

**BULLETIN**

**UNIVERSITY OF DEBRECEN  
MEDICAL AND HEALTH SCIENCE CENTER**

**ACADEMIC YEAR of 2012/2013**

**FACULTY OF MEDICINE**

International Education Center



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# CHAPTER 1

## INTRODUCTION

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### MISSION STATEMENT OF THE UNIVERSITY OF DEBRECEN MEDICAL AND HEALTH SCIENCE CENTER

The aim of the Medical and Health Science Center of the University of Debrecen is to become a university of medical sciences committed to the prevention and restoration of health of the people, not only in its region but in the entire country.

In the past two decades both medical science and health care have entered a new era: the medical science of the 21<sup>st</sup> century. Molecular medicine is opening up and new possibilities are available for the diagnosis, prevention, prediction and treatment of the diseases. One can witness such a progress in medical sciences that has never been seen before. Modern attitudes in health care should be enforced in practice, including therapeutical approaches that consider the explanation and possible prevention of diseases, and attempt to comprehend and take the human personality into consideration. These approaches demand the application of the most modern techniques in all fields of the medical education.

All curricula of the Medical and Health Science Center of the University of Debrecen wish to meet the challenges of modern times and they embody some very basic values. They are comprehensive; they take into consideration the whole human personality (body and soul) in its natural and social surroundings; and they are based upon the best European humanistic traditions. Moreover, all curricula prepare students for co-operation and teamwork.

With respect to **education**, both students and teachers are inspired to acquire higher levels of professionalism, precision, and problem solving skills, upon which the foundations of specialist training and independent medical practice can be built. This approach enables the assimilation of new scientific developments, facilitating further education and the continuous expansion of knowledge. The interplay of these factors ensures the ability to understand and handle the changing demands of health care.

With respect to **research**, the faculty members of the Medical and Health Science Center continuously acquire, internalize and subsume new knowledge, especially concerning the genesis, possible prevention and treatment of diseases. Moreover, new information aimed at improving, preserving and restoring the health of the society is also absorbed. The Medical and Health Science Center of the University of Debrecen is already internationally recognized in the fields of both basic and clinical research, and the clinicians and scientists of the Center are determined to preserve this achievement. Special attention is given to facilitate and support the close co-operation of researchers representing basic science and clinical research, and/or interdisciplinary studies.

With respect to **therapeutic practice**, the main objective is to provide high quality, effective, up to date and much devoted health care to all members of the society, showing an example for other medical institutions in Hungary. One of the primary tasks is to continuously improve the actual standards of the diagnostic and therapeutic procedures and techniques, and to establish regional or even nationwide protocols.

With respect to **servicing the community**, all faculty members of the Medical and Health Science Center wish to play a central role in shaping the policies of the health service; both within the region and in Hungary. They also want to ensure that sufficient number of medical doctors, dentists and other health care experts with university education is provided for the society.

With respect to the **development of the Medical and Health Science Center**, all employees strive for reinforcing those features and skills of the lecturers, scientists, medical doctors, health care professionals, collaborators and students which are of vital importance in meeting the challenges of medical education, research and therapy of the 21<sup>st</sup> century. These include humanity, empathy, social sensitivity, team-spirit, creativity, professionalism, independence, critical and innovative thinking, co-operation and management.

The organizational structure, including the multi-faculty construction of the institution, is a constantly improving, colorful educational environment, in which co-operation is manifest between the individual faculties and colleges, the various postgraduate programs as well as the molecular- and medical biology educations.

### HIGHER EDUCATION IN DEBRECEN

#### A Brief History

1235: First reference to the town of Debrecen in ancient charters.

1538: Establishment of the "College of Reformed Church" in Debrecen.

1567: Higher education begins in the College.

1693: Declaration of Debrecen as a "free royal town".

1849: Debrecen serves as the capital of Hungary for 4 months.

1912: Establishment of the State University of Debrecen comprising the Faculties of Arts, Law, Medicine and Theology.

1918: Inauguration of the Main Building of the Medical Faculty by King Charles IV of Hungary.

1921: The Medical Faculty becomes operational.

1932: Completion of buildings of the campus.  
 1944: Although during the Second World War, Debrecen became the capital of Hungary again (for 100 days), the University itself is abandoned for a while.  
 1949: The only year when the University has five faculties.  
 1950: The Faculty of Law idles; the Faculty of Science is established.  
 1951: The University is split up into three independent organizations: Academy of Theology, Medical School, Lajos Kossuth University of Arts and Sciences.  
 1991: The “Debrecen Universitas Association” is established.  
 1998: The “Federation of Debrecen Universities” is founded.  
 2000: The federation is transformed into the unified “University of Debrecen” with all the relevant faculties and with some 20,000 students.

Debrecen is the traditional economic and cultural center of Eastern Hungary. In the 16<sup>th</sup> century Debrecen became the center of the Reformed Church in Hungary and later it was referred to as the "Calvinist Rome". The 17<sup>th</sup> century was regarded as the golden age of the city because Debrecen became the mediator between the three parts of Hungary: the part under Turkish occupation, the Kingdom of Hungary and the Principality of Transylvania. For short periods of time, Debrecen served twice as the capital of Hungary. Nowadays, with its population of approximately a quarter of a million, it is the second largest city in Hungary.

Debrecen is a unique city: although it has no mountains and rivers, its natural environment is rather interesting. One of the main attractions and places of natural uniqueness in Hungary is Hortobágy National Park, known as “puszta” (“plain”), which begins just in the outskirts of Debrecen. This is the authentic Hungarian Plain without any notable elevations, with unique flora and fauna, natural phenomena (e.g. the Fata Morgana), and ancient animal husbandry traditions. The region is unmatched in Europe, no matter whether one considers its natural endowments or its historic and ethnographic traditions. A very lovely part of Debrecen is the “Nagyerdő” (“The Great Forest”), which is a popular holiday resort. Besides a number of cultural and tourist establishments, luxurious thermal baths and spas, Nagyerdő accommodates the University campus too.

The history of higher education in Debrecen goes back to the 16<sup>th</sup> century when the College of the Reformed Church was established. The University Medical School of Debrecen has its roots in this spiritual heritage. It was in the year of the millennium of the establishment of Hungary (1896) when the foundation of the present University was decided. The University of Debrecen was established in 1912, initially having four faculties (Faculties of Arts, Law, Medicine and Theology). The University was officially inaugurated by King Charles IV of Hungary on October 23<sup>rd</sup>, 1918.

The educational activity at the University started in 1924, although the construction of the whole University was completed only in 1932. In 1951 the Faculty of Medicine became a self-contained, independent Medical University for training medical doctors.

The special training of dentists began in 1976. As a further development the University Medical School established the Health College of Nyíregyháza in 1991. In 1993, as part of a nationwide program, the University was given the rights to issue scientific qualifications and new Ph.D. programs were also launched. Several new programs (e.g. the training of molecular biologists, pharmacists, general practitioners) were commenced in the '90s. The Faculty of Public Health was established in 1999, while the Faculty of Dentistry was founded in the academic year 2000/2001.

The architectural and instrumental developments of the University Medical School of Debrecen (UMSD) were completed in several stages. In the '70s, the Theoretical Building and the new building of Dentistry were completed. The second phase of development was the establishment of the new Dialysis Center and the Cardiac Surgery Unit in the early '90s. The next stage was the construction of the 3<sup>rd</sup> Department of Medicine and various radiological units (PET, linear accelerator, etc.) in the second half of the decade. The Life Science Building and a new library (with lecture halls, reading rooms and 200 computer terminals freely available for the students) were completed in 2006. At present, the Debrecen Building of the Health College is being planned.

The Medical and Health Science Center of the University of Debrecen celebrated the 90<sup>th</sup> anniversary of its foundation in October 2008 with a highly successful international scientific conference.

### **Education at the Medical and Health Science Center of the University of Debrecen**

Debrecen, the second largest city of Hungary, is situated in Eastern Hungary. Students enrolled in the various programs (e.g. General Medicine, Dentistry, Pharmacy, Public Health, Molecular Biology, etc.) study on a beautiful campus situated in the area called “Great Forest”.

The Hungarian Government gives major priorities to the higher education of health sciences in its higher education policy. One of these priorities is to increase the ratio of college level training forms within the Hungarian higher education system. The governmental policy wishes to implement conditions in which the whole health science education system is built vertically from the lowest (post-secondary or certificate) to the highest (PhD-training) levels. In fact, this governmental policy was the reason behind the establishment of the new Health Science Education Center within the Federation of Debrecen Universities (DESZ), based partially on the intellectual resources of the University of Debrecen Medical and Health Science Center. The new programs – with specialized training for paramedics – will help

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to correct the balance of the Hungarian labor-market that became rather unsettled in the past few decades.

The Act of Higher Education (1993) has restored the rights of the medical universities to award postgraduate degrees and residency, and permission was also given to license Physicians' procedures. This kind of training required a new structure, a new administrative apparatus, and a suitable training center. The new residency programs were commenced in 1999.

The introduction of the credit system, starting in September 2003, has been mandatory in every Hungarian university, helping the quantitative and qualitative evaluation of the students' achievements. Admission requirements for Hungarian students are defined at national level, and they are applicable for every student wishing to be enrolled into the General Medicine or Dentistry programs.

International students must pass an entrance interview in biology and (depending on their preference) in physics or chemistry. In some special cases it may be possible for the candidates to apply for transfer to higher years on the basis of their previous studies and achievements. International students study in English language, but those fluent in Hungarian may use this language also during their studies. Entrance for certain courses of the Health College is also possible on the basis of a special evaluation (scoring) and an entrance interview.

The syllabuses and classes of all courses correspond to European standards. The total number of contact hours in medical education is over 5,500, which can be divided into three main parts: basic theoretical training (1<sup>st</sup> and 2<sup>nd</sup> year), pre-clinical subjects (3<sup>rd</sup> year) and clinical subjects (4<sup>th</sup> and 5<sup>th</sup> year) followed by the internship (6<sup>th</sup> year). The proportion of the theoretical and practical classes is 30% to 70%; whereas the students/instructors ratio is about 8/1. The first two years of dentistry education are similar to the general medicine program, but the former contains a basic dental training that is followed by a three-year-long pre-clinical and clinical training. Besides the general medicine and dentistry programs, there are several other courses also available, including molecular biology. The various Health College courses include more and more new curricula.

The General Medicine program delivered in English and intended for international students was commenced in 1987; whereas the Dentistry and Pharmacy programs for international students started in 2000 and 2004, respectively. The curriculum of the English language General Medicine program meets all the requirements prescribed by the European medical curriculum, which was outlined in 1993 by the Association of Medical Schools in Europe. Compared to the Hungarian program, the most important differences are:

-Hungarian language is taught,

-More emphasis is laid upon the tropical infectious diseases (as parts of the "Internal Medicine" and "Hygiene and Epidemiology" courses).

Otherwise, the English language curriculum is identical with the Hungarian one. The 6<sup>th</sup> year of the curriculum is the internship that includes Internal Medicine, Pediatrics, Surgery, Obstetrics and Gynecology, Neurology, and Psychiatry. The completion of these subjects takes at least 47 weeks, although students are allowed to finish them within a 24-month-long period. The successfully completed internship is followed by the Hungarian National Board Examination. Just like the rest of the courses, the internship is also identical in the Hungarian and English programs.

A one-year-long premedical (Basic Medicine) course, which serves as a foundation year, is recommended for those applicants who do not possess sufficient knowledge in Biology, Physics and Chemistry after finishing high school.

After graduation, several interesting topics are offered for PhD training, which lasts for three years. If interested, outstanding graduates of the English General Medicine and Dentistry programs may join these PhD courses ("English PhD-program"). Special education for general practitioners has been recently started and a new system is in preparation now for the training of licensed physicians in Debrecen.

### **The accredited PhD programs of the Medical and Health Science Center include the following topics:**

-Molecular and Cell Biology; Mechanisms of Signal Transduction

-Microbiology and Pharmacology

-Biophysics

-Physiology-Neurobiology

-Experimental and Clinical Investigations in Hematology and Hemostasis

-Epidemiological and Clinical Epidemiological Studies

-Cellular- and Molecular Biology: Study of the Activity of Cells and Tissues under Healthy and Pathological Conditions

-Immunology

-Experimental and Clinical Oncology

-Public Health

-Preventive Medicine

-Dental Research

The PhD-programs are lead by more than 100 accredited, highly qualified coordinators and tutors.

### **Medical Activity at the University of Debrecen Medical and Health Science Center (UDMHSC)**

The UDMHSC is not only the second largest medical school in Hungary, but it is also one of the largest Hungarian hospitals, consisting of 49 departments; including 18 different clinical departments with more than 1,800 beds serving 62,000 inpatients and 670,000 outpatients every year. The UDMHSC is not only the best-equipped institution in the area but it also represents the most important health care facility for the day-to-day medical care in its region (including an adult hemodialysis center, open-heart surgery facilities, kidney transplantation unit, etc.).

The Kenézy Gyula County Infirmary (with some 1,400 beds) is strongly affiliated with the UDMHSC and plays an important role in teaching the practical aspects of medicine. The Department of Obstetrics and Gynecology of the UDMHSC has been an official reference center of the World Health Organization (WHO) for several years. There are also close contacts between the University and other health care institutions, mainly (but not exclusively) in its closer region. The UDMHSC has a Teaching Hospital Network consisting of 10 hospitals in nearby counties.

It is also of importance that the UDMHSC has a particularly fruitful collaboration with the Nuclear Research Institute of the Hungarian Academy of Sciences in Debrecen, allowing the coordination of all activities that involve the use of their cyclotron in conjunction with various diagnostic and therapeutic procedures (e.g. Positron Emission Tomography 'PET').

### **Scientific Research at the University of Debrecen Medical and Health Science Center**

Scientific research is performed both at the departments for basic sciences and at the laboratories of clinical departments. The faculty members of the UDMHSC publish about 600 scientific papers every year in international scientific journals. According to the scientometric data, the UDMHSC is among the 4 best of the more than 80 Hungarian research institutions and universities. Lots of scientists reach international recognition, exploiting the possibilities provided by local, national and international collaborations. Internationally acknowledged research areas are Biophysics, Biochemistry, Cell Biology, Immunology, Experimental and Clinical Oncology, Hematology, Neurobiology, Molecular Biology, Neurology, and Physiology. The scientific exchange program involves numerous foreign universities and a large proportion of the faculty members are actively involved in programs that absorb foreign connections (the most important international collaborators are from Belgium, France, Germany, Italy, Japan, the UK and the USA).

### **New Facilities at the University of Debrecen Medical and Health Science Center**

The development of the UDMHSC has been accelerated in recent years, with the following important results:

- New units have been developed to increase the quality of the medical care (Center for Nephrology, a newly constructed building serving the Cardiology and Heart Surgery Departments, a Kidney Transplantation Unit, a new building for the 3<sup>rd</sup> Department of Medicine).
- Up to date medical imaging equipments (including X-ray, MRI and PET) are now available for research and diagnostic purposes.
- The internationally acknowledged Gamma Radiosurgery Center of Debrecen allows the application of a unique method for the treatment of neurological diseases - even within one day.
- A Hungarian-Japanese Center for Electron Microscopy has been founded recently.
- The fiber optic cable computer network of the University is connected to the Internet World Academic Computer System via the metropolitan FDDI network. Students can use up to 30 terminals at the same time in the Education Center, in the Center for Educational Development, and in a number of other departments. There is a continuous development in this area with new Ethernet and ATM networks.
- A new computer center will be established for students, having 40 workstations connected to the Internet in one of the Students' Hostels. The access will be available free of charge for all students of the UDMHSC.
- A new linear accelerator has been purchased for patients requiring radiology treatment.
- New Life Science Building and Library have been built recently.
- A similar project, aimed at the construction of a new building for the Health College Faculty in Debrecen, has been initiated.
- A new building belonging to the Faculty of Dentistry has been built.
- In the frame of the "Augusta Program" – that was launched in 2005 – a center has been established dealing with cardiovascular and tumorous diseases. The primary goal of the program is to reduce the mortality of these severe disorders.
- A new PET/CT equipment started to operate in the UDMHSC in May 2007. This high-tech equipment not only allows easier, earlier, and more precise diagnosis of various tumorous diseases, but it also helps in the early recognition of several neurological and cardiovascular disorders.

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## CHAPTER 2

### ORGANISATION STRUCTURE

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**CHAPTER 3**


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 Ms. Eszter Pályu M.D.  
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**CHAPTER 4**


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## CHAPTER 5

# UNIVERSITY CALENDAR

### UNIVERSITY CALENDAR FOR MEDICINE PROGRAM 2012/2013 ACADEMIC YEAR

**CRASH COURSE OF HUNGARIAN LANGUAGE:** 27<sup>th</sup> August - 7<sup>th</sup> September, 2012

**OPENING CEREMONY:** 9<sup>th</sup> September, 2012

**MEDICAL DOCTOR GRADUATION:** 15<sup>th</sup> September, 2012, December, 2012, June 2013, September 2013, December 2013

#### 1<sup>st</sup> SEMESTER

Year	Course	Examination Period
Basic Medicine Course	10 <sup>th</sup> September 2012 - 21 <sup>st</sup> December, 2012 (15 weeks)	27 <sup>th</sup> December, 2012 - 8 <sup>th</sup> February, 2013 (6.5 weeks)
1 <sup>st</sup> year Medicine 2 <sup>nd</sup> year Medicine 3 <sup>rd</sup> year Medicine	10 <sup>th</sup> September, 2012 - 21 <sup>st</sup> December, 2012 (15 weeks)	27 <sup>th</sup> December, 2012 - 8 <sup>th</sup> February, 2013 (6.5 weeks)
4 <sup>th</sup> year Medicine 5 <sup>th</sup> year Medicine	10 <sup>th</sup> September 2012 - 21 <sup>st</sup> December, 2012 (15 weeks - 4 weeks block practice included)	27 <sup>th</sup> December, 2012 - 8 <sup>th</sup> February, 2013 (6.5 weeks)

#### 2<sup>nd</sup> SEMESTER

Year	Course	Examination Period
BMC	11 <sup>th</sup> February - 24 <sup>th</sup> May, 2013 (15 weeks)	27 <sup>th</sup> May - 21 <sup>st</sup> June, 2013 (4 weeks)
BMC II	7 <sup>th</sup> January - 21 <sup>st</sup> June, 2013 (24 weeks)	24 <sup>th</sup> June - 12 <sup>th</sup> July, 2013 (3 weeks)
1 <sup>st</sup> year Medicine 2 <sup>nd</sup> year Medicine 3 <sup>rd</sup> year Medicine	11 <sup>th</sup> February - 24 <sup>th</sup> May, 2013 (15 weeks)	27 <sup>th</sup> May - 12 <sup>th</sup> July, 2013 (7 weeks)
4 <sup>th</sup> year Medicine 5 <sup>th</sup> year Medicine	11 <sup>th</sup> February - 24 <sup>th</sup> May, 2013 (15 weeks)	4 <sup>th</sup> year: 27 <sup>th</sup> May - 12 <sup>th</sup> July, 2013 (7 weeks) 5 <sup>th</sup> year: 27 <sup>th</sup> May - 19 <sup>th</sup> July, 2013 (8 weeks)

#### SUMMER HOSPITAL PRACTICE

YEAR	DATE IN 2013
1 <sup>st</sup> year Medicine and 2 <sup>nd</sup> year Medicine	15 <sup>th</sup> July - 9 <sup>th</sup> August or 12 <sup>th</sup> August - 6 <sup>th</sup> September, 2013 (4 weeks)
3 <sup>rd</sup> year Medicine	15 <sup>th</sup> July - 2 <sup>nd</sup> August or 5 <sup>th</sup> August - 23 <sup>rd</sup> August, 2013 (3 weeks)
4 <sup>th</sup> year Medicine (freely chosen)	15 <sup>th</sup> July - 6 <sup>th</sup> September, 2013 (3 weeks between these dates)

**DEADLINE OF ENROLLING FOR THE SUMMER PRACTICE IS 19 APRIL, 2013**

## CHAPTER 6

### ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

**Basic Medicine Course (BMC, Premedical Studies)**
**Duration of studies:** 1 year (2 semesters)

A one year premedical Basic Medicine Course is recommended to those not having sufficient knowledge in Biology, Physics and Chemistry from high school. In addition to these subjects courses in English, Latin and basic Hungarian are also available. The requirements in these premedical science subjects are rigorous thus it is recommended that students who need a period of preparation prior to beginning the General Medicine, Dentistry or Pharmacy Program join the Basic Medicine Course. Students successfully completing the course are directly admitted to their chosen program. In addition to the Basic Medicine Course starting each September our University launches a Short BMC in January as well.

## Department of Biophysics and Cell Biology

 Subject: **INTRODUCTION TO BIOPHYSICS I.**

 Year, Semester: Basic Medicine Course 1<sup>st</sup>

Number of teaching hours:

 Lecture: **60**

 Seminar: **30**
**1<sup>st</sup> week:**
**Lecture:** 1. Introduction to modern physics. Standards of length, mass, time. 2. Conversion of units. Useful mathematics. Trigonometry.

**2<sup>nd</sup> week:**
**Lecture:** 3. Motion in one dimension, displacement, velocity, acceleration, motion diagrams. 4. Freely falling objects.

**3<sup>rd</sup> week:**
**Lecture:** 5. Vectors and their properties. Components of vectors. Displacement, velocity and acceleration in two dimensions. 6. Motion in two dimensions. Relative velocity.

**4<sup>th</sup> week:**
**Lecture:** 7. The laws of motion. Newton's First, Second and Third Law. 8. Applications of Newton's Laws. Forces of friction.

**Self Control Test (First SCT (Chapters 1-3))**
**5<sup>th</sup> week:**
**Lecture:** 9. Energy. Work. Kinetic energy and the work-energy theorem. Gravitational potential energy. 10. Spring potential energy. System and energy conservation. Power. Work done by varying forces.

**6<sup>th</sup> week:**
**Lecture:** 11. Momentum and impulse. Conservation of momentum. 12. Collisions. Elastic and inelastic collisions.

**7<sup>th</sup> week:**
**Lecture:** 13. Angular speed and angular acceleration. Rotational motion under constant angular acceleration. 14. Centripetal acceleration. Newtonian gravitation. Kepler's laws.

**8<sup>th</sup> week:**
**Lecture:** 15. Torque and the two conditions for equilibrium. The center of gravity. 16. Rotational kinetic energy. Angular momentum.

**Self Control Test (Second SCT (Chapters 5-7))**
**9<sup>th</sup> week:**
**Lecture:** 17. States of matter. Deformation of solids. The Young's's, shear and bulk modulus. 18. Density and pressure. Variation of pressure with depth. Pressure measurements. Buoyant forces and Archimedes's principle. Fluids in motion.

**10<sup>th</sup> week:**
**Lecture:** 19. Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids. 20. Macroscopic description of an ideal gas. The kinetic theory of gases.

**11<sup>th</sup> week:**
**Lecture:** 21. Energy in thermal processes. Heat and internal energy. 22. Specific heat. Calorimetry. Latent heat and phase change.

**Self Control Test (Third SCT (Chapters 7-9))**
**12<sup>th</sup> week:**
**Lecture:** 23. The first law of thermodynamics. 24. The second law of thermodynamics. Entropy. Refrigerators and heat pumps.

## ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

**13<sup>th</sup> week:**

**Lecture:** 25. Elastic potential energy. Hook's law. Simple harmonic motion. Motion of a pendulum. 26. Waves. Frequency, amplitude and wavelength. Interference of waves. Reflection of waves.

**14<sup>th</sup> week:**

**Lecture:** 27. Sound. Energy and intensity of sound waves. Shock waves, standing waves. 28. Doppler effect. The ear

and the principles of hearing.

**Self Control Test (Fourth SCT (Chapters 10-13))**
**15<sup>th</sup> week:**

**Lecture:** 29. Interactive seminar and preparation for ESE. 30. Interactive seminar and preparation for ESE.

## Requirements

The program consists of lectures and seminars. Attendance at seminars is compulsory and is recorded.

Place of lectures: Life Science Building, room No. 003.004

Place of seminars: seminar room of the Biophysics Department (Life Science Building)

1. Lectures: Attendance to lectures is emphatically recommended. All material covered in lectures is an integral part of the subject and therefore included in the self-control tests and the final exam. Some new concepts and ideas are discussed in the lectures only and are not present in the textbook.

2. Seminars: Topics of the seminars: 1st week: Information about requirements. Introduction to modern physics. 2nd to 29th weeks: The topics of the seminars follow the topics of the lectures with one or two weeks delay.

Attendance to seminars is obligatory. With acceptable excuse students may miss maximum 4 (four) seminars. Students missing 5-7 seminars can not be exempted from the End of Semester Examination or Final Examination, regardless their score reached on the Self Control Tests. Students missing 8 (eight) or more seminars are excluded from the class. Students are encouraged to ask questions related to the topic of the lectures discussed, and participate in solving physical problems related to the topic of the seminar.

The course ends with a Final Exam (FE) in the summer examination period. Four FE dates will be set during the 4 weeks of the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances).

Exemption is offered for students who achieve excellent academic performance during their study on the following base: Students with higher than 75 % average CT result of the 3 best tests and achieve minimum 50% of the CTs offered in the first semester will be exempted from the ESE.

One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the eight CTs offered in the first and second semester, and the average of the 3 best CTs in both semesters is higher than 75 %.

If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the CTs) in the second semester, he or she will be exempted from the FE.

Students who could not meet the above described conditions for exemption during the two semesters must sit for the FE from the whole material of the first and second semesters.

Control tests, End of Semester Exams, and Final Exams will be assessed as follows.

Percentage: Mark

0.00 - 49.99 fail (1)

50.00 - 64.99 pass (2)

65.00 - 74.99 satisfactory (3)

75.00 - 84.99 good (4)

85.00 - 100 excellent (5)

Absence for any reason counts as 0%.

Consulting person: Zsolt Fazekas educational manager

Consulting hours: Life Science building seminar room

Tuesday 10.00-12.00

Wednesday 10.00-11.00

Thursday 10.00-12.00

Friday 10.00-11.00

## Department of Human Genetics

Subject: **INTRODUCTION TO BIOLOGY I.**

Year, Semester: Basic Medicine Course 1<sup>st</sup>

Number of teaching hours:

Lecture: **60**

Seminar: **30**

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

**Lecture:** Introduction.

Studying Life.

The chemistry of life 1.

The chemistry of life 2.

### 2<sup>nd</sup> week:

**Lecture:** Macromolecules and the origin of life 1.

Macromolecules, and the origin of life 2.

Cells: The Working units of life 1.

Cells: The Working units of life 2.

### 3<sup>rd</sup> week:

**Lecture:** Cells: The Working units of life 3.

The dynamic cell membrane 1.

The dynamic cell membrane 2.

The dynamic cell membrane 3.

### 4<sup>th</sup> week:

**Lecture:** Energy, enzymes and metabolism 1.

Energy, enzymes and metabolism 2.

Energy, enzymes and metabolism 3.

Pathways that harvest chemical energy 1.

### 5<sup>th</sup> week:

**Lecture:** Pathways that harvest chemical energy 2.

Pathways that harvest chemical energy 3.

Photosynthesis: Energy from Sunlight 1.

Photosynthesis: Energy from Sunlight 2.

### Self Control Test

### 6<sup>th</sup> week:

**Lecture:** Chromosomes, the cell cycle and cell division 1.

Chromosomes, the cell cycle and cell division 2.

Chromosomes, the cell cycle and cell division 3.

Chromosomes, the cell cycle and cell division 4.

### 7<sup>th</sup> week:

**Lecture:** Genetics: Mendel and beyond 2.

Genetics: Mendel and beyond 3.

Genetics: Mendel and beyond 4.

Genetics: Mendel and beyond 5.

### 8<sup>th</sup> week:

**Lecture:** DNA and it's role in heredity 1.

DNA and it's role in heredity 2.

DNA and it's role in heredity 3.

From DNA to protein: Genotype, Phenotype 1.

### Self Control Test

### 9<sup>th</sup> week:

**Lecture:** From DNA to protein: Genotype, Phenotype 2.

From DNA to protein: Genotype, Phenotype 3.

From DNA to protein: Genotype, Phenotype 4.

Genetics of viruses and prokaryotes 1.

### 10<sup>th</sup> week:

**Lecture:** Genetics of viruses and prokaryotes 2.

Genetics of viruses and prokaryotes 3.

Genetics of viruses and prokaryotes 4.

The eukaryotic genome and its expression.

### 11<sup>th</sup> week:

**Lecture:** Recombinant DNA and Biotechnology DNA 1.

Recombinant DNA and Biotechnology DNA 2.

Genome sequencing, molecular biology and medicine 1.

Genome sequencing, molecular biology and medicine 2.

