chromatography and ionchromatography.

* Basic principles of resonance methods (NMR, ESR) and mass spectrometry.

* Determination of iron(II) ion.

Bromatometry:

* Preparation of potassium bromate standard solution.

Titration of arsenic(III) ion by Györy.

Determination of antipyrin by bromine substitution reaction.

Jodometry:

* Preparation and standardization of sodium-thiosulfate solution.

Determination of phenol by Koppeschaar.

Titration of thiocyanate ion by Schulek.

Jodometric determination of copper(II) ion.

Instrumental analysis:

Conductometric titration: determination of oxalic acid
Coulombmetry: determination arsenic(III) ion
PHYSICAL CHEMISTRY

LECTURE
* Thermodynamics
* The first law of thermodynamics
* The second law of thermodynamics
* The third law of thermodynamics

PRACTICE
Thermochemistry
Determination of the heat of neutralization.
Phase equilibria

Phase equilibrium
Reaction kinetics
Temperature dependence of the decomposition of a medicine. The kinetics of the hydrolysis of methyl acetate. The study of catalysis, promotion and inhibition. Primary salt effect on the kinetics of ionic reactions. Study of the kinetics of the decomposition of benzene-diazonium-chloride. Determination of initial rate and order of a reaction by clock reaction.

Chemical equilibrium
Electrochemical equilibrium
Iontransport
Reaction kinetics
Electric conductance
Study of dissociation by electric conductance.
Dependence of conductivity on concentration.
Solubility by conductivity measurements.
Electromotive force
Study of redoxy electrodes. Dependence of electrode potential on the concentration of electrolyte. Concentration cells. Determination of pH.

Experiments based on optical methods
Dependence of light refraction on the concentration.

ORGANIC CHEMISTRY
3rd semester

LECTURE

PRACTICE
Basic methods of synthetic organic chemistry;
Distillation; Crystallization, melting point; Extraction;


Carbonic acid derivatives.

4th semester

Lecture


Isoprenoids. Terpenoids, carotenoids, steroids.

Alkaloids.
## PHYSIOLOGY

### 3rd semester

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction, homeostasis</td>
<td>Information about work safety and fire protection. Recording technics, recording devices: Kimograph, computer. Methods of stimulation: thermal, chemical, electrical, types of electrodes.</td>
</tr>
<tr>
<td>Membrane physiology</td>
<td>Membrane potential and action potential observing with METANEURON system: ionic theory of the action potential, the threshold of action potential, stimulus strengths – duration relationship, refractory periods.</td>
</tr>
<tr>
<td>Transmission: synapsis, receptors</td>
<td></td>
</tr>
<tr>
<td>Muscle physiology</td>
<td>Electromyography (EMG). Neuromuscular studies with BIOPAC system.</td>
</tr>
<tr>
<td>Blood physiology</td>
<td>Blood tests: The microscope in haematological tests, sterilisation and disinfection, methods of taking blood from the fingertip, centrifuges. Blood cells (HEMOSURF program), qualitative blood smear, hematocrit (micro). Observation of blood clotting (in vitro), determination of blood groups (ABO, Rh), prothrombin time. Using and cleaning of the melangeur pipettes, Bürker's chamber, red blood cell count, white blood cell count, osmotic resistance of red blood cells, observing reticulocytes in blood smear. Principles of: methods of taking blood from a vein, Price-Jones' curve, erythrocyte sedimentation rate by Westergren, bleeding time, partial thromboplastin time, thrombin time, International Normalized Ratio (INR), thrombocyte count (Fischer-Germer), reticulocyte count, staining index, haematological automata.</td>
</tr>
<tr>
<td>Heart physiology</td>
<td>Studies on the circulatory system: Experiments in the isolated rat heart preparation (Langendorf perfusion): effects of ions and drugs (adrenaline, acetylcholine, atropine) on the heart. Video: in situ registration of the activity of the heart in the frog. Human ECG: recording the human ECG, characteristics of the normal ECG, draw the electrical axis of the heart.</td>
</tr>
<tr>
<td>Circulation</td>
<td>The human circulatory system: peripheral pulse, characteristics of the radial pulse, blood pressure measurement, effects of breathing on the circulation, cold pressor test, investigation of the axon reflex flare (triple response of the skin), jugular pulse.</td>
</tr>
<tr>
<td>Respiration physiology</td>
<td>The human respiratory system: spirometry, determination of inspiratory and expiratory pressures, palpation over the chest, auscultation over the heart and lungs.</td>
</tr>
<tr>
<td>Physiology of the urinary system</td>
<td>Technical information for the urine practice. Urine analysis: colour, smell, transparency and pH. Microscopic investigation of the urinary sediment (power point slide show). Specific gravity. Detection of: calcium (Sulkowitsch' test), glucose (Nylander's and Fehling's tests), proteins</td>
</tr>
<tr>
<td><strong>Curriculum 2014/2015</strong></td>
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<tr>
<td><strong>4th semester</strong></td>
<td><strong>Physiology of the gastrointestinal system</strong></td>
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<td><strong>Vitamins, nutrition, metabolism</strong></td>
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<td></td>
<td>Pregnancy tests The effect of insulin on blood glucose level Thorn's test (theory)</td>
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<tr>
<td></td>
<td><strong>Endocrine system</strong></td>
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<td></td>
<td>Demonstration of blood-brain barrier in the rat</td>
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<tr>
<td></td>
<td><strong>Physiology and structure of the nervous system</strong></td>
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<tr>
<td></td>
<td>Human reflexes (patella-, Achilles-tendon, biceps-, triceps-, radial-reflex; skin reflexes) Tremor – tremometer. Video (disorders of the motor system)</td>
</tr>
<tr>
<td></td>
<td><strong>Motor system</strong></td>
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<tr>
<td></td>
<td>Investigation of the skin senses (pressure, pain, tactile sense, graphaesthesia, sense of localisation). Weber’s 3 basin test. Cool and hot receptors localization on the hand.</td>
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<td></td>
<td><strong>Somatosensory system</strong></td>
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<td><strong>Autonomous nervous system</strong></td>
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<td></td>
<td>Observation of the autonomic nervous system with the BIOFEEDBACK program, the polygraph examination (BIOPAC),</td>
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<td><strong>Sensory system: vision, hearing, taste, smell</strong></td>
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<td>stimulus (BIOPAC)</td>
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<tr>
<td>Sleep ang higher brain functions</td>
<td>Effects of relaxation and arousal to body functions. EEG recording. Cognitive tests (Stroop paradigm, Mini-Mental Test, Eyes test, Trail making test).</td>
</tr>
<tr>
<td>Sport physiology</td>
<td>The effects of physical exercise on respiration, heart rate and blood pressure.</td>
</tr>
</tbody>
</table>

**COLLOID CHEMISTRY**

**LECTURE**

* Introduction
* Colloidal state and systems
* Major characteristics of colloidal systems: classification, definition, delimitation and comparison.
* Incoherent (incohesive) and coherent (cohesive) colloidal systems.
* Macromolecular colloids
* Chemical structure of macromolecules.
* Characterization of macromolecular coils.
* Preparation of polymeric materials.
* Macromolecular solutions, molecular mass determination.
* Polyelectrolytes, structure and solution behavior.
* Association colloids
* Structure and types of amphiphilic molecules, HBL scale.
* Micelle formation equilibrium.
* Structure of micelle.
* Critical micelle formation concentration.
* Physical-chemical properties of surfactant solutions.

**PRACTICE**

* Safety precaution, fire protection.
* Viscosity of polymer solutions.
* Effect of surface active agents on surface tension of water.
* Solubilization of organic acids.
* Adsorption from solution, determination of specific surface of adsorbent.
* Emulsions, microemulsions.
* Spreading and wetting. Making of monomolecular films by Pockels method.
BIOCHEMISTRY

* Enzymology
* Definition and scope of biochemistry
* Conditions of processes in biological systems
* Living organism as a thermodynamically open system
* Protein structure
* Functions of proteins in the organism
* Protein composition/structure
* Protein conformation
* Enzymes
* Enzymatic action
* Coenzymes
* Classification of enzymes.
* Isoenzymes, their clinical importance
* Units of enzyme activity
* Enzyme kinetics
* Role of enzymes during catalysis
* Steady state condition
* Order and conditions of reactions
* Lineweaver-Burk equation/plot
* Kinetics of inhibition
* Carbohydrate metabolism
* Energy generation and storage
* Glycolysis
* Glycogen metabolism
* Synthesis of glucose (gluconeogenesis) from non-carbohydrate precursors: glycerol (from neutral lipids), glucogenic amino acids
* Importance of hexose monophosphate shunt
* Relationship between the carbohydrate metabolism and other metabolisms
* Lipidmetabolism
* Metabolism of fatty acids and triacyl glycerols and phospholipids
* Lipoproteins
* Amino acid metabolism
* Urea cycle and nitrogen elimination
* Nucleotide metabolism
* Citric acid cycle, terminal oxidation and oxidative phosphorylation
* Citric acid cycle as the central pool of the intermediate metabolism
* Definition of terminal oxidation, redox systems in the organism
* Oxidative phosphorylation
* Biochemical characterization of the connective tissue and the cytoskeleton
* Collagen structure and its synthesis
* Biochemistry of membranes
* Structure of biological membranes, fluid mosaic model
* Membrane proteins and transport systems
* Biochemistry of contractile tissues
* Types of contractile tissues
* Regulation of muscle contraction by calcium
* Biochemistry of the neural tissue and vision
* Biochemistry of the blood
* Organic components of the blood plasma
* Biochemical characteristics of blood cells
* Biochemistry of blood clotting and fibrinolysis
* Biochemistry of the liver and biotransformation
* Structure of liver and its microcirculation system
**PHARMACEUTICAL BOTANY**

**4th semester**

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>PRACTICE</th>
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</thead>
<tbody>
<tr>
<td>(3 hrs/week)</td>
<td>(2 hrs/week)</td>
</tr>
<tr>
<td>* Cell wall, plasmodesmata. Meristem &amp; the primary plant body. Plant tissues, simple tissues, tissue systems. Parenchyma and collenchyma</td>
<td>Dermal Tissue System Epidermis cells and stomatal apparatus, Trichomes, Periderm and lenticel</td>
</tr>
<tr>
<td>* Sclerenchyma - Sclereids and fibers. Secretory structures (internal and external structures). Dermal Tissue System: Epidermis and stomata, trichomes. Periderm, lenticell</td>
<td>Ground Tissue System: Parenchyma Collenchyma Sclerenchyma, Secretory canals and glands</td>
</tr>
<tr>
<td>* Xylem - Tracheids, vessel members, fibers. Primary xylem and ontogenesis. Phloem - Sieve tubes and cells Sieve tubes and cells Ontogenesis and function</td>
<td>Vascular Tissue System Xylem, Phloem, Vascular bundles.</td>
</tr>
<tr>
<td>* Root - Primary structure and differentiation. Secondary growth in roots Adventitious roots</td>
<td>Tissues of a Monocot Root, Tissues of a Young Dicot Root, Secondary Thickened Roots</td>
</tr>
<tr>
<td>* Shoot apical meristem. Stems and Buds. Stem - Primary vascular differentiation. Stem - Differentiation and secondary growth.</td>
<td>Anatomy of Secondary Thickened Roots II</td>
</tr>
<tr>
<td>* Leaf arrangement, Leaf types, Morphology: leaf shapes, margins, venation, Modified structures. Flower structure, Corolla types, Stamens, Pistils, Ovary position, Floral formulas</td>
<td>Primary Growth of Stems, Herbaceous Stems, Woody Stems, Bark</td>
</tr>
<tr>
<td>* Inflorescence types, Sporogenesis and gametogenesis, Fertilization and embryogenesis. Pollination, Breeding Systems, Seed, Fruit (dry fruits, fleshy fruits) and seedlings</td>
<td>Underground stems</td>
</tr>
<tr>
<td>* Plant Taxonomy, Nomenclature, Cronquist System, Monocots vs. Dicots. Magnoliidae: Magnoliaceae, Lauraceae, Nymphaeaceae, Ranunculaceae,</td>
<td>Anatomy of Leaves</td>
</tr>
</tbody>
</table>
Papaveraceae

* Hamamelidae: Cannabaceae, Urticaceae, Juglandaceae, Fagaceae, Betulaceae.  
* Caryophyllidae: Phytolaccaceae, Caryophyllaceae, Polygonaceae.

* Rosidae: Rosaceae, Mimosaceae, Caesalpiniaceae, Fabaceae, Rutaceae  
Dilleniidae: Malvaceae, Violaceae, Passifloraceae, Cucurbitaceae, Salicaceae, Brassicaceae

* Rosidae: Apiaceae, Asteridae: Solanaceae, Lamiaceae, Scrophulariaceae, Rubiaceae  
Asteridae: Asteraceae, Commelinidae: Poaceae, Liliidae: Liliaceae

**PHARMACEUTICAL PROPEDEUTICS**

4th semester

**LECTURE**  
(2 hrs/week)

* Definition of drugs, classification of drugs. Active substances, additives, pharmaceutical dosage forms.  
* Medical prescription. Parts of prescription. Legal condition system of prescription writing.  
* Types of drug prescription: formula magistralis, formula normalis, formula originalis, formula nosocomialis, formula officinalis  
* Order of service of pharmacies. Instruments and tools in public pharmacies.  
* Functions and structures of pharmacopoeias. Hungarian Pharmacopoeia Ed. VII. and VIII., European Pharmacopoeia.  
* Pharmaceutical collections, specialist books  
* Pharmaceutical calculation (solubility, calculation of concentration, etc.) Role and rules of dose checking.  
Grouping of dosage forms (liquid, semisolid and solid dosage forms).  
* Classification of dosage forms according to application place. ATC code.  
* Institutional pharmacy and its tasks (hospital and clinical pharmacy).  
* Industrial pharmacy.  
* Definition and process of filtering. Grouping of procedures according to the energy used.  
* Pharmacist education, graduate and postgraduate education, PhD.  
* Hungarian organizations of pharmacy (Hungarian Society for Pharmaceutical Sciences, Hungarian Chamber of Pharmacists, National Association of Private Pharmacists, etc.). Most important international organizations of pharmacy (FIP, EUFEPS).

**HUNGARIAN LANGUAGE**

3rd semester

**PRACTICE**  
(4 hrs/week)

* General revision.  
* A weekend trip to Budapest. The comparative and superlative form of adjectives.  
Travelling by train.  
Sightseeing.  
* Travelling abroad: revision of case endings and postpositions. Noun formation.  
* At the doctor’s: kell, lehet, szabad, tilos. Suffix szor/szer/ször. Body parts.  
* Revision  
* TEST 1  
* Where were you in the summer: past tense conjugations.
* Revision of grammar and vocabulary.
* Revision of grammar and vocabulary.
* TEST 2
* Preparation for the oral exam
* Oral tests

4th semester

**PRACTICE**

*(4 hrs/week)*

* Services: possessive suffixes in the plural. At the pharmacy.
* Private conversations: personal pronouns with case endings. Hat/het.
* Revision of past and present tense conjugation.
* Questions and question words.
* Word order and complex sentences.
* Grammar exercises and reading comprehension tasks.
* TEST 1
* Practising role-play and picture description.
* Practising role-play and picture description.
* Grammar exercises and reading comprehension tasks.
* Grammar exercises and reading comprehension tasks.
* Words originating from the same root (kezd, kezdődik etc.)
* Revision of grammar and vocabulary.
* Practising role-play and picture description.
# SYLLABUS FOR 3RD YEAR PHARMACY STUDENTS

**PHARMACOGNOSY**

**5th semester**

<table>
<thead>
<tr>
<th>LECTURE (3 hrs/week)</th>
<th>PRACTICE (4 hrs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Basic phytochemistry procedures, extraction methods, chromatography I.: Percolation of Rutae herba with solvents of different polarity, TLC examination of the extracts</td>
</tr>
<tr>
<td>* Basic metabolic pathways. Primary metabolits. The origin of carbohydrates. The formation of fats and proteins. Secondary metabolites. The origin of terpenoids. The formation of phenolic compounds and alkaloids.</td>
<td>Basic phytochemistry procedures, extraction methods, chromatography II.: Separation with column chromatography: chloroformic extract of Rutae herba, TLC examination of the fractions</td>
</tr>
<tr>
<td>* About carbohydrates in general. The types, occurrence, uses (in medicine) of carbohydrates. Honey, Tamarin pulp, manna, fig. Rose fruits. Starches.</td>
<td>Basic phytochemistry procedures, extraction methods, chromatography III.: Isolation of rutamarin with preparative TLC, Purity examination of the isolated component by TLC</td>
</tr>
<tr>
<td>* Gums and mucillages. Tragacantha, acacia gum, agar, cotton. Carragen, steraculia gum, psillium, marshmallow root, linseed.</td>
<td>Two dimensional TLC</td>
</tr>
<tr>
<td>* Fats, fixed oils, waxes. Arachis oil, sesame oil, olive oil. Castor oil, coconut oil, linseed oil, theobroma oil. Hydnocarpus oil, bees wax, spermaceti.</td>
<td>Drugs with carbohydrate content content I.: Testing of starch containing drugs (Maydis amylum, Solani amylum, Triticum amylum), Microscopical characteristics, General starch tests, Test for impurities, Gossypii lana: Behrens, Schweitzer test, Isolation of polysaccharides from Lini semen and Althaeae radix</td>
</tr>
<tr>
<td>* Prostaglandins. Krebs cycle. Amino acids. Peptides. Enzymes, pepsin.</td>
<td>Drugs with fixed oil content: Comparison of fixed oils derived from different drugs with TLC, Test for rancidity, Detection of vitamin A from cod fish liver oil</td>
</tr>
<tr>
<td>* Alkaloids in general.</td>
<td>Drugs with alcoholic content I.: General alkaloid reactions, Drugs with alkaloids derived from ornitine: alkaloids with tropane skeleton., TLC determination of Belladonnae folium, Stramonii folium, Hyoscyami folium, Vitali reaction, Detection of scopoletin, Drugs with alkaloids of phenylalanine-origin: Ipsecacuanhae radix → Rubremetin-reaction, Frohde-reaction</td>
</tr>
<tr>
<td>* Lysine-derived alkaloids. Lobelia. Tobacco alkaloids.</td>
<td>Drugs with alkaloids derived from phenylalanine: Detection of carotinoids from Capsici fructus, Marquis reaction, detection of meconic acid from Opium</td>
</tr>
<tr>
<td>* Phenylalanine-derived alkaloids. Opium poppy.</td>
<td>Separation of morphine from the other opium alkaloids, Purity test of the isolated morphine by TLC</td>
</tr>
<tr>
<td></td>
<td>Drugs with alkaloid content III.</td>
</tr>
</tbody>
</table>
Drugs with alkaloids derived from tryptophane: Strychnos semen: detection of strychnine, brucine, loganin, Chinchonae cortex: Thalleioquin reaction, Grahe test
Secale cornutum: van Urk reaction, detection of antraquinones (sclereritin)


Drugs with alkaloid content IV.

Triptophan-derived alkaloids. Ergot.

Drugs with alkaloids derived from xanthine: TLC examination of the caffeine, theobromine, theophylline content of Coffea semen, Colae semen, Cacao semen, Theae folium, Micromurexid reaction


Drugs with alkaloid content IV.

Triptophan-derived alkaloids. Ergot.

Drugs with alkaloids derived from xanthine: TLC examination of the caffeine, theobromine, theophylline content of Coffea semen, Colae semen, Cacao semen, Theae folium, Micromurexid reaction


Oral exam: images of medical herbs and in toto drugs

6th semester

LECTURE
(3 hrs/week)

Isoprenoid compounds (in general, biogenesis). Monoterpenes, volatile oil (preparation, characters, uses) Peppermint leaf and oil, spermint oil. Lavender oil and flower. Rosemary oil and leaves. Oil of rose.

PRACTICE
(4 hrs/week)

Receipt of laboratory tools

Safety and laboratory procedures

Determination of drugs with volatile oil content I.

General examination of volatile oils (colour, odour, taste, purity), Lavandulae flos, Coriandri fructus, Menthae piperitae folium, Menthae crispae folium, Carvi fructus: TLC determination of monoterpenes

Determination of drugs with volatile oil content II.

TLC examination of Matricariae flos, Determination of proazulenes by EP-test (Absinthii herba, Millefolii herba, Matricariae flos), Equipment for the steam distillation of the volatile oils

Determination of drugs with volatile oil content III.


Caryophylli floris aetheroleum: determination of the eugenol content in Cassia flask, Cinnamomii cassiae aetheroleum: determination of the cinnamaldehyde content in Cassia flask, Anisi fructus and Foeniculi dulcis fructus: TLC determination of phenylpropane-derivatives

Drugs with miscellaneous terpene content:

Determination of valepotriates, Definition of bitterness value

Determination of unknown drug powders

Drugs with saponin content: Liebermann-Burchard reaction (Primulae radix, Saponariae albae radix), TLC determination of Liquiritiae radix, TLC determination of Hederae folium

Determination of unknown drug powders


Drugs with digitalis glycoside content: Keller-Kiliani test, Baljet test, Kedde test (Digitalis purpureae folium, Digitalis lanatae folium, Strophanthi semen), TLC determination of Digitalis purpureae, Determination of unknown drug powders

* About steroids in general (biogenesis of steroids). Steroidal saponins (dioscorea, solanum, sarsapanilla root). Natural steroids as staring materials for partial synthesis of pharmaceuticals.

Drugs with triterpene saponin content I.: TLC determination of Calendulae flos, TLC determination of Hippocasteni semen, TLC determination of Urticae herba et radix, Determination of unknown drug powders

* About cardioactive glycosides containing drugs in general. Digitalis (purpurea) leaf. Digitalis lanata leaf.

Drugs with anthraquinone content: Gel chromatographic separation and TLC determination of the anthraquinone derivatives of Frangulae cortex, Bornträger reaction (Frangulae cortex, Rhei rhizome, Sennae folium, Aloe), Separation of the free and glycosidic antranoids of Aloe and Sennae folium, Rosenthaler and Schouteten test (Aloe)

* Strophantus and other (nerium, thevetia, convallaria, adonis) cardenolid containing drugs. Bufadienolids and its drugs (squills, black hellebore rhizom).

Drugs with flavonoid content I.: TLC determination of the flavonoid aglycones (glycoside-free components) from Tiliae flos, TLC determination of the flavonoids from Sambuci flos and Hyperici herba, Determination of unknown drug powders


Drugs with flavonoid content II.: Isolation and TLC determination of the purity of hesperidin from Aurantii epi- and mesocarpium, Detection of procyanidins from Crataegi folium cum flore and Crataegi fructus (Bate-Smith test), Determination of unknown drug powders


Drugs with tannin content: General tannin reactions

* Flavonoid compounds. Silybum. Sambucus.

Drug with hydroquinone derivative content: TLC determination of the methanolic extract and sublimate of Uvae ursi folium, Determination of catechin derivatives and phenolic components of Uvae ursi folium, Determination of unknown drug powders


Drug with triterpene saponin content II.: TLC determination of the ginsenosides (A-I) from Panax ginseng tea, capsule and alcoholic extract, Determination of unknown drug powders


MTO


Oral exam: images of medical herbs and in toto drugs

PHARMACEUTICAL CHEMISTRY

5th semester

LECTURE

GENERAL PART

* Definition and classification of drugs or pharmaceuticals. The history and development of drug control. Nomenclature of drugs. Physical, physico-chemical and chemical investigations of

PRACTICE


Natrii chloridum It. A, B, Pt. Appearance of solution, Acidity or alkalinity, Ferrocyanides, Iodides, Phosphates, Sulphates, Arsenic, Barium, Iron, Heavy metals, Informative test: 2, 3
pharmaceuticals and substances used in pharmacy. Identification and qualitative tests, quantitative assays.

**INORGANIC PART**

- **Halogen group.** Chlorine water, Iodine, Hydrochloric acid, Sodium fluoride, Sodium chloride, Potassium chloride, Sodium bromide, Potassium bromide, Sodium iodide, Potassium iodide, Potassium chlorate, Potassium perchlorate.

- **Oxygen compounds.** Demineralized water, Distilled water, Hydrogen peroxide solution 30%, Potassium hydroxide, Sodium hydroxide.

- **Sulphur and its compounds.** Purified sulphur powder, Precipitated sulphur, Sodium disulphite, Potassium sulphate, Sodium sulphate, Sodium thiosulphate.

- **Nitrogen group.** Nitrogen, Concentrated ammonia solution, Ammonium chloride, Ammonium bromide, Nitrous oxide, Sodium nitrite, Concentrated nitric acid, Potassium nitrate.

- **Phosphoric acid and its salts.** Sodium dihydrogenphosphate, Disodium hydrogenphosphate, Calcium hydrogenphosphate, Tricalcium phosphate.

- **Compounds of arsenic, antimony and bismuth.** Arsenic oxide, Bismuth oxynitrate.

- **Carbon group.** Activated charcoal, Carbon dioxide, Lithium carbonate, Sodium carbonate, Potassium carbonate, Potassium thiocyanate.

- **Silicon compounds.** Hydrophilic colloidal silica, Hydrophobic colloidal silica, Talc, Magnesium trisilicate, White clay.

- **Lead compounds.** Lead monoxide, Lead acetate.

Seminar: Reagents, limit test solutions and colorimetric matching fluids. Identifying and general purity tests of European Pharmacopoeia 6th Ed.

- *Ammonii chloridum* It. A, B. Pt. Appearance of solution, Acidity or alkalinity, Bromides and iodides, Calcium, Assay, Informative test: 2, 3
- *Kalii chloridum* It. A, B. Pt. Appearance of solution, Acidity or alkalinity, Iodides, Sulphates, Barium, Heavy metals, Iron, Informative test: 2, 3


Seminar: Sulphur and sulphur compounds. Compounds of the nitrogen group, salts of the phosphoric acid.


- *Aqua purificata* Pt. Nitrates, Acidity or alkalinity, Oxidisable substances, Chlorides, Sulphates, Ammonium, Calcium and magnesium

- *Hydrogenii peroxidum* 3 per centum It. A, B)


- *Kalii bromidum* It. A, B, Pt. Appearance of solution, Acidity or alkalinity, Bromates, Iodides, Sulphates, Heavy metals, Iron, Informative test: 2, 3
- *Ammonii bromidum* It. A, B, Pt. Appearance of solution, Acidity or alkalinity, Bromates, Iodides, Informative test: 2, 3
* Boron compounds. Boric acid, Sodium borate.


* Aluminium compounds. Dried aluminium hydroxide, Aluminium sulphate, Crystalline potassium aluminium sulphate, Aluminium chloride.

* Zinc compounds. Zinc chloride, Zinc oxide, Zinc sulphate.

* Mercury and its compounds. Mercury, Mercury(I) chloride, Mercury(II) amidochloride, Red mercury iodide, Yellow mercury(II) oxide, Mercury(II) sulphide.

* Copper and silver compounds. Copper(II) sulphate, Silver nitrate.

* Iron and its compounds. Powdered iron, Reduced iron, Iron(III) chloride, Iron(II) sulphate.

* Manganese compounds. Potassium permanganate.

* Calcium compounds. Calcium chloride, Calcium oxide, Dried calcium sulphate, Calcium carbonate.

* Magnesium compounds. Magnesium chloride, Magnesium carbonate, Magnesium oxide, Magnesium sulphate.

* Barium compounds. Barium sulphate.