### 12<sup>th</sup> week:

**Lecture:** Cellular signaling and communication 1.

Cellular signaling and communication 2.

The mechanisms of evolution 1.

The mechanisms of evolution 2.

### Self Control Test

### 13<sup>th</sup> week:

**Lecture:** The evolution of genes and genomes 1.

The evolution of genes and genomes 2.

Bacteria and Archaea.

The origin and diversification of the Eukaryote.

### 14<sup>th</sup> week:

**Lecture:** Fungi: pathogens, parasites and plant partners.

Animal origins and the evolution of body plan 1.

Animal origins and the evolution of body plan 2.

Deuterostomate animals.

### 15<sup>th</sup> week:

**Lecture:** Primates and the evolution of Humans.

Primates and the evolution of Humans.

Differential gene expression in development 1.

Differential gene expression in development 2.



## Requirements

The 2-semester course consists of lectures and seminars. Attendance at the seminars is compulsory. In each semester four Control Tests (CTs) are organized.

The first semester of the course ends with an End of Semester Examination (ESE). Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). Students who fail even the 3rd ESE (C chance) may continue the study in the second semester; however, they lose their chance to be exempted from the final examination.

The course ends with a Final Exam (FE) in the summer examination period. Four FE dates will be set during the 4 weeks of the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances). Exemption is offered for students who achieve excellent academic performance during their study on the following base: Students with higher than 75 % average CT result of the 3 best tests (out of the four SCT organized in the first semester) will be exempted from the ESE provided the fourth test result is minimum 50% pass (2). One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the eight CTs offered in the first and second semester, and the average of the 3 best CTs in both semesters is higher than 75 %. If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the SCTs) in the second semester, he or she will be exempted from the FE. Students who could not meet the above described conditions for exemption during the two semesters must sit for the FE from the whole material of the first and second semesters.

Control tests, End of Semester Exams, and Final Exams will be assessed as follows.

Percentage (%)	Mark
0 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

## Department of Medical Chemistry

Subject: **INTRODUCTION TO MEDICAL CHEMISTRY I.**

Year, Semester: Basic Medicine Course 1<sup>st</sup>

Number of teaching hours:

Lecture: **60**

Seminar: **30**

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

**Lecture:** Introduction to general chemistry. Elements. Symbols for the elements. The SI system of measurement. Atoms. The structure of atoms. Nuclear arithmetic. Molecules and ions, compounds and mixtures.

### 2<sup>nd</sup> week:

**Lecture:** Chemical formulas. Naming chemical compounds. Chemical equations. Avogadro's number and the mole. Atomic, molecular and molar mass relationships. Stoichiometry: chemical arithmetic. Yields of chemical reactions. Empirical and molecular formulas.

### 3<sup>rd</sup> week:

**Lecture:** Light and the electromagnetic spectrum. Atomic spectra. The Bohr model of the hydrogen atom. The quantum mechanical model of the atom. Orbitals and

quantum numbers. Quantum mechanics and atomic spectra.

### 4<sup>th</sup> week:

**Lecture:** Electron configurations and the periodic table. Classification of the elements. Representative and transition elements. The sizes of atoms and ions. Ionization energy, electron affinity, electronegativity.

### 5<sup>th</sup> week:

**Lecture:** FIRST CONTROL TEST Chemical bonds: metallic, ionic and covalent bonds. Electron-dot structures for molecular compounds and polyatomic ions.

## CHAPTER 6

**6<sup>th</sup> week:**

**Lecture:** Single and multiple covalent bonds. Valence bond theory. Molecular shapes: the VSEPR model. Hybridization. Intermolecular forces.

**7<sup>th</sup> week:**

**Lecture:** The gaseous state. Gases and gas pressure. The gas laws. The ideal gas law. Stoichiometric relationships with gases. Kinetic-molecular theory of gases.

**8<sup>th</sup> week:**

**Lecture:** Liquid and solid states. Phase changes. Evaporation, vapor pressure, boiling point. Solutions and their properties. Concentration of solutions. Units of concentration: molarity, mass percent, molality. Dilution of solutions. Some factors affecting solubility. The chemistry of water. Ions in aqueous solution: electrolytes and nonelectrolytes.

**9<sup>th</sup> week:**

**Lecture:** SECOND CONTROL TEST. Chemical equilibrium. The equilibrium constant factors that alter the composition of an equilibrium mixture.

**10<sup>th</sup> week:**

**Lecture:** Acids and bases. The pH in solutions of strong acids and strong bases. Equilibria in solutions of weak

acids. Equilibria in solutions of weak bases. Relation between  $K_a$  and  $K_b$ .

**11<sup>th</sup> week:**

**Lecture:** Thermochemistry. Energy changes and energy conservation. Internal energy and state functions. Expansion work. Energy and enthalpy. The thermodynamic standard state. Hess's law. Chemical calculus.

**12<sup>th</sup> week:**

**Lecture:** THIRD CONTROL TEST. Chemical reactions in perspective. Oxidation and reduction. Oxidation state.

**13<sup>th</sup> week:**

**Lecture:** The activity series of the elements. Balancing redox reactions. Galvanic cells.

**14<sup>th</sup> week:**

**Lecture:** Hydrogen. The main group elements. The s-block and p-block metals. The d-block metals.

**15<sup>th</sup> week:**

**Lecture:** FOURTH CONTROL TEST. Noble gases. The halogens. Compounds of the halogens.

## Requirements

The 2-semester course consists of lectures and seminars. Attendance at the seminars is compulsory. In each semester four Control Tests (CTs) are organized.

The first semester of the course ends with an End of Semester Examination (ESE). Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). Students who fail even the 3rd ESE (C chance) may continue the study in the second semester; however, they lose their chance to be exempted from the final examination.

The course ends with a Final Exam (FE) in the summer examination period. Four FE dates will be set during the 4 weeks of the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances). Exemption is offered for students who achieve excellent academic performance during their study on the following base:

Students with higher than 75 % average CT result of the 3 best tests and achieve minimum 50% of the CTs offered in the first semester will be exempted from the ESE.

One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the eight CTs offered in the first and second semester, and the average of the 3 best CTs in both semesters is higher than 75 %.

If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the CTs) in the second semester, he or she will be exempted from the FE.

Students who could not meet the above described conditions for exemption during the two semesters must sit for the FE from the whole material of the first and second semesters.

Control tests, End of Semester Exams, and Final Exams will be assessed as follows.

<b>Percentage:</b>	<b>Mark</b>
0.00 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)
Absence for any reason counts as 0%.	

## Department of Biophysics and Cell Biology

Subject: **INTRODUCTION TO BIOPHYSICS II.**

Year, Semester: Basic Medicine Course 2<sup>nd</sup>

Number of teaching hours:

Lecture: **60**

Seminar: **30**

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

**Lecture:** 1. Properties of electric charges. Insulators and conductors. Coulomb's law. 2. Electric field. Electric field lines. Electric flux and Gauss's law.

### 2<sup>nd</sup> week:

**Lecture:** 3. Electrical energy and capacitance. 4. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

### 3<sup>rd</sup> week:

**Lecture:** 5. Electric current. Current and voltage measurements in circuits. Resistance and Ohm's law. 6. Resistivity, temperature variation of resistance. Semiconductors and superconductors. Electrical activity of the heart. Defibrillators.

### 4<sup>th</sup> week:

**Lecture:** 7. Direct current circuits. Resistors in parallel and series. 8. Kirchhoff's rules and complex DC circuits. RC circuits. Conduction of electrical signals by neurons.  
**Self Control Test (First SCT (Chapters 15-17))**

### 5<sup>th</sup> week:

**Lecture:** 9. Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on current loop and electric motors. 10. Magnetic field of a long straight wire and Ampere's law. Magnetic field between two parallel conductors. Magnetic field of loops and solenoids.

### 6<sup>th</sup> week:

**Lecture:** 11. Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law. 12. Generators. Self-inductance RL circuits.

### 7<sup>th</sup> week:

**Lecture:** 13. Alternating current. Resistors, capacitors and inductors in AC circuits. 14. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves.

### 8<sup>th</sup> week:

**Lecture:** 15. The nature of light. Reflection, refraction and dispersion. 16. Prisms. The rainbow. Huygen's principle. Total internal reflection and its medical applications.  
**Self Control Test (Second SCT (Chapters 18-21))**

### 9<sup>th</sup> week:

**Lecture:** 17. Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. 18. Thin lenses. Images formed by lenses. Lens aberrations.

### 10<sup>th</sup> week:

**Lecture:** 19. Wave optics. Conditions for interference, polarization of light. Diffraction. 20. The camera, the simple magnifier, the compound microscope, the telescope and the eye.

### 11<sup>th</sup> week:

**Lecture:** 21. Quantum physics. Blackbody radiation. Photoelectric effect. Particle theory of light. 22. The production and attenuation of X-ray. Characteristic X-ray.  
**Self Control Test (Third SCT (Chapters 22-25))**

### 12<sup>th</sup> week:

**Lecture:** 23. Atomic physics. Early model of the atom. Quantum mechanics and the hydrogen atom. The spin magnetic quantum numbers. 24. Lasers and holography.

### 13<sup>th</sup> week:

**Lecture:** 25. Some properties of the nuclei. Binding energy. Radioactivity, the decay processes. Medical application of radioactivity. 26. Nuclear reactions. Nuclear fission and fusion. Positron and other antiparticles. Mesons and quarks.  
**Self Control Test (Fourth SCT (Chapters 26-29))**

### 14<sup>th</sup> week:

**Lecture:** Preparation for the final exam.

### 15<sup>th</sup> week:

**Lecture:** Final exam.

## Requirements

The program consists of lectures and seminars. Attendance at seminars is compulsory and is recorded.

Place of lectures: Life Science Building, room No. 003.004

Place of seminars: seminar room of the Biophysics Department (Life Science Building)

**CHAPTER 6**

1. Lectures: Attendance to lectures is emphatically recommended. All material covered in lectures is an integral part of the subject and therefore included in the self-control tests and the final exam. Some new concepts and ideas are discussed in the lectures only and are not present in the textbook.

2. Seminars: Topics of the seminars: 1st week: Information about requirements. Introduction to modern physics. 2nd to 29th weeks: The topics of the seminars follow the topics of the lectures with one or two weeks delay.

Attendance to seminars is obligatory. With acceptable excuse students may miss maximum 4 (four) seminars. Students missing 5-7 seminars can not be exempted from the End of Semester Examination or Final Examination, regardless their score reached on the Self Control Tests. Students missing 8 (eight) or more seminars are excluded from the class. Students are encouraged to ask questions related to the topic of the lectures discussed, and participate in solving physical problems related to the topic of the seminar.

The course ends with a Final Exam (FE) in the summer examination period. Exemption is offered for students who achieve excellent academic performance during their study term on the following base.

In each semester four Self Control Tests (SCTs) are organized. One will be exempted from the Final Examination if he/she achieves minimum 50% on each of the eight SCTs, and the average of the marks of the 3 best SCT in both semesters is higher than 75%.

Unsuccessful students may repeat the ESE twice ("B" and "C" chances). Students who fail even the 3rd ESE ("C" chance) may continue the study in the second semester; however, they lose their chance to be exempted from the final examination.

If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the SCTs) in the second semester, he or she will be exempted from the FE.

Students who could not meet the above described conditions for examination during the two semesters must sit for the FE from the whole material of the first and second semesters.

If a student successfully passed the exam but is not satisfied with the result may take a repeated "so called improvement exam". In one semester only one improvement exam can be done regardless the number of subjects taken by the student.

**Control tests and Final Examinations will be assessed as follows.**

<b>Percentage:</b>	<b>Mark</b>
0.00 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

Absence for any reason counts as 0%.

## Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE FOR BMC STUDENTS**

Year, Semester: Basic Medicine Course 2<sup>nd</sup>

Number of teaching hours:

Practical: **36**

**1<sup>st</sup> week:**

**Practical:** Introduction, The Hungarian alphabet, Vowel harmony. Ki vagy? (Who are you?)

**2<sup>nd</sup> week:**

**Practical:** Köszönések. Personal pronouns, Conjugation of the verb "lenni".

**3<sup>rd</sup> week:**

**Practical:** Számok. Magyar pénz. How many? Ordinal numbers.

**4<sup>th</sup> week:**

**Practical:** Hogy vagy? Word formation with "-ul, -ül".

**5<sup>th</sup> week:**

**Practical:** Mit csinálsz? Present tense verbal endings. Adverbs of time.

**6<sup>th</sup> week:**

**Practical:** Hová mész ma este? "Lenni" in past and future. Adverbs of place. Revision. Mid-term test.

**Self Control Test**

## ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

**7<sup>th</sup> week:**

**Practical:** Mit kérsz? Te vs. ön/maga. Object of the sentence. Revision.

**8<sup>th</sup> week:**

**Practical:** Kérsz egy kávét? Word formation. Plural marker.

**9<sup>th</sup> week:**

**Practical:** Tud/akar/szeret/szeretne gitározni. Infinitive.

**10<sup>th</sup> week:**

**Practical:** Postán. Vasútállomáson. Tetszik a ruhád.

**11<sup>th</sup> week:**

**Practical:** Az emberi test. Milyen szeme van? Revision.

**12<sup>th</sup> week:**

**Practical:** Oral minimal requirement exam. Mid-term test.

## Requirements

### Requirements of the language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each Hungarian language course, students have to sit for 2 written language tests and a short minimal requirement oral exam.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. Every week there is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect 6 points at least to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score. Based on the final score the tests are graded according to the following table:

Final score	Grade
0 – 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60 the student once can take an oral remedial exam covering the material of the whole semester.

**Consultation classes.** In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** Gabriella Marschalkó: Hungarolingua Basic I.

**Website:** Oral exam topics and vocabulary minimal lists are available from the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Human Genetics

Subject: **INTRODUCTION TO BIOLOGY II.**

Year, Semester: Basic Medicine Course 2<sup>nd</sup>

Number of teaching hours:

Lecture: **45**

Seminar: **60**

**1<sup>st</sup> week:**

**Lecture:** Tissues, Organs and Organ Systems 1.  
Tissues, Organs and Organ Systems 2.

**2<sup>nd</sup> week:**

**Lecture:** Physiology, Homeostasis and Temperature Regulation.

Blood, a fluid tissue 1.

Blood, a fluid tissue 2.

**3<sup>rd</sup> week:**

**Lecture:** Circulatory systems 1.

Circulatory systems 2.

The human circulatory system 1.

**4<sup>th</sup> week:**

**Lecture:** The human circulatory system 2.

The lymphatic system.

**Self Control Test**

**5<sup>th</sup> week:**

**Lecture:** Natural Defenses against Disease 1.

Natural Defenses against Disease 2.

Natural Defenses against Disease 3.

**6<sup>th</sup> week:**

**Lecture:** Nutrition, Digestion and Absorption 1.

Nutrition, Digestion and Absorption 2.

Nutrition, Digestion and Absorption 3.

**7<sup>th</sup> week:**

**Lecture:** Nutrition, Digestion and Absorption 4.

Gas exchange in Animals 1.

Gas exchange in Animals 2.

**8<sup>th</sup> week:**

**Lecture:** Salt and Water Balance and Nitrogen Excretion 1.

Salt and Water Balance and Nitrogen Excretion 2.

**Self Control Test**

**9<sup>th</sup> week:**

**Lecture:** Animal Hormones 1.

Animal Hormones 2.

Animal Hormones 3.

**10<sup>th</sup> week:**

**Lecture:** Animal Hormones 4.

Animal Hormones 5.

Neurons and Nervous system 1.

**11<sup>th</sup> week:**

**Lecture:** Neurons and Nervous system 2.

Neurons and Nervous system 3.

Neurons and Nervous system 4.

**12<sup>th</sup> week:**

**Lecture:** Neurons and Nervous system 5.

Effectors: making Animals move 1.

**Self Control Test**

**13<sup>th</sup> week:**

**Lecture:** Effectors: making Animals move 2.

Effectors: making Animals move 3.

Animal reproduction and Animal Development 1.

**14<sup>th</sup> week:**

**Lecture:** Animal reproduction and Animal Development 2.

Animal reproduction and Animal Development 3.

The human Reproduction System and Sexual Behavior.

**15<sup>th</sup> week:**

**Lecture:** Animal behavior 1.

Animal behavior 2.

### Requirements

The 2-semester course consists of lectures and seminars. Attendance at the seminars is compulsory. In each semester four Control Tests (CTs) are organized.

The first semester of the course ends with an End of Semester Examination (ESE). Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). Students who fail even the 3<sup>rd</sup> ESE (C chance) may continue the study in the second semester; however, they lose their chance to be exempted from the final examination.

The course ends with a Final Exam (FE) in the summer examination period. Four FE dates will be set during the 4

## ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

weeks of the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances). Exemption is offered for students who achieve excellent academic performance during their study on the following base: Students with higher than 75 % average CT result of the 3 best tests (out of the four SCT organized in the first semester) will be exempted from the ESE provided the fourth test result is minimum 50% pass (2). One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the eight CTs offered in the first and second semester, and the average of the 3 best CTs in both semesters is higher than 75 %. If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the SCTs) in the second semester, he or she will be exempted from the FE. Students who could not meet the above described conditions for exemption during the two semesters must sit for the FE from the whole material of the first and second semesters. Control tests, End of Semester Exams, and Final Exams will be assessed as follows.

Percentage (%)	Mark
0 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

## Department of Medical Chemistry

Subject: **INTRODUCTION TO MEDICAL CHEMISTRY II.**

Year, Semester: Basic Medicine Course 2<sup>nd</sup>

Number of teaching hours:

Lecture: **60**

Seminar: **30**

**1<sup>st</sup> week:**

**Lecture:** Oxygen. Substances with oxygen-oxygen bonds. Sulfur, compounds of sulfur. Industrial acids. Oxiacids.

**2<sup>nd</sup> week:**

**Lecture:** Nitrogen, nitrogen compounds, phosphorus, phosphorus compounds. Carbon and its inorganic compounds.

**3<sup>rd</sup> week:**

**Lecture:** Covalent bonding in organic compounds. Saturated hydrocarbons: alkanes.

**4<sup>th</sup> week:**

**Lecture:** FIFTH CONTROL TEST. Cycloalkanes.

**5<sup>th</sup> week:**

**Lecture:** Unsaturated hydrocarbons: alkenes and alkynes. Aromatic compounds: the structure and properties of benzene and its derivatives.

**6<sup>th</sup> week:**

**Lecture:** Heteroatomic compounds. The reaction of benzene.

**7<sup>th</sup> week:**

**Lecture:** Organic halogen compounds. Alcohols and phenols.

**8<sup>th</sup> week:**

**Lecture:** SIXTH CONTROL TEST. Important alcohols. Ethers and organic sulfur compounds.

**9<sup>th</sup> week:**

**Lecture:** Aldehydes, ketones and quinones. Nitrogen containing organic compounds: the structure and properties of amines. Basicity and reactions of amines.

**10<sup>th</sup> week:**

**Lecture:** Heterocyclic amines. Amines of biological importance

**11<sup>th</sup> week:**

**Lecture:** Carboxylic acids: classification and nomenclature. Properties of carboxylic acids. Reactions of carboxylic acids. Important carboxylic acids.

**12<sup>th</sup> week:**

**Lecture:** SEVENTH CONTROL TEST. Important carboxylic acids. Carboxylic acid derivatives.

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**13<sup>th</sup> week:**

**Lecture:** Acyl chlorides, anhydrides, esters, amides.

**14<sup>th</sup> week:**

**Lecture:** Stereochemistry. Optical activity: properties of enantiomers and diastereomers. Absolute and relative configurations. Synthesis of enantiomers.

**15<sup>th</sup> week:**

**Lecture:** EIGHTH CONTROL TEST. Summary and discussion.

## Requirements

The 2-semester course consists of lectures and seminars. Attendance at the seminars is compulsory. In each semester three Control Tests (CTs) are organized.

The first semester of the course ends with an End of Semester Examination (ESE). Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). Students who fail even the 3rd ESE (C chance) may continue the study in the second semester; however, they lose their chance to be exempted from the final examination.

The course ends with a Final Exam (FE) in the summer examination period. Four FE dates will be set during the 4 weeks of the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances). Exemption is offered for students who achieve excellent academic performance during their study on the following base:

Students with higher than 75 % average CT result of the 3 tests and achieve minimum 50% of the CTs offered in the first semester will be exempted from the ESE.

One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the six CTs offered in the first and second semester, and the average of the 3 CTs in both semesters is higher than 75 %.

If the result of the first semester ESE is Good (4) or Excellent (5), and the student is exempted (based on the result of the CTs) in the second semester, he or she will be exempted from the FE.

Students who could not meet the above described conditions for exemption during the two semesters must sit for the FE from the whole material of the first and second semesters.

Control tests, End of Semester Exams, and Final Exams will be assessed as follows.

<b>Percentage:</b>	<b>Mark</b>
0.00 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)
Absence for any reason counts as 0%.	



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## CHAPTER 7

# ACADEMIC PROGRAM FOR THE SHORT BASIC MEDICINE COURSE

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## Department of Biophysics and Cell Biology

Subject: **INTRODUCTION TO BIOPHYSICS**

Year, Semester: Short Basic Medicine Course

Number of teaching hours:

Lecture: **96**

Seminar: **144**

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

**Lecture:** 1. Introduction to modern physics. Standard of lengths, mass, time. 2. Motion in one dimension, displacement, velocity, acceleration, motion diagrams.

### 2<sup>nd</sup> week:

**Lecture:** 3. Freely falling objects. 4. Motion in two dimensions. Relative velocity.

### 3<sup>rd</sup> week:

**Lecture:** 5. The laws of motion. Newton's First, Second and Third Law. 6. Application of Newton's Laws. Forces of friction.

### 4<sup>th</sup> week:

**Lecture:** 7. Energy. Work. Kinetic energy and the work-energy theorem. Gravitational potential energy. 8. Spring potential energy. System and energy conservation. Power. Work done by varying forces.

### 5<sup>th</sup> week:

**Lecture:** 9. Momentum and impulse. Conservation of momentum.

10. Collisions. Elastic and inelastic collisions.

### 6<sup>th</sup> week:

**Lecture:** 11. Angular speed and angular acceleration. Rotational motion under constant angular acceleration.

12. Centripetal acceleration.

### 7<sup>th</sup> week:

**Lecture:** 13. Torque and the two conditions for equilibrium. The center of gravity.

14. Rotational kinetic energy. Angular momentum.

### 8<sup>th</sup> week:

**Lecture:** 15. States of matter. Deformation of solids. The Young's, shear and bulk modulus.

16. Density and pressure. Variation of pressure with depth. Pressure measurements. Buoyant forces and Archimedes's principle. Fluids in motion.

### 9<sup>th</sup> week:

**Lecture:** 17. Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids.

18. Macroscopic description of an ideal gas. The kinetic theory of gases.

### 10<sup>th</sup> week:

**Lecture:** 19. Energy in thermal processes. Heat and internal energy. Specific heat. Calorimetry. Latent heat and phase change.

20. The first law of thermodynamics.

### 11<sup>th</sup> week:

**Lecture:** 21. The second law of thermodynamics. Entropy. Refrigerators and heat pumps.

22. Elastic potential energy. Hook's law. Simple harmonic motion. Motion of a pendulum.

### 12<sup>th</sup> week:

**Lecture:** 23. Waves. Frequency, amplitude and wavelength. Interference of waves. Reflection of waves.

24. Sound. Energy and intensity of sound waves. Shock waves, standing waves.

### 13<sup>th</sup> week:

**Lecture:** 25. Doppler effect.

### 14<sup>th</sup> week:

**Lecture:** 26. Properties of electric charges. Insulators and conductors. Coulomb's law.

27. Electric field. Electric field lines. Electric flux and Gauss's law.

### 15<sup>th</sup> week:

**Lecture:** 28. Electrical energy and capacitance.

29. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

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**16<sup>th</sup> week:**

**Lecture:** 30. Electric current. Current and voltage measurements in circuits. Resistance and Ohm's law.  
 31. Resistivity, temperature variation of resistance.  
 Semiconductors and superconductors. Electrical activity of the heart. Defibrillators.

**17<sup>th</sup> week:**

**Lecture:** 32. Direct current circuits. Resistors in parallel and series.  
 33. Kirchhoff's rules and complex DC circuits. RC circuits. Conduction of electrical signals by neurons.

**18<sup>th</sup> week:**

**Lecture:** 34. Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on a current loop and electric motors.  
 35. Magnetic field of a long straight wire and Ampere's law. Magnetic field between two parallel conductors. Magnetic field of loops and solenoids.

**19<sup>th</sup> week:**

**Lecture:** 36. Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law.  
 37. Generators. Self-inductance RL circuits.

**20<sup>th</sup> week:**

**Lecture:** 38. Alternating current. Resistors, capacitors and inductors in AC circuits.  
 39. The transformer. Properties of electromagnetic waves.

The spectrum of electromagnetic waves.

**21<sup>st</sup> week:**

**Lecture:** 40. The nature of light. Reflection, refraction and dispersion.  
 41. Prisms. The rainbow. Huygen's principle. Total internal reflection and its medical applications.

**22<sup>nd</sup> week:**

**Lecture:** 42. Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors.  
 43. Thin lenses. Images formed by lenses. Lens aberrations.

**23<sup>rd</sup> week:**

**Lecture:** 44. Wave optics. Conditions for interference, polarization of light. Diffraction.  
 45. The camera, the simple magnifier, the compound microscope, the telescope and the eye.

**24<sup>th</sup> week:**

**Lecture:** 46. Some properties of the nuclei. Binding energy. Radioactivity, the decay processes. Medical application of radioactivity.  
 47. Nuclear reactions. Nuclear fission and fusion. Positron and other antiparticles. Mesons and quarks.

## Requirements

The course ends with a Final Exam (FE). Exemption is offered for students who achieve excellent academic performance during their study term on the following base.

During the term six Self Control Tests (SCTs) are organized. One will be exempted from the Final Examination if he/she achieves minimum pass (2) on each of the six SCTs, and the average of the marks of the 5 best SCTs is higher than 3.5. Three dates will be set for the Final Examinations (FE) during the examination period. Students with higher than 3.5 average mark of the 5 best tests will be exempted from the FE.

Students who could not meet the above described conditions for exemption must sit for the FE from the whole material of the semester. Unsuccessful students may repeat the ESE twice ("B" and "C" chances).

A student who has successfully passed an exam but is not satisfied with the result may take a repeated (so called "improvement") exam. Only one improvement examination can be done regardless the number of subjects taken by the student.

Control tests, End of Semester Exams, and Final Exams will be assessed as follows:

Percentage (%)	Mark
0 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

## Department of Human Genetics

Subject: **INTRODUCTION TO BIOLOGY**

Year, Semester: Short Basic Medicine Course

Number of teaching hours:

Lecture: **96**

Seminar: **96**

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

**Lecture:** Introduction; Studying Life, The chemistry of life.

### 2<sup>nd</sup> week:

**Lecture:** Macromolecules and the origin of life; Cells: The Working units of life.

### 3<sup>rd</sup> week:

**Lecture:** Cells: The Working units of life; The dynamic cell membrane.

### 4<sup>th</sup> week:

**Lecture:** Energy, enzymes and metabolism; Pathways that harvest chemical energy.

### 5<sup>th</sup> week:

**Lecture:** Chromosomes, the cell cycle and cell division.

### 6<sup>th</sup> week:

**Lecture:** Chromosomes, the cell cycle and cell division; Genetics: Mendel and beyond.

### 7<sup>th</sup> week:

**Lecture:** Genetics: Mendel and beyond; DNA and it's role in heredity.

### 8<sup>th</sup> week:

**Lecture:** From DNA to protein: Genotype, Phenotype; Genetics of viruses and prokaryotes.

### 9<sup>th</sup> week:

**Lecture:** Genetics of viruses and prokaryotes; The eukaryotic genome and its expression; Recombinant DNA and Biotechnology.

### 10<sup>th</sup> week:

**Lecture:** Recombinant DNA and Biotechnology; Genome

sequencing, molecular biology and medicine; Cellular signaling and communication.

### 11<sup>th</sup> week:

**Lecture:** Cellular signaling and communication; The mechanisms of evolution; The evolution of genes and genomes.

### 12<sup>th</sup> week:

**Lecture:** Bacteria and Archaea; Fungi: Recyclers, pathogens, parasites and plant partners. The origin and diversification of the Eukaryotes; Animal origins and the evolution of body plan.