** ORGANIC PART **

* General Anaesthetics

* Ether, Chloroform, Halothane (Narcotan), Isofluran (Florane), Thiopental (Trapanal)
* Sedative-Hypnotics
Chloral hydrate, Paraldehyde, Carbromal, Barbital, Phenobarbital, Hexobarbital, Glutethimide, Talidomide (Contergan), Nitrazepam (Eunoctin), Midazolam (Dormicum)

* Drugs Used in the Treatment of Chronic Alcoholism
Amberlyst 15 It. A, B, Pt. Acidity or alkalinity, Alkaline soluble coloured substances, Sulphides, Adsorption power, Informative test: 2

* Disulfirame (Antaethyl)

* Anticonvulsant Drugs
Phenobarbital (Sevinal), Primidon (Sertan), Phenytoin (Diphedan), Ethosuximide (Petnidan), Clonazepam (Rivotril), Carbamazepin (Stazepine, Tefretol), Lamotrigin (Lamictal), Valproic acid (Convulex)

* Antipsychotics, Neuroleptics

* Chlorpromazine (Hibernal), Chlorprotixene (Truxal), Haloperidol, Risperidon (Risperdal), Clozapine (Leponex), Olanzapin (Zyprexa)

* Antidepressants

* Imipramine (Melipramin), Amitriptyline (Teperin), Maprotilin (Ludiomil), Fluoxetin (Prozac), Sertraline (Zolof)

* Antiparkinson Agents
Levodopa, Carbidopa, Amantadine (Viregyt-K), Selegilin (Jumex), Procyclidine (Kemadrin), Apomorphine (Apo Go)

* Muscle Relaxants
Pipercuronium bromide (Arduan), Baclofen (Lioresal), Carisoprodol, Tolperisone (Mydeton)

* Muscle Relaxants
Magnesium sulphate pentahydrate It. A, B
Magnesium sulphate monohydrate It. A, B, C. Pt. Appearance of solution, Chlorides, Sulphates, Arsenic, Calcium, Iron, Informative test: 1
Antiepileptics: Phenobarbital (Sevenal), Primidonom (Sertan), Phenytoinum (Diphedan), etosuximid (Petnidan), clonazepam (Rivotril), carbamazepine (Stazepine, Tegretol), lamotrigin (Lamictal), valproic acid (Convulex)
Curriculum 2014/2015

* Psychomotor Stimulants, Anorectics
  Neuroleptics: Chlorpromazin hydrochloricum (Hibernal), chlorprothixen (Truxal), Haloperidolum, Risperidonum (Risperdal), Clozapinum (Leponex), olanzapin (Zyprexa)
  * Amphetamine, Caffeine
  Anxiolytics: Chlordiazepoxidum (Librium), Diazepamum (Valium), medazepam (Rudotel), alprazolam (Xanax), tofisopam (Grandaxin), meprobamate (Andaxin), buspirom (Anirxon), Trimetozinum (Trioxazin)
* Hallucinogens and illegal drugs
  * Cocain, Heroin, LSD, tetrahydrokannabinol (THC), MDMA (Exstasy)
  Magnesi trisilicas It. A, B, Informative test: 1, 2, 3
* Sibutramin (Reductil)
  Magnesi oxidum leve It. A, B, Pt. Appearance of solution, Chlorides, Sulphates, Arsenic, Calcium, Iron, Informative test: 1, 3)
* Nootropics
  * Piracetam (Nootropil)
  * Acetylcholine, Carbachol (Miostat), Pilocarpine (Humacarpin), Physostigmine, Neostigmine methylsulphate (Stigmosan)
  Cholinesterase reactivators
  Opioid analgesics and antagonists: Morphinium chloratum, Aethylmorphini hydrochloricum, Pethidini hydrochloricum (Doligan), Methadoni hydrochloricum (Depridol), Fentanil (Durogesic), tramadol (Contramal), Naloxone (Narcati)
  * Pralidoxime
  Antidepressants: Imipramini hydrochloricum (Melipramin), Amitriptilini hydrochloricum (Teperin), maprotilin (Ludomiil), fluoxetine (Prozac), sertaline (Zolof)
  * Sympathomimetics
  Antiparkinson agents: levodopa (Dopaflex), carbidopa, amantadine (Viregyt-K), Apomorphini hydrochloricum (Apo-Go), seleqeline (Jumex), procyclidine (Kemadrin)
  * Epinephrine (Anapan), Isoprenaline, Oxedrine (Sympathomim), Phenylephrine (Vibrocil), Ephedrine (Epherit), Naphazoline, Xylomethazoline (Novorin)
  Bismuthi subnitra ponderosus It. A, B, C, Assay, Informative test: 2
  Alumen It. A, B, C, Informative test: 1
  Alumini sulas It. A, B, Pt. Appearance of solution, Ammonium, Iron, Heavy metals, Informative test:
  Barii sulas It. A, B, Pt. Oxidisable sulphur compounds, Soluble barium salts
  Titanii dioxidum It. A, Informative test: 2, 3
  Hydrargyri dichloridum It. A, B
  Argenti nitas It. A, B
  Cupri sulfus pentahydricus It. A, B, Assay

6th semester

**LECTURE**
* Parasympatholytics
  * Atropine, Homatropine, Methylhomatropine bromide, Scopolamine, Propantheline bromide, Tropicamid (Mydrum)
  * Sympatholytics
  * Prazosine (Minipress), Propranolol (Huma-pronol), Atenolol (Blokium), Metoprolol (Betaloc), Pindolol (Visken)

**PRACTICE**
Seminar:
Psychomotor stimulants: Amphetamine,[2] Caffeine
Hallucinogens and illegal drugs: Cocaine, heroin, LSD, Tetrahydrokannabinol (THC), MDMA (Ecstasy)
Anorectics: Sibutramin (Reductil)
* Anti-Migrain Agents
  Nootropics: Piracetam (Nootropil)
* Sumatipran (Imigran)
  Parasympathomimetics: Acetylcholine, Carbachol (Mostat), Pilocarpine (Humacarpin), Physostigmine, Neostigmine methylsulphate (Stigmosan)
* Local anesthetic agents
  Cholinesterase reactivators: Pralidoxime
* Cocain, benzoicin, procain, lidocain, bupivacain (Bucain, Marcain)
* Spasmolytics
  Acetylcholine, Carbachol (Miostat), Pilocarpine (Humacarpin), Physostigmine, Neostigmine methylsulphate (Stigmosan)
* Papaverin, Drotaverin (NoSpa), bencyclan (Halidor)
* Antiasthmatic drugs
  Theophylline, Salbutamol (Buventol), Terbutaline (Bricanyl)
* Antiarrhythmic drugs
  Seminar:
  Sympathomimetics: Epinephrine (Anapen), Isoprenaline (Isuprel), Oxadrene (Sympathomim), Phenylephrine, Ephedrine (Epherit), Naphazoline, Xylomethazoline (Novorin)
* Quinidine, Lidocaine, Amiodarone (Cordaron)
  Digitalis and other cardiac glycosides
  Parasympatholytics: Atropine, Homatropine, Methylhomatropine bromide, Scopolamine, Propantheline bromide, Tropicamid (Mydrum)
* Digitoxin (Digimerck)
  Local anesthetic agents: Cocaine, Benzocaine, Procaine, Lidocaine, Bupivacaine (Bucain, Marcain)
* Xantin derivatives
  Spasmolytics: Papaverine, Drotaverine (NoSpa), Bencyclan (Halidor)
* Theobromine, Theophylline, Caffeine
  Anti-Migrain Agents: Sumatriptan (Imigran)
* Antiemetics
  Aether (Tests: Acidity, Substances with a foreign odour, Aldehydes, Peroxides)
* Ondansetron (Zofran), Dimenhydrinate (Daedalon)
  Barbitalum (Identification: D; Tests: Acidity; Informative test: 4)
* Anticoagulants and haemostatics
  Hexobarbitalum (Identification: D)
* Acenocoumarol (Syncumar), Ticlopidine (Ticlid)
  Phenobarbitalum (Identification: D; Tests: Acidity; Informative test: 4)
* Antithyroidal agents
  Phenobarbitalum matricum (Identification: D, E; Informative test: 1)
* Methyldopum (Dopegyt), Captopril (Tensiomin), Enalapril (Ednyt), Losartan (Cozaar), Dihydralazin (Depressan), Moxonidine (Cynt)
  Natrii acetas trihydricus (Identification: A, B; Tests: Appearance of solution, pH; Reducing substances, Chloride, Sulphate, Arsenic, Heavy metals, Iron; Informative test: 2, 3)
* Antianginal agents and vasodilators
  Tosylchloramidum matricum (Identification: A, B, C, D, E; Assay)
* Glyceril trinitrate (Nitromint), Pentaerythritol tetranitrate (Nitropentone), Isosorbide mononitrate (Cardisorb, Rangin), Nicotinic acid, Pentoxyfilline (Trental)
* Antihyperlipidaemic agents
  Sympathomimetics: Prazosine (Minipress), Propranolol (Huma-pronol), Atenolol (Blokim), Metoprolol (Betacol), Pindolol (Visken)
* Lovastatin (Mevacor), Phenofibrate (Lipanthyl, Lipidil)
  Calcium channel blockers
  Antiarrhythmic drugs: Quinidine, Lidocaine, Amiodarone (Cordaron)
* Nifedipine (Corinfar), Amlodipin (Amlipin, Norvasc), Verapamil (Isoptin), Diltiazem (Blocalcin)
* Agents improving cerebral circulation
  Digitalis and other cardiac glycosides: Digitoxin (Digimerck)
* Vinpocetine (Cavinton), Cinnarizine (Stugeron)
  Anticoagulants and haemostatics: Acenocoumarol (Syncumar), Ticlopidine (Ticlid)
* Antitussiv agents
  Ethanolum (96 per centum) (Identification: C, D; Tests: Appearance, Acidity, alkalinity; Informative test: 2)
* Codeine, Noscapine, Butamirate (Sinecod), Prenoxdizine (Libexin)
  Alcohol isopropylicus (Identification: C; Tests: Peroxides)
Curriculum 2014/2015

* Mucolytics
  Apomorphini hydrochloridum (Identification: C; Informative test: 3, 4)
  Codeini hydrochloridum dihydricum (Identification: C, D; Informative test: 4)
  Ethylmorphini hydrochloridum (Identification: C, D; Informative test: 4)
  Mucolytics: Bromhexine (Paxirasol), Ambroxol (Halixol), Terpin, Acetylcysteine (ACC, Fluimucil)
  Drugs of osteoporosis prevention: Clodronic acid (Bonefos)

* Drugs of osteoporosis prevention
  Clodronic acid (Bonefos)
  Drugs for rheumatic gout
  Allopurinol (Milurit), Colchidin (Colchicum-Dispert)
  Thyroid and antithyroid drugs
  Chlorali hydras (Identification: A, B; Tests: Appearance of solution, pH; Chloral alcoholate, Chloride, Heavy metals; Assay)

* Drugs used in stomach disease
  Drugs of osteoporosis prevention: Clodronic acid (Bonefos)

* Antidiabetics
  Antihypertensive agents: Methylodump (Dopegyt), Captopril (Tensiomin), Enalapril (Ednyt), Losartan (Cozaar), Dihydralazine (Depressan), Moxonidine (Cyt)
  Antianginal agents and Vasodilators: Glyceril trinitrate (Nitromint), Pentaerythritol tetranitrate (Nitropenton), Isosorbide mononitrate (Cardisorb, Rangin), Nicotinic acid, Pentoxifylline (Trental)

* Artificial sweeteners
  Antihyperlipidaemic agents: Lovastatin (Mevacor),atorvastatin (Aторvox, Liprimar), Phenofibrate (Lipanthyl, Lipidil)

* Saccharin sodium, Aspartame (Nutrasweet), Acesulfam-potassium
  Calcium channel blockers: Nifedipine (Corinfar), amlodipine (Amlopin, Norvasc), Verapamil (Isoptin), Diltiazem (Bicalcain)

* Mono- and disaccharides
  Agents improving cerebral circulation: Vinpocetine (Cavinton), Cinnarizine (Stugeron)

* Fructose, Glucose, Lactose, Sucrose
  Benzocainum (Identification: C, D; Tests: Appearance of solution, Chloride, Sulphate; Assay; Informative test: 2, 3)

* Drugs used in stomach disease
  Diuretics: Procaini hydrochloridum (Identification: C, D, E, F; Informative test: 3, 4)
  Tetraecaini hydrochloridum (Identification: B, C, D; Informative test: 2)

* Phenolphthalein, Diphenoxylate (Reasec), Loperamide (Imodium), Metclopropamide (Cerucal), Cimetidine, Ranitidine (Ulceran, Zantac), Omeprazole (Losec), Sulfasalazine (Salazopyrin)
  Diuretics: Procaini hydrochloridum (Identification: C, D, E, F; Informative test: 3, 4)
  Tetraceaini hydrochloridum (Identification: B, C, D; Informative test: 2)

* Antiallergic antihistamins
  Acidum asparticum (Identification: B; Tests: Appearance of solution, Chloride, Sulphate; Assay; Informative test: 2, 3)
  Glycerolum (85 per centum) (Identification: C, D; Assay)

* Promethazine (Pipolphen), Dimenhydrinate (Daedalon), Dimethindene (Fenistil), Cetirizine (Zyrtec), Loratadine (Claritine)
  Seminar:
  Nonsteroidal analgesics and antipyretics
  Salicylic acid, Acetylsalicylic acid (Aspirin), Paracetamol (Rubopen), Phenacetin, Phenazone, Aminophenazone, Propiphenazone, Metamizol sodium (Algopyrin)

* Nonsteroidal antiinflammatory agents
  Mucolytics: Bromhexine (Paxirasol), Ambroxol (Halixol), Terpin, Acetylcysteine (ACC, Fluimucil)
  Drugs of osteoporosis prevention: Clodronic acid (Bonefos)

* Phenylbutazone, Etofenamate (Rheumon), Nifluminic acid (Donalgin), Indometacin, Diclofenac (Voltaren, Cataflam), Ibuprofen (Solfaplex, Advil), Naproxen (Naprosyn, Aleve)
* Piroxicam (Hotemin, Feldene),

* Antiinflammatory steroids

* Hydrocortisone, Prednisolone, Triamcinolone acetonide (Florocort), Fluocinolone acetonide (Flucin), Betamethazone (Diprophos), Dexamethasone (Oradexon), Beclomethasone (Aldecin), Budesonide (Pulmicort), Mupredone (Depersolon)