### 13<sup>th</sup> week:

**Lecture:** Tissues, Organs and Organ Systems.

### 14<sup>th</sup> week:

**Lecture:** Physiology, Homeostasis and Temperature Regulation; Blood, a fluid tissue.

### 15<sup>th</sup> week:

**Lecture:** Circulatory systems; The human circulatory system.

### 16<sup>th</sup> week:

**Lecture:** The human circulatory system; The lymphatic system.

### 17<sup>th</sup> week:

**Lecture:** Immunology: gene expression and natural defenses.

### 18<sup>th</sup> week:

**Lecture:** Nutrition, Digestion and Absorption.

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**19<sup>th</sup> week:**

**Lecture:** Nutrition, Digestion and Absorption; Gas exchange in Animals.

**20<sup>th</sup> week:**

**Lecture:** Salt and Water Balance and Nitrogen Excretion.

**21<sup>st</sup> week:**

**Lecture:** Animal Hormones.

**22<sup>nd</sup> week:**

**Lecture:** Neurons and Nervous system.

**23<sup>rd</sup> week:**

**Lecture:** Sensory systems; Effectors: How animals get things done.

**24<sup>th</sup> week:**

**Lecture:** Animal reproduction and Animal Development; The human Reproduction System.

## Requirements

The program consists of lectures and seminars. Attendance at the seminars is compulsory. In both halves of the program four Control Tests (CTs) are organized.

The course ends with a Final Examination (FE). Exemption from the FE is offered for students who achieve excellent academic performance during their study term on the following base.

One will be exempted from the FE if he/she achieves minimum pass (2) on each of the eight CTs offered during the program, and the average of the 3 best CTs in both parts is higher than 75 %.

Students who could not meet the above described conditions for exemption must sit for the FE from the topics of the entire program.

During the 3-week examination period 4 exam dates will be set. Unsuccessful students may repeat the FE twice (B and C chances).

Control tests and Final Examinations will be assessed as follows.

Percentage (%)	Mark
0 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

## Department of Medical Chemistry

Subject: **INTRODUCTION TO MEDICAL CHEMISTRY**

Year, Semester: Short Basic Medicine Course

Number of teaching hours:

Lecture: **96**

Seminar: **96**

**1<sup>st</sup> week:**

**Lecture:** L1. Introduction to general chemistry. Elements. Symbols for the elements. The SI system of measurement. L2. Atoms. The structure of atoms. Nuclear arithmetic. Molecules and ions, compounds and mixtures.

**2<sup>nd</sup> week:**

**Lecture:** L1. Chemical formulas. Naming chemical compounds. Chemical equations. Avogadro's number and the mole. Atomic, molecular and molar mass relationships. L2. Stoichiometry: chemical arithmetic. Yields of chemical

reactions. Empirical and molecular formulas.

**3<sup>rd</sup> week:**

**Lecture:** L1. Light and the electromagnetic spectrum. Atomic spectra. The Bohr model of the hydrogen atom. The quantum mechanical model of the atom. Orbitals and quantum numbers. L2. Self-control test

**Self Control Test**
**4<sup>th</sup> week:**

**Lecture:** L1. Electron configurations and the periodic

## ACADEMIC PROGRAM FOR THE SHORT BASIC MEDICINE COURSE

table. Classification of the elements. Representative and transition elements. L2. The sizes of atoms and ions. Ionization energy, electron affinity.

**5<sup>th</sup> week:**

**Lecture:** L1. Chemical bonds: metallic, ionic and covalent bonds. Electron-dot structures for molecular compounds and polyatomic ions. L2. Single and multiple covalent bonds. Molecular shapes: the VSEPR model. Valence bond theory. Hybridization.

**6<sup>th</sup> week:**

**Lecture:** L1. Intermolecular forces. L2. First control test

**7<sup>th</sup> week:**

**Lecture:** L1. The gaseous state. Gases and gas pressure. The gas laws. The ideal gas law. Stoichiometric relationships with gases. Kinetic - molecular theory of gases. L2. Liquid and solid states. Phase changes. Evaporation, vapor pressure, boiling point.

**8<sup>th</sup> week:**

**Lecture:** L1. Solutions and their properties. Concentration of solutions. Units of concentration: molarity, mass percent, molality. Dilution of solutions. Some factors affecting solubility. L2. The chemistry of water. Ions in aqueous solution: electrolytes and nonelectrolytes. Reactions in aqueous solution.

**9<sup>th</sup> week:**

**Lecture:** L1. Chemical equilibrium. The equilibrium constant. Factors that alter the composition of an equilibrium mixture. L2. Second control test

**10<sup>th</sup> week:**

**Lecture:** L1. Acids and bases. The pH in solutions of strong acids and strong bases. L2. Equilibria in solutions of weak acids. Equilibria in solutions of weak bases.

**11<sup>th</sup> week:**

**Lecture:** L1. Thermochemistry. Energy changes and energy conservation. Internal energy and state functions. Expansion work. Energy and enthalpy. The thermodynamic standard state. Enthalpies of physical and chemical changes. Hess's law. L2. Oxidation and reduction. Oxidation state. The activity series of the elements. Balancing redox reactions. Galvanic cells.

**12<sup>th</sup> week:**

**Lecture:** L1. Discussion of general chemistry. L2. Third control test

**13<sup>th</sup> week:**

**Lecture:** L1. Introduction to organic chemistry. L2. Saturated hydrocarbons: alkanes.

**14<sup>th</sup> week:**

**Lecture:** L1. Cycloalkanes. L2. Unsaturated hydrocarbons: alkenes and alkynes.

**15<sup>th</sup> week:**

**Lecture:** L1. Aromatic compounds: the structure and properties of benzene. L2. Self - control test  
**Self Control Test**

**16<sup>th</sup> week:**

**Lecture:** L1. The reactions of benzene. L2. Heteroaromatic compounds.

**17<sup>th</sup> week:**

**Lecture:** L1. Organic halogen compounds. L2. Alcohols.

**18<sup>th</sup> week:**

**Lecture:** L1. Phenols. Ethers and organic sulfur compounds. L2. Fourth control test

**19<sup>th</sup> week:**

**Lecture:** L1. Aldehydes, ketones and quinones. L2. Nitrogen containing organic compounds: the structure and properties of amines. Basicity and reactions of amines.

**20<sup>th</sup> week:**

**Lecture:** L1. Heterocyclic amines. Amines of biological importance. L2. Carboxylic acids: classification and nomenclature.

**21<sup>st</sup> week:**

**Lecture:** L1. Properties of carboxylic acids. Reactions of carboxylic acids. Dicarboxylic acids. Unsaturated acids. L2. Fifth control test

**22<sup>nd</sup> week:**

**Lecture:** L1. Carboxylic acid derivatives: esters, fats, lactones, amides, lactams, thiol esters anhydrides, acyl chlorides. L2. Salts and detergents. Substituted carboxylic acids: halo acids, hydroxy acids, keto acids, amino acids.

**23<sup>rd</sup> week:**

**Lecture:** L1. Stereochemistry. L2. Types of isomerism.

**24<sup>th</sup> week:**

**Lecture:** L1. Optical activity: properties of enantiomers and diastereomers. L2. Sixth control test

## Requirements

The program consists of lectures and seminars. Attendance at the seminars is compulsory. Six control and two self control tests will be organized. (Self Control Tests (SCT) are offered for self evaluation but the results of SCTs will not be used for the evaluation of the students performance.)

The course ends with a Final Examination (FE). Exemption from the FE is offered for students who achieve excellent academic performance during their study term on the following base. One will be exempted from the FE if he/she achieves minimum pass (2) on each of the six CTs offered during the program, and the average of the 5 best CTs is higher than 75 %. Students who could not meet the above described conditions for exemption must sit for the FE from the topics of the entire program.

During the 3-week examination period 4 exam dates will be set. Unsuccessful students may repeat the FE twice (B and C chances).

Control tests and Final Examinations will be assessed as follows.

<b>Percentage:</b>	<b>Mark</b>
0.00 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

Absence for any reason counts as 0%.

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## CHAPTER 8

# ACADEMIC PROGRAM FOR CREDIT SYSTEM

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### ACADEMIC PROGRAM FOR CREDIT SYSTEM

The introduction of the credit system became compulsory in every Hungarian university, including the University of Debrecen by September, 2003. The aim of the credit system is to ensure that the students' achievements can be properly and objectively evaluated both quantitatively and qualitatively.

A credit is a relative index of cumulative work invested in a compulsory, a required elective or a freely chosen subject listed in the curriculum. The credit value of a course is based upon the number of lectures, seminars and practical classes of the given subject that should be attended or participated in (so called "contact hours"), and upon the amount of work required for studying and preparing for the examination(s). Together with the credit(s) assigned to a particular subject (quantitative index), students are given grades (qualitative index) on passing an exam/course/class. The credit system that has been introduced in Hungary meets the standards of the European Credit Transfer System (ECTS). The introduction of the ECTS promotes student mobility, facilitates more effective organization of students' exchange programs aimed at further education in foreign institutions, and allows recognition of the students' work, studies and achievements completed in various foreign departments by the mother institution. Credit-based training is flexible. It provides a wider range of choice, enables the students to make progress at an individual pace, and it also offers students a chance to study the compulsory or required subjects at a different university, even abroad. Owing to the flexible credit accumulation system, the term "repetition of a year" does not make sense any longer. It should be noted, however, that students do not enjoy perfect freedom in the credit system either, as the system does not allow students to randomly include subjects in their curriculum or mix modules. Since knowledge is based on previous studies, it is imperative that the departments clearly and thoroughly lay down the requirements to be met before students start studying a subject.

#### **The general principles of the credit system are the following:**

1. Students can be given their degree if, having met other criteria as well, they have collected 360 credits during their studies. Considering the recommended curriculum, this can be achieved in six years.
2. According to the credit regulations, students should obtain an average of 30 credits in each semester.
3. The criterion of obtaining 1 credit is to spend 30 hours (including both contact and non-contact hours) studying the given subject.
4. Credit(s) can only be obtained if students pass the exam of the given subject.
5. Students accumulate the required amount of credits by passing exams on compulsory, required elective and freely chosen subjects. Completion of every single compulsory credit course is one of the essential prerequisites of getting a degree. Courses belonging to the required elective courses are closely related to the basic subjects, but the information provided here is more detailed, and includes material not dealt with in the frame of the compulsory courses. Students do not need to take all required elective courses, but they should select some of them wisely to accumulate the predetermined amount of credits from this pool. Finally, a certain amount of credits should be obtained by selecting from the freely chosen courses, which are usually not related to the basic (and thus mandatory) subjects, but they offer a different type of knowledge.
6. 80, 15 and 5 percent of the total of 360 credits should be accumulated by completing the compulsory, required elective and freely chosen courses, respectively.
7. According to the qualification requirements, professional (compulsory and required elective) courses fall into three modules. The basic module provides the theoretical basis of medicine, and ensures that the necessary practical skills are developed. The preclinical module lays down the foundations of clinical knowledge, while in the clinical module the students are taught clinical medicine, and they attend practical classes to ensure proper command of the medical procedures. The credits accumulated in the different modules for compulsory and required courses should show the following distribution: basic module: 110-116, preclinical module: 50-58, and clinical module: 150-170 credits.
8. The pilot curricula show the recommended pacing of compulsory courses. If these courses are carefully supplemented with credits obtained from the necessary number of required elective and freely chosen courses, students can successfully accumulate the credits required for their degree within 12 semesters.
9. In the case of two-semester subjects, when students have to pass a final exam, they get higher credits in the semester of the final examination since preparation for a final examination takes up more non-contact hours from the students' time.
10. There are 15 compulsory final examinations in the curriculum; therefore one final exam is worth at least 10 credits.
11. The diploma work is worth 20 credits.
12. Internship in the final year is compulsory; students get 1 credit per week.

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13. Regulations concerning the training of students in the credit system prescribe a minimum amount of credits for certain periods as outlined in the Rules and Regulations for English Program Students.
14. Although Physical Education and Summer Internship are not recognized by credits, they have to be completed to get the final degree (see the rules outlined in the Information section about the conditions).
15. Evaluation of the students' achievements needed for grants or applications is described in Rules and Regulations for English Program Students.

Further information is available in the Rules and Regulations for English Program Students.

We very much hope that the system of training will contribute to the successful completion of your studies.  
We wish you good luck with your university studies.



Compulsory courses															
1. year															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject	
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Anatomy, histology and embryology I.	AOANA02T2						29				86	ESE		8	None
Biophysics	AOBIF02T1	30	30	22	ESE*	6									None
Biostatistics	AOBST02T1		30		ESE	2									None
Cell Biology	AOSEJ02T2						30	25	20	ESE*	6				None
First aid and reanimation	AOELS03T2AOELS03T1	6		15	AW5	2									None
Hungarian Crash course	AOG261008			36	AW5	0									None
Hungarian language I/1.	AOHUN01T1			24	AW5	2									Hungarian Crash Course
Hungarian language I/2.	AOHUN02T2										30	AW5	2		Hungarian language I/1.
Medical Chemistry	AOKEM02T1	48	60	45	ESE*	11									None
Medical Genetics	AOGEN02T2						30				30	ESE*	4		None
Medical Psychology I.	AOPSZ02T1	20			AW5	2									None
Molecular Biology	AOMB101T2						45	15	15	ESE	5				None

Compulsory courses														
2. year														
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Anatomy, histology and embryology II.	AOANA06T3	51		130	FE	11								Cell biology, Anatomy I.
Biochemistry I.	AOBIK03T3	45	15	30	ESE	7								Medical chemistry, Molecular biology
Biochemistry II.	AOBIK04T4						45	15	30	FE	7			Biochemistry I.
Hungarian language II/1.	AOHUN03T3			30	AW5	2								Hungarian language I.
Hungarian language II/2.	AOHUN04T4								30	AW5	2			Hungarian language II/1.
Medical Physiology I.	AOELE03T3	60	30	45	ESE	7								Anatomy I., Biophysics
Medical Physiology II.	AOELE04T4						36	18	27	FE	9			Anatomy II., Physiology I.
Neurobiology (Neuroanatomy, Neurobiochemistry, Neurophysiology)	AONEB02T4						62	15	52	ESE*	8			Physiology I.
Nursing practice	AO_NYGY_NURSI NG								120	SIGN	0			has to be completed before the 3rd year

Compulsory courses														
3. year														
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Basic Oncology	AOONK02T5	13			AW5	1								Medical Genetics, Biochemistry II.
Basic surgical techniques	AOMUT02T5	15	18	12	ESE	3								Anatomy II., Medical Physiology II.
Clinical Biochemistry I.	AOKBK03T5	30		15	AW5	3								Biochemistry II., Medical Physiology II.
Clinical Biochemistry II.	AOKBK04T6						45			30	FE	7		Clinical biochemistry I.
Clinical Physiology	AOKFI04T6						15	30			ESE	3		Pathology I. and Medical Physiology II.
Immunology	AOIMM02T5	40	8	12	ESE	4								Biochemistry II., Cell biology
Internal Medicine II. (Immunology and Rheumatology)	AOBEL04T6						27			18	ESE	3		Immunology, Prop. of Internal Medicine
Medical Hungarian I.	AOHUN05T5			30	AW5	2								Hungarian language II/2.
Medical Hungarian II.	AOHUN06T6									30	FE	2		Medical Hungarian I.
Medical Microbiology I.	AOMIK03T5	30		30	AW5	5								Cell Biology, Anatomy II.
Medical Microbiology II.	AOMIK04T6						20			30	FE	5		Microbiology I.
Medical Psychology II.	AOPSZ08T6						10			20	ESE	2		Medical psychology I.
Pathology I.	AOPAT03T5	30		45	ESE	5								Anatomy II, Neurobiology
Pathology II.	AOPAT04T6						45			45	FE	5		Pathology I.
Propedeutics of Internal Medicine	AOBEL22T5	30		30	ESE	4								Anatomy II., Medical Physiology II.
Internal Medicine summer practice	AO_NYGY_INTME D									90	SIGN	0		has to be completed before the 4th year

Compulsory courses															
4. year															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject	
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Behavioural Sciences FE	AOMAG02T8												FE	0	None
Bioethics	AOET102T9	10			AW5	1									Medical Psychology II.
Clinical Genetics	AOKGE02T8	20			ESE	2									Genetics, Pathology II.
Internal Medicine Block Practice I. - 4th year	AOBLOCKINTME D_1_IV			60	SIGN	0									Propedeutics of Internal Medicine, Clinical Physiology, Pathology II.
Internal Medicine Block Practice II. - 4th year	AOBLOCKINTME D_2_IV									60			SIGN	0	Propedeutics of Internal Medicine, Clinical Biochemistry, Pathology II.
Internal Medicine III. (Cardiology, Angiology)	AOBEL17T7	20		10	ESE	3									Propedeutics of Internal Medicine, Clinical Physiology, Pathology II.
Internal Medicine IV. (endocrinology, nephrology)	AOBEL08T8-K3									20			ESE	3	Prop. of Internal Medicine, Pathology II., Clinical biochemistry II.
Obstetrics and Gynecology Block Practice - 4th year	AOBLOCKOBGYN_IV			60	SIGN	0									Pathology II., Clinical biochemistry II.
Obstetrics and Gynecology I.	AOSZU03T7	10		10	ESE	2									Pathology II., Clinical biochemistry II.
Obstetrics and Gynecology II.	AOSZU04T8									5		10	ESE	3	Obstetrics and gynecology I.
Orthopaedic Surgery	AOORT03T7									10		16	ESE*	3	Pathology II.,
Pharmacology I.	AOGYO03T7	30		20	ESE	4									Pathology I., Physiology II.
Pharmacology II.	AOGYO04T8									50		20	FE	6	Pharmacology I., Clinical Physiology

Compulsory courses														
4. year (continued)														
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.	Prerequisites of taking the subject		
Preventive Medicine and Public Health I.	AOMEG03T7	30	40		AW5	5								Medical Microbiology II., Clinical Biochemistry II.
Preventive Medicine and Public Health II.	AOMEG04T8						30	20	15	FE	5			Preventive medicine and public health I.
Pulmonology	AOPUL03T7 AOPUL04T8						15		10	ESE*	3			Clinical physiology, Prop of Internal medicine
Radiology and Nuclear Medicine I.	AORAD03T7	10		10	AW5	1								Pathology II.,
Radiology and Nuclear Medicine II.	AORAD04T8						10		30	ESE*	3			Radiology I.
Small Surgery Block Practice - 4th year	AOBLOCKSMAILL SURG_IV			60	SIGN	0								None
Stomatology	AOFOG03T7						10		16	ESE*	2			Pathology II.
Surgery Block Practice - 4th year	AOBLOCKSURGE RY_IV			60	SIGN	0								Pathology II., Basic Surgical Techniques
Surgery I.	AOSEB05T7	10		10	AW5	2								Pathology II., Basic Surgical Techniques
Surgery II.	AOSEB06T8						10			ESE	3			Surgery I.
Traumatology I.	AOTRA01A7	15		10	ESE*	2								Pathology II.
Urology	AOURO04T8	10		16	ESE*	3								Pathology II.
4th year summer practice	AO_NYGY_4TH YEAR								90	SIGN	0			has to be completed before the 5th year

Compulsory courses														
5. year														
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Anesthesiology and intensive care	AOINT02T10	10		20	ESE	2								Prerequisites of taking the subject Pharmacology II.
Clinical Oncology	AOKON02T10						20	7	ESE	2				Basic Oncology, Radiology and nuclear medicine II.
Dermatology	AOBOR03T9-KI	15	10	20	ESE*	4								Pathology II., Pharmacology II.
Emergency medicine	AOOXY03T9	20		20	ESE	3								Pathology II., First aid and reanimation
Family medicine	AOCSA02T9		10		AW5	1								Pharmacology II., Prop. of Internal Medicine
Forensic Medicine I.	AOIGA03T9	10		10	AW5	2								Pathology II., Bioethics
Forensic Medicine II.	AOIGA04T10						10		ESE*	2				Forensic medicine I.
Infectology	AOFER02T10	15		20	ESE	2								Pathology II., Microbiology II., Pharmacology II.
Internal Medicine Block Practice I. - 5th year	AOBLOCKINTME D_1_V			60	SIGN	0								Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II.
Internal Medicine Block Practice II. - 5th year	AOBLOCKINTME D_2_V								ESE	0	60			Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II.
Internal Medicine V. (Gastroenterology)	AOBEL20T9	20		10	ESE	4								Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II.

Compulsory courses															
5. year (continued)															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject	
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Internal Medicine VI. (Haematology, Haemostaseology)	AOBEL16T10						15					10	ESE	3	Clinical Biochemistry II., Cardiology of Internal Medicine
Neurology Block Practice - 5th year	AOBLOCKNEURO_V			60	SIGN	0									Internal medicine III., Neurobiology
Neurology I.	AONEU03T9	15		10	AW5	4									Internal medicine III., Neurobiology
Neurology II.	AONEU04T10						10						ESE	2	Neurology I.
Ophthalmology	AOSZE04T10						10					20	ESE*	3	Pathology II., First Aid and Resuscitation
Otolaryngology	AOFUL04T10						10					20	ESE*	3	Pathology II., Clinical biochemistry II.
Pediatrics Block Practice - 5th year	AOBLOCKPEDIA_T_V			60	SIGN	0									Pathology II., Pharmacology II.
Pediatrics I.	AOGYE03T9	20		10	AW5	4									Pathology II., Pharmacology II.
Pediatrics II.	AOGYE04T10						15				10		ESE	3	Pediatrics I.
Psychiatry I.	AOELM03T9	20		20	AW5	4									Medical Psychology II., Neurobiology
Psychiatry II.	AOELM04T10						10						ESE	2	Psychiatry I.

Compulsory courses														
6. year														
Subjects	Neptun code	1 <sup>st</sup> semester					2 <sup>nd</sup> semester					Prerequisites of taking the subject		
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Internal Medicine VII.	AOBEL18T11			300	FE	10								Successful completion of all compulsory subjects
Neurology III.	AONEU08T11			120	FE	4								Successful completion of all compulsory subjects
Obstetrics and Gynecology III.	AOSZU08T11			150	FE	5								Successful completion of all compulsory subjects
Pediatrics III.	AOGYE08T11			210	FE	7								Successful completion of all compulsory subjects
Psychiatry III.	AOELM06T11			120	FE	4								Successful completion of all compulsory subjects
Surgery III.	AOSEB09T11-KI			150	FE	5								Successful completion of all compulsory subjects



Required elective courses														Prerequisites of taking the subject	
1. year															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Basic hospitalisation techniques for medical students	AOAPO42T1	5		5	AW5	1									None
Communication Skills	AOKOM42T1			30	AW5	2									None
Computer science	AOINF43T1										30	AW5	3		None
Introduction to students' scientific activities	AOTDK02						10					AW5	1		None
Latin language	AOLAT42T1			30	AW5	2									None
Library system	AOKON43T1			10	AW5	1									None
Medical Genomics	AOGEN43T2						16				4	AW5	2		None
Understanding medical problems through experiments: a problem-based elective practical course	AOOBP42T2										30	AW5	3		Medical Chemistry

Required elective courses															
2. year															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject	
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Advanced students' scientific activity	AOTDK06				AW5	2									-
Modern biophysical methods in biology and medicine	AOMOD42T4						24						AW5	2	Biophysics, Cell Biology
Modern techniques allowing the investigation of physiological phenomena	AOKOR42T4						24						AW5	2	Physiology I.
Problem based learning in Physiology	AOPEL42T4											30	AW5	3	Physiology I.
Selected topics in Cell Biology	AOG157403-K1						24						AW5	2	Cell Biology
Students' scientific activity for beginners	AOTDK04								AW5	1					Introduction to students' scientific activities
The regulatory role of the cell membrane in physiological and pathological conditions	AOSEM42T4						20						AW5	2	Physiology I.

Required elective courses															
3. year															
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject	
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Medical Anthropology	AOANT02T5		15		AW5	2									Medical Psychology I.
Medical Sociology	AOSZO02T6						8	7		AW5	2				Medical Psychology I.
Molecular Mechanism of Diseases concerning great populations	AOG167605	25			AW5	2									Biochemistry II.
Nutritional Bioactivation	AONU01T5	10	20		ESE	2									Biochemistry II.
PBL in haemostasis	AOPBL42T6							20		AW5	2				Clinical Biochemistry I.
Problem based learning in Complex Pathology	AOEKP42T6						30			AW5	3				Clinical Biochemistry II.
Problem based learning in Oncohematology	AOG327906							30		AW5	2				Clinical biochemistry I.
Refraction, refractive errors, corrections, refractive surgery	AOREF42T9	5			AW5	1									Anatomy II., Medical Physiology II.
Social acceptance of people with disabilities	AOFOGY42T5	20		2	AW5	2									None
Surgical operative techniques	AOG517407						4	8		AW5	1				Basic Surgical Techniques
Wound Healing	AOGI77205		12		AW5	1									None

Required elective courses														
4. year														
Subjects	Neptun code	1 <sup>st</sup> semester						2 <sup>nd</sup> semester						Prerequisites of taking the subject
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Basic microsurgical training- Introduction to microsurgery	AOG517507	2		10	AW5	1								Basic Surgical Techniques, Surgical Operative Techniques
Behavioural medicine	AOMAG42T7	10			AW5	1								Medical psychology I-II.
Clinical biochemistry and laboratory evaluation of thrombophilia	AOTHR42T7	12			AW5	1								Clinical biochemistry II.
Diagnosis and therapy of acute leukaemias	AOG138005						20							Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine
Dietetics in the everyday practice and beyond. Nutritional therapy	AOG149607	24			AW5	2								Propedeutics of Internal Medicine
Epidemiology, pathophysiology, diagnosis and treatment of osteoporosis.	AOEPI01T7	11	2	2	AW5	1								Internal Medicine II. (Immunology and Rheumatology)
PBL in haemostasis	AOPBL42T6							20		AW5	2			Clinical Biochemistry I.
Problem based learning - Skills' training	AOPSZ42T10			20	AW5	2								Internal Medicine II., Surgery I.
Radiotherapy in the clinical practice	AOSUG42T7							14		AW5	2			Biophysics, Radiology I.
Rare diseases	AOG138107	10			AW5	1								Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine
Surgical operative techniques	AOG517407						4			AW5	1	8	AW5	Basic Surgical Techniques
Traumatology II.	AOTRA41A7	10			AW5	1								Pathology II.

Required elective courses														
4. year (continued)														
Subjects	Neptun code	1 <sup>st</sup> semester					Crd.	2 <sup>nd</sup> semester					Prerequisites of taking the subject	
		L	S	P	Exam	Crd.		L	S	P	Exam	Crd.		
Travel Medicine for medical scholars	AOUTA42T8	30			AW5	2								Pathology II, Medical Microbiology II.
Vascular and microcirculation abnormalities in systemic sclerosis	AOG1450007						10					AW5	1	Immunology-Rheumatology

Required elective courses														Prerequisites of taking the subject	
5. year															
Subjects	Neptun code	1 <sup>st</sup> semester					2 <sup>nd</sup> semester					Crd.			
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Basic laparoscopic surgical training	AOG517607-K10	5		15	AW5	2									Basic Surgical Techniques, Surgical Operative Techniques
Course on Problem-Based Learning and Skills' Training	AOPSZ42T10						22							2	None
Diagnosis and therapy of acute leukaemias	AOG138005						20							1	Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine
Neurosurgery	AOISE02T10						6				8			2	Neurology I.
PBL in haemostasis	AOPBL42T6									20				2	Clinical Biochemistry I.
Pharmacotherapy	AOG248110						30							3	Pharmacology II.
Principles of Physical Medicine and Rehabilitation	AOREH42T6						16							2	Internal Medicine III., Surgery II.
Surgical biomaterials	AOG518110						12							1	Basic Surgical Techniques

Freely Chosen Courses										
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator		
Clinical Research Center	Platelet function and platelet function disorders	AOG632006	1	2	12	AW5	Clinical Biochemistry II.	Zsuzsa Bagoly M.D., Ph.D.		
Clinical Research Center	Quality management in medical diagnostic laboratory	AOG631806	2	2	26	AW5	Pathology I.	Jolán Hársfálvi M.Sc., Ph.D.		
Clinical Research Center	Multidisciplinary approach to the treatment of cutaneous malignancies	AOG528209	1	1	15	AW5	Taking of Dermatology			
Clinical Research Center	Coagulation factor XIII in health and disease	AOG632607	1	1	15	AW5	grade 4 or 5 in Clinical Biochemistry II., or Complex Pathology II., or membership in the UDMHSC, Student's Scientific Society	László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc.		
Department of Anatomy, Histology and Embryology	Functional Anatomy of Brainstem	AOG107704-K1	1	2	16	AW5	Anatomy II.	Klára Matesz M.D., Ph.D., D.Sc.		
Department of Anatomy, Histology and Embryology	Selected problems of the neural control: Modelling of single neurons and neural networks	AOG108504-K1	1	2	12	AW5	Anatomy II.	Ervin Wolf M.Sc., Ph.D.		
Department of Anatomy, Histology and Embryology	Noiceptive sensory information processing at the level of the spinal cord in health and disease	AOG1091A4	1	2	18	AW5	Anatomy II.	Miklós Antal M.D., Ph.D., D.Sc.		
Department of Anatomy, Histology and Embryology	Functional anatomy of the visual system	AOG108204-K1	1	2	16	AW5	Anatomy II.	Zoltán Kisvárdy M.Sc., Ph.D., D.Sc.		
Department of Anatomy, Histology and Embryology	Advanced Histology	AOG107803-K8	1	1	16	AW5	Anatomy, histology and embryology I.	Szabolcs Felszeghy Ph.D., D.D.S.		