* Antifungal agents

* Clotrimazole (Canesten), Tolnaftate (Chinofungin), Terbinafine (Lamisil), Ketoconazole (Nizoral), Fluconazole (Diflucan)

* Drugs used in the chemotherapy of helminthiasis

* Levamisole (Decaris), Mebendazole (Vermox)

* Antimalarial agents

* Antiseptics and desinfectans

* Methenamine, Ethanol, Isopropanol, Phenol, Thymol, Resorcin, Cloquino, Hexachlorophene, Benzalkonium chloride, Tosylchloramid sodium, Lactic acid, Chlorohedidine, Acriflavinium chloride, Xanthacridine chloride, Brilliant green, Fuchsin, Methylen blue

* Microbiological preservatives

* Methyl (p-hydroxy benzoate), Benzylalcohol, Benzoic acid, Sorbic acid

* Chemotherapeutic sulfonamides

* Sulfadimidine, Sulfamethoxazole

* Chemotherapeutic nitrocompounds

* Nitrofurantoin, Metronidazole (Klion)

* Other chemotherapeutic compounds

* Trimethoprim, Nalidixic acid (Nevidramon)

* Fluoroquinolon derivatives

* Ciprofloxacin (Ciprobay), Ofloxacar (Tarivid)

* Antituberculotics

* Isoniazid (Isonicid), Pyrazinamide, Ethambutol (Sural)

* Other hormones and analogues

* Oestradiol, Oestrone, Ethinyl oestradiol, Clomifen (Clomid), Rasoxifen (Evista), Testosterone (Andriol), Nandrolol (Retabolil), Progesterone, Levonorgestrel
<table>
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<tr>
<th>Section</th>
<th>Content</th>
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<tr>
<td><strong>Curriculum 2014/2015</strong></td>
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<tr>
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<tr>
<td>Nonsteroidal agents acting on sexual activity</td>
<td>Antiallergic antihistamins: Promethazine (Pipolphen), Dimenhydrinate (Daedalon), Dimethindene (Fenistil), Cetirizine (Zyrtec), Loratadine (Claritine)</td>
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<td>Sildenafil (Viagra), Apomorphine (Uprima)</td>
<td>Acidum ascorbicum (Identification: D; Assay; Informative test: 2)</td>
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<tr>
<td>Vitamins</td>
<td>Nicotinimidum (Identification: C, D)</td>
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<tr>
<td>Retinol (vitamin A), Ergocalciferol (vitamin D₂), Cholecalciferol (vitamin D₃), Menadione (vitamin K₃), Thiamine chloride (vitamin B₁), Riboflavin (vitamin B₂), Pyridoxine (vitamin B₆), Nicotinamide, Folic acid, Ascorbic acid (vitamin C)</td>
<td>Riboflavinum (Identification: C)</td>
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<tr>
<td>Antiviral agents</td>
<td>Thiamini hydrochloridum (Identification: B; C; Informative test: 2)</td>
</tr>
<tr>
<td>Amantadine, Acyclovir (Zovirax), Ribavirin (Copegus, Rebetol), Nevirapine (Viramune)</td>
<td>Cholesterolum (Identification: C; Informative test: 1)</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Prednisolonum (Informative test: 1)</td>
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<tr>
<td>Benzylpenicillin, Ampicillin (Semicillin), Amoxicillin (Aktil), Oxacillin, Imipenem (Tienam)</td>
<td>Acidum citricum monohydricum (Identification: A, C, D; Tests: Appearance of solution, Oxalic acid, Sulphate, Heavy metals; Informative test: 3)</td>
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<td>Sulbactam (Unasyn), Clavulanic acid, Cephalexin (Pyassan), Cefuroxime (Zinacef, Zinnat), Chloramphenicol, Doxycycline (Tenutan)</td>
<td>Natrii citras (Identification: A, B; Tests: Appearance of solution, Acidity, alkalinity, Chloride, Oxalates, Sulphate, Heavy metals; Assay; Informative test: 2, 3)</td>
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<tr>
<td>Antineoplastic agents</td>
<td>Seminar: Nonsteroidal analgesics and antipyretics: Salicylic acid, Acetylsalicylic acid (Aspirin), Paracetamol (Rubophen), Phenacetin, Aminophenazone, Propiphenazone, Metamizol sodium (Algopyrin)</td>
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<td>Cyclophosphamide (Cytoxan), Carmustin (BICNU), Cisplatin (Platidiam), Carboplatin (Cycloplatin), Fluorouracil (Efudix), Methotrexate (Trexan), Imatinib (Glivec)</td>
<td>Nonsteroidal antiinflammatory agents: Phenybutazone, Etofenamate (Rheimon), Nifluminic acid (Donalgin), Indometacin, Diclofenac (Voltaren, Cataflam), Ibuprofen (Solvaplex, Advil), Naproxen (Naprosyn, Aleve), Piroxicam (Hotemin, Feldene)</td>
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<tr>
<td>Drugs used for immunomodulation</td>
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<tr>
<td>Azathioprine (Imuran)</td>
<td>Antiinflammatory steroids: Hydrocortisone, Prednisolone, Triamcinolone acetonide (Ftorocort), Flucinolone acetonide (Flucinar), Betamethazone (Diprophos), Dexamethasone (Oradexon), Beclomethasone (Aldecin), Budesonide (Pulmicort), Mazipredone</td>
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<tr>
<td>Caffeinum</td>
<td>Coffeinum (Identification: C, D, F; Informative test: 3)</td>
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<tr>
<td>Theobrominum</td>
<td>Theobrominum (Identification: B, C; Tests: Acidity; Informative test: 3)</td>
</tr>
<tr>
<td>Theophyllinum</td>
<td>Theophyllinum (Identification: C, E; Tests: Appearance of solution, Acidity; Assay; Informative test: 3)</td>
</tr>
<tr>
<td>Acidum tartaricum</td>
<td>Acidum tartaricum (Identification: A, B; Tests: Appearance of solution, Oxalic acid, Sulphate, Calcium)</td>
</tr>
<tr>
<td>Methenaminum</td>
<td>Methenaminum (Identification: B, C, D; Tests: Appearance of solution, Acidity, alkalinity, Free formaldehyde, Chloride, Sulphate, Ammonium, Heavy metals; Informative test: 1)</td>
</tr>
<tr>
<td></td>
<td>Seminar: Antiinfectious agents: Clotrimazole (Canesten), Tolnaftate (Chinofungin), Terbinafine (Lamisil), Ketoconazole (Nizoral), Fluconazole (Diflucan)</td>
</tr>
<tr>
<td>Drugs used in the chemotherapy of helminthiasis</td>
<td>Drugs used in the chemotherapy of helminthiasis: Levamisole (Decaris), Mebendazole (Vermox)</td>
</tr>
<tr>
<td>Antimalarial agents: Quinine, Chloroquine (Deragal), Mefloquine (Lariam), Pyrimethamine</td>
<td></td>
</tr>
<tr>
<td>Antiseptics and disinfectants: Tosylchloramide sodium, Methenamine, Chlorhexidine</td>
<td></td>
</tr>
</tbody>
</table>
Microbiological preservatives: Methyl p-hydroxybenzoate

Chemotherapeutic silfonamides: Sulfadimidine, Sulfamethoxazole

Chemotherapeutic nitrocompounds: Nitrofurantoin, Metronidazole (Klon)

Other chemotherapeutic compounds: Trimethoprim, Nalidixic acid (Nevisramon)

Fluoroquinolone derivatives: Ciprofloxacin (Ciprobay), Ofloxacin (Tarivid)

Antituberculotics: Isoniazid (isonicid), Pyrazinamide, Ethambutol (Sural)

Saccharinum natricum (Identification: C, D, E; Informative test: 1)

Fructosum (Identification: B, C, D)

Glucosum anhydricum (Identification: C; Tests: Appearance of solution, Acidity, Alkalinity, Foreign sugars, soluble starch, dextrins, Chloride, Sulphate, Arsenic, Barium, Calcium; Informative test: 2)

Lactosum monohydricum (Identification: C; Informative test: 2)

Sorbitolum (Tests: Reducing sugars; Informative test: 2)

Saccharum (Identification: C; Tests: Appearance of solution, Acidity, Alkalinity, Dextrin, Glucose and invertsugars)

Bismuthi subsalicylas (Identification: A, B; Tests: Chloride; Assay; Informative test: 1)

Bismuthi subgallas (Identification: A, B)

Seminar:

Sex hormones and analogues: Oestradiol, Ethinyl oestradiol, Clomifen (Clostilbegyt), raloxifen (Evista), Testosterone (Andriol), Nandrolone (Retabolil), Progesterone, Levonorgestrel

Nonsteroidal agents acting on sexual activity: Sildenafil (Viagra), Apomorphine (Uprima)

Vitamins: Retinol (vitamin A1), Ergocalciferol (vitamin D2), Cholecalciferol (vitamin D3), Menadione (vitamin K3), Thiamine chloride (vitamin B1), Riboflavine (vitamin B2), Pyridoxine (vitamin B6), Nicotinamide, Folic acid, Ascorbic acid (vitamin C)

Phenol (Identification: A, B, C)

Resorcinol (Identification: B, C; Tests: Appearance of solution, Acidity, alkalinity, Pyrocatechol; Assay)

Thymol (Identification: C, D)

Acidum benzoicum (Identification: B; Tests: Oxidisable substances; Assay; Informative test: 1, 2)

Natrii benzoas (Identification: A, B; Tests: Appearance of solution, Acidity, Alkalinity; Informative test: 2, 3)

Seminar:

Antiviral agents: Amantadine, Acyclovir (Zovirax), Ribavirin (Copegus, Rebetol), Nevirapine (Viramune)

Antibiotics: Benzylpenicillin, Ampicillin (Semicillin), Amoxicillin (Aktol), Oxacillin, Imipenem (Tienam), Sulbactam, Clavulanic acid, Cephalexin (Pyssan), Cefuroxime (Zinacef, Zinnat), Chloramphenicol, Doxycycline (Tenutan), Neomycin, Erythromycin (Eryc)

Antineoplastic agents: Cyclophosphamide (Cytoxan), Cisplatin (Platidiam), Carboplatin (Cycloplatin), Fluorouracil (Efudix), Methotrexate (Treman), Imatinib (Glivec)
* Drugs used for immunomodulation: Azathioprine (Imuran)
* Chloramphenicol (Identification: D, E; Informative test: 1)
* Oxytetracyclini hydrochloridum (Identification: B, C; Informative test: 2)
* Sulfadimidinum (Identification: C, D; Informative test: 1)
* Chinidini sulfas (Identification: B, C; D, E, F; Tests: pH; Informative test: 1, 3, 4)
* Chinini sulfas (Identification: B, C, D, E; Tests: pH; Informative test: 1, 3, 4)
* Acidum lacticum (Identification: A, C; Tests: Appearance, Sugars and other reducing substances, Citric, oxalic and phosphoric acids, Sulphate, Calcium, Heavy metals; Assay; Informative test: 3)

PHARMACEUTICAL TECHNOLOGY

5th semester

**LECTURE**
* Introduction to Pharmaceutical Technology I, General considerations
* Pharmaceutics
* Biopharmaceutics
* Classification of technological operations
* Types of dosage forms
* Quality for pharmaceutical products
* Introduction to Pharmaceutical Technology II
* Preformulation, formulation
* Drug formulation by neural network and factorial design
* Normatives in pharmaceutical technology
* GMP, ISO
* Validation, qualification
* Basics of industrial drug formulation
* Physico-chemical basics of pharmaceutical technology, theory and practice
* Interfacial phenomena
* Surface and interfacial phenomena
* Adsorption
* Adhesion
* Electrokinetic processes
* Rheology in pharmaceutical technology
* Concept of rheology
* Classification of rheological processes
* Rheology of disperse and coherent systems
* Connection between the pharmaceutical technology and the technical chemistry
* Water purifying methods
* Distillation
* Ion exchanging
* Reverse osmosis
* Seawater desalination
* Excipients in pharmaceutical technology
* Classification of excipients
* Dosage forms and excipients
* Liquid dosage forms
* Grouping
* Physicochemical characteristics
* Stability problems
* Biopharmaceutical considerations
* Emulsions and suspensions
* Types and stability
* Administration routes
* Excipients
* Liposomes
* Types and stability
* Administration routes
* Powders
* Particle size, distribution
* mixing
* Extraction of plants
* Methods and equipment
* Types

6th semester

**LECTURE**

* Aerosols and Inhalasols
* Types and stability
* Administration routes
* Preparations
* Theory and practice of sterilization
* Theory of sterilization
* Methods
* Control of sterilizing
* Aseptic dosage forms
* Requirements of parenteral preparations
* Clean air technology
* Application routes
* Excipients
* Containers
* Elements of homeostasis
* TestS for pyrogens
* Dosage forms
* Industrial methods
* Microbiological preservation of liquid dosage forms
* Requirements of preservatives
* Efficacy of preservatives
* Preservatives
* Ophthalmic dosage forms
* Eye drops
* Eye cleaning solutions
* Semisolid dosage forms
* Classification of dermatological preparations
* Types of ointment bases
* Production of ointments
* Investigation of ointments
* Choice of ointments, therapeutic and practical considerations
* Gels
* Polymers in pharmaceutical technology
* Hydrogels
* Stimuli responsive hydrogels
* Nasal drug delivery systems
* Basic concepts of administration
* Factors affecting bioavailability
* Dosage forms and excipients
* Rectal and vaginal dosage forms

**PRACTICE**

* Prescription pharmacy 1
* General instruction
* Rules of measuring
* Dispensing of solutions
* „A” measuring of liquids
* „B” measuring of powders
* Writing of prescriptions
* Liquid dosage forms
* Solutio
* Diluendum, aqua aromatica, gargarisma, elixírium, mixtura, sirupus, klysma
* Solubility, right order of dissolving, dilution, calculation
* Solvents, excipients
* Calculation
* Solutio acrífavini (FoNo VII. 20,0 g)
* Solutio contra rhagades mamillae(FoNo VII. 33,6 g)
* Gargarisma chlorogenii (FoNo VII. 100,0 g)
* Sirupus zinci (FoNo VII. 100,0 g)
* Solutio noraminophenazoni pro parvulo (FoNo VII. 100,0 g)
* Mixtura pectoralis (FoNo VII. 100,0 g)
* Solutio pepsini (FoNo VII. 100,0 g)
* Magistral preparation (50,0g)
* Mixtura solvens (FoNo VII. 100,0 g)
* Gutta, Klysma
* Checking the dose
* Otogutta, nasogutta
* Dilutio, trituration
* Gutta methylhomatropini composita (FoNo VII. 10,0 g)
* Ototgutta peroxydi (FoNo VII. 10,0 g)
* Klysma chlorali pro infante (FoNo VII. 80,0 g)
* Nasogutta zinci cum ephedrino (FoNo VII. 10,0 g)
* Solutio theophyllini (FoNo VII. 100,0 g)
* Solutio nephriloticia (FoNo VII. 100,0 g)Incompatibility
* AUV preparations
* Oily and alcoholic solutions
* Incomp II (sol. 150,0g)
* Ototgutta fungicida (FoNo III Vet)
* Solutio metronidazoli (FoNo VII. 30,0g)
* Spiritus iododalicylatus (FoNo VII. 30,0g)
* Self-made preparation
* Incomp I (gutta 20,0g)
* Therapeutic considerations
  Oleum pro inhalatione (FoNo VII. 20,0g)
* Dosage forms
  Gutta antipyretica (FoNo Vet. III. 100,0g)
* Additives
  Galenic Practice
* Granulation and granules
  Introduction
* Types of granules
  Functions of a galenic pharmacy
* Particle binding mechanisms
  Galenic preparations of the Pharmacopoea
* Methods of granulation
  Calculations
* Investigation of granules
  Dosage form investigations of the Pharmacopoea (Ph.Eur., USP, Br.Ph.)
* Pressing of solid particles, compressibility and process
  Quality control, Operation methods, Production sheets
* Tablet compression
  Safety precaution, fire protection, material safety data sheets
* Tablet compression machinery
  Measurement of mass, balances
* Compressibility and its measurement
  Definitions, types, general rules
* Tablet making and texture of tablets
  Mechanical balances:
  mass-comparative balances: equal arm balances (Berkel), unequal-arm balances (OWA, Metripond, cg quick balance); deformation principles balances (coil, spiral and bent spring);
* Methods
  Electronical (strain-gauge) balances: advantages, different functions, types (analytical, precision and industrial platform balances, moisture analyser balance), adjusting/calibration (inner, external).
* Excipients
  Separation methods:
* Preformulation tests
  Distillation: definition, parts, sets of operation/material/heating, laboratory distillator, thermocompression, products;
  Ion-exchange/demineralization: theory, synthetic resins, capacity, process, products;
* Tests of tablets
  Reverse osmosis (RO): theory, RO membrane, process, product;
* Influencing factors on the physical parameters
  Centrifugation: definition, factors, alignment, parts, types of rotors (e.g. swing-out
* Problems during tableting
  Crushing, pulverization: definitions, working principle, efficiency of crushing, crushers (Jaw, gyratory) grinders (roller and hammer);
  Process of milling: mills (mortar and pestle, ball, vibratory ball, centrifugal ball, planetary ball, disk, cutting, industrial jet and colloid mill), rotary cone sample divider;
* Equipment for the tablet making
  rotor, angle rotor).
* Desintegration
  Particle size analysis (PSA) and its application: importance, FDA guide, USP tests, US and UK standard sieves, frequency of distribution, cumulated plots, microscopic measurement, laser diffractometer.
* Homogenization
  Mixing: definition, efficiency, required mixing time, mixing equipments
* Liquid mixing: paddle, anchor and propeller type, high shear homogenizer, circular flow and turbine mixer, shakers;
* Mixing of semisolids: planetary mixer, kneaders, dispersers, curved blade impeller;
* Mixing of solids: cylindric, cubic, tumbler, double cone, twin shell and vertical screw mixers.
* Material transfers
* Drying: definitions, purpose, efficiency, industrial microwave drying, vacuum drying, spray drying (nozzle, atomizer) and its application;

* Dissolution: solutions, theory, definitions, expressions of concentration, pharmaceutical applications, dosage form, dissolution rate, formulation;

* Molecular and colloidal solution (preparation): real solution, stock solution, syrups (medicinal and flavouring), mucilages (polymers), elixirs, spirits, mixtures, aromatic waters, tinctures;

* Industrial liquid mixing equipments (e.g. double planetary mixer, high-shear rotor-stator mixer, different mixing blades, Powermix and Triple Shaft mixer, disperser), filtering, storage tanks, industrial liquid filling.

* Extraction and extracts: definition, types of process and equipments (maceration, turboextraction, vibroextraction, percolation), dosage forms (preparation, requirements, storage): extracts, tinctures.

* Preparation of disperse systems

* Emulsifying: emulsions, definitions, types, calculation (work-equation, required HLB), industrial manufacturing methods, equipments (mixers, homogenizers, colloid mills, ultrasonic devices), stability;

* Suspending: suspensions, definitions, classification, flocculation, industrial manufacturing methods, equipments, kinetics of sedimentation.

* Semisolid dosage forms

* Soaps and soap-containing preparations: definitions, types, preparations (Ph.Hg. and USP);

* Ointments, creams, pastes, hydrogels: definitions, classifications, requirements, types of ointment bases, industrial production of semisolid preparations, laboratory (LUX, Erweka, Sabaria) and industrial mixers (e.g. counter-rotating paddle agitator), pastes, three-roll apparatus, penetrometric examination;

* Suppositories: definitions, types, types and preparation of suppository bases, laboratory and industrial preparation of suppositories (suppository moulding equipments), types of moulds (metal, plastic), form-fill-seal.

**PATHOPHYSIOLOGY**

**5th semester**

**LECTURE**

Introduction to Pathophysiology;

Inflammation I.: Definition, causes, mediators and signs of acute inflammation. Regulation and outcome of acute inflammation.

Inflammation II.: Chronic inflammation. Local and generalized reactions of inflammation: fever, inflammatory pain.

Pathophysiology of leukocytes I.:

Immunology: *In vivo* allergic reactions,
Curriculum 2014/2015

autoimmunity, immunodeficiency.


**Endocrinology II.** Hypoparathyreoidism. Diseases of adrenal (cortex and medulla) gland.

**Starvation and obesity. Diabetes mellitus, hypoglycemia**
Diabetes mellitus causes, types, clinical signs, pathogenesis and consequences. Hypoglycemia

**Cardiovascular system I.** Pathophysiology of plasma lipoprotein metabolism. Development of atherosclerosis.

**Cardiovascular system II.**
Pathogenesis and consequences of atherosclerosis. Primary and secondary hypertension.

**Cardiovascular system III.**
Pathophysiology and ECG of acute coronary syndromes: angina pectoris, myocardial infarction

**Cardiovascular system IV.**

**Peripheral circulatory diseases:**

**Pathophysiology of salt-water balance I.**
Volume excess, hyper- and hyponatremia, hyper- and hypocalcemia

**Pathophysiology of salt-water balance II.**
Hyper- and hypokalemia, disturbances of trace elements and vitamins.

**Cardiovascular system V.**
Disturbances of electrical impulse generation and conduction.

**Seminars:**
- Pathophysiology of leukocytes I.: Immunology (Lecture topic of the 3rd week).
- Endocrinology I. (Lecture topic of the 4th week).
- Endocrinology II. (Lecture topic of the 5th week).
- Starvation and obesity. Disturbances of carbohydrate metabolism (Lecture topic of the 6th week).
- Cardiovascular system I. (Lecture topic of the 7th week).
- Cardiovascular system II. (Lecture topic of the 8th week).
- Cardiovascular system III. (Lecture topic of the 9th week).
- Cardiovascular system IV. (Lecture topic of the 10th week).
- Peripheral circulatory disease (Lecture topic of the 11th week).
- Pathophysiology of salt-water balance I (Lecture topic of the 12th week).
- Pathophysiology of salt-water balance II (Lecture topic of the 13th week).

6th semester

**Lecture**
- Pathophysiology of kidney diseases I.: Proteinuria, hematuria, glycosuria, ketonuria, pyuria, bacteruria, polyuria, oliguria and anuria.

**Seminar/Practice**
- Pathophysiology of kidney diseases I. (Lecture topic of the 1st week).
- In the practice room: Investigation of urine and renal function: proteinuria, hematuria, pyuria, hemoglobinuria, ketone bodies, urobilinogen, urine

Safety regulations. Seminar: Thermoregulation. (Please download and study the material from our website or coospace before class).
**Pulmonary diseases I:** Abnormal breathing patterns, dyspneas. Obstructive pulmonary diseases: CODP, asthma bronchiale, cystic fibrosis.

**Pulmonary diseases II:** Restrictive pulmonary diseases (pleural disorders, pulmonary edema, embolism, hypertension), hypoxias, respiratory failure.

**Disturbances of acid-base metabolism:** Respiratory acidosis and alkalosis. Metabolic acidosis and alkalosis.

**Gastrointestinal diseases I.:** Nausea, vomiting, dysphagia. Abnormalities of gastric juice secretion, peptic ulcer.

**Gastrointestinal diseases II.:** Diseases of absorption, diarrhea, constipation. Intestinal obstruction. Acute and chronic pancreatitis.

**Diseases of liver and biliary tract:** Diseases of bilirubin metabolism: hemolytic, hepatocellular and obstructive jaundice. Causes, pathogenesis and consequences of hepatic cirrhosis.

**Pathophysiology of leukocytes:** Leucopenia. Proliferative diseases: reactive and malignant diseases (leukemias, lymphomas).

**Red blood cell diseases I.:** Polycytemias, Anemias - ineffective erythropoesis.

**Red blood cell diseases II.:** Anemias due to blood loss, hemolysis. **Hemostasis I.:** Bleeding disorders (platelet disturbances).

**Hemostasis II.:** Bleeding disorders (vascular, clotting factor disturbances), thrombosis and embolism.

**Pathophysiology of the CNS I.:** Multiple sclerosis, neurodegenerative diseases: Alzheimer’s, Parkinson’s and Huntington’s disease. Pathogenesis of psychiatric disorders.

**Pathophysiology of the CNS II.:** Circulatory diseases of the CNS. Cerebral edema. Pain, headaches, seizures and epilepsy.

**Seminars:**
- **Kidney diseases II. (Lecture topic of the 2nd week).**
- **Pathophysiology of pulmonary diseases I. (Lecture topic of the 3rd week).**
- **Pathophysiology of pulmonary diseases II. (Lecture topic of the 4th week).**
- **Disturbances of acid-base metabolism (Lecture topic of the 5th week).**
- **Gastroenterology I. (Lecture topic of the 6th week).**
- **Gastroenterology II. (Lecture topic of the 7th week).**
- **Pathophysiology of liver diseases (Lecture topic of the 8th week).**
- **Pathophysiology of leucocytes II. (Lecture topic of the 9th week).**
- **Red blood cell diseases I. (Lecture topic of the 10th week).**
- **Hemostasis II. (Lecture topic of the 12th week).**
- **Pathophysiology of the CNS II. (Lecture topic of the 13th week).**
- **Pathophysiology of the CNS. (Lecture topic of the 14th week).**

**In the practice rooms:**
- Investigation of urine and renal function: proteinuria, hematuria, pyuria, hemoglobinuria, ketone bodies, urobilinogen, urine sediment and casts.
- Determination of WBC, RBC, platelet, eosinophyl and reticulocyte count. Staining and analysis of blood smear.
## MICROBIOLOGY AND IMMUNOLOGY
### 5th semester

<table>
<thead>
<tr>
<th>LECTURE (4hrs/week)</th>
<th>PRACTICE (2hrs/week)</th>
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</table>
Hypersensitivity reaction. Immunodeficiencies.

* RNA viruses II.
  Slow viruses. Retroviridae, AIDS
  RNA viruses I.
  Influenzaviruses, measles-, mumps-, rubeola viruses.
  Immunization against microbes.
  Vaccination

* RNA viruses III
  Poliovirus, coxsackie viruses
  Rabiesvirus.
  Manufacture of immunological products and their quality control.
  Fungi of medical importance.
  Immunological methods.
  Important human pathogenic helminths.
  Important human pathogenic protozoa.

Summary of the most important human pathogenic bacteria II.

Propagation and assay of viruses.
Serological methods in virology.

Important human pathogenic fungi.
Consultation

**BIOPHARMACY**

**LECTURE**

Basic principles


Drug metabolism, first-pass effect, factors influencing metabolism.

Drug elimination, clearance. Pharmacokinetics of repeated dose administration, plato phenomenon.

Pharmacokinetic model systems.

Concept and determination of AUC. Model independent pharmacokinetics.

Physiological and Biological availability. Equivalences.

Factors influencing biological effects of drugs.

Dose - response relationships.

Drug interactions. Synergism, antagonism.

Receptors, signal transduction.

Drug allergy, idiosyncratic drug reactions, polymorphisms.

Therapeutic drug monitoring. Non-linear pharmacokinetics.

**PRACTICE**

Basic principles, drug administration.

Absorption, distribution. Blood plasma curve of one compartment intravascular model system.

Drug metabolism. Blood plasma curve of one compartment extravascular model system.

Pharmacokinetic of Infusion. Blood plasma curve of repeated dose administration.

Blood plasma curve of two compartment intravascular model system.

Calculation of physiological availability and absolute and relative bioavailability. Multi dose schedule for subject with renal impairment.

Multi dose schedule for subject with hepatic dysfunction. Dosage schedule for children and elderly subjects.

Dose-response curves. Calculation of ED$_{50}$, pD$_{2}$.

Synergism, antagonism, dose-response curves. Calculation of ED$_{50}$, pD$_{2}$, pA$_{2}$, pD'$_{2}$.