Freely Chosen Courses									
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator	
Department of Anatomy, Histology and Embryology	Computer human anatomy: musculoskeletal system, extremities	AOG1092A2	1	2	20	AW5	None	Miklós Antal M.D., Ph.D., D.Sc.	
Department of Anatomy, Histology and Embryology	Clinical anatomy and plastination I.	AOG109404	2	1	30	AW5	grade 4 or 5 in Anatomy I.	Miklós Antal M.D., Ph.D., D.Sc.	
Department of Anatomy, Histology and Embryology	Clinical anatomy and plastination II.	AOG109604	2	2	30	AW5	Anatomy I.	Miklós Antal M.D., Ph.D., D.Sc.	
Department of Anesthesiology and Intensive Care	Pulmonary disturbances in the ICU and in the OR. Problem based learning discussions. Clinical scenarios.	AOG117210	1	2	20	AW5	Propedeutics of Internal Medicine	Béla Fülecsi M.D., Ph.D., D.Sc.	
Department of Behavioural Sciences	Inborn sociality - socialized individuality: a new concept	AOG358902-K8	2	-	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.	
Department of Behavioural Sciences	Becoming a doctor: thematic self-awareness group	AOG359005-K10	2	2	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.	
Department of Behavioural Sciences	Evolution and Medicine	AOG359101-K8	1	1	26	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.	
Department of Behavioural Sciences	Human Ethology	AOG359201	2	2	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.	
Department of Behavioural Sciences	The basic problems of medicine	AOG358601	1	1	20	AW5	None	Attila Bánfalvi M.A., Ph.D.	
Department of Behavioural Sciences	Madness and psychiatry (philosophical approach)	AOG359602	1	2	20	AW5	None	Attila Bánfalvi M.A., Ph.D.	



Freely Chosen Courses										
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator		
Department of Behavioural Sciences	Theory of psychoanalysis and its influence on the concept of human being in medicine	AOG359501-K8	1	1	20	AW5	None	Attila Bánfalvi M.A., Ph.D.		
Department of Behavioural Sciences	Psychic Trauma	AOG3511102-K1	1	2	20	AW5	None	Attila Bánfalvi M.A., Ph.D.		
Department of Behavioural Sciences	Theoretical and methodological questions of patient satisfaction studies	AOG359308	1	2	15	AW5	None	Csilla Kemény M.A., Ph.D.		
Department of Behavioural Sciences	Music therapy	AOG3512102-K1	1	2	20	AW5	None	János Kollár M.A., Ph.D.		
Department of Behavioural Sciences	Yoga and Meditation I.	AOG3512001-K1	1	1	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.		
Department of Behavioural Sciences	Bioethical cases	AOG358706	2	2	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.		
Department of Behavioural Sciences	Intercultural health care	AOG3511605-K1	2	2	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.		
Department of Behavioural Sciences	Internet and Medicine	AOG359901	1	2	20	AW5	None	János Kollár M.A., Ph.D.		
Department of Behavioural Sciences	Jewish Medical Ethics I.	AOG3514406	2	1	15	AW5	None	Attila Bánfalvi M.A., Ph.D.		
Department of Behavioural Sciences	Jewish Medical Ethics II.	AOG3514407	2	2	15	AW5	None			
Department of Behavioural Sciences	Bioethics on Films	AOG3514405	1	1	26	AW5	None	Péter Kakuk M.A., Ph.D.		
Department of Behavioural Sciences	Attachment and couple relationships	AOG3510001	2	1	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.		

Freely Chosen Courses										
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator		
Department of Behavioural Sciences	Yoga and Meditation II.	AOG3510401-K1	2	2	30	AW5	None	Péter Molnár M.Sc., Ph.D., D.Sc.		
Department of Behavioural Sciences	Psynema	AOG3511406	1	1-2	20	AW5	None	Iános Kollár M.A., Ph.D.		
Department of Behavioural Sciences	Medicine in Art	AOG3515003	1	1-2	20	AW5	None	Sándor Kótműves M.A., Ph.D.		
Department of Behavioural Sciences	Issues about the Start and End of Life	AOG3515103	1	1-2	22	AW5	None	Sándor Kótműves M.A., Ph.D.		
Department of Biochemistry and Molecular Biology	Biochemistry of apoptosis	AOG167406	1	-	20	AW5	Biochemistry II.	Zsuzsa Szondy M.D., Ph.D., D.Sc.		
Department of Biochemistry and Molecular Biology	Retroviral Biochemistry	AOG167506	1	2	20	AW5	Molecular Biology	József Tözsér M.Sc., Ph.D., D.Sc.		
Department of Biophysics and Cell Biology	Physical foundations of biophysics	AOG157303	1	1	24	AW5	None	György Vámosi M.Sc., Ph.D.		
Department of Cardiology	Echocardiography	AOG317307	1	1	18	AW5	Internal Medicine I., Clinical Physiology	Ida Hegedűs M.D., Ph.D.		
Department of Cardiology	Cardiac interventions	AOG317408-K1	1	1	14	AW5	Internal Medicine I., Clinical Physiology	Tibor Szűk M.D.		
Department of Foreign Languages	Hungarian Language Elective General II.	AOG269102	2	2	30	AW5	Hungarian Crash Course	László Répás M.A.		
Department of Foreign Languages	Hungarian Language Elective General I.	AOG268901	2	1	30	AW5	Hungarian Crash Course	László Répás M.A.		
Department of Foreign Languages	Hungarian Language Elective - Medical I.	AOG26108A1-K1	2	1	30	AW5	None	László Répás M.A.		
Department of Foreign Languages	Hungarian Language Elective - Medical II.	AOG26108A2-K1	2	2	30	AW5	Completion of Hungarian Language Elective Medical I.	László Répás M.A.		

Freely Chosen Courses										
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator		
Department of Foreign Languages	Latin medical terminology	AOG2611002	2	2	30	AW5	Latin language	László Répás M.A.		
Department of Immunology	Selected topics of Immunology	AOG297206	1	2	20	AW3	Immunology	Éva Rajnavölgyi M.Sc., Ph.D., D.Sc.		
Department of Internal Medicine	Immune intervention therapy in patients with autoimmune diseases	AOG149307	1	1	8	AW5	Pathology II., Immunology			
Department of Internal Medicine	Apheresis treatment in medical intensive care	AOG149009	1	1	10	AW5	Internal Medicine IV.			
Department of Internal Medicine	Inflammatory bowel diseases: clinical, therapeutical and immunological aspects	AOG148709	1	1	8	AW5	Internal Medicine II. (Immunology and rheumatology)			
Department of Internal Medicine	Modern functional diagnosis of microcirculation.	AOG149110	1	2	8	AW5	Pathology II., Internal Medicine V.			
Department of Internal Medicine	Laboratory methods of clinical immunology	AOG149506	1	2	8	AW5	Propedeutics of Internal Medicine			
Department of Internal Medicine	Acute and chronic liver diseases	AOG138207	1	2	14	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	István Tornai M.D., Ph.D.		
Department of Internal Medicine	Current endoscopic practice in gastroenterology	AOG137707	1	1	14	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	István Altorjay M.D., Ph.D.		
Department of Internal Medicine	Interesting cases in haemostaseology	AOHAE02T8	1	2	10	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	Zoltán Boda M.D., Ph.D., D.Sc.		

Freely Chosen Courses									
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator	
Department of Internal Medicine	Selected chapters and case presentations in lympho-, and myeloproliferative diseases	AOG137405	1	1	16	AW5	Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine		
Department of Internal Medicine	Clinical cases and differential diagnosis in general medicine	AOG158507	1	1	12	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine		
Department of Medical Laboratory and Diagnostic Imaging	Selected Chapters from the Cross-Sectional Anatomy of the Human Body	AOCSA01L3	2	1	28	ESE	Anatomy 1-2.	Ervin Berényi M.D., Ph.D.	
Department of Medical Laboratory and Diagnostic Imaging	Multimodal imaging and virtual reality in neurosciences	AOG487503	1	1	18	AW5	Biophysics	András Jakab M.D.	
Department of Medical Laboratory and Diagnostic Imaging	History of Radiology	AOG487407	1	1	18	AW5	None	Ervin Berényi M.D., Ph.D.	
Department of Medical Microbiology	Tumor viruses and oncogenes	AOG427804	1	2	12	AW5	Medical Microbiology II.	Vera Gulácsy M.D.	
Department of Medical Microbiology	Interpretive clinical bacteriology and virology	AOG428108	1	2	14	AW5	Medical Microbiology II.	József Kónya M.D., Ph.D.	
Department of Medical Microbiology	Interesting Issues of Medical Parasitology	AOG429907	1	1	12	AW5	Medical Microbiology I.	Judit Szabó M.D., Ph.D.	
Department of Medical Microbiology	The problem of resistance to antibiotics. Antibiotic policy	AOG428405	1	2	15	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.	
Department of Medical Microbiology	Infections of the immunocompromised	AOG429407	1	2	21	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.	

Freely Chosen Courses									
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator	
Department of Medical Microbiology	Case studies in clinical microbiology	AOG429505	1	2	9	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.	
Department of Medical Microbiology	Fingerprinting of pathogens, methods in epidemiological tracing.	AOG429605	2	2	21	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.	
Department of Medical Microbiology	Travel and infectious diseases, imported infections	AOG429707	2	2	21	AW5	Medical Microbiology I.	Gábor Kardos M.D., Ph.D.	
Department of Medical Microbiology	Infections spreading from animals to humans.	AOG429807	2	2	21	AW5	Medical Microbiology I.	Krisztina Szarka M.Sc., Ph.D.	
Department of Medical Microbiology	Molecular diagnosis of multiresistant bacteria	AOG4210008	1	2	12	AW5	Medical Microbiology II.	Judit Szabó M.D., Ph.D.	
Department of Medical Microbiology	Microbiology of sepsis	AOG4210007	1	1	12	AW5	Medical Microbiology I.	Judit Szabó M.D., Ph.D.	
Department of Medical Microbiology	Laboratory diagnosis of anaerobic bacteria	AOG4210006	1	2	12	AW5	Medical Microbiology I.	Judit Szabó M.D., Ph.D.	
Department of Medical Microbiology	Introduction to Medical Mycology	AOG4210207	1	1-2	14	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.	
Department of Medical Microbiology	Clinical Mycology	AOG4210107	1	1-2	12	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.	
Department of Medical Microbiology	Malaria	AOG4210407	1	1-2	15	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.	
Department of Medical Microbiology	Chapters in the history of medical virology	AOG4210807	1	2	15	AW5	Medical Microbiology II.	György Veress M.Sc., Ph.D.	
Department of Neurosurgery	Neurosurgical emergency	AOG277210	1	1	12	AW5	Pathology II.	Sándor Szabó M.D., Ph.D.	
Department of Neurosurgery	Pediatric Neurosurgery	AOG277807	1	1	12	AW5	Pathology II.	Álmos Klekner M.D., Ph.D.	

Freely Chosen Courses										
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator		
Department of Nuclear Medicine	Introduction into PET techniques	AOG467505-K1	2	2	28	AW3	None	László Balkay M.Sc., Ph.D.		
Department of Nuclear Medicine	Nuclear medical differential diagnostics	AOG397310	2	1	22	AW5	Radiology and Nuclear Medicine II.	László Galuska M.D., Ph.D.		
Department of Obstetrics and Gynecology	Ultrasound diagnosis in obstetrics and gynecology	AOG557908	1	2	15	AW5	Obstetrics and gynecology I.	Zoltán Tóth M.D., Ph.D., D.Sc.		
Department of Obstetrics and Gynecology	Prenatal diagnosis of genetic diseases	AOG558110	1	2	15	AW5	Obstetrics and gynecology I.	Olga Török M.D., Ph.D.		
Department of Obstetrics and Gynecology	Practical healthcare in the English-speaking countries in the junior doctors' perspective	AOG558409	1	1	15	AW5	Obstetrics and gynecology II.	Tamás Kovács M.D., Ph.D.		
Department of Operative Techniques and Surgical Research	Basics of Hemorheology	AOG517908-K1	1	1-2	10	AW5	Basic Surgical Techniques	Norbert Németh M.D., Ph.D.		
Department of Otolaryngology and Head and Neck Surgery	Reconstructive and voice rehabilitation methods in head and neck surgery	AOG217410	1	1-2	10	AW5	Propedeutics of Internal Medicine, Physiology II.	Attila Szűcs M.D., Ph.D.		
Department of Pathology	Neurodegenerative diseases	AOG457207	1	-	20	AW5	Pathology II.	Péter Molnár M.Sc., Ph.D., D.Sc.		
Department of Psychiatry	Self-centered psychotherapy	AOG478009	1	1	13	AW5	None	Anikó Égerházi M.D., Ph.D.		
Department of Pulmonology	Asthma bronchiale	AOG587707	1	1	8	AW5	Pathology II.	László Brugós M.D.		
Department of Pulmonology	Lung cancer	AOG587607	1	1	10	AW5	Pathology II.			

Freely Chosen Courses									
Department	Subject	Neptun code	Crd. point	Semester	Nr. of hours	Exam	Prerequisites of taking the subject	Coordinator	
Department of Traumatology and Hand Surgery	State of the art treatment of big joint's injuries. Diagnostic and treatment of pediatric bone and arthritic injuries	AOG578608	1	2	12	AW5	Traumatology I.	Ferenc Urbán M.D.	
Department of Urology	Andrology	AOG599607	1	1-2	15	AW5	Pathology II., Propedeutics of Internal Medicine	Mátyás Benyó M.D.	
Department of Urology	Urological Laparoscopic Surgery	AOG599707	1	1-2	15	AW5	Basic Surgical Techniques	Mátyás Benyó M.D.	
Department of Urology	Urolithiasis	AOG599807	1	1-2	15	AW5	Pathology II., Propedeutics of Internal Medicine	Csaba Bercei M.D., Ph.D.	
Department of Urology	Urological Oncology	AOG599507	1	1-2	15	AW5	Pathology II., Propedeutics of Internal Medicine	Csaba Bercei M.D., Ph.D.	
Department of Urology	Benign Prostatic Hyperplasia (BPH)	AOG5910107	1	1-2	15	AW5	Pathology II. and Propedeutics of Internal Medicine	Morshed Ali Salah M.D., Ph.D.	
Department of Urology	Uro-radiology	AOG5910207	1	1-2	15	AW5	Pathology II. and Propedeutics of Internal Medicine	Morshed Ali Salah M.D., Ph.D.	
Division of Cardiac Surgery	Cardiac Surgery	AOG607508	1	2	22	AW5	Surgery I.	Tamás Szeráfin M.D., Ph.D.	
Division of Clinical Physiology	Cellular and molecular pathophysiology of the cardiovascular system	AOG337406	1	2	20	AW5	Clinical Physiology	Zoltán Papp M.D., Ph.D., D.Sc.	

<b>Freely Chosen Courses</b>									
<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd. point</b>	<b>Semester</b>	<b>Nr. of hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>	
<b>Division of Radiotherapy</b>	<b>Operativ techniques in radiotherapy (brachytherapy)</b>	<b>AOG527810</b>	<b>1</b>	<b>2</b>	<b>12</b>	<b>AW5</b>	<b>Radiology II.</b>	<b>Andrea Furka M.D., Ph.D.</b>	
<b>Division of Radiotherapy</b>	<b>Dealing with irradiation induced side effects</b>	<b>AOG528006</b>	<b>1</b>	<b>2</b>	<b>12</b>	<b>AW5</b>	<b>Propedeutics of Internal Medicine; Med. Physiology II.</b>	<b>Andrea Furka M.D., Ph.D.</b>	
<b>Division of Radiotherapy</b>	<b>Basic principles of radiotherapy</b>	<b>AOG527107</b>	<b>1</b>	<b>2</b>	<b>14</b>	<b>AW5</b>	<b>None</b>	<b>Kornélia Szluha M.D., Ph.D.</b>	
<b>Division of Radiotherapy</b>	<b>Multidisciplinary approach to the treatment of cutaneous malignancies</b>	<b>AOG528209</b>	<b>1</b>	<b>1-2</b>	<b>15</b>	<b>AW5</b>	<b>taking of Dermatology subject</b>	<b>Kornélia Szluha M.D., Ph.D.</b>	
<b>Division of Rheumatology</b>	<b>Rheumatology: Research and Clinical</b>	<b>AOG149108</b>	<b>1</b>	<b>2</b>	<b>10</b>	<b>AW5</b>	<b>Internal Medicine II. (Immunology and Rheumatology)</b>	<b>Zoltán Szekaneecz M.D., Ph.D., D.Sc.</b>	
<b>Institute of Surgery</b>	<b>Surgical Oncology</b>	<b>AOG497408</b>	<b>1</b>	<b>1-2</b>	<b>10</b>	<b>AW5</b>	<b>Pathology II.</b>	<b>Péter Sápó M.D., Ph.D., D.Sc.</b>	



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## CHAPTER 9

### ACADEMIC PROGRAM FOR THE 1ST YEAR

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#### Department of Behavioural Sciences

Subject: **MEDICAL PSYCHOLOGY I.**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

**1<sup>st</sup> week:**

**Lecture:** Behavioural sciences: fields and their role in professional socialization of medical students. The principles of bioethics.

Psychology - area, main theories and their relevance to health issues.

**2<sup>nd</sup> week:**

**Lecture:** Person perception and its typical errors.

Communication: human ethological foundations.

**3<sup>rd</sup> week:**

**Lecture:** Channels, messages and feed-back processes of face-to-face inter-personal interactions.

Empathy: its analysis, appearances, levels; its relation to burnout phenomena.

**4<sup>th</sup> week:**

**Lecture:** Emotions: basic emotions and their psychophysiological concomitants.

Human emotions and their relation to health. Hostility and its consequences.

**5<sup>th</sup> week:**

**Lecture:** Competence as an independent motive: origin of the concept, appearance in medical students.

Motivation: Maslow's hierarchical model, social penetrance; attachment: theory and pathology.

**6<sup>th</sup> week:**

**Lecture:** Learning: the field. The inborn-acquired

controversies and their outcome.

Memory, as a process: characteristics, organization, the "eyewitness effect"; forgetting, motivated forgetting.

**7<sup>th</sup> week:**

**Lecture:** Personality development and its critical periods, environmental effects: a complex view of socialization. E. Erikson's psychosocial theory.

Personality: a concise summary of personality theories.

**8<sup>th</sup> week:**

**Lecture:** Persons in relations: group processes, group development and its phases, group cohesion and its sinister effects, "group thinking" and its appearances in medical decisions.

Introducing dynamic psychological schools and their health related relevance.

Key concepts; defence mechanisms; transference and counter transference.

**9<sup>th</sup> week:**

**Lecture:** A review of behaviourism; conditioning and learning; social learning theories.

Humanistic psychology: the "third force" and its main figures. Carl Rogers.

**10<sup>th</sup> week:**

**Lecture:** Summative review.

### Requirements

Course objectives:

The aim of the course is to familiarize the students with the most important psychological aspects of health and illness, the psychological characteristic of medical profession as well as the healing/caring process. The main schools of psychology are also introduced. The course is intended to give basic knowledge for the purpose of understanding the phenomena of motivation, memory, socialization, empathy as far as they are relevant for future medical doctors. This means the first steps toward the more specialised courses like medical psychology and behavioural medicine, as well as electives to be introduced in the third and fourth academic years.

First year students should pass "End of Semester Examination" (ESE) at the end of the semester. The Department of Behavioural Sciences will adhere to the requirements of the Rules and Regulations for English Program Students. The student must be present and the examination at the designated time. (He/she must explain the reason for any absence from the examination to the Departmental Adviser within 1 day of the day of examination.)

## Department of Biophysics and Cell Biology

Subject: **BIOPHYSICS**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Seminar: **30**

Practical: **22**

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

**Lecture:** 1. Introduction. Electromagnetic waves, thermal radiation, wave-particle duality, Heisenberg uncertainty principle, absorption, spectra of atoms and molecules. 2. X-ray, X-ray crystallography.

**Seminar:** Introduction.

**Practical:** Please see the web page of the Department (biophys.med.unideb.hu) for detailed information about practicals.

### 2<sup>nd</sup> week:

**Lecture:** 3. Light absorption and emission. Fluorescence, phosphorescence. 4. Absorption spectroscopy, Fluorescence spectroscopy, Application of fluorescence techniques.

**Seminar:** Material related to lectures 1 and 2.

### 3<sup>rd</sup> week:

**Lecture:** 5. Lasers and their application in medicine. 6. Optics, optical microscopy, electron microscopy.

**Seminar:** Material related to lectures 3 and 4.

### 4<sup>th</sup> week:

**Lecture:** 7. Physical properties of sound, ultrasound, Doppler principle. 8. Nuclear magnetic resonance (NMR) and electron spin resonance (ESR).

**Seminar:** Material related to lecture 6.

### 5<sup>th</sup> week:

**Lecture:** 9. Nuclear physics (nuclear binding energy), radioactivity, law of radioactive disintegration, radioactive series. 10. Features of nuclear radiation and its interaction with absorbing material. Detection of radiation.

**Seminar:** Material related to lectures 7 and 8.

### 6<sup>th</sup> week:

**Lecture:** 11. Radiation biophysics: target theory, direct and indirect action of radiation. Dosimetry. Biological effects of radiation. 12. Experimental and diagnostic application of isotopes. Accelerators, Gamma camera.

**Seminar:** Material related to lecture 9.

### 7<sup>th</sup> week:

**Lecture:** 13. Principles of tomographic methods, PET and SPECT. Principles of Computer Tomography (CT). 14. Magnetic resonance imaging (MRI), Ultrasound imaging and therapy.

**Seminar:** Material related to lectures 11 and 12

**Self Control Test**

### 8<sup>th</sup> week:

**Lecture:** 15. Free enthalpy, chemical potential. Thermodynamic probability, Brownian motion, osmosis. 16. Diffusion at the molecular level, statistical interpretation. Fick's I. and II. Law.

**Seminar:** Material related to lectures 13 and 14.

### 9<sup>th</sup> week:

**Lecture:** 17. The structure of biological membranes. Membrane transport. 18. Thermodynamic equilibrium potentials (Nernst, Donnan). Diffusion potential, Goldman-Hodgkin-Katz equation.

**Seminar:** Material related to lectures 15 and 16.

### 10<sup>th</sup> week:

**Lecture:** 19. Resting potential, action potential, and electrical excitability. Measurement of membrane potential. 20. Ion channels (gating, selectivity).

**Seminar:** Material related to lectures 17 and 18

### 11<sup>th</sup> week:

**Lecture:** 21. The physical background of ECG and EEG. 22. The human ear. Mechanism of hearing. The Weber-Fechner law.

**Seminar:** Material related to lectures 19 and 20.

### 12<sup>th</sup> week:

**Lecture:** 23. The human eye. Photoreceptors. The molecular mechanism of vision. 24. Information and entropy. Communication systems. Feed back mechanisms.

**Seminar:** Material related to lectures 21 and 22.

**Self Control Test**

### 13<sup>th</sup> week:

**Lecture:** 25. Fluid mechanics, blood circulation. 26. Biomechanics.

**Seminar:** Material related to lectures 23 and 24.

**14<sup>th</sup> week:**

**Lecture:** 27. Flow cytometry and its application in medicine. 28. Modern microscopic techniques, near field, atomic force and electron microscopy, confocal laser scanning microscopy.

**15<sup>th</sup> week:**

**Lecture:** 29. Sedimentation methods, electrophoresis, isoelectric focusing, blotting techniques. 30. Research in the Institute.

## Requirements

### 1. Lectures

Attendance at lectures is emphatically recommended. All material covered in lectures is an integral part of the subject and therefore included in the self-control tests and the final exam. Some new concepts and ideas are discussed in the lectures only and are not present in the textbook.

Attendance at seminars is compulsory, however, a student may miss maximum 7 (seven) seminars. Students may attend the seminars only according to their group assignment. In the seminars, students are encouraged to ask questions related to the topic of the lectures discussed (see timetable of lectures and seminars). Besides, students may prepare short presentations (**10-15 minutes**) about the topic of the seminars (max 2 students/seminar). Materials for short presentations will be available from the beginning of the semester. The talks are graded on a scale of 0-3. This grade counts toward the bonus points earned during the semester. Students obtaining less than 3 points for the presentation may prepare an additional one (in the student's own group) given that spots are still available. In this case the better score is considered for bonus points (the two presentations are not cumulative). To get the maximum 3 points for the presentation the followings must be fulfilled:

- 1, keeping the allocated time (max. 15 min)
- 2, good quality of the figures (axis labels, color combinations, appropriate resolution)
- 3, good quality of the presentation (reading text from the slides or notes is not acceptable here)
- 4, teaching merit of the presentation (too many slides without proper explanation is not accepted here)

### 3. Practical

Attendance at labs is mandatory. Labs missed with acceptable excuses can be completed during the spare practical on week 12 with a written permission (recorded in the lab logbook) of the academic advisor (permission is given during the office hours only). For missed labs (if missing is due to the student's fault), bonus points will be withdrawn. A separate lab logbook should be prepared (A4, cross-hatched, bound). The first page of the logbook should have a table with 6 columns (date, title of the practical, signature for presence, grade, signature for grade, acceptance). For each lab students must write a short summary of the background of the practical to be performed into the logbook. The summary has to be hand-written, i.e. photocopies of the relevant book chapter or printed materials are not acceptable. The lab tutor may test the students' preparation for the practical and based on this the tutor might instruct the student to repeat the lab (scheduling is the same as for absences). All data must be entered directly into the logbook, no loose sheets or photocopies or printed versions of the laboratory manual are accepted. The lab, including calculations and graphs, has to be finished by the end of the class. Logbooks will be graded at the end of the lab on a scale between 0-3 (0 means that the lab is not accepted and it has to be repeated) on the spot, i.e. it is not possible to turn in the logbook for scoring later. At the end of the semester, the grades for your logs and your attitude during labs will be summed up as a Practical Grade (PG) on a scale of 0-3.

*Practical exam (week 13).* Students can take a lab exam during their regular lab class on week 13. It is not allowed to repeat the lab exam to improve the grade. The duration of the lab exam is approximately 30 minutes and students have to perform an experiment based on the semester work, assigned randomly. The students can use their own logbook and a calculator, but no other material. The grading will be on a scale of 0-3 (PE grade) based on the record of this experiment and the calculations (concept, work plan, clarity and punctuality are primary consideration).

Evaluation of the practical part:

PG+PE  $\geq$  4, practical part accepted, exempted from practical exam on the day of the Final Exam.

2  $\leq$  PG+PE < 4 practical part accepted, practical exam on the day of the Final Exam.

PG+PE < 2, practical part is not accepted, the semester is not accepted.

For students who were exempted from attending the practicals, but have to take the lab exam, the exam on week 14 is evaluated as a pass or fail.

In order to get full exemption from the biophysics course the student has to write an application to the Educational Office. The Department of Biophysics and Cell Biology does not accept such applications. Applications for exemptions

## CHAPTER 9

from part of the courses are handled by the department. The deadline for such applications is Friday on the third week. No application will be considered after this date. The following documents have to be submitted to the academic advisor: 1. application with an explanation why the student thinks that he/she is eligible for an exemption; 2. certificates about the courses the student has taken; 3. a reliable description of the curriculum of the courses taken. An application is rejected, accepted, or in most cases students applying for an exemption will be examined by the Biophysics Chairman before granting an exemption. Applicants will be notified whether they have to take such an examination. The deadline for taking such an exam is Friday on week 5.

### 5. Conditions for signing the lecture book

1. 7 or fewer absences from seminars.
2. All labs accepted, PG+PE  $\geq 2$

### 6. Self control tests

There will be **2 self-control tests (SCT)** during the semester (week 7 and week 12). **None of the SCTs are obligatory.** The type of the questions will be similar to those on the final exam (FE). Each SCT will be graded (0-100 %, 0% for absence) and the results of the two SCTs will be averaged ( $X_{ave}$ ). The missed test will be counted as 0% in the average. Based on the written tests students may obtain the following bonus points and exceptions from the final exam:

- i) if  $X_{ave}$  is at least 66 points, the student is exempted from the (a) part of the biophysics final exam (see below)
- ii) according to  $X_{ave}$  SCT bonus points earned to the FE are as follows:

$X_{ave}$	SCT bonus points	$X_{ave}$	Bonus points	$X_{ave}$	bonus points
0- 34.99	0	55-60.99	7	73-78.99	10
35-49.99	5	61-65.99	8	79-	11
50-54.99	6	66-72.99	9	85-	see point iii)

- iii) if  $X_{ave}$  is at least 85 the students' FE grade is automatically 4. To improve the grade to 5 an oral exam is conducted.