Non-linear pharmacokinetics, Michaelis-Menten pharmacokinetics.

**HUNGARIAN FOR PHARMACEUTICAL PURPOSES**

1st semester

**PRACTICE**

(3 hrs/week)

* The human body. The main systems and organs. Terminology exercises.
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* Drug forms. Drugs for internal and external use. Definition and translation of new expressions.
* Classification of drugs. Drug types. Standard expressions and phrases.
* Mid-term test.
* In the pharmacy. OTC drugs and prescription drugs. Pharmacist-patient dialogue.
* Food and nutrition. The major components of food. Healthy diet. Terminology exercise.
* Deficiency diseases. Listening exercise on healthy nutrition. Discussion.
* Infections. Antibacterial and antiviral drugs. Influenza. Pharmacist-patient dialogue
* Vaccination. Resistance to infections. Medical leaflets for educational purposes.
* Revision of previous topics. Test.

2nd semester

PRACTICE
(3 hrs/week)

* The GI tract and drugs. Antidiarrhoeal drugs and laxatives. Emetics and antiemetics. Role play.
* Revision of previous topics. Mid-term test.
* Drugs for IBS and IBD. Diet and regimen. Discussion.
* Diabetes. IDDM, NIDDM. Oral anti-diabetics. The importance of good control.
* The pharmaceutical industry in Hungary. Hungarian drugs on the world market. Discussion.
* The Faculty of Pharmacy at SZTE. The institutes and departments of the faculty. Scientific achievements. International cooperation.
* General revision. Test.

COMMUNICATION IN PHARMACY PRACTICE (ELECTIVE COURSE)

* Introduction, course content. Importance of psychotherapy and communication in health care
* Laws and ethical regulations concerning pharmacist' communication
* Patient types and their handling
* Practice: situations in pharmacy
* Dispensing and consulting: verbal and non-verbal elements of pharmacist-patient relationship I.
* Dispensing and consulting: verbal and non-verbal elements of pharmacist-patient relationship II.
* Improving patient adherence with proper communication, special patients and situations in pharmacy I.
* Improving patient adherence with proper communication, special patients and situations in pharmacy II.

* Persuasion in pharmacy

* Promotion of medicinal products
SYLLABUSES FOR 4TH YEAR PHARMACY STUDENTS

PHARMACEUTICAL ANALYSIS AND DRUG CONTROL

LECTURE

* Instrumental analytical methods are applied for characterization of starting materials and final products, and also for the control of pharmaceuticals and their decomposition products according to pharmacopoeias, together with the metabolites of pharmaceuticals.

* Electrometric methods: voltammetry, polarography, amperometry, potentiometry, conductometry and oscilometry.

* Spectrophotometry, spectrophotometers, atomic and molecular spectra, UV and visible absorption spectrophotometry, chemical structure and qualitative and quantitative determination of pharmaceuticals by spectrophotometry. Spectrofluorometry and IR spectrophotometry. Structure determination and application of IR spectra for qualitative and quantitative purposes. Emission and atomic absorption spectrophotometry and flame photometry.

* Nuclear magnetic resonance spectroscopy (NMR).

* Mass spectrometry (MS) and combinations of gas chromatography and high-pressure liquid chromatography with MS. Field ionization and chemical ionization mass spectrometry.

* Thermoanalytical methods (TG DTG. DTA, DSC).

* Optical rotation (ORD, CD), refraction and molecular refraction.

* X-ray diffraction (XRD), XRD analysis of solid pharmaceuticals and determination of particle size.


* Physical methods: density, solubility, viscosity, surface tension, melting range, eutectic temperature, dropping point, congealing point, boiling range, sublimation, flame coloration, residues of drying and ignition, loss on drying, acid-insoluble ash, etc.

* Chromatographic methods: adsorption column, partition column, paper chromatography, thin-layer chromatography (TLC), gas chromatography (GC), high-performance liquid chromatography (HPLC), ion-exchange chromatography, molecular sieves, gel permeation (filtration), zone electrophoresis and counter-current distribution.


* Methods of drug registration, preclinical requirements, clinical trials (phases I-III), quality control during manufacturing (GMP) and quality control in post-marketing phase.

PRACTICE

* Pulvis neutracisus (FoNo) (a multicomponent divided powder)

* Identity tests: frangula bark, sodium, carbonate, bismuth, magnesium.

* Assay: bismuth, magnesium.

* Pilula somniferens (FoNo)

* Identity tests: hexobarbital, phenobarbital, lactose.

* Assay: hexobarbital phenobarbital.

* Spiritus iodosalicylatus (FoNo)

* Identity tests: iodine, potassium, ethanol, iodide, salicylic acid.

* Assay: iodine and salicylic acid

* Pulvis antidoloricus (FoNo)

* Identity tests: ethylmorphine, caffeine, phenacetin, acetylsalicylic acid.

* Assay: ethylmorphine, acetylsalicylic acid.

* Unguentum hydrargyri amidochlorati (FoNo)

Assay: mercury(II)amidochloride

Suppositorium aminophenazoni (FoNo)

Identity tests: aminophenazone

Assay: aminophenazone

Suppositorium antiemeticum (FoNo)

Identity tests: lidocaine, atropine, caffeine.

Assay: lidocaine, caffeine.

Injectio algopyrini 50%

Identity tests: noraminophenazonum sodium mesilate

Assay: noraminophenazonum natrium mesilicum

Solution theobromoiodati (FoNo)

Identity tests: theobromine, sodium, potassium, iodide, salicylic acid.

Assay: theobromine, iodide.

The constituents of the following dosage forms are identified by thin layer chromatography (TLC):

Pulvis asthmalyticus fortis (FoNo)

Pulvis asthmalyticus fortis cum atropino in tablettis (FoNo)

Antineuralgica tablet

Barbamid tablet

Nasogutta ephedrini (FoNo)

Identity tests: ephedrine

Assay: ephedrine

Chromatographic methods prescribed in the Pharmacopoeia VII.

Sparsorium sulfaboricum (FoNo)

Identity tests: sulphadimidine, boric acid.

Assay: sulphadimidine.

Measurement of physical data prescribed in pharmacopoeias (melting, boiling range, optical rotation, specific rotation, refraction, etc.)

Identification of 20 pharmaceutical substances on the basis of pharmacopoeial tests.

Methods of instrumental analysis.
Acidi-alkalimetry, direct titrations of strong acids and bases and weak acids and bases, back titrations, determination of organically combined nitrogen. Related with these all of the methods of pharmacopoeias and the prescriptions of the National Institute of Pharmacy (NIP) should be interpreted.


Oxidation reduction titrations with potassium permanganate, iodine, potassium iodate, potassium bromate, cerium(IV) sulphate solutions. Karl-Fischer titrations (aquametry).

Argentometric titrations.

Complexometric methods: direct and back titrations. Gravimetric methods in Ph. Hg. VII.

Separation of complex mixtures of pharmaceuticals on the basis of chemical characters (weak acids, bases, amphoter and neutral) of the components.

### PHARMACEUTICAL TECHNOLOGY

#### 7th semester

#### LECTURES

* General instruction
* Coating process of solid dosage forms
* Requirements of coating process
* Sugarcoating, filmcoating, melted coating
* Instrumentation of coating process
* Capsules
* Categories of capsules
* Soft and hard gelatin capsules
* Capsule filling
* Tests for capsules
* Soaps, patches, preparations for veterinary use
* Application of soaps
* Process of preparation
* Medicated plasters
* FoNo VET and preparations
* Homeopathy
* Preparation of mather tincture
* Preparation of potencies
* Dosage forms
* Drying
* Classification of methods
* Convective and radiation drying
* Driers
* Freeze drying
* Crystallization processes
* Operations and methods
* Crystallization from melt

#### PRACTICE

* Prescription pharmacy 2
* General information
* Fire safety
* Solutions, repetition
* Ph.Hg.VIII, FoNo VII.)
* Calculations
decoctum, infusion
* Collodium cum acido salicylico Fo No VII. dos. I (10,0 g)
* Gutta analeptica FoNo VI. dos. ½ (10,0 g).
* Otogutta chloramphenicoli FoNo Vet III. dos I (10,0 g)
* Suspensions
* Emulsions
* Units, Latin number
* Solution against perspiration (Husz-Regdon) (50,0 g)
* Solutio gingivalis FoNo VII. dos. I (30,15 g)
* Nasogutta containing protargol Manuale
* Pharmaceuticum dos. ½ (16,8 g)
* Decoctum saponariae FoNo VII. dos. ½ (100,0 g)
* Self-made preparations
* Checking the dose
* Infusum sennea cum magnesio sulfurico (100,0 g)
* Suspensio bismuthi subsalicylici pro infante FoNo VI. dos. I. (100,0 g)
* Suspensio expectorans FoNo VII. dos ½ (100,0 g)
* Emulsio olei jecoris FoNo VII. dos. ½ (100,0 g)
* Linimentum scabicidum FoNo VII. dos. ½ (50,0 g)
* Linimentum sulfadimidini FoNo Vet. II. dos. I. (50,0 g)
* Suspensio anaesthetica FoNo VII. dos. I (100,0 g)
* cs
* Suspensio salicylamidi 2% cum sorbito FoNo VI. dos. I (100,0 g)
* Spherical crystallization
* Packaging, packaging materials
* Requirements
* Safety
* Modification of biological activity
* Interactions in pharmaceutical technology
* Interaction and incompatibility
* Causes and types
* directions and guidelines
* Stability of drugs and dosage forms
* Stability
* ICH and structure of ICH
* Shelf life, reaction kinetics
* Automation, instrumentation and monitoring of technological processes
* Product manufacturing process
* On – line monitoring
* Process development and optimization

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**Suspensio zinci aquosa FoNo VII. dos. 1 (100,0 g)**

**Zinkoxidshüttelmixtur NRF 2001 dos. I (100,0 g)**

**Zinkoxyd-Schüttelpinselung NFA dos. I (100,0 g)**

**Linimentum calcis FoNo VI. dos. ½ (50,0 g)**

**Linimentum ammoniatum FoNo VII. dos. ½ (50,0 g)**

**Incomp. III. (solution or suspension) (100,0 g)**

**Gargarisma antisepticum FoNo VII. dos. ½ (50,0 g)**

**Powders**

**Dusted and undivided powders**

**Capsula operculata**

**Incompatibility**

**Tea mixtures**

**Emulsions, suspensions**

**Powder dividing by eyes, checking with measurement**

**Powder dividing by Hunfalvyl, checking with measurement**

**Capsula operculata calibration**

**Pills**

**Calculation, writing of prescription**

**Infusum senae cum magnesio sulfurico (100,0 g)**

**Pulvis coffeini 50 mg FoNo VII. dos. 1/3 (No. X)**

**Pilula coffeini 50 mg FoNo VII. dos. I (No. XXX)**

**Sparsorium antisudoricum FoNo VII. dos. ½ (34,2 g)**

**Pulvis calcii lactophosphorici FoNo VII. dos ½ (25,0 g)**

**Suppository**

**Preparing of suppository with moulding and hand-made method**

**Calibration of moulding forms**

**Suppository containing Bismuthum subgallicum (No. X)**

**Hard gelatine capsules containing Ascorbic acid (No. XX)**

**Pulvis bismuthi tannici FoNo VII. dos. ½ (No. X)**

**Suppositorium analgeticum forte FoNo VII. dos. ½ (No. III)**

**Suppositorium antipyreticum pro infante FoNo. VII. dos. I (No. VI)**

**Suppositorium paracetamoli 60 mg FoNo VII. dos. I (No. X)**

**Vaginal dosage forms**

**Stifts**

**Powders**

**Calculation for moulding and hand-made method**

**Sal ad rehydrationem cum natrio hydrogencarbonico pro parvulo FoNo VII. dos. I (30,8 g)**

**Oralypulver 60 SR 2001 dos. I (28,0 g)**

**Oral Rehydration Salts BP 1998 dos. I (27,9 g)**

**Emulsio paraffini cum phenolphthaleino FoNo VII. dos. ½ (100,0 g)**

**Globulus containing Zincum sulfuricum (No. IV)**

**Suppositorium laxans FoNo. VII. dos. I (No. X)**

**Pilula tonisans FoNo VI. dos. ½ (No. XXV)**
* Ovulum metronidazoli FoNo VII. dos. I (No. X)
* Suppositorium ad nodum FoNo. VII. dos. I (No. X)
* Suppository containing Benzocainum Manuale
Pharmaceuticum dos. 1/10 (No. X)
* Inkomp. VI. dusting powder (50,0 g)
* Eoszacharum containing barbitalum (No. X)
* Suppository
* Calculation of prescription components
* Globulus metronidazoli compositus FoNo VII. dos. I. (No. X) ½ g.globulus
* Suppositorium expectorans FoNo VI. dos. I. (No. VI)
* Suppository for children Manuale Pharmaceuticum
  dos. I (No. X)
* Effervescent powder for x-ray (Manuale
Pharmaceuticum dos. I (16,6 g)
* SELF-MADE PREPARATIONS
* Preparation of sterile and aseptic dosage forms
* Aseptic preparation
* Eye-drops
* Solutions for eye-drops
  * Solutio ophthalmica
  * cum benzalkonio
* Solvens pro oculoguttis
  * cum benzalkonio
  * cum thiomersalo
* Solvens viscosa pro oculoguttis
  * cum thiomersalo
  * cum cetrimido
* Hydrogelum carbomerae pro oculoguttis
* FoNo preparations
* Oculogutta antidota
* Oculogutta atropini
* Oculogutta carbomerae
* Oculogutta chloramphenicoli
* Oculogutta erythromycinii
* Oculogutta gentamicini
* Oculogutta homatropini
* Oculogutta indosoli
* Oculogutta naphaizolini
* Oculogutta neomyclini
* Oculogutta neonatorum
* Oculogutta pilocarpini
* Oculogutta polymyxini
* Oculogutta rifampicini
* Oculogutta scopalamini
* Oculogutta tetracainii
* Oculogutta viscosa
* Oculogutta zinci
* Eye ointments
* Bases of eye ointments
* Oculentum simplex
* Oculentum hydrosom
* Oculentum basis
* FoNo preparations
* Oculentum dionini
* Oculentum erythromycinii
* Oculentum neomyclini
* Oculentum neomyclini cum prednisolono
Aerosols, inhalasols
Concentration of infusion solutions, isotonic calculations
Sterilization
Pyrogens, pyrogen removal methods
Filtration
Large volume parenteral preparations
Infusions with electrolyte
Infusio natrii chlorati
Infusio salina
Infusions with sugars
Infusio glucosi
Infusio manntiti
Infusio sorbiti
Infusions with electrolyte and sugars
Infusio glucosi cum kalio
Infusio glucosi salina
Investigation of large volume parenteral preparations
Supplementary infusions
Stock solution
Natrium lacticum solutum 20% pro infusion
Infusions for correction of acidosis
Infusio natrii lactici
Infusio natrii hydrogencarbonici
Infusions for correction of alkalosis
Infusio gastrica
Dialysis
Peritoneal dialysis solutions
Solutio pro dialysi peritoniale I.
Solutio pro dialysi peritoniale II.
Perfusion solutions
Plasma substitute infusions
Infusio dextrani
Parenteral nutrition
Preparation of parenteral nutrition infusion
Magistral parenteral nutrition infusion
Injections
Injectio natrii chlorati
Injectio glucosi
Injectio papaverini chlorati
Injectio coffeini natrii benzoici
Investigation of injections
Non-heat sterilizable injections
Injectio urea
Injectio aethylmorphinii chlorati
Multidosage injections
Injectio procainii chlorati
Injectio atropinii sulfurici
Powder ampoules
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Liofilization
Emulsion and suspension type injections
Visit in the Central Pharmacy
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* Therapeutic systems I
  Preparing granules with high shear mixer (solvent granulation with Pro-c-epT equipment).
* Solid systems
  Preparing granules (binder granulation with LuxRoyal equipment).
* Biodegradable polymers
  Preparing granules with centrifugal granulator (binder granulation with Freund CF-360 equipment).
* Therapeutic systems II
  Preparing granules with fluid granulator (binder granulation with Strea-1 equipment).
* Semisolid systems
  Capsule filling and blistering. Mass control of filled capsules.
* TTS
  Cycle 2
* Lyotropic liquid crystals
  Compressibility investigation of different materials with the use of different compression forces. Recording and analysing different pressure curves.
* Micro- and multiple emulsions
  Geometrical investigation of tablets prepared by different compression forces.
* Microspheres, liposomes
  Physical investigation of different tablets (breaking hardness, friability, etc.).
* In vitro dissolution test methods
  Tablet preparation by direct compressing without auxiliary materials with the use of eccentric tablet machine.
* Ex vivo and in vivo methods
  Tablet preparation by direct compression with auxiliary materials with the use of eccentric tablet machine.
* Characterisation of dissolution profiles
  Preparing and mechanical investigation of tablets with effective materials compressed with different compression forces.
* Comparision of dissolution profiles IVIVC
  Water absorbing capacity of different tablets.
* Biopharmaceutical aspects of original and generic preparations
  Dissolution and solution test of different tablets. Sartorius resorption test.
* Cycle 3
  Investigation of film forming temperature with different film forming polymer compositions.
* Film coating of granules in centrifugal granulator.
* Film coating of granules in fluid granulator with the use of Wurster-column.
* Film coating of tablets.
* Sugar coating of tablets in drageé pan.
* In vitro dissolution test of enteric coated tablets.
* Investigation of diffusion.
* Designing, preparing and investigating of new tablet composition.
* Investigation of dosage forms
  Investigation of suspensions:
  □ distributional stability investigations of flocculated and non-flocculated suspensions
  □ determination of the type of sedimentation and the half life time
  □ investigation of the effect of different additives on the sedimentation process.
* Investigation of air humidity on the geometrical parameters of tablets:
Curriculum 2014/2015

* determination the influence of 100% relative air humidity on the weight and geometrical parameters of phenylbutazone tablets.

* Investigation of polymer films:
  □ determination of solvating time of gelatin films with different thickness in artificial gastric and intestinal juice.

* Investigation of hydrophilic sols' viscosity changing:
  □ study the viscosity changing by electrolytes of the Mucilago methylcellulose and Mucilago hydroxyethylcellulose.

* Investigation of ointments I:
  □ Characterization of water-free ointment bases with the help of physical investigations.

* Investigation of ointments II:
  □ Determination of washability and rheological features of ointments.

* Investigation of ointments III:
  □ Consistency characterisation of the ointments by determining viscosity, spreadability and adhesion.

  * Determination of average molecular weight of dextrane:
  □ Determination of average molecular weight of dextrane with measuring density and viscosity.

* Water-absorption of polymers:
  □ Investigation of the water-absorption process by means of Enslin-apparatus.

* Light permeability determination of glass containers:
  □ Investigation of transmittancy of glass containers with different colours in a given wavelength range.

* Investigation of drug release by means of the agar diffusion plate method:
  □ Investigation of drug release from different ointments.

  * Determination of drop weight:
  □ Investigation of the effect of different additives on the drop-weight and surface tension.

PHARMACODYNAMICS-TOXICOLOGY

7th semester

LECTURE


* Pharmacology of sympathomimetics

PRACTICE

Administration of drugs to experimental animals. Demonstration of the local and systemic effect. External and parenteral route of administration.


* Pharmacology of sympatholytics
* Diuretics and antidiuretics  

* Antianginal agents. Antihyperlipidemic agents  
  Investigation of local anaesthetics on frog skin and rabbit cornea. In vitro demonstration of nerve block anaesthesia.

* Cardiotonics, treatment of congestive heart failure  
  Agents acting on the autonomic nervous system. Effects on isolated frog heart, the pupil of rabbit and the salivary secretion of rat.

* Antiarrhythmic agents  
  Agents acting on the autonomic nervous system. Demonstration of drug effects on isolated ganglia and nictitating membrane of cat.

* Antihypertensive therapy. Calcium channel blockers.  
  Drugs acting on renin-angiotensin system  
  Agents acting on the autonomic nervous system. Effects on cholinergic and adrenergic drugs on the blood pressure of anaesthetized animals.

* Pharmacology of blood coagulation. Thrombolytics.  
  Drugs acting on platelets.  
  Agents affecting the smooth muscle function. Demonstration of the action of drugs on isolated ileum.

* Steroidal antiinflammatory drugs. Non-steroidal antiinflammatory drugs.  
  Drugs affecting the striated muscles. Muscle relaxant effect of tubocurarine and succinylcholine.  
  Effect of cardiotonics on isolated frog heart.  
  Demonstration of cardiac action with the help of ECG.

* Antihistamines  
  Diuretic effect of drugs in rats and in anaethetized rabbit.

* Pharmacology of insulin and its congeners. Orally acting antidiabetics  
  Diuretic effect of drugs in rats and in anaethetized rabbit.

* Antitussive agents and mucoregulators. Antiasthmatic agents.  
  Drugs used in the treatment of peptic ulcer.  

* Digestive agents, digestive enzymes  
  Choleretic and laxative drugs. Biliary excretion of BSP. Investigation of laxative effect.

* Laxatives & prokinetic agents  
  Pharmacological effects of histamine and antihistamines. Effect of drugs on permeability of capillaries in rat.

* Drugs for inflammatory bowel disorders, obstipants  
  Investigation of antiphlogistics. Demonstration of drug effect in rat-paw edema, exudative pleuritis and cotton-granuloma tests.

* Drugs acting on bile. Hepatoprotectives  

* Antiemetics  

8th semester

* Hypnotics and sedatives. Pharmacology of barbiturates, benzodiazepines, zolpidem, zopiclone, zaleplone, and miscellaneous drugs. Intoxication with sedato-hypnotics.

* Ethanol, alcoholism, alcohol withdrawal

* Pharmacology of anxiolytic drugs

* Definition of general anaesthesia, stages.

* Inhalational general anaesthetics.

* Intravenous general anaesthetics. Premedication and complementary medication of general anaesthesia. Neureolept-analgesia

* Mechanism of action of local anaesthetics. Therapeutic use of local anaesthetics


* Pharmacotherapy of epilepsies
Curriculum 2014/2015

* Therapy of Parkinson's disease, secondary parkinsonism
* Therapy of Alzheimer's disease and sclerosis multiplex
* Neuroleptics
* Therapy of endogenous depression
* Psychostimulants. Pharmacology of amphetamine
* Hallucinogens
* Peripheral skeletal muscle relaxants
* Centrally acting skeletal muscle relaxants
* Pharmacology of bone metabolism. Osteoporosis, rheumatoid arthritis, osteoarthritis
* Pharmacology of female sex hormone and their antagonists
* Pharmacology of androgens and their antagonists
* General characterisation of contraceptives, oral contraceptives
* Therapy of infertility
* Pharmacology of pituitary hormones
* Pharmacology of thyroid gland
* Drugs acting on the uterine function
* Pharmacology of obesity
* Therapy of erectile dysfunction

PUBLIC HEALTH AND Preventive Medicine
7th semester

LECTURE (2 hrs/week)

*Introduction. The aim and scope of public health and preventive medicine. Basic knowledge of demography.
*Basic knowledge of epidemiology, main types of epidemiological studies. Health status of world population.
*Epidemiology of cardiovascular and cerebrovascular diseases, and malignant tumours.
*Epidemiology of metabolic, gastrointestinal, and chronic respiratory diseases. Epidemiology of accidents and suicide.
*Epidemiology of infectious diseases: enteric, hematogenic and lymphogenic diseases, cutaneous and sexually transmitted diseases.
*Epidemiology of infectious diseases: zoonoses, transmissible spongiform encephalopathies, health care associated infections, infection control (nosocomial surveillance).

HOLIDAY
*Epidemiology of smoking, alcohol and drug consumption (health risks, prevention).
*Structure and operation of health systems. Health and health care in the family (mother, infants, youth, elderly).
*Environmental health. Climate change and health. Health effects of physical, chemical and biological factors of micro- and macro environment.
*Occupational health. Occupational diseases caused by physical, ergonomic and psychosocial exposures.
*Health effects of occupational and environmental chemical exposures. Risk assessment and communication. Chemical safety.

ETHICS IN PHARMACY

Lectures
* Ethics and morality. History of ethics, Ethical theories. Fields of ethics
* Code of Practices, their role in regulation, functions, general content.
* Ethics in health care (autonomy, non-maleficence, beneficence, justice)
* Ethics of the therapeutic relationship
* Allocation of resources in health care, relationship between economy and ethics. Organ donation and transplantation
* The beginning and end of life: abortion, assisted reproductive technics, euthanazia, hospice
* Research ethics
* Sale and promotion of medicinal products, ethical aspects and regulations
* Ethics in pharmacy, Code of Pharmacy Practice

Seminars
* Ethics of pharmacy practice. Pharmaceutical care in pharmacy; Private life of a pharmacist
Pharmacist and different relationships: patient, physician, assistant, pharmacist, other health care workers

* Competency fields of a pharmacist, Promotion and marketing in pharmacy, keeping the secret of the patient
* Pharmaceutical service (strike, misuse of drugs)
* other topics, exam consultation

**DRUG REGULATORY AFFAIRS**

**8th semester**
* Introduction
  * Bacis Acts and Regulations within Pharmacy
  * Regulation of drug research and human clinical trials
  * Drug manufacture, procurement, wholesale distribution
  * Retail medicine supply (to patients) – regulation concerning community pharmacies
  * Regulation of hospital pharmacies
  * Marketing authorization process of medicinal products
  * Prescribing and dispensing of medicinal products
  * Regulation of herbal medicines (mostly in Europe)
  * Regulation of controlled substances (narcotic and addictive products)
  * Advertising and promotion of medicinal products
  * Drug pricing, drug reimbursement or subsidy, governmental drug budget control
  * Regulation of hazardous waste handling
  * Pharmacovigilance-system

**INTRODUCTION TO ECONOMICS**

**7th semester**
* Introduction lecture: affiliation between economics and pharmaceutics, introduction of the necessity of the subject, statement of the syllabus
* Theoretical economics: efficacy, change and comparative benefits, act of decreasing border profit, formation of money and its functions
* Theoretical economics: market processes (demand, offer, rate, benefit, economic profit, inventory profit), market persons
* Theoretical economics: competition, monopoly, price searching (price flexibility, price discrimination)
* Theoretical economics: income allocation, externalies, markets and state, total performance of economic systems
* Theoretical economics: national economic policy, international change, employment and unemployment
* Accountancy and analysis: basic definitions (property, subject tools, etc.), movement of tools and sources, economic events, certificates
* Accountancy and analysis: accounting of economic events, definition of expenses and result, indexes of financial state of employments
* Basics of marketing: marketing research, marketing channels, price policy, marketing communication
* Basics of marketing: marketing planning, marketing strategy, marketing service
* Business planning, financial planning: theory of development of business and financial plan
* Fiscal and monetary policy: functions of the state, subsystems of the finances, persons of financial system and their functions
* Basics of pharmacoeconomics: economic characterizations of the health care market, health care systems, comparability of medicine doses (ATC, DDD), comparative standard indexes of therapies’ efficiency (NNT, NNH, etc.)
* Basics of pharmacoeconomics: measurem of quality of life (QALY, questionnaires), pharmacoeconomic analyses
INTRODUCTION TO LAW (SOCIAL LAW)

7th semester

* Basic terms, introduction to the law
* Basics of constitution and state organizations
* Constitutional law
* Basics on the European Union, European Law
* Basics of civil law: contracts
* Basics of civil law: partnerships and self-employment
* Intellectual property
* Basics of criminal law
* Basics of labour law
* Basics of tax law
* Basics of social security
* Equal treatment

HUNGARIAN FOR PHARMACEUTICAL PURPOSES

1st semester

PRACTICE
(2 hrs/week)

* Video program "The Role of the Pharmacist in the Community". Discussion, new words, expressions.
* A modern pharmacy. General rules, requirements. The laboratory.
* Reading comprehension, vocabulary practice. Briefing pharmaceutical news.
* Mid-term test.
* AIDS. Reading comprehension, discussion. Terminology exercise.
* Life expectancy in different countries. Discussion. Role play.
* Revision. Test.