### 7. Final examination (FE)

Students have three chances (A,B,C) for passing the biophysics final exam in the winter exam period after the semester in which the course was taken.

The FE consists of 3 parts:

- a) A written quiz of 20 minimum requirement questions. These questions and the answers thereto are provided on the website of the department (biophys.med.unideb.hu). Minimum questions regarding the biophysics labs are not asked in the exam. 16 out of 20 have to be answered correctly in order to pass this part. **Exemption from this part of the FE is discussed in 6. i).** One must pass this part to have the written test evaluated. This part is evaluated as pass or fail, once passed it is valid for B and C chance(s) of the FE. The result of the minimum requirement questions are not counted into the result of the written test (part c of the FE).
- b) A practical exam similar to that on week 13. Those reaching at least 4 points as their total practical grade (PG+PE, see above) are exempted. For those students who are not exempted from this part, the practical exam is evaluated as pass or fail independent of their practical grade (PG). For students who got exemption from attending the practicals the lab exam will also be evaluated as pass or fail. The result of the practical exam is not counted into the result of the written exam (part c of the FE). The result of a successful practical exam is valid for further exam chances (B or C chances).
- c) A written exam (0-100 points) with essays, fill-in-the-missing-phrase type questions, relation analysis and various simple test and multiple-choice questions. This will only be evaluated if part (a) and part (b) are both passed. However, those failing Part (a) can still do the practical exam (Part (b)) on the day of the FE. The total bonus for the semester (**SCT bonus points (max. 11) + seminar bonus points (max. 3)**) will be added to the score of the written exam **ONLY**

**IF** a minimum score of 45% is achieved in part (c) of the FE. **Additional exemptions are in point 6. iii)**

**Evaluation of the FE:**

**Grade is calculated based on the sum of written exam score + bonus points (see condition for adding the bonus points above)**

Grade	written exam score + bonus points	Grade	written exam score + bonus points
fail (1)	0-54.99	good (4)	75-84.99
pass (2)	55-64.99	excellent (5)	85-
satisfactory (3)	65-74.99		

Dates, sites and detailed instructions for SCTs and the FE will be announced on the notice board of the Department of Biophysics and Cell Biology and on the educational web site (biophys.med.unideb.hu).

**8. Rules for calculator usage during self-control tests and the final examination**

In order to ensure a fair evaluation, to avoid disturbances in the testing room, and to protect the security of the test material the following types of calculators are NOT permitted:

- calculators with built-in computer algebra systems (capable of simplifying algebraic expressions)
- pocket organizers, handheld or laptop computers
- any device capable of storing text. Calculators with a typewriter keypad (so-called QWERTY devices), electronic writing pads and pen-input devices are not allowed either. Calculators with letters on the keys (e.g. for entering hexadecimal numbers or variable names) are permitted as long as the keys are not arranged in QWERTY format.
- Calculators or other devices capable of communicating with other devices
- Calculators built into wireless phones
- Calculators with paper tape or models that make noise

In general, students may use any four-function, scientific or graphing calculator except as specified above. However, we reserve the right to prohibit the usage of ANY type of calculator, computer and data storage and retrieval device during some tests if no calculations or only very simple calculations are necessary. Sharing calculators during tests is not allowed, and the test proctor will not provide a calculator.

Further information: Zsolt Fazekas, Ph.D., academic advisor, Dept. of Biophysics and Cell Biology

E-mail: biophysedu@med.unideb.hu

Office hours: In the seminar room of Dept. of Biophysics and Cell Biology, Life Science Building, F.102. Times of Office hours are posted on the web site (biophys.med.unideb.hu) and on the Departmental Bulletin board.

## Department of Biophysics and Cell Biology

Subject: **BIostatistics**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Seminar: **30**

**1<sup>st</sup> week:**

**Seminar:** 1. Introduction, random variables, qualitative variables, quantitative variables, discrete and continuous random variables. 2. Counting techniques (permutations and combination), Set theory, definition and properties of probability, conditional probability, Bayes's theorem.

**2<sup>nd</sup> week:**

**Seminar:** 3. Descriptive statistics, ordered array,

frequency distribution, cumulative frequency distribution, histogram mean, median, mode, range, variance. 4. Probability distributions (discrete, continuous), Binomial and Poisson distributions.

**3<sup>rd</sup> week:**

**Seminar:** 5. Normal distribution, standard normal distribution, problems for normal and standard normal distributions. 6. Sampling, sampling distributions (special

## CHAPTER 9

focus on SEM and the central limit theorem).

**4<sup>th</sup> week:**

**Seminar:** 7. Hypothesis testing, type I and type II errors.  
 8. Statistical tests (z, t and F tests).

**5<sup>th</sup> week:**

**Seminar:** 9. Clinical implications of conditional probability (sensitivity, specificity, positive and negative predictive values). 10. Summary.

## Requirements

### Requirements for the Biostatistics course

1. *Seminars for all groups (called lectures from here):* If a student is present on every lecture, he/she receives 10 bonus points which is added to the result of the final exam and/or the course test according to point 5. Attendance to the lectures will be checked randomly. The student will lose the 10 bonus points, obtainable for attendance to every biostatistics lecture, if he/she misses one of the lectures. No kind of certificate, including a medical certificate, is accepted for the absences.

2. *Seminars:* The teacher will discuss the material of the lectures in more detail on seminars. Attendance to seminars is compulsory.

3. *Exemptions:* Applications for exemption from the biostatistics course has to be turned in to the Credit Transfer Committee. Such requests are not accepted by the Biomathematics Division or the Department of Biophysics and Cell Biology.

4. *Requirements for signing the lecture book:* Maximum 2 absences are allowed from the seminars. If the number of absences from the seminars is more than two, we will not sign the lecture book.

5. *Course test and final exam:* Students will have a written test on week 14 whose structure and evaluation will be identical to those of the final exam. Based on the results of the course test final grades will be offered. During the exam period there will be usually one exam day/week in biostatistics which will also be a written test. Features of the course test and the final exam:

- Structure:
  - o part A: biostatistics minimum requirement questions and simple calculations (mean, median, mode, plotting data, SD, SEM, standardizing normal distribution, etc.). Total score of part A is 40 points.
  - o part B: test questions, essay (open) questions, calculations. Total score of part B is 60 points.
- Evaluation: the student will fail the course test and the final exam if the score of part A without the bonus points obtainable for attendance to the lecture-wise seminars is less than 75%.
- Grading: if the score of part A without the bonus points is at least 75%, the bonus points will be added to the summed score of parts A and B resulting in the final score (F.S). Based on the F.S. the tests will be graded according to the following table:

Final score (F.S.)	Grade
F.S. < 60	fail (1)
$60 \leq \text{F.S.} < 70$	pass (2)
$70 \leq \text{F.S.} < 80$	satisfactory (3)
$80 \leq \text{F.S.} < 90$	good (4)
$90 \leq \text{F.S.}$	excellent (5)

A grade of pass or better achieved on the grade-offering test is valid for the final exam.

#### Rules for calculator usage during course tests and the final examination

In order to ensure a fair evaluation, to avoid disturbances in the testing room, and to protect the security of the test material the following types of calculators are NOT permitted:

- calculators with built-in computer algebra systems (capable of simplifying algebraic expressions)
- pocket organizers, handheld or laptop computers
- any device capable of storing text. Calculators with a typewriter keypad (so-called QWERTY devices), electronic writing pads and pen-input devices are not allowed either. Calculators with letters on the keys (e.g. for entering

hexadecimal numbers or variable names) are permitted as long as the keys are not arranged in QWERTY format.

- Calculators or other devices capable of communicating with other devices
- Calculators built into wireless phones
- Calculators with paper tape or models that make noise

In general, students may use any four-function, scientific or graphing calculator except as specified above. Sharing calculators during tests is not allowed, and the test proctor will not provide a calculator.

## Department of Foreign Languages

Subject: **HUNGARIAN CRASH COURSE**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Practical: **36**

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

**Practical:** 1<sup>st</sup> day: Introduction, The Hungarian alphabet, Vowel harmony. Ki vagy? Köszönések. Personal pronouns, Conjugation of the verb "lenni". 2<sup>nd</sup> day: Köszönések (Greetings). Magyar nevek, magyar családnevek. Számok (Numbers). Fontos telefonszámok, telefonszámok kiolvasása. 3<sup>rd</sup> day: Magyar pénz. How many? Ordinal numbers. Hogy vagy? Milyen nyelven beszélsz? Word formation with "-ul, -ül". 4<sup>th</sup> day: Mit csinálsz? Present tense verbal endings. Adverbs of time. Hová mész ma este? "Lenni" in past and and future. Adverbs of place. 5<sup>th</sup> day: Mit kérsz? Te vs. ön/maga. Object of the sentence. Revision of previous topics.

### 2<sup>nd</sup> week:

**Practical:** 1<sup>st</sup> day: Kérsz egy kávét? Word formation. Plural marker. Tud/akar/szeret/szeretne gitározni. Infinitive. 2<sup>nd</sup> day: Milyen idő van ma? "-ik" group verbs. Irregular verbs in the present tense. Postán. Vasútállomáson. Mit eszünk ma este? Double negation. The negative of "van, vannak". 3<sup>rd</sup> day: Tetszik a ruhád. Possessive. Az emberi test. Nekem van. 4<sup>th</sup> day: Milyen szeme van? Absence of "van, vannak". Comparison. Summary. Practice. 5<sup>th</sup> day: End course exam. Oral minimal requirement exam.

## Requirements

9.00 - 10.30: language classes

10.30 - 11:00 break

11.00 - 12.30: language classes

Assessment: five grade evaluation (AW5).

Evaluation: Based on a written final test (80 %) + class participation + daily word quizzes (20 %) . Passing the oral exam is a minimal requirement for the successful completion of the Hungarian Crash Course. The oral exam consists of a role-play randomly chosen from 7 situations announced in the beginning of the course. Further minimal requirement is the knowledge of 200 words announced at the beginning of the course.

**STUDENTS WHO DO NOT ATTEND THE HUNGARIAN CRASH COURSE DUE TO THEIR OWN FAULT OR FAIL THE ORAL EXAM HAVE TO TAKE AN EXTRA COURSE FOR AN ADDITIONAL FEE OF 500 USD DURING THE FIRST SEMESTER.**

## Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE I/1.**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Practical: **24**

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

**Practical:** Revision. Pretest.

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**2<sup>nd</sup> week:**
**Practical:** Bemutakozás (Létige ismétlése).

**3<sup>rd</sup> week:**
**Practical:** Foglalkozások (igék, helyragok ismétlése, különös tekintettel az orvosokra)

**4<sup>th</sup> week:**
**Practical:** A családom (birtokos személyragok ismétlése)

**5<sup>th</sup> week:**
**Practical:** Emberek leírása (test) (melléknevek)

**6<sup>th</sup> week:**
**Practical:** Emberek leírása (test) (birtoklás ismétlése)

**7<sup>th</sup> week:**
**Practical:** Ismétlés. Mid-term test.

**8<sup>th</sup> week:**
**Practical:** Összehasonlítása (fokozás).

**9<sup>th</sup> week:**
**Practical:** Napirend (napok, napszakok, óra ismétlése)

**10<sup>th</sup> week:**
**Practical:** Szabadidő (+ időjárás, gyakoriság)

**11<sup>th</sup> week:**
**Practical:** Revision. Practising for the oral minimal.

**12<sup>th</sup> week:**
**Practical:** Written End-term Test. Oral minimal exam. Evaluation.

## Requirements

### Requirements of the language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each Hungarian language course, students have to sit for 2 written language tests and a short minimal requirement oral exam.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. There is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class, every week. In each word quiz students can be given 1 point if they know at least 80 % of the words asked. They have to collect at least 6 points to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal exam results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score. Based on the final score the tests are graded according to the following table:

Final score	Grade
0 – 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60, the student once can take an oral remedial exam covering the material of the whole semester.

#### Consultation classes

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** See the website of the department.

**Website:** Oral exam topics and vocabulary minimal lists are available from the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).



## Department of Medical Chemistry

Subject: **MEDICAL CHEMISTRY**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **48**

Seminar: **60**

Practical: **45**

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

**Lecture:** Introduction to Medical Chemistry. Quantum theory and the atom. Electronic structure and the periodic table. Types of chemical bonds. Covalent bonding and properties of molecules.

**Seminar:** Atoms and elements. Atomic structure. Electronic structure and the periodic table. Periodic perspective. Ionic and metallic bonds. Covalent bond: valence bond theory, hybridization and molecular orbital theory.

**Practical:** Laboratory safety instructions. Chemical calculations. Concentration of solutions.

### 2<sup>nd</sup> week:

**Lecture:** Intermolecular forces. Changes of state. Kinetic-molecular theory of gases and liquids. Solutions and colloids.

**Seminar:** Intermolecular forces. The gaseous state. Liquid and solid states. Vapor pressures of liquid solutions and related properties. Freezing point depression. Osmosis.

**Practical:** Laboratory techniques: Laboratory equipments, volumetric apparatus. Filtration. Preparations of solutions. Chemical analysis of drinking-water.

### 3<sup>rd</sup> week:

**Lecture:** Chemical equilibrium. Ionic equilibria. Acid base equilibria. Bronsted Lowry and Lewis theories

**Seminar:** Chemical equilibrium. Equilibrium constant expressions. Le Chatelier's principle. Ionic equilibria. Acids and bases. Electrolytes. Buffers. Solubility product.

**Practical:** Quantitative analysis. Acid-base titrations. Paper chromatography.

### 4<sup>th</sup> week:

**Lecture:** Thermochemistry and thermodynamics. Chemical kinetics.

**Seminar:** Thermochemistry: internal energy and enthalpy. Hess' law. Thermodynamics: entropy, free energy and free enthalpy. Chemical kinetics at the molecular level. Reaction rates and rate equations. Reaction mechanisms. Catalysis.

**Practical:** Quantitative analysis. Acid-base titrations. Paper chromatography.

### 5<sup>th</sup> week:

**Lecture:** Electrochemistry. Thermodynamics of redox reactions. Summary of general chemistry, relevance to biology and medicine.

**Seminar:** Oxidation-reduction and electrochemistry.

Summary of general chemistry. Relevance to biology and medicine. **STUDENT WORK:** Each student collects 1 biological/medical phenomenon related to any part of general chemistry.

**Practical:** Ion exchange chromatography and gel filtration. Desalting of a protein solution. Kinetic study of the saponification reaction of ethylacetate. Kinetic analysis of the oxidation of iodide ion using the Landolt-method.

### 6<sup>th</sup> week:

**Lecture:** Introduction to organic chemistry. Stereochemistry. Saturated and unsaturated hydrocarbons.

**Seminar:** Separation of chiral molecules. Electron distribution in organic compounds. Saturated and unsaturated hydrocarbons.

**Practical:** Ion exchange chromatography and gel filtration. Desalting of a protein solution. Kinetic study of the saponification reaction of ethylacetate. Kinetic analysis of the oxidation of iodide ion using the Landolt-method.

### Self Control Test

### 7<sup>th</sup> week:

**Lecture:** Aromatic hydrocarbons. Organic halogen compounds. Alcohols and phenols.

**Seminar:** Alkynes. Aromatic hydrocarbons. Heteroaromatic compounds. The mechanism of nucleophilic substitution. Important alcohols and phenols.

**Practical:** Electrometry. Electrometric pH measurement. Determination of buffering capacity. Electrometric titrations. Spectrophotometry.

### 8<sup>th</sup> week:

**Lecture:** Aldehydes and ketones and quinones. Nitrogen containing compounds.

**Seminar:** Aldehydes, ketones, quinones. Ethers. Sulfur containing organic compounds. Nitrogen containing compounds.

**Practical:** Electrometry. Electrometric pH measurement. Determination of buffering capacity. Electrometric titrations. Spectrophotometry.

### 9<sup>th</sup> week:

**Lecture:** Carboxylic acids. Amino acids and peptides.

**Seminar:** Carboxylic acid derivatives: esters, thioesters, anhydrides, acyl halides, amides. Amino acids and peptides.

**Practical:** Redox titrations. Iodometric titrations. Titrations with potassium bromate. Enzyme kinetics. Assay of glycogen phosphorylase activity.

## CHAPTER 9

**10<sup>th</sup> week:**

**Lecture:** Proteins. Carbohydrates.

**Seminar:** Purification of proteins. Enzymes. Oligosaccharides of glycoproteins. Heteropolysaccharides.

**Practical:** Redox titrations. Iodometric titrations. Titrations with potassium bromate. Enzyme kinetics. Assay of glycogen phosphorylase activity.

**11<sup>th</sup> week:**

**Lecture:** Glycolysis and tricarboxylic acid cycle. Lipids.

**Seminar:** Glycolysis and tricarboxylic acid cycle. Lipids.

**Practical:** Qualitative analysis of mono- and disaccharides. Polarimetric analysis of carbohydrates. Quantitative protein analysis. Assay of glucose.

**Self Control Test**
**12<sup>th</sup> week:**

**Lecture:** Nucleotides and nucleic acids. Coordination chemistry.

**Seminar:** Nucleotides and nucleic acids. Coordination chemistry.

**Practical:** Qualitative analysis of mono- and disaccharides. Polarimetric analysis of carbohydrates. Quantitative protein analysis. Assay of glucose.

**13<sup>th</sup> week:**

**Lecture:** Alkaline and alkaline earth metal cations. Transition metals: iron, copper, zinc.

**Seminar:** Alkaline and alkaline earth metal cations.

Biological functions of transition metals: Fe, Cu, Zn, Mo, Mn, Au.

**Practical:** Photometric determination of iron. Analysis of inorganic salts and complexes. Complexometric titrations.

**14<sup>th</sup> week:**

**Lecture:** Toxic metal ions: Hg, Cd, Pb. Platinum complexes in cancer therapy. Natural silicates, and biological functions of silicon. Biological functions of the nonmetallic elements: oxygen, selenium, the nitrogen cycle, halogens.

**Seminar:** Toxic metal ions: Hg, Cd, Pb. Platinum complexes in cancer therapy. Natural silicates, and biological functions of silicon. Biological functions of the nonmetallic elements: oxygen, selenium, the nitrogen cycle, halogens.

**Practical:** Photometric determination of iron. Analysis of inorganic salts and complexes. Complexometric titrations.

**15<sup>th</sup> week:**

**Lecture:** Summary of bioinorganic chemistry I. Summary of bioinorganic chemistry II.

**Seminar:** Discussion of the control test.

**Practical:** Practical exam (for students who have missed a lab or didn't get a signature for a lab).

**Self Control Test**

## Requirements

The program consists of lectures, seminars and laboratory practices. Attendance at laboratory practices and seminars is recorded. Students should attend at least 80% of seminars and 100% of laboratory practices. Upon approval by the laboratory teacher, missed and not accepted practices can be made up by the students on the same week or the next week (if the missed lab is still running). If the student fails the practical examination (on week 15), (s)he cannot get exemption from the written part of final examination and her/his final exam will also cover the laboratory practices.

Three control tests (general chemistry; organic chemistry; bioorganic and bioinorganic chemistry) covering the topics of lectures and seminars will be written during the semester. Preparation for the tests and exams should be based on the official textbooks, lectures and seminars. Knowledge of the "minimal requirements" as published on the Department's homepage is not sufficient for the successful completion of control tests/exams. Minimal requirements simply indicate the core knowledge, the lack of which (or any part of it) necessarily results in the student failing the test/exam.

Control tests and final exams will be assessed as follows\*:

Percentage (%)*	Mark
0-56	fail (1)
57-65	pass (2)
66-75	satisfactory (3)
76-84	good (4)
85-100	excellent (5)

\*Percentage values may slightly vary depending on the actual number of questions in the tests/exams.

The final exam begins with a written test composed of three modules: general chemistry; organic chemistry; bioorganic and bioinorganic chemistry. Each module consists of multiple choice questions. For each module students may opt for either accepting the percentage of the corresponding control test or taking the exam test. The mark of the written exam will be determined by calculating the average percentage values of the three modules (either from control tests or from exam tests). Thus the student may get full exemption from the final written exam in case (s)he passed all three control tests and chooses to take the results of the control tests rather than sitting a final written exam. The student can only

pass the written exam if the result of all three modules is at least a “pass (2)” and (s)he successfully fulfilled the requirements in laboratory practices. The second part of the final exam is an oral exam covering all three modules. Only students who passed the written test qualify to sit the oral exam.

Students should declare till a given deadline whether or not they accept the control test result(s) otherwise the results will be cancelled. If the student chooses to use control test results, then (s)he should answer questions in the final written examination only from the missing module(s). Results of control tests and exam modules can be carried to B or C chance exams.

Students who have successfully passed the exam are allowed to take one improvement exam.

In case students take the exam in the second semester at the end of an exam course, then all three modules of the exam must be taken and results of previous control tests or exam modules cannot be considered.

## Division of Emergency Medicine

Subject: **FIRST AID AND REANIMATION**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **6**

Practical: **15**

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

**Lecture:** Definition of “first aid”; first aid levels; time factor; behavior of first responder in the field; the emergency call

### 2<sup>nd</sup> week:

**Lecture:** Unconsciousness; airway obstruction; airway opening maneuvers; Gábor maneuver

### 3<sup>rd</sup> week:

**Lecture:** Death as a process; determining of clinical death; the different oxygen demand of the brain depending on age; establishing unconsciousness or death; assessment of vital signs; assessment of breathing, circulation, pupils and muscle tone

### 4<sup>th</sup> week:

**Lecture:** Reanimation on the spot – organization problems; the theory of CPR; complications during the CPR; effect, results and success during CPR

### 5<sup>th</sup> week:

**Practical:** Examination of breathing and circulation; the chest-thrust; airway opening maneuvers; the recovery position (Gábor maneuver); one hour

### 6<sup>th</sup> week:

**Practical:** Practicing the ventilation (one hour)

### 7<sup>th</sup> week:

**Practical:** Practicing the chest compression (one hour)

### 8<sup>th</sup> week:

**Practical:** CPR training without equipment (two hours)

### 9<sup>th</sup> week:

**Practical:** CPR training, two-rescuer method (two hours)

### 10<sup>th</sup> week:

**Practical:** Bleeding control with direct pressure and pressure point techniques; bandages and fixation; equipments, tools and maneuvers; general rules of provisory injury therapy; pressure bandage for controlling of arterial and venous bleeding on the spot (two hours)

### 11<sup>th</sup> week:

**Practical:** Bandages for head, nose; ears, eyes; chin, body and extremities; practicing the bandages (two hours)

### 12<sup>th</sup> week:

**Practical:** First aid in fractures, luxations, distortions and extended soft-tissue injuries; bandage for fixation with special triangle; Schantz collar; stifneck; Dessault bandage; fixation of finger and hand fractures; usage of Kramer splint and pneumatic splint (two hours)

### 13<sup>th</sup> week:

**Practical:** CPR training (two hours)

### Self Control Test

### 14<sup>th</sup> week:

**Lecture:** Burning; first aid in burning diseases; shock

### 15<sup>th</sup> week:

**Lecture:** Intoxication; guideline of poisoning in toxicology; typical intoxications, special signs, first aid

## Requirements

Condition of signing the Lecture book:

Attendance at practices is compulsory. The tutor may refuse to sign the Lecture book if the student is absent from the practices more than twice in a semester. Missed practices should be made up for after consultation with the practice tutor. Facilities for a maximum of 2 make-up practices are available at the Ambulance Station in Debrecen. The current knowledge of students will be tested two times in each semester in written test.

## Department of Anatomy, Histology and Embryology

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY I.**

Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **29**

Practical: **86**

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

**Lecture:** General introduction. Epithelial tissue: covering and lining epithelia

**Practical:** Anatomy: Anatomical terminology. Bones and joints of the upper limb. a. Anatomical terminology. Terms of positions and directions. Bones of the upper limb. Make schematic drawings of the bones: show the characteristic features. Reconstruction of the carpus from individual bones. b. Joints of the upper limb. Please pay special attention to the following issues: Classification of the articular surface according to the shape. Note the presence of discs and menisci. Describe the joint capsule, extracapsular and intraarticular ligaments, bursal cavities and other accessory parts of the joint. - Classification of synovial joints. Freedom, axes and planes of movements at synovial joints. Correlation between the shape of the articular surface and the freedom of movements. Function of individual joints: their contribution to the action of the upper limb. Histology: Introduction to microscopy and basic histological methods. Introduction to histological methods. The microscope. Using the microscope: the condensor, focus adjustment. The evaluation and interpretation of histological sections. Always keep in mind: What you can see in the microscope is a thin (almost 2-dimensional) section of a 3-dimensional object. 1. Small intestine (HE)

### 2<sup>nd</sup> week:

**Lecture:** Osteology and arthrology - introduction. The muscular system - general introduction. Innervation of the muscles.

**Practical:** Anatomy: Joints of the upper limb. Dissection of the upper limb: part one and two a. Dissection of the upper limb: part one. Surface anatomy of the upper limb. Mark the surface projections of superficial veins and cutaneous nerves on the cadaver, show the sites where the fascia is pierced by superficial veins and nerves. Projections and landmarks of the deep elements. Lymph nodes and lymphatic drainage of the upper limb. Places of the intravenous injections. Palpate the pulse on the upper limb. Transmit these markings to the scheme of the upper limb provided in your anatomy schedule handout. Incise

the skin from the deltoideopectoral sulcus to the wrist and fold it laterally. Peel off the skin of the hand separately and fold it into the distal direction. Dissection of the infraclavicular region: incise the skin along the clavicle and fold it downward! b. Dissection of the volar side of the upper limb. Axillary fossa, medial and lateral bicipital sulci, cubital fossa, palmar region. The dissection of the latter region can be commenced after finishing the preparation of the infraclavicular region. Show clearly the origin and insertion of muscles. Remove all fasciae. Histology: Epithelial tissues: simple covering and lining epithelia 1. Mesothelium (mesentery, Silver impregnation) 2. Endothelium (small intestine, HE stain) 3. Simple squamous epithelium, simple cuboidal epithelium (kidney, HE stain) 4. Simple columnar epithelium with microvilli (small intestine, HE stain) 5. Pseudostratified columnar epithelium ciliated (trachea, HE stain) 6. Demonstration: movement of cilia (video) Make schematic drawings of the epithelial tissues. Identify epithelial tissues on the basis of the distribution and form of nuclei at low-power magnification.

### 3<sup>rd</sup> week:

**Lecture:** Glandular epithelium. Connective tissue - part one

**Practical:** Anatomy: Dissection of the upper limb: parts three and four a. Arteries, veins and nerves on the volar side of the upper limb. Dissection of the deep structures. Continue the dissection of the medial and lateral bicipital sulci, the axillary region, cubital fossa, carpal canal, synovial sheaths of the flexor digitorum. Spare the flexor retinaculum. Dissect the nerves and blood vessels on one of the fingers. Dissection of the superficial and deep palmar arches. Show clearly the origin and insertion of muscles. b. Dorsal side of the upper limb. Peel off the skin of the dorsal surface and fold it proximally and then medially towards the thorax. Peel off the skin of the dorsal surface of the hand and fold it into the distal direction. Muscles of the shoulder. Histology: Stratified epithelial tissues. 1. Stratified squamous nonkeratinizing epithelium (esophagus, HE stain) 2. Stratified squamous keratinizing epithelium (skin, HE stain) 3. Stratified columnar

epithelium (urethra masculina, HE stain) 4. Transitional epithelium: urothelium (ureter, HE stain)

#### 4<sup>th</sup> week:

**Lecture:** Connective tissue - part two. Clinical anatomy of the upper limb.

**Practical:** Anatomy: Dissection of the upper limb: parts five and six. a. Dorsal side of the upper limb: deep structures. The osteo-fibrous tunnels deep to the extensor retinaculum. Action of individual muscles and muscle groups of the upper limb. Nerve supply of muscles. Cardinal symptoms of injuries to nerve trunks: paralysis of different muscle groups. b. Completion of the dissection of the upper limb. Histology: Glandular epithelium, pigment epithelium I. Sebaceous, sweat and apocrine glands (axillary skin, HE stain) 2. Serous and mucous glands (submandibular gland, HE stain) 3. Serous, mucous glands (sublingual gland, PAS+H stain) 4. Pigment epithelium (retina). 5. Pigment containing cells (skin, methyl-green) (Classification of exocrine glands, mechanism of secretion and their microscopical features, the chemical character of the secretion product. Localization of different types of glands in various organs.)