2nd semester

PRACTICE
(2 hrs/week)

* Pharmacotherapy. Reading comprehension. Vocabulary study.
* Interferon. Translation. Vocabulary study. Short news from "Magyar gyógyszerészet".
* Revision. Mid-term test.
Taleum nasal spray. Vocabulary study. Role play.
* Committee on the Safety of Medicines. Drug tests on animals. Discussion.
* Outstanding personalities of the Faculty of Pharmacy, their scientific achievements.
* General revision. Preparation for the final exam.
* Final test, exam.

**CLINICAL LABORATORY DIAGNOSTICS**

**8th semester**

**Lecture:**

- Obtaining biological samples, general pretest preparation
- Diagnostics of anorganic ions
- Diagnostics of carbohydrate metabolism
- Diagnostics of lipid metabolism
- Proteins
- Rest nitrogen, creatinine, ammonia, urea and bilirubin determinations
- Enzymes, enzyme diagnostics
- Immunoanalytical methods
- Diagnostics of hereditary metabolic diseases
- Endocrinological tests
- DNA based diagnostic tests (PCR, real-time PCR, DNA array)
- Quality control

**Practice:**

- Urine analysis
- Hematology (sampling, test tubes, complete blood count, clotting probes)
- Tumormarkers
- Pregnancy tests
- POCT for blood glucose and hemoglobin A1c
- POCT for cholesterol and triglycerades

**PHARMACY ADMINISTRATION**

**8th semester**

**PRACTICE**

(2 hrs/week)

The aim of the course is to teach pharmacy students about the essential administrative and management steps during everyday work in a community pharmacy. The course gives insight to national and international practices.

Topics covered during the course:
- type of pharmacies
- ownership pharmacies
activities of community pharmacies
storing medications
counterfeit medication
Price of medicines
Health insurance systems, medication reimbursement
Prescription (forms, requirements, essential elements)
Prescribing errors, medication errors
SYLLABUSES FOR 5TH YEAR PHARMACY STUDENTS

PHARMACODYNAMICS III.
9th semester
* Antineoplastic drugs: alkylating agents, antimetabolites
* Immunsuppressants and immunstimulants
* Basic principles of the chemotherapy: resistance, selective toxicity
* Penicillins, cephalosporines
* Pharmacology of the sulfonamides
* Aminoglycosides
* Tetracyclines, macrolides
* Fluoroquinolones and chloramphenicol
* Drugs used in the treatment of tuberculosis
* Antiviral drugs
* Drugs used in the treatment of malaria
* Antifungal agents
* Antiseptic agents
* Antiparasitic agents
* Pharmacology of the vitamins
* Pain management
* Drug treatment in perinatology and gerontology
* Headache disorders: migrain and cluster
* Principles of toxicology and treatment of poisoning

FUNDAMENTALS OF CLINICAL THERAPY

* Internal medicine
* The patient's examination
* The more important diseases of the circulatory system and their therapy
* Diseases of the respiratory system therapy
* Diseases of the kidneys therapy
* Diseases of the digestive system therapy
* The most important diseases of the ductless glands and their therapy
* Diseases of the blood therapeutic possibilities
* Surgery
* Resuscitation restitution of the circulation and of the breathing
* Mass accidents emergency service
* Skull-injuries commotio, contusio, compressio: fracture of bones sprain
* Dull-damages of the chest
* The types of bleeding and their therapy
* Burning damages
* Appendicitis, ileus, acute abdomen
* Pediatrics
* The periods of childhood
* The main stations of the baby's and child's normal development
* The conditions of the reasonable treatment
* The various types of treatment, the sorts of taking in the drugs which are the rules in childhood?
* Special standpoints of drug use in Pediatrics
* Methods of antifebrile therapy in Pediatrics
* Antispasmodic drugs in Pediatrics
* The treatment of circulatory insufficiency and shock
* What to do in case of status(asthmaticus)?
* The most common complaints of the respiratory system in childhood treatment.
* Obstetrics and Gynaecology
* Pharmacological influence of the uterus' activity
* /oxytocin, prostaglandins, beta-mimetics etc./
The starting of a delivery
Disseminated intravascular coagulation /DIC/ placenta praevia, missed abortion, rupture of the uterus
"Extraterin" pregnancy
Acute inflammatory diseases in obstetrics /"post partum" endometritis, septic abortion etc./
Torsion of ovarian cyst's peduncle
Neurology, psychiatry
The role of psychiatry in the education of medical and pharmacy students.
The symptoms of increased intracranial pressure and its treatment
The course of parkinsonism and its treatment
Schizophrenia
Psychosis maniaco-depressiva
Neurological, psychiatric and social consequences of alcoholism
Polytoxicomania
Suicide
Enumeration of psychic abnormalities and the principles of the treatment

CLINICAL PHARMACY I.

Introduction to Clinical Pharmacy
Activity round and function areas of clinical pharmacy. General and special works of clinical pharmacy.
Connection of clinical pharmacist with pharmacotherapy and drug order. Drug safety.
The role and works of pharmacist in the in-patient provision
Place of pharmacist in medical attendance. The role of pharmacist in drug provision. Connection with patients, physicians, nurses, members of other disciplines.
Clinical importance of drug formulation
Non-compliance
Therapeutic drug monitoring
Drug side-effects
Drug side-effects. Classification, reasons of drug side-effects. Drug side-effect monitoring systems.
Drug interactions
Influential factors of development of drug interactions. Mechanism of drug interactions, its evaluating methods. Clinical important interactions.
Drug information
Topics connected with drug information. The role of pharmacist. The sources of information, its storage and retrieval.

VETERINARY PHARMACY (COMPULSORY ELECTIVE SUBJECT)
9th semester

- Introduction to veterinary pharmacy.
- Legal requirements for the sale and supply of veterinary medical products.
- Business and financial aspect of veterinary products.
- Comparative anatomy and physiology.
- FoNo Vet III. Veterinary vaccines
- Animals and human health.
- Food-borne zoonoses.
- Complementary and alternative therapies.
- Health and nutrition of horses and pigs.
- Diseases of cattle, sheep and goats
- Diseases of cats and dogs
- Pigeon healthcare.
- The diseases and healthcare of bees and fish.
- The diseases and healthcare of other small pets (Reptiles, aviary and cage birds, small mammals).
- Veterinary vaccines
- The management of animal soft tissue injuries
- Laboratory animals, knock-out animals, transgenic animals
- Genetically modified foods and organisms

**PHYTOTHERAPY - AN INTRODUCTION TO HERBAL MEDICINE (COMPULSORY ELECTIVE SUBJECT)**

9th semester

**LECTURE**
(2 hrs/week)
* History and modern phytotherapy
  traditional medicinal systems that use plants (TCM, ayurveda, North-America, Africa, European traditions etc.); the principles of evidence-based phytotherapy
* Herbal product regulation
  International outlook
* Phytochemical overview of herbal active substances
  Alkaloids, glycosides, flavonoids, saponins, tannins, bitters, mucilages etc.
* The issue of safety and efficacy
  Standardization, quantification, preclinical and clinical trials, the value of tradizional use
* Plants and the nervous system
  Anxiety, insomnia
  Depression
* Plants and the digestive system
  Stomatitis, gingivitis
  Dyspepsia
  Flatulence
  Gastritis, eptic ulcer
  Kinetosis
  Obstipation
  Diarrhea
* Plants an the cardiovascular system
  Congestive heart failure
  Atherosclerosis, hypertension
  Chronic venous insufficiency, haemorrhoids
  Arterial occlusive disease
* Plants and the renal system
  Infections of the urinary tract
Diuretics, urinary stones
* Plants and the respiratory system
  Cold and flu, rhinitis
  Expectorants
  Mucilaginous drugs, antitussives
  Immunomodulatory drugs
* Plants and the reproductive system
  Premenstrual syndrome
  Menopausal symptoms
  Benign prostatic hyperplasia
* Plants and metabolic diseases
  Lipid metabolism
  Glucose metabolism
  Obesity
* Plants and the cutaneous system
  Antiseptic herbal drugs
  Anti-inflammatory drugs
  Wound healing and post-traumatic drugs
* Plants in the treatment of pain
  Headache
  Migraine
  Articular and muscular pain
* Adaptogenic plants

PHARMACEUTICAL PSYCHOLOGY (COMPULSORY ELECTIVE SUBJECT)

9th semester

LECTURE
(2 hrs/week)
1. Introduction
2. Compliance, adherence, basis of communication
3. Communication barriers I.
4. Communication barriers II.
5. Impression formation
6. Giving information, patient education
7. Non-verbal communication I.
8. Non-verbal communication II.
9. Enhancing the pharmacist-patient relationship
10. Test
11. Consultation

PHARMACEUTICAL CARE

9th semester

LECTURE
(2 hrs/week)
Methods of patient counselling
Sunburn
Allergic rhinitis, atopic dermatitis
Asthma, COPD
Diabetes mellitus
Thromboembolism
Musculoskeletal disorders
Common cold, Flu
Antibacterial therapy
Hypertension
Headache
Insect bite
Constipation & diarrhoea

EVERYDAY DERMATOLOGY (COMPULSORY ELECTIVE SUBJECT)

9th semester

LECTURE
(2 hrs/week)
Cutaneous structure; layers & typical cells
Basic physiological functions of the skin
Acne
Seborrhoeic dermatitis (face and scalp)
Diseases of the Hair (alopecia areata, telogen effluvium, male pattern alopecia)
Psoriasis
Dermatophyte infection of the skin
Candidiasis
Impetigo contagiosa
Folliculitis
Erysipelas
Herpes labialis, herpes genitalis
Herpes zoster
Kaposi’s sarcoma
Gonorrhoea
Syphilis
Scabies
Urticaria
Allergic contact dermatitis
Topical corticosteroids: recommendations for use
Common warts
Condyloma acuminatum
AIDS
Pityriasis versicolor
Dermatological vehicles

QUALITY ASSURANCE (COMPULSORY ELECTIVE SUBJECT)

9th semester

* Introduction: pharmaceutical quality assurance
  ▪ Definitions of „quality”
  ▪ Quality control and conformity assessment
  ▪ From quality control to quality assurance. PDCA
  ▪ Levels of the quality assurance/management
* Certain defect analysis and quality monitoring methods
* Quality assurance in the standardised and regulated fields: different sides of the national quality assurance systems
* The ISO quality assurance standard series
* Good Manufacturing Practices
* Good Laboratory Practices
* Good Clinical Practices
* Good Pharmacy Practices and quality assurance in pharmacies
Vow to be made by 1st year medical and dental students

I, ........ name ........, as the student of the University of Szeged, promise solemnly that I will observe and adhere to the rules and regulations of the Hungarian Republic. Also I will observe and adhere to the rules and regulations of the University of Szeged and I am aware of these. I devote all my best efforts to go through with my studies here as efficiently as possible. I will give my teachers the respect and gratitude which is their due. I will respect the secrets which are confided in me even after the patient has died. I will maintain by all means in my power the honor and the noble traditions of the medical and dental profession. I will devote my time and efforts to learn the progressive achievements of the basic and clinical sciences in order to use this knowledge for advancing medicine and dentistry, for the care of my patients and to promote man's progress on Earth. I make these promises solemnly, freely, and upon my honor.

Oath to be taken by medical and dental graduates

I, ........ name ........, on this occasion of my admission to the ranks of the medical profession swear on my honor to devote my talents and knowledge to the benefit of mankind. I shall hold University of Szeged in esteem. I shall count those who have instructed me in the science of medicine as my masters, and shall show them gratitude and respect at all times. I shall impart my medical knowledge and experience to the generations of physicians to come. I shall constantly labour to increase my erudition with a view to developing and advancing medical science. I shall practice my profession conscientiously. I vow to devote my medical knowledge to the protection of health and to the benefit of the sick. I shall treat and advise patients in the best of their interest and to the best of my knowledge and convictions and I shall strive to safeguard their health against hazardous and injurious effects. I shall reveal no secret concerning my fellow men whether learned within my practice of medicine or outside it unless the law demands this. I shall inform the patients and also their relatives if the patients' interest so requires as to the patients' condition and the method of treatment in a timely and considerate manner. I shall issue a medical certificate only in accordance with my true convictions. I shall conduct myself towards the patients, my fellow physicians and the society as a whole in a matter befitting my calling as a physician. I shall preserve the honor of the medical profession and its noble traditions. I shall not be hampered from fulfilling the duties of my profession on the grounds of social, political, national, racial or religious distinction. I take this oath solemnly and of my own free will.

Vow to be made by 1st year pharmacy students

I, ........ name ........, as the student of the University of Szeged promise solemnly that I will respect the Constitution and laws of the Hungarian Republic. I will also observe and adhere to the rules and regulations of the University of Szeged. I promise to devote all my best efforts to go through with my studies here as efficiently as possible. I will give my teachers the respect and gratitude which is their due. I will respect the secrets of the patients which are confided in me during my course of studies. I will maintain by all means in my power the honor and the noble traditions of my profession. I will devote my time and efforts to learn the progressive achievements of the basic and clinical sciences in order to use this knowledge for advancing medicine, for the care of my patients and to promote man's progress on Earth. I make these promises solemnly, freely and upon my honor.

Oath to be taken by pharmacy graduates

I, ........ name ........, hereby swear that I shall always maintain an attitude in accordance with my vocation as a pharmacist. In my professional practice I shall proceed with the greatest degree of conscientiousness and with the utmost diligence. I shall always behave worthy of my profession. As part of the healing work I shall devote all my energies to the protection and recovery of the health of the individual and society. I shall not reveal any data concerning the health status or the medication of my patients unless the law obliges me to. 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. I shall use my knowledge only for the defence and restoration of health of my fellow humans. I shall do my best to promote the science of pharmacy and keep the good name of the University of Szeged. I take this oath solemnly and of my own free will.