#### 5<sup>th</sup> week:

**Lecture:** Connective tissue-part three. Adipose tissue. Cartilage

**Practical:** Anatomy: SELF CONTROL: upper limb. a. SELF CONTROL: The upper limb. (Bones, joints, muscles, blood vessels and nerves) b. SELF CONTROL - REMEDIAL: The upper limb. (Bones, joints, muscles, blood vessels and nerves). Histology: Cells of the connective tissue: 1. Mesenchyma (umbilical cord, HE stain) 2. Fibroblasts (granular tissue, HE stain) 3. Mast cells (healing wound from rat skin, Toluidin blue stain) 4. Macrophages (Skin, Trypanblue - nuclear fast red stain) 5. Demonstration: 1. Plasma cells (lymph node, HE stain) 2. Fibroblasts (tissue culture, H stain)

#### 6<sup>th</sup> week:

**Lecture:** Histology of bone. Development and growth of the bone.

**Practical:** Anatomy: Bones of the lower limb. The structure of the pelvis. a. Bones of the pelvic girdle: hip bone, sacrum. Joints, ligaments and walls of the pelvis. Statics of the pelvis. Make schematic drawings! b. Bones of the lower limb. Make schematic drawings of the bones! Histology: Fibers of the connective tissue: 1. Collagen fibers (large intestine, HE stain) 2. Collagen fibers (large intestine, Azan stain) 3. Elastic fibers (aorta, orcein stain) 4. Reticular fibers (liver, silver impregnation) 5. Collagen and elastic fibers (spermatic cord, Van Gieson and Resorcin- fuchsin) Make distinction between collagen and elastic fibers. Fine structure of collagen fibers.

#### 7<sup>th</sup> week:

**Lecture:** Muscular tissue - part one. Muscular tissue - part two.

**Practical:** Anatomy: Joints of the lower limb. Dissection of the lower limb: part one. a. Joints of the lower limb.

Follow the instruction that was given at the upper limb. b. Surface anatomy of the lower limb. Mark the surface projections of the following structures on the cadaver: cutaneous nerves, superficial veins. Projections of the deep structures: femoral artery, popliteal artery, anterior and posterior tibial arteries, arteries of the sole and dorsum of the foot, femoral and ischiadic nerves. Femoral canal, femoral triangle, popliteal fossa and their structures. Lymph nodes of the lower limb. Places of the intramuscular injections. Palpate the pulse on the lower limb. The drawings from the body have to be transmitted to the scheme in your anatomy schedule. Remove the skin from the ventral surface. Make incisions along the inguinal ligament along the midline all the way down to the level of the ankles. Fold the skin laterally in the thigh and leg, and distally in the foot. Histology: SELF CONTROL (Basic histological methods. Epithelial and connective tissues.)

#### 8<sup>th</sup> week:

**Lecture:** Spermiogenesis. Oogenesis. The structure of the foot.

**Practical:** Anatomy: Dissection of the lower limb: parts two and three. a. Dissection of the ventral surface of the lower limb. Muscles of the ventral part of the lower limb. Hiatus subinguinalis. Adductor and femoral canal. Saphenous opening. Femoral triangle. b. Dissection of the dorsal surface of the lower limb. Incise the skin at the level of the heel, and fold it back in the rostral direction as far as the iliac crest, and keep continuous with the skin of the back. Leave the skin covering the perineal region in position. The skin of the sole is removed at the level of the plantar aponeurosis starting from the calcaneus and is folded back at the toes. Spare the superficial nerves and blood vessels. Muscles of the dorsal surface of the lower limb. Histology: SELF CONTROL: REMEDIAL

#### 9<sup>th</sup> week:

**Lecture:** Fertilization, beginning of the pregnancy. Clinical anatomy of the lower limb

**Practical:** Anatomy: Dissection of the lower limb: parts four and five. a. Dissection of the gluteal region, popliteal fossa and the sole. Clear all fasciae from the gluteus maximus muscle before transection. Note the relationships of the fascia of back and thigh (thoracolumbar, gluteal fascia, iliotibial tract). b. Dissection of the dorsal surface of the lower limb. Cut the tendo calcaneus and fold back the triceps surae. Dissection of the structures at the medial malleolus. Arteries and nerves of the dorsal surface of the lower limb. Actions and movements of the muscles and joints of the lower limb. Muscle actions in different forms of joint movements. Nerve supply of muscles. Cardinal symptoms of the injuries to peripheral nerve trunk - peripheral paralysis of different muscle groups. Histology: The adipose tissue and the cartilage. 1. Fat cells (skin, Osmium + H stain) 2. Hyaline cartilage (trachea, HE stain) 3. Elastic cartilage (epiglottis, orcein stain) 4. Fibrocartilage (knee joint, HE stain) 5. Fibrocartilage (knee joint, Azan stain) 6. Fibrocartilage and hyaline cartilage (knee joint, toluidin-blue stain) 7. Intervertebral disc (HE stain)

## CHAPTER 9

**10<sup>th</sup> week:**

**Lecture:** Gastrulation. The early differentiation of the mesoderm. Histology of the blood vessels

**Practical:** Anatomy: SELF CONTROL: lower limb. a. SELF CONTROL: lower limb (bones, joints, muscles, blood vessels, nerves). b. SELF CONTROL - REMEDIAL: lower limb (bones, joints, muscles, blood vessels, nerves). Histology: Histology and development of the bone. 1. Cross section of compact bone (Schmorl stain). 2. Longitudinal section of compact bone (Schmorl stain). 3. Intramembranous ossification (skull of a rat, HE stain) 4. Enchondral ossification and the epiphysial plate. (rabbit knee joint, HE stain) 5. Enchondral ossification and the epiphysial plate. (rabbit knee joint, Azan stain) 6. Enchondral ossification and the epiphysial plate. (rabbit knee joint, toluidin-blue stain)

**11<sup>th</sup> week:**

**Lecture:** The differentiation of the ectoderm and mesoderm. Blood

**Practical:** Anatomy: Bones and joints of the thoracic cage and vertebral column. The muscles of the back. a. Bones and joints of the thorax b. The structure of the thorax and vertebral column. Movements of the thoracic cage. Muscles of the back. Structure of the posterior abdominal wall. Thoracolumbar fascia. Histology: Muscle tissue 1. Striated muscle (HE stain). 2. Striated muscle (iron-H stain). 3. The smooth muscle (large intestine) HE stain. 4. The cardiac muscle (HE stain) 5. The cardiac muscle (PTAH) Demonstration: Electron micrographs of longitudinal sections of striated muscle.

**12<sup>th</sup> week:**

**Lecture:** The differentiation of the entoderm, the folding of the embryo. Bone marrow

**Practical:** Anatomy: The skull: parts one and two a. Parts of the skull: the braincase and the facial skeleton. The bones of the braincase - overview. Main parts of the bones of the braincase. Parts of the braincase: the vault /calvaria/ and the cranial base. The structure of the braincase. b. Recapitulation of isolated bones: frontal, temporal, parietal, occipital, sphenoid bones. Superior view of the cranial base. Subdivisions of the internal cranial base: anterior, middle and posterior cranial fossae. Parts and foraminae of the fossae. Make drawings of the fossae.

Histology: The microscopic structure of blood vessels. 1. Elastic artery (HE stain). 2. Elastic artery (orcein stain). 3. Muscular arteries and veins (HE stain) 4. Large intestine (HE stain) 5. Demonstration: Spermatic cord (Van-Gieson resorcin fuchsin stain)

**13<sup>th</sup> week:**

**Lecture:** Fetal membranes. Stages of development: embryonic and fetal periods. Twins. Developmental mechanisms The formation of blood cells.

**Practical:** Anatomy: The skull: parts three and four a. Inferior aspect of the skull. Vault of the skull (calvaria), sutures, fonticuli. Drawings b. Bones of the facial skeleton including the mandible - overview Individual bones: shape, main parts. The structure of the facial skeleton. Histology: Blood. Bone marrow. 1. Sinusoids (Hypophysis, HE stain) 2. Bone marrow (HE stain) 3. Peripheral blood smear (May-Grünwald-Giemsa stain) 4. Demonstration: Bone marrow smear (May-Grünwald-Giemsa stain) video

**14<sup>th</sup> week:**

**Lecture:** Development of the skull and vertebrae Overview of general embryology

**Practical:** Anatomy: Skull - parts five and six a. The orbit, nasal cavity, and paranasal sinuses. Facies malaris. b. The pterygopalatine fossa, temporal fossa, infratemporal fossa. The temporomandibular joint, atlantooccipital and atlantoaxial joints. Histology:SELF CONTROL (Adipose tissue, cartilage, bone, development and growth of the bone, muscular tissue. The histology of blood vessels, blood and bone marrow.)

**15<sup>th</sup> week:**

**Lecture:** -

**Practical:** Anatomy: SELF CONTROL. Bones and joints of the thoracic cage and vertebral column. The muscles of the back. Bones and joints of the skull. a. SELF CONTROL: Bones and joints of the thoracic cage and vertebral column. The muscles of the back. Bones and joints of the skull. b. SELF CONTROL - REMEDIAL: Bones and joints of the thoracic cage and vertebral column. The muscles of the back. Bones and joints of the skull. Histology: SELF CONTROL: REMEDIAL SELF CONTROL: Embryonic development.

## Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the University are valid. The attendance on the seminars and practices and at least 30% of the lectures is compulsory. The presence in practices and seminars will be recorded. The head of the department may refuse to sign the Lecture Book if a student is absent more than twice from practices and seminars (including anatomy, histology and embryology) in one semester even if he/she has an acceptable reason. Compensation of practices and seminars is possible only on the same week at another student's group. The compensation of three practices and/or seminars is allowed (including anatomy, histology and embryology) in one semester.

**Rules of examinations:**

Midterm examinations:

## ACADEMIC PROGRAM FOR THE 1ST YEAR

The dates and topics of the midterm examinations are indicated in the English program Bulletin. The exams cover the topics of lectures and practices of the semester and include relevant material from official textbooks. The midterm exams will be evaluated with points.

**Improvement of a failed midterm examination:**

Failed midterm examinations can be improved if the score of the failed midterm examination is between 40 and 59 %. With this restriction the following midterm examinations can be improved:

1. All three anatomy midterm examination; on the second practical of the week of the self control.
2. Both histology midterm examinations; on the histology practical at the consecutive week.

**Five grade evaluation of the overall academic performance of the student at the end of the semester:**

At the end of the semester the overall academic performance (OAP) of the students will be evaluated with a five grade mark (OAP mark) on the basis of the following rules:

The performance of the students on the midterm examinations from anatomy, histology and embryology will be evaluated separately on each self control. To obtain a pass or better OAP mark the student has to collect at least 60% of the total score from each anatomy, histology and embryology self controls. If the student does not reach the 60% limit from all parts the OAP mark is fail (1). If the midterm performance of the student is at least 60% from all parts, the scores of the three parts (anatomy, histology, embryology; max. 100% each) will be added and the OAP mark will be calculated on the basis of the following rules:

<b>Overall performance</b>	<b>Mark on the midterm exams</b>
36 - 41%	2 (pass)
42 - 47%	3 (satisfactory)
48 - 53%	4 (good)
54 - 60%	5 (excellent)

**End-semester exam at the end of the 2nd semester**

The end of semester exam is an oral exam in anatomy and written in histology and embryology, that covers the topics of lectures and practices of the semester as well as the relevant material in the official textbooks. Those students who have got a pass (2) or better OAP mark may ask the department to accept it as a mark for the end of semester exam. Those students who have got a fail (1) OAP mark have to sit for the end of semester exam, but the student will be examined only from those parts from which he/she did not reach the 60% limit on the midterm examinations. The first exam is an A-chance exam.

**The end of semester oral examination at the end of the 2nd semester consists of the following parts:**

Oral part.

Anatomy. 3 preparations

- a. upper limb
- b. lower limb
- c. back - skull

Written parts:

Embryology

Histology I.: microtechnic, epithelial tissue, connective tissue

Histology II.: adipose tissue, cartilage, bone, bone formation muscle tissue, blood vessels, red bone marrow, blood)

If the student, on the basis of his/her performance on the midterm examinations, earn an exemption (collecting at least 60% of the total score) from one or two parts of the end-semester exam, the results of the midterm examinations will be converted into partial end-semester marks as follows:

<b>Overall performance</b>	<b>Mark on the midterm exams</b>
60 - 69%	2 (pass)
70 - 79%	3 (satisfactory)
80 - 89%	4 (good)
90 - 100%	5 (excellent)

Registration and postponement: Through the NEPTUN system.

## Department of Biochemistry and Molecular Biology

 Subject: **MOLECULAR BIOLOGY**

 Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Lecture: **45**

 Seminar: **15**

 Practical: **15**
**1<sup>st</sup> week:**

**Lecture:** Molecular dimensions of life in space and time. Energies governing molecular interactions. Covalent and non-covalent molecular interactions. The importance of water. Molecular organization of cells. The importance of water. The molecular organization of the cells. Origin of eukaryotic cells. Cellular compartmentalization. Organization and hierarchy of biological structures. Proteins. Structure and function of proteins. Structural organization of proteins. Protein folding. Techniques for studying proteins structures. Protein evolution.

**2<sup>nd</sup> week:**

**Lecture:** Enzymology. Characterization and classification of enzymes. General features of enzyme action: enzyme specificity, the active site. The transition state theory. Examples of catalytic action: ribonuclease-A, lysozyme, and carboxypeptidase-A. Enzyme kinetics: the Michaelis-Menten and Briggs-Haldane kinetics. Definition and determination of  $K_M$  and  $v_{max}$ . Multisubstrate reactions. Enzyme inhibition: irreversible and reversible inhibition of enzymes. Competitive, non-competitive and uncompetitive inhibition. Regulation of the enzymes by allostery. Medical significance of enzymes. Isoenzymes.

**3<sup>rd</sup> week:**

**Lecture:** Chemical features of DNA. DNA packaging in prokaryotes and eukaryotes. Histones and nucleosomes. DNA as an information storage material. The central dogma of molecular biology. Definition of the genome. Molecular nature of genes. Coding and noncoding genome sequences. Chromosomal and extrachromosomal genomes in prokaryotes. The gene organization in prokaryotes. Eukaryotic genome. Mitochondrial and nuclear genomes. Gene structure in eukaryotes. Genome evolution. Vertical inheritance and horizontal gene transfer. Extrachromosomal and bacteriophage/virus genomes. Mobile genetic elements. Genome evolution in prokaryotes. Pathogenicity islands. Genome evolution in eukaryotes. Exon-shuffling.

**4<sup>th</sup> week:**

**Lecture:** DNA isolation. Enzymatic modifications of DNA molecules. DNA polymerases. Ligases. Nucleases. Restriction endonucleases and DNA methylases. Separation of DNA molecules according to the size. Application of restriction endonucleases. Creating recombinant DNA: vectors, strategy of DNA cloning. Genomic libraries.

**Practical:** Biochemical informatics

**5<sup>th</sup> week:**

**Lecture:** Molecular biological methods relying on DNA-DNA hybridization. Fundamental aspects of nucleic acid hybridization, main steps of the hybridization procedure. Southern-blotting. In situ hybridization. DNA chip. Molecular background of DNA polymerization. Primers. The basics of chemical synthesis of primers. DNA-polymerization-based molecular biological methods. Theory of Polymerase Chain Reaction (PCR). DNA sequencing. Genome sequencing projects.

**Practical:** Biochemical informatics

**6<sup>th</sup> week:**

**Lecture:** Prokaryotic and eukaryotic genome replication. Replication initiation. The structure of the replication fork. Replication of leading and lagging DNA strands. Solution for the topological problems caused by the replication process. Problems associated with the replications of non-circular chromosomes; the telomeres and telomerase. Molecular biology of recombination. DNA damaging agents, mutations. Principles of DNA repair. Main types of DNA-repair, the excision repair and removal of non-complementary nucleotides (mismatch repair).

**Practical:** Biochemical informatics

**7<sup>th</sup> week:**

**Lecture:** Overview of gene expression and its significance. The chemical features of RNA. Main RNA classes. Principles of RNA polymerization. Reverse transcriptases. Enzymatic modifications of RNA. Ribonucleases. Transcription in prokaryotes. Stages of transcription. Transcription regulation in prokaryotes. The promoter. Transcription factors. Binding of transcription factors to the DNA. The operon. Repressors and activators. The mode of operation of the lac and ara operons. Catabolite repression.

**Practical:** Biochemical informatics

**8<sup>th</sup> week:**

**Lecture:** Transcription in eukaryotes. Transcription of mRNAs. Stages of eukaryotic transcription. Formation of caps (capping). Excision of introns (splicing), snRNAs and the spliceosome. The polyadenylation. Alternative splicing. Export of mRNA. Quality control of mRNA. Transcription and posttranscriptional modifications and transport of rRNA and tRNA.

**Practical:** Protein blotting and immunological identification by specific antibodies.

**Self Control Test**



**9<sup>th</sup> week:**

**Lecture:** Regulation of transcription in eukaryotes. Transcription regulation by epigenetic modifications. The role of DNA methylation. The importance of DNA packaging in transcription regulation. The role of histone modifications in DNA packaging. Transcription regulation through regulation of transcription initiation. Regulatory sequences located on the DNA. Promoters and enhancers/silencers. Eukaryotic transcription factors.

**Practical:** Protein blotting and immunological identification by specific antibodies.

**10<sup>th</sup> week:**

**Lecture:** Regulating multiple genes at the same time. Gene clusters, isolator sequences. The role of noncoding RNA in regulation of gene expression. Molecular biological methods for studying transcription and transcription regulation. RNA isolation and separation based on size. Northern blotting. Synthesis of cDNA. Construction, sequencing and screening of cDNA libraries. RT-PCR. Microarray technology.

**Practical:** Protein blotting and immunological identification by specific antibodies.

**11<sup>th</sup> week:**

**Lecture:** Translation. The genetic code. Codons, anticodons and tRNAs. Loading of tRNA with amino acids. Wobbliness of the codon-anticodon recognition and its evolutionary significance. Ribosome structure. Biochemistry of protein synthesis. Translation initiation, elongation and termination. Energy balance of the translation process. Comparison of prokaryotic and eukaryotic translation. Regulation of protein synthesis. Protein maturation. Protein folding.

**Practical:** Studies on phosphatases

**12<sup>th</sup> week:**

**Lecture:** Protein fates. Synthesis and degradation of cytoplasmic and nuclear proteins. Cytoplasmic, nuclear and membrane targeting. The signal recognition particle. Transition of polypeptide chain through the membrane. Posttranslational modifications of the proteins: ubiquitination and the proteasome system. Proteases.

**Practical:** Studies on phosphatases

**13<sup>th</sup> week:**

**Lecture:** Posttranslational protein modifications: phosphorylation-dephosphorylation, glycosylation, acylation, prenylation, carboxylation and ADP-ribosylation. Methods for purification, separation and characterization of proteins. Immunochemical methods applied in molecular biology: ELISA, Western blotting, immunofluorescence and immunoprecipitation.

**Practical:** Studies on phosphatases

**14<sup>th</sup> week:**

**Lecture:** Protein expression systems. Expression libraries. Protein expression in biotechnology. Modification of the genome: transgenesis. Creation and significance of transgenic mice. Gene therapy and its importance. The significance of molecular biology in medicine, the molecular medicine.

**15<sup>th</sup> week:**

**Self Control Test**

## Requirements

Attendance on the lectures is recommended, but not compulsory. Note that getting the bonus points on the seminars will be very difficult without the proper understanding of the material, for which the attendance on the lectures is essential.

Students must attend the seminars and may not miss more than three seminars during the semester. In case a student misses more than three, the subject will not be signed. Students can't make up a seminar with another group. The attendance on the seminars will be recorded by the seminar leaders.

Each student must give two small presentations during the semester about the material of the previous week lectures. Presentations are scheduled by the seminar leader. Note that you can only give the presentation in your own group. The presenter has to show his or her ability to present the material clearly, focus on the most important parts in a concise manner and answer the questions raised by the audience or the seminar leader. If all presentations are successful, each student may earn up to 12 bonus points.

Practicals must be performed, students must do the practicals in their own groups. In case a student misses a practical, the subject will not be signed. If a student cannot participate a practical for a well-justifiable reason he/she should arrange with the laboratory practical tutor to attend the practical with another group. Note that for technical reasons the laboratory runs one particular practical for a limited period: "Biochemical Informatics" on week 4-7, "Western-blot" on week 8-10, "Study of phosphatases" on week 11-13, therefore the students should be sure that they make the arrangements accordingly. The laboratory practical leader through signing the practical "lab-book" of the student acknowledges the acceptance of a practical. Students have to be prepared for the practicals. Please check our homepage to get more information and the schedule of the practicals ([http://bmbi.med.unideb.hu/Education/Molecular Biology](http://bmbi.med.unideb.hu/Education/Molecular%20Biology)).

For obtaining the signature students need to attend the seminars and attend the three practicals, submit the laboratory books in the required format.

Self-control examination tests: During the semester students may choose to write two self-control tests addressing the curriculum of the lectures and seminars. By writing the two self-control tests a total of maximum 100 points can be collected (Test 1: 0-50 points and Test 2: 0-50 points). Successful self-control tests will grant you an offered grade. Grades: 2 (pass) 60-69.5 points, 3 (satisfactory) 70-79.5 points, 4 (good) 80-89.5 points and 5 (excellent) 90-112 points. Form of tests: The self-control and the end of semester exam tests as well as the improvement exams will be conducted in a written form. The structure of the self-control tests and the end of semester exam is fundamentally similar. They are composed of 40 single choice test questions (one correct answer must be marked among five possible answers). Points will be multiplied by 1,25 to get the maximum 50 points. Bad answers are not punished by deduction. Offered grades: By the end of the semester the total score is calculated by adding up the results of the self-control tests (0-100 points) and the small presentations (0-12 points). The students may or may not accept the offered grade. If one declines the offered grade (s)he must proceed to the end of semester exam. If one accepts the offered grade, it will be recorded in the Neptun.

End of semester exam: The “A”, “B” and “C” exams are all written exams that are conducted in the same format as the self-control tests. If a student fails the “C” end of semester exam the department provides him/her a chance to prove his/her knowledge of molecular biology in an oral exam in front of an official examination committee. If the student passes the oral exam he/she will given a grade 2 (pass).

End of semester exam tests: After the semester students who are not eligible for or decline the offered grade proceed to end of semester exam tests. By the tests 50 points can be achieved. Half of the bonus points will be added to the score of the exam, too. The department will provide one examination date per week during the exam period.

Improvement of the grade (or offered grade): One may choose and is allowed to take one improvement exam for a fee in the form of a end of semester exam. The policy of the institute is that one may not worsen the already achieved grade. Please follow the announcements of the department for reviewing the results of the self-control examination tests. The results will be announced anonymously on the institute web site and on the announcement table of the department (LSB downstairs, 1st corridor).

**Exemption from the written part of the final biochemistry and molecular biology exam:** Those students who collect at least 220 points during the three semesters taught by the Department of Biochemistry and Molecular Biology and have more than 60 points from each of the three semesters during the course of their Biochemistry and Molecular Biology studies (Molecular Biology, Biochemistry I., Biochemistry II.) will be exempted from the written part of the biochemistry and molecular biology final exam.

## Department of Biophysics and Cell Biology

Subject: **CELL BIOLOGY**

Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **30**

Seminar: **25**

Practical: **20**

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

**Lecture:** 1. Introduction. Cell membrane. 2. Membrane transport, ABC-transporters.

**Seminar:** Introduction, preparation for labs, signing up for short presentations.

### 2<sup>nd</sup> week:

**Lecture:** 3. Calcium homeostasis. 4. Osmo-, volume and pH regulation.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 3<sup>rd</sup> week:

**Lecture:** 5. Ion channels, membrane potential. 6. Cellular organelles. Trafficking overview.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 4<sup>th</sup> week:

**Lecture:** 7. Intracellular membrane systems, lysosome, peroxisome, endoplasmic reticulum. 8. The Golgi complex, endo- and exocytosis, protein sorting.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 5<sup>th</sup> week:

**Lecture:** 9. Cytoskeleton I: microtubules. 10. Cytoskeleton II: intermediate filaments, actin cytoskeleton.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 6<sup>th</sup> week:

**Lecture:** 11. Energetics/mitochondrion. 12. Cell-cell contacts.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### Self Control Test

### 7<sup>th</sup> week:

**Lecture:** 13. The nucleus. 14. Structure of chromatin.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 8<sup>th</sup> week:

**Lecture:** 15. Cell signaling I. General concepts. Nuclear receptors. G-protein coupled receptors. 16. Cell signaling II. Receptor tyrosine kinases. The Ras/MAPK, PI3K/Akt and PLC/CaMK pathways.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 9<sup>th</sup> week:

**Lecture:** 17. The nuclear membrane. 18. Cell cycle I: Methods, experimental systems.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (labs 1 through 4 in small groups, rotary system).

### 10<sup>th</sup> week:

**Lecture:** 19. Cell signaling III. Pathways to the nucleus. Oncogenes in signaling. 20. Cell signaling IV. Cell-cell communication in the nervous and the immune system.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (spare labs).

### 11<sup>th</sup> week:

**Lecture:** 21. Cell cycle II: Regulation. 22. Cell cycle III: Regulation of the G<sub>0</sub>/G<sub>1</sub> transition.

**Seminar:** Material related to preceding lectures.

**Practical:** See schedule on the web page (spare labs).

### Self Control Test

### 12<sup>th</sup> week:

**Lecture:** 23. Cell fates I: Overview, differentiation. 24. Cell fates II: Stem cells.

**Seminar:** Material related to preceding lectures.

### 13<sup>th</sup> week:

**Lecture:** 25. Cell fates III: Cell senescence, apoptosis. 26. Cell fates IV: Tumor cell biology.

**Seminar:** Material related to preceding lectures.

### 14<sup>th</sup> week:

**Lecture:** 27. Meiosis. 28. Fertilization.

**Seminar:** Material related to preceding lectures.

### Self Control Test

### 15<sup>th</sup> week:

**Lecture:** 29. Cellular interactions, viruses and bacteria. 30. Cellular motility.

**Seminar:** Material related to preceding lectures.

## Requirements

**As a student, you are responsible for obtaining the information provided: please read the next paragraphs carefully and also check regularly the website of the Department of Biophysics and Cell Biology for announcements.**

### **Recommendation for success in class:**

This is a key course in your development as a student in medical sciences. Most other courses use material introduced and covered in this course as a starting point, whether it's pharmacology, internal medicine or basic histology. Treat it very seriously and you will be creating a very sound foundation for yourself. Expect to work hard. This is a class with a lot of information and there is also the requirement to "see the big picture" within the cell. It is not supposed to be easy. Your textbooks cover a lot of interesting and up-to-date information which you should be prepared to read on a continuous basis, after every lecture and seminar.

Lectures: Attendance of lectures is highly indispensable for acquiring the knowledge required to pass! They are your best source of synthesized and structured information. Some new concepts are discussed exclusively at the lectures.

### **Seminars:**

In the seminars, students should ask their questions related to the topic of the lectures discussed (see final timetable of lectures and seminars that will be announced on the week 1. of the semester). Besides, every student (two in each group in every seminar) will give a short presentation on the topic of one of the lectures discussed in the seminar. The topics will be distributed in the first seminar. The talks are graded on a scale of 0-3. Getting a "0" on the presentation means a failure and the presentation has to be repeated on a new topic, in a seminar of the student's own group. Otherwise everyone is entitled to give 1 presentation only. No lecture book can be signed without getting at least 1 point for the presentation. No presentation can be done after the end of the study period. The presentation has to be a free talk, not a reading. The duration of a presentation should not exceed 15 minutes. You have to read the relevant background information from your textbook and make the topic understandable to your fellow students. You should use the lecture material available at the cell biology website to make your presentation easy to follow. Only exceptionally good presentations that clearly present good summaries of the lectures are awarded with 3 points. The material covered in the presentations is fully part of the SCT-s and the Final Exam. Including extra material obtained through the student's own research in textbooks or the internet will be appreciated, but will not substitute for a clear and detailed knowledge of the lecture/textbook material.

Attendance of seminars is compulsory! Missed seminars should be made up during the same week with another group. Please bring your medical record or other document justifying your absence and present it to the study advisor so that your appearance with another group can be taken into consideration. No more than two absences are accepted.

Books to be studied: 3rd ed. of Essential Cell Biology (Alberts et al.) is the course book recommended as a foundation. It is concise, easy to read and the thorough knowledge of the material contained in its chapters (1 and 11-20 in the 3rd ed.) is absolutely necessary for passing the Final Exam. The preceding chapters contain explanations for basic molecular concepts: these chapters serve as reference and will not be directly asked in tests, except for certain parts indicated by the lecturer and also published in our website. In addition, there is a lot of additional information presented at lectures, and also discussed in the seminars, which you are also required to know. The slides presented in lectures will be provided at the department website; however, you must attend the lectures and take notes to be able to interpret them.

### **To read a full-text version of this additional material we recommend two books:**

Molecular Cell Biology (Lodish et al.) is a good comprehensive source of information relevant to the course. Molecular Biology of the Cell (Alberts et al.) is also a great and very didactic source. Both books are accessible online free of charge at the URLs below.

Molecular Cell Biology (ed4):

<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=mcb>

Molecular Biology of the Cell (ed4):

<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=mboc4>

<http://www.ncbi.nlm.nih.gov/sites/entrez?db=books&itool=toolbar>

These books, in general, serve as reference material. Studying the Essential Cell Biology and the lecture material (including pages or chapters from any alternative source indicated by the lecturer) suffice to achieve the best score in the tests during and at the end of the semester.

**Labs:**

Completing all labs, and writing up the results and their interpretation in a lab log book on the spot is required. You must prepare for the lab before the lab starts. The compulsory preparation for the lab includes the writing of an introduction to your lab logbook BEFORE THE LAB that outlines the problem you will address in the lab and the methods and approaches that are used to answer the question. ONLY HANDWRITTEN, BOUND LAB LOG BOOKS ARE ACCEPTABLE! Labs begin with a 10 minutes short quiz related to the topic of that particular lab. On site scoring of the quiz for randomly selected 4 students and further oral questions will allow the tutors to immediately decide if students have prepared for the lab. If a student's preparation is considered unacceptable by the tutor or if the handwritten introduction is missing in the lab logbook, the student will have to perform the lab practices at the spare weeks and after appropriate preparation. Students will receive penalty points for missed labs: one point after the first missed lab and two more for each subsequent missing. Only medical or official excuses are accepted after showing the appropriate documents. Failure on the opening quiz or not showing up at the beginning of the practice is always considered as a missed lab, without any excuse. The penalty points will be withdrawn from the student's bonus points at the end of the semester. After completing the lab, the lab tutor should sign, on the cover of the log book, certifying your presence at the lab and sign separately for the acceptance of your work. You are eligible for this second signature only if you know what and why you did during the lab and what the result was. You should obtain these two signatures at the end of the lab and no later. Those who do not have all their labs accepted are not entitled for the end of term signature in their lecture book. You are expected to show up sharp at the beginning of your lab to make the quiz and spend the time in the lab working. The acceptance of your work is on a yes-or-no basis: if you actually do your lab, understand what and why you do, do a decent write-up of the PROTOCOL (so that others can repeat your experiment) and the RESULTS (including color drawings) together with their interpretation, your lab will be accepted.

**Reading source for the lab and lab schedule:**

A Cell Biology lab manual written by the members of the department is provided in the Book Store (in the Theoretical Building). Additional material is available on the web site. Small groups (subgroups) consist of 3-7 people for doing the various labs in a rotary system are formed in the first seminar. The rotary system is published on the web page and shown on the lab door. If you missed the first seminar you will be put into a subgroup where you fit and you should check your assignment with your fellow students. YOU ARE NOT ALLOWED TO CHANGE SUBGROUPS!

Lab questions will be included in the 3rd self control test and the Final Exam as approximately 10% of the test. Those who reach 60% or more on the lab part of the 3rd self control test are allowed to transfer their lab score to the Final Exam. For example if someone gets 7% for the lab part of the 3rd self control test will receive 7% on the Final Exam without answering the practical questions. Students who answer the practical part of the Final Exam but also have transferable lab points from the 3rd self control test will receive the better score for their lab part.

You have 4 labs (and one spare lab) during this semester, so you should do your best to appear in time, be prepared, and do the labs when scheduled. In order to get a signature, you need to have completed all the four labs and have the four signatures of acceptance. Labs missed because of a justifiable reason (i.e. serious illness – you have to present the medical records to your lab tutor!) or because of insufficient preparation, should be made up on the spare labs (week 10 and 11). In case of the missed lab the study advisor should be announced by email to arrange your lab make up. Those whose lab absences are unjustified, or are sent away because of insufficient preparation, have to repeat the lab.

**Self Control Tests (SCT-s):** There are three SCT-s. The dates and topics for SCT-s will be announced on week 1 of the semester. Exact times and locations for each group will be posted during the semester. Types of the SCT questions are akin to the Final Exam questions; i.e. true or false, simple selection, multiple selection, relation analysis, fill in questions or define a definition type questions may be awaited. Essay questions, related to the lab, as well as to chapters of cell biology relevant to their theoretical background, are also part of the Final Exam. Based on the score of the SCT-s, you receive bonus points that count towards your grade in the Final Exam (added to the score of part B).

**Conversion of SCT points into bonus points for Final Exam:**

Bonus points based on the score (as a %) of an SCT. No bonus points are given below 40%. Above 40% the bonus points are calculated as  $0.05 \times \text{score (as a \%)}$ .

For example: if 66% is reached on a SCT, then:  $66 \times 0.05 = 3.3$ , which is rounded to 3 bonus points. Maximum 5 bonus points can be earned with each SCT, so totally 15+3 (for the presentation) can be collected during the semester.

Writing the SCT-s is highly recommended. If you miss a SCT, you will miss valuable points from your Final Exam score!

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There is a grade offering as well, for those performing well on each SCT-s and reaching at least 50% on each test (independently). Those earning 60 % or more in the average of the three SCT-s will receive offered final grades as follows:

60-69.5 %:	pass (2)
70-79.5 %:	satisfactory (3)
80-89.5 %:	good (4)
above 90 %:	excellent (5)

The offered grades will be posted on the Neptun system where students must declare acceptance or refusal. Accepting the grade means exemption from the final exam, the accepted grade will be entered into the lecture book as final grade. Students without offered grade must attend the Final Exam (see below).

### Signing the lecture book:

The conditions for signing the lecture book are the following: (1) presence at, and acceptance of all the labs, (2) presence at the seminars and (3) minimum 1 point for the presentation at the seminar. This is valid also for those who repeat the subject (for exceptions, see below). The lecture book will not be signed if the student has any unaccepted labs, or missed more than 2 seminars. Missing a lab or more than 2 seminars is only permitted in the case of serious illness certified with medical records, or similar honorable excuses. Even in these cases, the missed lab or seminar has to be made up for with another group (see above), and you have to submit a copy of all documentation to the study advisor.

Lecture books will be signed at the Education Office on week 14. Please do not remove your lecture books from the Education Office before they are signed. Please make sure that your name and group is indicated on the cover of your lecture book! Repeaters should make sure that their lecture books are also available at the Education Office.

### Rules concerning repeaters:

Attendance of labs is not compulsory if you had all the four labs accepted last year and your lecture book was signed. Please note, however, that questions on the lab will be part of the SCT-s and the Final Exam. Attendance of seminars is compulsory. Your short presentation of last year does not have to be repeated if it scored 2 points or more, otherwise you have to redo it.

### Final Exam:

The exam is a written test of two parts (A and B).

Part A of the written test is a set of 10 questions addressing the basic concepts listed among the key-words published in our website. These questions will include 5 brief definitions of basic concepts, and 5 questions of fill-in, simple choice, sketch-recognition, or yes/no type. The definitions should contain 2 valuable and relevant facts/statements on the subject asked, for maximal score (2 points each). The A test has to be completed in 10 minutes. You will need to collect at least 14 points to pass the A test. Those earning below 14 points in part A fail the entire exam without regard to their score on part B. The score of a passed A test will be added to the score of part B, thus yielding 14-20% of the total exam points.

Part B is a complex test, including a short essay (10%), fill-in, short answer, multiple choice, relation analysis, sketch-recognition as well as simple choice and yes/no questions (60%). It contains all material from textbooks, lectures and seminars. The lab questions are a section of the part B exam, (10%). For those, who have earned during the study period more than 60% on the lab part of the 3rd SCT, those points are transferable to this part of the exam (see above).

### Summing up your points for the Final Exam:

Cell Biology part A written	max.	20%
Cell Biology part B written	max.	80%
Cell Biology short presentation bonus	max.	3%
Bonus points based on SCT scores	max.	15%
<b>Total</b>	max.	118%

**Your grade on the Final Exam:**

below 60%	fail (1)
60-69.5%	pass (2)
70-79.5%	satisfactory (3)
80-89.5%	good (4)
above 90%	excellent (5)

**Important:** The test/exam grade earned should reflect the true knowledge of the student. Therefore, if there are doubts whether the result of the written tests (SCTs, A, B, C exam) really reflect the true knowledge of the student, the teachers/professors may also ask oral questions so as to be able to give a grade they deem justified.

**Repeated exams:**

On repeated exams during the exam period of the 2nd semester, points earned from SCT-s during the current semester and from short presentations are valid throughout. Practical part (if reached 60% or more) of the 3rd SCT and Cell biology written part A passed are also valid. However, all bonuses and merits expire by next spring exam period. Please note that all other parts have to be repeated on repeated exams, that is, cell biology written part B, and cell biology written part A with less than 14 points.

**Further information**

\* Academic advisor from Cell Biology: Zsolt Fazekas Ph.D. (cellbioedu@med.unideb.hu)

\* Info regarding tests, seminars, lectures is posted on the lab door ("Biophysics lab", ground floor, Theoretical Building), the department bulletin board and <http://biophys.med.unideb.hu>.

User names and passwords will be given out at the first cell biology seminar during the first week of the semester.

\* We offer to keep an e-mail contact with the students whenever possible. This is smooth, fast and effective. Please write to cellbioedu@med.unideb.hu.

\* Personal consultation with the study advisor: office hours are posted on the web site and the bulletin board of the Department. For appointments outside office hours please write an email.

**Textbook:**

Alberts et al.: ESSENTIAL CELL BIOLOGY, 3rd edition  
Garland Publ. Inc., 2009  
ISBN 978-0-8153-4129-1

Cell Biology Laboratory Manual  
Department of Biophysics and Cell Biology, 2003  
Material published on the [biophys.med.unideb.hu](http://biophys.med.unideb.hu) web page.

**Recommended books:**

Lodish et al.: MOLECULAR CELL BIOLOGY  
6th edition, W. H. Freeman, 2007  
ISBN-13: 978-0716776017

Alberts et al.: Molecular Biology of the cell  
5th edition, Garland Publ. Inc., 2002,  
ISBN 978-0-8153-4105-5

**Recommended websites:**

Several medicine and biology related textbooks are available online at the following home-site.  
<http://www.ncbi.nlm.nih.gov/sites/entrez?db=books&itool=toolbar>  
Every online book can be searched electronically for keywords.

## Department of Foreign Languages

 Subject: **HUNGARIAN LANGUAGE I/2.**

 Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Practical: **30**
**1<sup>st</sup> week:**
**Practical:** Organization of the course. Pretest

**2<sup>nd</sup> week:**
**Practical:** Mi van a boltban? (ételek, élelmiszerek ismétlés, többes szám ismétlése)

**3<sup>rd</sup> week:**
**Practical:** Mit veszünk? (tárgyeset ismétlése)

**4<sup>th</sup> week:**
**Practical:** Mit eszünk? (étterem, rendelés ismétlése, asztalfoglalás, tortarendelés, reklamációk)

**5<sup>th</sup> week:**
**Practical:** A lakásban (helyragok, névutók ismétlése)

**6<sup>th</sup> week:**
**Practical:** Lakást keresek

**7<sup>th</sup> week:**
**Practical:** Revision. Mid-course test

**8<sup>th</sup> week:**
**Practical:** A városban.

**9<sup>th</sup> week:**
**Practical:** Hova megyünk este? (helyragok ismétlése)

**10<sup>th</sup> week:**
**Practical:** Mozi vagy bowling? (összehasonlítás ismétlése)

**11<sup>th</sup> week:**
**Practical:** Hogy jutok oda? (útbaigazítás)

**12<sup>th</sup> week:**
**Practical:** Utazás, közlekedés (taxi, vasút).

**13<sup>th</sup> week:**
**Practical:** Ismétlés

**14<sup>th</sup> week:**
**Practical:** Oral minimal requirement exam. End-term test.

**15<sup>th</sup> week:**
**Practical:** Evaluation

## Requirements

### Requirements of the language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each Hungarian language course, students have to sit for 2 written language tests and a short minimal requirement oral exam.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. There is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class, every week. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect at least 6 points to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal exam results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score. Based on the final score the tests are graded according to the following table:



Final score	Grade
0 – 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60, the student once can take an oral remedial exam covering the material of the whole semester.

### Consultation classes

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** See the website of the department.

**Website:** Oral exam topics and vocabulary minimal lists are available from the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Human Genetics

Subject: **MEDICAL GENETICS**

Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **30**

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

**Lecture:** 1. Introduction to molecular genetics and genomics.

Thompson: Genetics in Medicine; Ch. # 1.

2. Molecular organization of chromosomes.

Thompson: Genetics in Medicine; Ch. # 2.

3. The Human Genome: Gene Structure and function

Thompson: Genetics in Medicine; Ch. # 3.

**Practical:** Methods of study, required and advised readings. Laboratory safety in biochemical and microbiological laboratories. Study of electron micrographs. Cellular and subcellular structures. The nucleus and chromatin. Cell division. Mitosis and meiosis.

### 2<sup>nd</sup> week:

**Lecture:** 4. The molecular genetics of gene expression

Thompson: Genetics in Medicine; Ch. # 3. (Lecture notes on departmental homepage)

5. Regulation of gene expression.

(Lecture notes on departmental homepage)

6. Bacterial genetics.

(Lecture notes on departmental homepage);

**Practical:** Seminar on molecular genetics. Gene structure and function.

### 3<sup>rd</sup> week:

**Lecture:** 7. Human cytogenetics. Karyogram, ideogram, banding techniques. Molecular cytogenetics, interphase cytogenetics; Thompson: Genetics in Medicine Ch# 5.

8. Human Cytogenetics II. Autosomal trisomies, abnormalities of the sex chromosomes, structural chromosomal abnormalities.

Thompson: Genetics in Medicine, Ch # 6

9. Human cytogenetics III. Modern genetics in clinical diagnosis (prenatal diagnostics).

Thompson: Genetics in Medicine; Ch # 6.

**Practical:** Seminar in molecular genetics. Gene regulation. Bacterial genetics.

### 4<sup>th</sup> week:

**Lecture:** 10. The genetic role of RNA.

Lecture notes on the departmental homepage.

11. Transposition. Mobile genetic elements.

Lecture notes on the departmental homepage;

12. Results of the Human Genome Project.

**Practical:** Cytogenetics seminar. Evaluation of karyograms. (homework).

1<sup>st</sup> test in extra time.

**Self Control Test (Thompson: Genetics in Medicine Ch # 1, 2, 3, 4, 5, 6, lectures 1-9, seminars 1-3)**

### 5<sup>th</sup> week:

**Lecture:** 13. Patterns of single gene inheritance. Autosomal and X-linked genes.

Thompson: Genetics in Medicine; Ch # 7

14. Gene interactions. Variations of gene expression.

Lecture notes on the departmental homepage.

15. Non-mendelian inheritance. Mitochondrial genes.

Thompson: Genetics in Medicine; Ch# 7

**Practical:** Mendelian genetics. Pedigree analysis of human single gene disorders.

Problems in classical genetics (homework). Practical courses in genetics pp 35-44.

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**6<sup>th</sup> week:**

**Lecture:** 16. Dynamic mutations. Imprinting. Epigenetics.  
Thompson: Genetics in Medicine; Ch. # 7.

17. Inheritance of Complex Traits

Thompson: Genetics in Medicine Ch. # 8.

18. Mutations and repair.

Thompson: Genetics in Medicine Ch. # 9.

**Practical:** Seminar on molecular genetics of genetic diseases. Internet search in databases (homework).

**7<sup>th</sup> week:**

**Lecture:** 19. Genetic polymorphisms I. Genetics of blood groups and MHC.

Thompson: Genetics in Medicine Ch. # 9.

20. Genetic polymorphisms II. DNA polymorphisms: RFLP, SNP, micro- and minisatellites, CNP.

Thompson: Genetics in Medicine; Ch. # 9.

21. Population genetics I.

Thompson: Genetics in Medicine; Ch. # 9.

**Practical:** Changes in genetic information.

**8<sup>th</sup> week:**

**Lecture:** 22. Genetic control of development

Thompson: Genetics in Medicine; Ch #14.

23. Gene mapping. The concept of LOD.

Thompson: Genetics in Medicine; Ch #10.

24. Identification of human disease genes.

Thompson: Genetics in Medicine; Ch #10.

**Practical:** Seminar on recombinant DNA, developmental or oncogenetics.

**9<sup>th</sup> week:**

**Lecture:** Medical genomics lecture 1

Medical genomics lecture 2

Medical genomics lecture 3

**Practical:** Medical genomics seminar 1.

**Second genetics test in extra time.**

**Self Control Test (Thompson: Genetics in Medicine Ch 7, 8, 9, 10, 14, Lectures 10-24. Seminars 4-8.)**

**10<sup>th</sup> week:**

**Lecture:** 25. Molecular mechanisms of genetic diseases I.

Thompson: Genetics in medicine; Ch # 11.

26. Molecular mechanisms of genetic diseases II.

Thompson: Genetics in medicine; Ch # 12.

27. The treatment of genetic diseases.

**Practical:** Medical genomics seminar 2.

**11<sup>th</sup> week:**

**Lecture:** 28. Molecular genetics of cell cycle and cancer.

Thompson: Genetics in Medicine; Ch. # 16.

29. Pharmacogenetics and pharmacogenomics.

Thompson: Genetics in Medicine; Ch. # 18.

30. Personalized medicine. Genetic counseling.

Thompson: Genetics in Medicine; Ch. # 17, 19, 20.

**Practical:** Demonstration of the X chromatin. Practical courses in genetics pp 7-13. Demonstration of mammalian chromosomes, pp 15-25. Polytene chromosomes of Drosophila.

**12<sup>th</sup> week:**

**Lecture:** Medical genomics lectures 4-6.

**Practical:** Complementation test. The gene concept.

Practical courses in genetics. pp. 47-52.

**13<sup>th</sup> week:**

**Lecture:** Medical genomics lectures 7-9.

**Practical:** Detection of a human DNA polymorphism by polymerase chain reaction.

Practical courses in Genetics pp. 85 - 89 and handout from homepage. 3<sup>rd</sup> test in extra time.

**Self Control Test (Thompson: Genetics in Medicine, Ch 11, 12, 13, 15, 16, 17, 18, 19. Lectures: 25-30, Practicals: weeks 11-12)**

**14<sup>th</sup> week:**

**Lecture:** Medical genomics lectures 10-12.

**Practical:** Model investigation in population genetics.

Problem solving in population genetics (homework).

Laboratory manual pp. 91-102.

**15<sup>th</sup> week:**

**Lecture:** Medical genomics lectures 13-15.

**Practical:** Induction of beta-galactosidase in E. coli cells.

Operons.

Practical courses in Genetics pp. 53-58.

## Requirements

**Conditions of signing the lecture book:**

Concerning attendance, the rules are set out in the Rules and Regulations of the University are clear. The presence of students at laboratory practices and seminars is obligatory and will be recorded. Students are responsible for signing the list of attendance. The professor refuses his/her signature in the student's Lecture Book for the semester's course-work in the case of over four weeks of absence, even if the student has an acceptable excuse.

If the student is absent from more than two practices or seminars, the semester will be accepted only if he/she passes an examination based on the material covered by the laboratory classes of the semester (labtest). Students have to take notes during lab classes and seminars. The notes are occasionally inspected and signed by the instructors. If 3 or more laboratory or seminar notes are missing, the student must take a labtest to qualify for the signature of the lecture book.

## ACADEMIC PROGRAM FOR THE 1ST YEAR

Missed laboratory classes may only be made up for in the classes with other groups during the same week. For permission to make up a missed laboratory class please consult the academic advisor. If the student is absent from more than 4 practices and seminars, the signature will be denied and the student has to repeat the semester. During the semester there will be three self-control tests offered in the 4th, 9th and 13th weeks. The questions include multiple choice and short essay questions, figures, pedigrees, definitions, etc. Based on the % average of the three tests a final grade will be offered according to the next table:

points (%)	mark
60.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

Attendance of at least two of the tests is obligatory and it is a condition for signing your lecture book. Those students who want a better mark have to take the regular end of semester "A" exam. The result of this ESE is binding, it can be better, the same or worse than the offered mark. Students with lower achievement than 60 % should take the regular ESE.

**Rules concerning repeaters:** Attendance of labs and seminars for those repeaters who have a signed lecture book from the previous year (i.e. they failed, or they are repeaters because they have never taken Genetics exam) is dispensable. Students should register for the subject electronically during the first weeks of the semester. They can take the three midterm tests in order to qualify for an offered grade based on these tests, or they take the regular exam at the end of the semester. Students, who did not earn a signature in the previous year have to register and attend the labs and seminars.

**Exemption requests:** Applications for exemption from the course (based on previous studies at other schools) should be submitted during the first two weeks of the semester. Requests are not accepted after that deadline! Exemption is granted if an "assessment of knowledge" test is passed. The passing limit is 50%.

**End of Semester Exam** (regular assessment of your course work): There will be a written examination (ESE) at the end of the semester that covers all the material of the semester taken in the lectures, seminars, and laboratory practices. The examination questions include multiple choice and short essay questions, figures, definitions, etc. The marks are based on the student's performance, expressed in percentage (%) as shown in the table below:

Percentage (%)	Mark
0 - 49.99	fail (1)
50.00 - 64.99	pass (2)
65.00 - 74.99	satisfactory (3)
75.00 - 84.99	good (4)
85.00 - 100	excellent (5)

The percentage values include the student's performance at the ESE as well as the bonus percentage they have obtained by taking the three mid-semester tests, and submitting the homeworks. The bonus percentage is based on the average result of the three mid-semester tests. Absence counts as 0%.

Further bonus points (1 points each) are given for the timely and correct completion of the following midterm homeworks:

Analysis of human karyograms. Problem solving in genetics. Use of databanks through the Internet. Problem solving in population genetics. Maximum number of bonus points is 14.

The submission of home-works is voluntary. Homeworks are not accepted after the submission deadline.

The slides of the lectures and up-to-date information can be found at [www.genetics.dote.hu](http://www.genetics.dote.hu), username: medical\_genetics, password: arachnodactylia. Click on "Oktatás" (teaching) and Downloads or Information and Medical genetics.

## CHAPTER 10

### ACADEMIC PROGRAM FOR THE 2ND YEAR

#### Department of Anatomy, Histology and Embryology

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY II.**

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **51**

Practical: **130**

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

**Lecture:** Topographical anatomy of the head and neck - part one. Topographical anatomy of the head and neck - part two. Topographical anatomy of the oral and nasal cavities. Anatomy, histology and development of the teeth.

**Practical:** Anatomy: Topographical anatomy of the head and neck I.-II. a. Topographical anatomy of the head and neck: part one. Surface anatomy: Draw the surface projections and landmarks of the following structures on the cadaver: Head: cutaneous branches of the trigeminal nerve. Branches of the facial nerve on the face and neck. Facial, superficial temporal and external carotid arteries. Retromandibular vein. Parotid gland and parotid duct. Lymph nodes and lymphatic drainage of head. Neck: Triangles of the neck. Superficial veins (ext. jugular vein). Cutaneous branches of the cervical plexus. Position of the hyoid bone, thyroid cartilage, thyroid gland. The carotid sheath (vagina vasorum) and its structures. The site of cricothyrotomy. Surface projection of the apex of the lungs. Relations of the scalene muscles. Lymphatic drainage of the neck. Make schematic drawings of these structures! Incise the skin in the midline and peel off laterally. The incision of the facial skin has to be made from the medial part of the orbit down to the philtrum passing round the nose, then continued through the lower lip to the chin. At the neck region a vertical incision has to be made in the midline, from the base of the mandible to the sternum, and a transversal incision along the clavicle. The skin is to be folded laterally. Attention: Branches of the supraclavicular nerves cross the clavicle! b. Dissect the superficial structures: branches of the V<sup>th</sup> and VII<sup>th</sup> cranial nerves, facial artery and vein, parotid duct, cutaneous branches of the cervical plexus, superficial cervical artery, external jugular vein, triangles of the neck. Careful preparation of the muscles of face. Face: Topography of the parotid gland. Nerves and blood vessels related to the parotid gland. Remove the parotid gland only one side by careful preparation of branches of the facial nerve and blood vessels. Dissection of the frontal and temporal regions. Neck: dissection of the supraclavicular triangle. Spare the sternocleidomastoid muscle. Histology: a. - b. Repetition of general histology 1. Large intestine (HE stain) 2. Trachea (HE stain) 3. Esophagus (HE stain) 4. Axillary skin (HE stain) 5. Urethra masculina (HE stain) 6. Ureter (HE stain) 7. Granulation tissue (healing wound from rat skin) (HE stain) 8. Knee joint (HE stain) 9. Cardiac muscle (PTAH) 10. Blood smear (May-Grünwald-

130

Giemsa stain)

##### 2<sup>nd</sup> week:

**Lecture:** Pharynx. Larynx. Development of the face, and oral and nasal cavities. Development of the pharyngeal gut.

**Practical:** Anatomy: Topographical anatomy of the head and the neck: III.-IV. a. Dissection of the submandibular triangle. Continue the dissection of the frontal, temporal and supraclavicular regions. Cut the sternocleidomastoid muscle. At the side of the intact parotid gland dissect the structures which pierce the gland. The parotid gland itself remains in position. b. Carotid triangle and the middle part of the neck. Sulcus lateralis linguae, muscles of the floor of the mouth. Topography of the salivary glands. Dissection of the scalenotracheal fossa. Branches of the subclavian artery. Repetition of the superficial regions of the head and neck. Histology: a. - b. Lip, tongue and salivary glands 1. Lip (HE stain). 2. Tongue (filiform and fungiform papillae) (HE stain). 3. Tongue (circumvallate papillae) (HE stain) 4. Parotid gland (HE stain) 5. Submandibular gland (HE stain) 6. Sublingual gland (PAS + H stain)

##### 3<sup>rd</sup> week:

**Lecture:** Clinical anatomy of the head and neck - part one. Clinical anatomy of the head and neck - part two.

Lymphatic tissue - part one. Lymphatic tissue - part two.

**Practical:** Anatomy: Topographical anatomy of the head and the neck: V.-VI. a. Head: Infratemporal fossa. At the side of the removed parotid gland dissect the alveolar nerve and artery from the mandibular canal and remove that half of the mandible. Cut out the masseter, the external and internal pterygoid muscles by careful preparation of the structures between the two pterygoid muscles. Preparation of the inferior alveolar nerve, lingual nerve, chorda tympani, maxillary artery, auriculotemporal nerve, middle meningeal artery, stylohyoid, styloglossus, stylopharyngeus muscles, glossopharyngeal nerve. Remove the lateral plate of the pterygoid process of the sphenoid bone. Find the muscles of the soft palate. b. Dissection of the nuchal region from the external occipital protuberance to the 7<sup>th</sup> thoracic vertebra. Occipital artery, muscles of the nuchal region from layer to layer. Identify the suboccipital triangle and its elements. Remove all muscles attached to the occipital bone. Make visible the posterior arch of the atlas and exarticulate the atlantooccipital joint. Cut through the alar ligaments and the apical ligament. Bend the head forward. The head

remains connected to the body only through the pharynx and esophagus. In the other cadaver, structures related to the pharynx are dissected. Histology: a. - b. Tooth. 1. Tooth grinding (Fuchsin) 2., 3. Development of teeth (teeth primordia in the rat's head) (HE stain). 4., 5. Development of teeth (teeth primordia in the rat's head) (Azan stain).

#### 4<sup>th</sup> week:

**Lecture:** Lymphatic tissue - part three. The skin. The hypothalamo-hypophyseal system. Hypophysis and epiphysis.

**Practical:** Anatomy: Topographical anatomy of the head and the neck: VII.-VIII. a. Open the posterior wall of the pharynx and investigate the related structures. Study the faucial isthmus. Dissection of the larynx in situ: remove the lamina of the thyroid cartilage on the one side and dissect the muscles of larynx. b. Demonstration of the median section of the head and neck. Conclusion of the dissection of the pharynx and larynx. Make a schematic drawing of the median section of the head. Demonstration of the pharynx, larynx, tongue, palatine and lingual tonsil. Make schematic drawings of these structures. Histology: a. Lymphatic tissues - part one 1. Thymus (HE stain) 2. Lymphatic follicle (large intestine) HE stain 3. Lymph node (HE stain) 4. Demonstration: Cells of the lymph node (video) b. Lymphatic tissues part two 1. Spleen (HE stain) 2. Palatine tonsil (HE stain) 3. Lingual tonsil (HE stain)

#### 5<sup>th</sup> week:

**Lecture:** Thyroid gland, parathyroid gland, suprarenal gland. The APUD system. Heart - part one. Heart - part two.

**Practical:** Anatomy: Topographical anatomy of the head and the neck: IX. SELF CONTROL. a. Repetition of the topographic anatomy of the head and neck. b. SELF CONTROL: Topographical anatomy of the head and neck. Pharynx, larynx, oral and nasal cavities. Histology: a. - b. The skin 1. Fingertip (HE stain) 2. Skin (HE stain) 3. Mammary gland (HE stain)

#### 6<sup>th</sup> week:

**Lecture:** Heart - part three. Development of the heart - part one. Development of the heart - part two. Trachea and lungs.

**Practical:** Anatomy: Dissection of the thoracic cavity I-II. a. Surface projections of the thoracic organs. On the anterior thoracic wall draw the following landmarks, projection lines of the heart and its orifices, the auscultation areas of the cardiac valves, margins of the cardiovascular shadow, projections of the lungs, pleurae and pleural recesses. These drawings are to be transmitted into the body scheme provided in your anatomy schedule handout. Carefully relate the projections to the position of the sternum and ribs in the schematic drawing! Presentation of radiographs. b. Structure of the thoracic wall. Topography of the intercostal spaces. Lymphatic drainage of the breast. After removing the pectoralis major muscle, dissect the intercostal branches of the internal thoracic artery and the intercostal muscles. Opening of the thoracic cavity: exarticulate the sternoclavicular joint and

cut the ribs along the anterior axillary fold. Compare the surface projection lines on the body and in your own schematic drawings with the in situ positions of the thoracic organs. Mediastinum and its divisions. Histology: a. -b. Endocrine organs - part one 1. Hypophysis (HE stain) 2. Hypophysis (Azan stain) 3. Epiphysis (HE stain)

#### 7<sup>th</sup> week:

**Lecture:** Pleural sac. Development of the respiratory system. Mediastinum. Esophagus. Clinical anatomy of the organs of the thorax. Structure of the abdominal wall.

**Practical:** Anatomy: Dissection of the thoracic cavity III.-IV. a. Study of the heart on isolated preparations. Size and position of the heart. External anatomy of the heart. Preparation of arteries and veins of the heart. Internal anatomy of the atria and the ventricles of the heart. Types and functions of the heart valves. Layers of the heart wall. The conducting system. Functional aspects of the circulatory system. Pulmonary and systemic circulation. b. In situ dissection of the heart, its vessels and chambers. Topography of the heart and pericardium and its sinuses. Open the pericardium between the superior and inferior vena cava and near the diaphragm along an L shaped line. Demonstration of the excised heart. Dissect the coronary arteries, the coronary sinus, the small cardiac vein, the great cardiac vein, the middle cardiac vein. Open a window on the anterior surface of the right auricle and turn backward. Remove and wash the coagulated blood to make the structures of the right atrium and the right atrioventricular orifice visible. Then cut a window on the anterior surface of the right ventricle starting from the conus, and turn the flap caudally while preserving the moderator band. Investigate the structures of the right ventricle including the tricuspid valve. Make a hole on the left ventricle by cutting out a piece of its wall, and identify its structures through the opening. The semilunar valves are studied at the aortic and pulmonary orifices after making window-like holes on their anterior walls. Presentation of radiographs. Dissection of the structures of the supracardiac mediastinum. Histology: a. - b. Endocrine organs - part two 1. Thyroid gland (HE stain) 2. Parathyroid gland (HE stain) 3. Suprarenal gland (HE stain) 4. Demonstration: Thyroid gland: parafollicular cells (C) cells (silver impregnation, immunohistochemistry)

#### 8<sup>th</sup> week:

**Lecture:** Digestive system - introduction. Development of the primitive gut. Stomach. Small intestines. Large intestine.

**Practical:** Anatomy: Dissection of the thoracic cavity V.-VI. a. Study the pleura and its recesses. Remove the lungs and inspect the surfaces. Make schematic drawings of the medial surfaces of the lungs. Dissect bronchopulmonary segments (in one of the lungs) and bronchial arborization (in lung). Structures of the posterior mediastinum. b. Structures of the posterior mediastinum. Dissection of the intercostal vessels and nerves. Topography of the intercostal space and the cupula pleurae. Presentation of radiographs. Histology: a. Respiratory system. 1. Larynx (HE stain) 2. Trachea (HE stain) 3. Lung (HE stain) 4.

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Lung (The vascular system filled with drawing ink + HE)  
 b. Digestive system - part one 1. Esophagus (HE) 2. Stomach (HE stain) 3. Stomach (PAS+H) 4. Demonstration: Sromach (GEP cells: silver impregnation and immunohistochemical reaction)

**9<sup>th</sup> week:**

**Lecture:** Histology of the stomach and the intestines. Pancreas. Liver - part one. Liver - part two. Portal system. Peritoneum. Lesser sac of the peritoneum.  
**Practical:** Anatomy: SELF CONTROL: Dissection of the abdominal cavity I. a. SELF CONTROL. Anatomy of the thorax. Development of the heart, respiratory system, face, oral ad nasal cavities, pharyngeal gut. b. Demarcate the regions of the abdominal wall and cavity and draw the surface projections of abdominal organs on the cadaver. These drawings should be introduced in the body scheme in your anatomy schedule handout. Dissection of the median abdominal and the inguinal regions. Structure of the posterior abdominal wall (repetition). Presentation of radiographs. Histology: a. Digestive system - part two 1. Gastro-duodenal junction (HE stain) 2. Gastro-duodenal junction (PAS+H stain) 3. Jejunum (HE stain) 4. Jejunum (Goldner's stain) b. Digestive system - part three 1. Colon (HE stain) 2. Demonstration: Colon (GEP cells, immunohistochemical reaction) 3. Appendix (HE stain) 4. Rectum (HE stain)

**10<sup>th</sup> week:**

**Lecture:** Development of the peritoneum and intestines. Separation of the body cavities. Retroperitoneum. Gross anatomy of the kidneys.  
**Practical:** Anatomy: Dissection of the abdominal cavity II.-III. a. Structure of the abdominal wall, layers of the abdominal wall, thoracolumbar fascia. Opening of the abdominal cavity. Inspection and identification of the abdominal organs. Compare the surface projections on the body and in your own drawings with the actual positions of the organs. Presentation of radiographs. b. Dissection of the lesser omentum and branches of the celiac trunk. Dissection of the blood vessels of the small and large intestines. Memorise the position of the abdominal viscera. Presentation of radiographs. Histology: a. SELF CONTROL: Histology of the lip, tongue, salivary glands, teeth, lymphatic tissue, skin, endocrine organs, respiratory system, stomach, intestines. b. Digestive system - part four 1. Pancreas (HE stain) 2. Demonstration: Pancreas (GEP cells: silver impregnation and immunohistochemical reaction) 3. Liver from pig (HE stain) 4. Liver from pig (Azan stain) 5. Human liver (HE stain) 6. Liver from rat (Trypan blue vital stain + Nuclear fast red stain)

**11<sup>th</sup> week:**

**Lecture:** Structure of the kidneys and urinary system. Development of the urinary system. Topographical anatomy of the wall of the pelvis and perineal region. Male genital organs: testis and epididymis.  
**Practical:** Anatomy: Dissection of the abdominal cavity IV.-V. a. Dissection of the blood vessels. Discussion of the abdominal lymphatic system. Removing the intestines

from the duodeno-jejunal flexure to the sigmoid colon-rectal border (only from one cadaver). Cut and demonstrate the inner surface of different parts of the intestine (including the cecum). Demonstration of the rectum on an isolated preparation. In the cadaver from which intestines were removed dissect the structures of the retroperitoneal region. b. Topography and relations of the stomach, duodenum, pancreas and spleen. Liver: inspect and make a drawing of the visceral (inferior) surface. Make schematic drawings of the relations of abdominal organs. Topography and sheaths of the kidney. Layers of the retroperitoneal space. Histology: a. SELF CONTROL REMEDIAL b. Digestive system part five, Urogenital system - part one 1. Gall bladder (HE stain) 2. Kidney - coronal section (HE stain)

**12<sup>th</sup> week:**

**Lecture:** Ductus deferens, spermatic cord, seminal vesicle, prostate, scrotum. Penis. Mechanism of erection. Female genital organs: the ovary. Anatomy of the uterine tube and the uterus. Broad ligament. Vagina.  
**Practical:** Anatomy: Dissection of the abdominal cavity VI-VII. a. Paired visceral branches of the abdominal aorta. Kidneys, suprarenal glands. - Dissection of the kidney, demarcate a lobe of the kidney. Make a schematic drawing of the coronal section of a kidney. b. Dissection of the retroperitoneal space. Diaphragm. Openings of the diaphragm and its piercing structures. Lumbar plexus. Parietal branches of the abdominal aorta. Histology: a. Urogenital system - part two 1. Kidney - tangential section (HE stain) 2. Kidney (Vascular infiltration with drawing ink + HE stain) b. The urogenital system - part three 1. Ureter (HE stain) 2. Urinary bladder (HE stain) 3. Urethra masculina (HE stain) 4. Cross section of an embryonic penis (HE stain) 5. Demonstration: Penis (HE stain)

**13<sup>th</sup> week:**

**Lecture:** Attachment and peritoneal relations of the uterus. Female external genital organs. Structure of the uterus and uterine tube. Menstrual cycle and its endocrine regulation. Implantation. The pregnant uterus. Placenta - part one.  
**Practical:** Anatomy: True pelvis and perineal region I.-II. a. Topography of the organs in the true pelvis. External genital organs - demonstration. Dissection of the branches of the internal iliac artery. b. Dissection of the perineal region. Structures of the anal region. Ischiorectal fossa. (Removing of the lower limbs from one of the cadavers). Histology: a. Urogenital system - part four 1. Testis and epididymis (HE stain) 2. Spermatic cord (HE stain) 3. Seminal vesicle (HE stain) 4. Prostate (HE stain) 5. Demonstration: Prostate (Goldner's stain) b. Urogenital system - part five 1. Vagina (HE stain) 2. Ovary (HE stain) 3. Ovary with corpus luteum (HE stain)

**14<sup>th</sup> week:**

**Lecture:** Placenta - part two. Fetal circulation. Development of the blood vessels. Development of the genital organs. Subdivision of the cloaca. Sexual differentiation. Sexual anomalies of genetic and hormonal origin.

**Practical:** Anatomy: True pelvis and perineal region III.- IV. a. Dissection of the urogenital region and external genital organs. Nerves and blood vessels on the dorsal surface of the penis. Preparation of the roots of penis/clitoris. Preparation of the corpora cavernosa and corpus spongiosum penis. Layers of the scrotum. Preparation of the pelvis for median section. b. Halving of the pelvis in the median plane. Dissection of the organs of the true pelvis from the lateral aspect. Branches of the internal iliac artery. Make schematic drawings of the female and male pelvic organs. Histology: a. Urogenital system - part six 1. Uterine tube (HE stain) 2. Uterus - proliferative stage (HE stain) 3. Uterus - secretory stage (HE stain) Demonstration: Uterine tube with peg-shaped

cells (HE stain) b. Urogenital system - part seven 1. Pregnant uterus (HE stain) 2. Placenta (HE stain)

**15<sup>th</sup> week:**

**Lecture: -**

**Practical:** Anatomy: True pelvis and perineal region V. a. Male and female genital organs - demonstration of excised preparations. Placenta. Sacral plexus. b. SELF CONTROL. Anatomy of the abdominal cavity, pelvis and perineal region. Histology: a. SELF CONTROL. Histology of the pancreas, liver, gall bladder and the urogenital system. b. -

## Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the Faculty of Medicine, University of Debrecen are valid. The presence in practices, seminars and lectures will be recorded. The head of the department may refuse to sign the Lecture Book if a student is absent more than four times from practices (including anatomy, histology and embryology) in one semester even if he/she has an acceptable reason. Compensation of practices is possible only on the same week at an other student's group. The compensation of three practices is allowed (including anatomy, histology and embryology) in one semester.

**Rules of the examinations:**

**Midterm examinations;**

Attendance in the midterm examinations is compulsory. The exams cover the topics of lectures, seminars and practices of the semester, and include relevant material from official textbooks.

Three anatomy and two histology midterm examinations will be organized with the following topics:

Anatomy 1: Gross and topographic anatomy of the head and neck.

Anatomy 2: Gross and topographic anatomy including visceral relations of the organs of the thorax.

Anatomy 3: Gross and topographic anatomy including visceral relations of the organs of the abdomen, pelvis and perineum.

Histology 1: Histology of the oral cavity, lymphatic tissue, skin, endocrine organs, respiratory system, stomach, intestines.

Histology 2: Histology of the pancreas, liver, gall bladder and the urogenital system.

**Evaluation of the midterm examinations:**

Midterm examinations will be evaluated with points. The midterm examination is successful in case of 60% or better performance. In case of successful midterm examinations the student will be exempted from the corresponding parts of the final practical examination.

**Improvement of a failed midterm examination:**

Failed midterm examinations can be improved if the score of the failed midterm examination is between 40 and 59 %.

With this restriction the following midterm examinations can be improved:

The first anatomy midterm examination; on the 6th week (on Monday at 8 o'clock).

The second anatomy midterm examination; on the 11th week (on Monday at 8 o'clock).

The first histology midterm examination; on the 11th week at the time of the first histology class.

Conversion of the successful midterm examination to grades for the end of semester final exam:

The achievements on successful midterm examinations are converted to grades for the end of semester final exam on the basis of the following scheme of conversion:

60-69 %	2 (pass)
70-79 %	3 (satisfactory)
80-89 %	4 (good)
90-100 %	5 (excellent)

**Final examination at the end of the 1st semester:**

The final examination consists of a practical and a theoretical part.

**Practical examination:**

The exam is an oral examination conducted with the continuous aid of anatomical and histological preparations.

The exam consists of the following parts:

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1. Anatomy (3 topics from different regions of the human body)
    - a. Head and neck: (gross and topographic anatomy including visceral relations)
    - b. Visceral organs 1: (gross and topographic anatomy including visceral and skeletal relations of the organs of the thorax)
    - c. Visceral organs 2: (gross and topographic anatomy including visceral and skeletal relations of the organs of the abdomen, pelvis and perineum)
  2. Histology (2 slides)
    - a. Histology 1: Histology of the lip, tongue, salivary glands, teeth, lymphatic tissue, skin, endocrine organs, respiratory system, stomach, intestines.
    - b. Histology 2: Histology of the pancreas, liver, gall bladder and the urogenital system.
- The parts of the exam will be evaluated separately from each other. The exam is successful if the student pass all five parts successfully. On the "B" and "C" examinations the student will be exempted from the parts that have been successfully passed previously.

**Theoretical examination**

The exam is an oral examination. The topics of the examination are formulated in a way that student should present a synthetic knowledge from anatomy, histology and embryology. On the "B" and "C" examinations the entire examination has to be repeated.

**Calculation of the mark for the final examination**

To calculate the mark for the final examination the performance on both the practical and theoretical examinations will be taken into consideration.

**Registration for the examination:**

Students are supposed to register for the exam through the NEPTUN system.

## Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY I.**

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **45**

Seminar: **15**

Practical: **30**

**1<sup>st</sup> week:**

**Lecture:** Energy in biology. Oxidative phosphorylation. The citric acid cycle and its regulation. The mitochondrial genom.

**Practical:** Safety instructions and fire regulations. Introduction to the practicals.

**2<sup>nd</sup> week:**

**Lecture:** Introduction. Main pathways of the carbohydrate metabolism, central role of glucose. Absorption and transport of monosaccharides. Carbohydrate metabolism in various tissues. Glycolytic pathway. Rapoport-Luebering shunt. Energy production of the glycolytic pathway. Non-physiological inhibitors of the glycolytic pathway. Shuttle pathways. Cori cycle. Glucose-alanine cycle. Gluconeogenesis. Substrates of the gluconeogenesis.

**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH.

**3<sup>rd</sup> week:**

**Lecture:** Regulation of the glycolytic pathway in liver and muscle. Regulation of gluconeogenesis. Glycogen in liver and muscle. Degradation and synthesis of glycogen. Regulation of glycogen synthesis and degradation. Metabolism of galactose and fructose.

**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH.

**4<sup>th</sup> week:**

**Lecture:** Pentose phosphate pathway. Synthesis of disaccharides. Metabolism of glucuronic acid. Inherited diseases in the carbohydrate metabolism. Biochemistry of diabetes mellitus. Pyruvate dehydrogenase complex.

**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH.

**5<sup>th</sup> week:**

**Lecture:** Organization of lipid structures. Mixed micelles in the digestive tract. Lipoproteins in blood plasma. Covalent interactions between proteins and lipids.

Oxidation of fatty acids. Synthesis of fatty acids.

**Practical:** Study on transaminases.

**6<sup>th</sup> week:**

**Lecture:** Synthesis of triacyl-glycerol. Lipid metabolism during starvation. Ketone bodies.

**Practical:** Study on transaminases

**7<sup>th</sup> week:**

**Lecture:** The mevalonate metabolic pathway. Synthesis of cholesterol. Cholesterol transport in the body. The LDL receptor and its gene. Excretion of cholesterol.

Biochemical explanation of elevated blood cholesterol levels.



**Practical:** Study on transaminases

**8<sup>th</sup> week:**

**Lecture:** Steroid hormones. Bile acids. Vitamin D. Eicozanoids. Lipid peroxidation. Synthesis of sphingolipids and phospholipids

**Practical:** Extraction and separation of lipids. Determination of free fatty acids.

**9<sup>th</sup> week:**

**Lecture:** Comparison of the amino acid metabolism with the carbohydrate and lipid metabolisms. Formation and utilisation of the intracellular amino acid pool. Nitrogen balance. Exogenous amino acid sources, digestion of proteins. Amino acid transports. Structure and function of glutathione. Endogenous amino acid sources: intracellular protein breakdown. Common reactions in the amino acid metabolism: fate of the nitrogen. Transaminations and deaminations. Enzymes containing pyridoxal phosphate cofactors, and their mechanism of action: stereoelectronic control. Formation and elimination of ammonia in the body. Nitrogen transport between the tissues.

**Practical:** Extraction and separation of lipids. Determination of free fatty acids.

**10<sup>th</sup> week:**

**Lecture:** The urea cycle and its regulation. Mitochondrial carbamoyl phosphate synthetase. Intracellular glutamine cycle. Decarboxylation and carboxylation reactions in the amino acid metabolism. C1 transfer and transmethylation, related enzyme and vitamin deficiencies.

Monoxygenation and dioxygenation reactions. Fate of the carbon skeleton of amino acids: glucogenic and ketogenic amino acids. Degradation of amino acids in the pyruvate pathway. Transport function of alanine. Degradation and synthesis of cysteine. Formation and utilization of PAPS. Degradation and synthesis of serine and glycine. Pathways of threonine degradation. Degradation of amino acids in the - ketoglutarate pathway. Degradation of histidine, histidinemia.

**Practical:** Extraction and separation of lipids. Determination of free fatty acids.

**11<sup>th</sup> week:**

**Lecture:** Degradation and synthesis of proline.

Degradation and synthesis of arginine and ornithine, their precursor functions: NO, creatine, polyamines. Aspartate and asparagine degradation and synthesis in the oxaloacetate pathway. Degradation of amino acids in the succinyl-CoA pathway. The vitamin requirements and enzyme deficiencies in the propionyl CoA succinyl CoA conversion. Degradation of isoleucine and valine, related enzyme deficiencies. Comparison of leucine degradation with the degradation of isoleucine and valine. Degradation of lysine and tryptophane, their precursor functions.

Carnitine synthesis. Degradation of phenylalanine and tyrosine, related enzyme deficiencies and precursor functions. Synthesis and degradation of catecholamines.

**Practical:** Evaluation and discussion of the practices. Control test.

**12<sup>th</sup> week:**

**Lecture:** Nucleotide pool. Digestion and absorption of nucleic acids. Sources of atoms in purine ring. De novo synthesis of purine nucleotides. Regulation of purine nucleotide synthesis. Salvage pathways for the purine bases. Degradation of purine nucleotides. Diseases associated with purine nucleotide metabolism.

**13<sup>th</sup> week:**

**Lecture:** De novo synthesis of pyrimidine nucleotides. Regulation of pyrimidine nucleotide synthesis. Salvage pathways for the pyrimidines. Degradation of pyrimidine nucleotides. Nucleoside and nucleotide kinases. Synthesis of deoxythymidilate. Nucleotide coenzyme synthesis (NAD,FAD,CoA). Antitumour and antiviral action of base and nucleoside analogues. Biochemistry of nutrition. Energy requirement. Basic metabolic rate. Energy content of the food. Energy storage and thermogenesis. Biochemical mechanism of obesity. Protein as N and energy source. N balance. Essential amino acids. Protein malnutrition. Vegetarianism. Clinical aspects of protein nutrition. Carbohydrates and lipids. Pathological mechanisms in obesity. Vitamins. Structure, biochemical functions. Relationship between the biochemical functions and the symptoms of deficiency. Essential inorganic elements of the food (metabolism, function, deficiency).

## Requirements

**Requirements for signing the lecture book:**

Participation in each practical, in the seminars and in the obligatory lectures. Only one absence is accepted from the obligatory lectures, in case of more absences the lecture book will not be signed.

**Content of Biochemistry I.:**

Topics of metabolism presented at the lectures (available at the <http://bmbi.med.unideb.hu> web site, username: student, password:student2011) and discussed during the seminars.

At the seminars the lectures of the previous week can be discussed with the lecturer (or with his/her colleague). New scientific information connected to the lectures will also be presented by the lecturers; this material will be asked on the exams, too. In case of the seminars maximum three absences are accepted.

Every practical must be performed, if someone is absent because of any serious reason, the missing experiment have to be performed within the three weeks practical period of a particular practical joining to another group (after an appointment with a practical teacher). In case of more than one remedial practical students can not get any points for

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that practical. Practicals are not obligatory for repeaters.

Achievement during the semester will be evaluated in term of points. During the semester 100 + 6 points can be collected for the laboratory test (10 points), note book (3 x 5 points) and by the control tests from the material of the lectures (75 points); 2/3rd of the test questions will be from the listed "most important topics" of the lecture themes. Control tests consist of test questions and recognition of chemical structures. The list of the chemical structures can be found in the biochemistry practical guide. Bonus points earned by scientific essay will be added to the total collected points (half of the bonus points can be added to the result of the semester exam).

**Scientific essay:** (which is not obligatory) should be a summary of scientific papers, based on the newest scientific information connected to the material of the lectures (3-6 pages). Only those articles can be used, which were published between 1st March 2012 - 31st August 2012! If the quality of the essay reaches the appropriate level, max. 6 bonus points can be earned (students can get help and advices from the practical teachers). Essays must be submitted at the last manual practical to the practical teachers. The final deadline: Wednesday on the 10th week.

In the first semester grade will be offered on the base of the collected points for all those students, who collected at least 60 points (and reached at least 60% of the practical points!): pass for 60-69,5 points; satisfactory for 70-79,5 points; good for 80-89,5 points; excellent for 90-106 points. Those students who want to get a better grade can take an exam. Those, who did not collect 60 points have to take a written exam in the exam period.

The exam is a written one and consists of 25 test questions from the "most important topics" (25x1 point), 5 assay questions (4 from the lectures and one from the practicals; 5x5 points). 60% (30 points) is needed to get a passing mark, and the grade increases with every 5 points (30-34.5 pass, 35-39.5 satisfactory, 40-44.5 good, 45-50 excellent).

Those students, who reach at least 220 points during the three semesters (Molecular Biology, Biochemistry I., II.), will be exempted from the written part of the final exam (for this exemption at least 60 points must be collected separately in each semester).

Please follow the announcements of the department for reviewing the results of the self-control examination tests. The results will be announced anonymously on the institute web site and on the announcement table of the department (LSB downstairs, 1st corridor).

## Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE II/1.**

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** Introduction. Revision.

**2<sup>nd</sup> week:**

**Practical:** Hová? (Where to?) A doctor's daily routine. (Ch. 7.)

**3<sup>rd</sup> week:**

**Practical:** Mikor? Hány órákor? (When?) Daily routine in a hospital. (Ch. 8.)

**4<sup>th</sup> week:**

**Practical:** Van/nincs. Birtoklás (Possession) (Ch. 8.)

**5<sup>th</sup> week:**

**Practical:** Napirend 1. (Daily routine 1.) (Ch. 9.)

**6<sup>th</sup> week:**

**Practical:** Napirend 2. (Daily routine 2.) (Ch. 9.)

**7<sup>th</sup> week:**

**Practical:** Revision. Practice. Mid-term test.

**8<sup>th</sup> week:**

**Practical:** Múlt idő 1. (Past tense 1.) (Ch. 10.)

**9<sup>th</sup> week:**

**Practical:** Múlt idő 2. (Past tense 2.) (Ch. 10.)

**10<sup>th</sup> week:**

**Practical:** Verb conjugation

**11<sup>th</sup> week:**

**Practical:** "Szokott", "kell", "szabad" (Modal verbs) (Ch. 12.)

**12<sup>th</sup> week:**

**Practical:** Possession. (Ch. 13.)

**13<sup>th</sup> week:**
**Practical:** Adjective formation. Future. (Ch. 13.)

**14<sup>th</sup> week:**
**Practical:** Revision. Practice. End-term test.

**15<sup>th</sup> week:**
**Practical:** Oral minimal exam. Evaluation.

## Requirements

### Requirements of the language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each Hungarian language course, students have to sit for 2 written language tests and a short minimal requirement oral exam.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. There is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class every week. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect at least 6 points to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score. Based on the final score the tests are graded according to the following table:

Final score	Grade
0 – 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60, the student once can take an oral remedial exam covering the material of the whole semester.

## Department of Physiology

Subject: **MEDICAL PHYSIOLOGY I.**

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **60**

Seminar: **30**

Practical: **45**

The lectures of Medical Physiology I. are listed at the web site of the Department of Physiology (<http://phys.dote.hu>).

### Requirements

#### 1. Signature of Lecture Book

Attendance of lectures, laboratory practices and seminars is compulsory. The signature of the Lecture Book may be refused for the semester in case of more than five absences from the seminars and/or more than two absences from the practices. All missed practices must be made up, whereas the completion of a missed seminar with a different group is not possible. Completion of all topic sheets in the Exercise Book, each verified by the signature of the teacher, is also a precondition of the signature of the Lecture Book.

If one has six or more lecture absences, the end of semester examination (ESE) may not be substituted with the average test score (see later).

Each student must attend seminars with the group specified by the Education Office. For continuous updates on all education-related matters, please check the departmental web-site (<http://phys.dote.hu>)

#### 2. Evaluation during the semester

The knowledge of students will be tested 3 times per semester in the form of a written test (multiple choice questions). Participation on mid-semester written tests is compulsory. If one wishes to improve on his/her general performance, it is possible to take a make-up (remedial) test on one of the three topics. Note that the calculation of the average score will be based upon the result of the remedial test, even if it is worse than the original score. At the end of the 2nd semester the 1st semester test results will be used to calculate your bonus points. The bonus points are valid only for a given academic year! The calculation of bonus points are detailed at the description of Medical Physiology II.

Laboratory practical knowledge of the students will be tested at the end of the first semester as part of the Closing Lab, evaluation with two level marks (accepted or not accepted). As a precondition of attending the Closing Lab, the fully completed Exercise Book (with all the verified topics) must be presented during the Closing Lab. Students are expected to perform the given experiment on their own and must be familiar with theoretical background also. In case of a negative result, the Closing Lab can be repeated, but only once. If the final evaluation of the Closing lab is "not accepted", then the student will be given laboratory practical questions on the end of semester examination.

#### 3. Examination

The first semester is closed by an oral end of semester exam (ESE) covering the topics of all lectures, seminars and laboratory practices of the semester. The list of exam questions is available on the departmental website (<http://phys.dote.hu>).

If the final evaluation of the Closing lab is "not accepted", then the student will be given laboratory practical questions, too.

It is not compulsory to take the ESE, as a mark based on the average score of mid-semester tests will be offered if

- one's average score of the three mid-semester tests is above 60%, and
- (s)he successfully completed the Closing Lab, and
- (s)he has fewer than 6 lecture absences, and
- the Dept. of Physiology signs the lecture book.

The mark based on the average score of mid-semester tests is calculated according to the following table:

score	mark
0 – 59 %:	fail
60 – 69 %	pass
70 – 79 %	satisfactory
80 – 89 %	good
90 – 100 %	excellent

- If one is not satisfied with this result, (s)he may participate in ESE during the examination period.

## Department of Anatomy, Histology and Embryology

Subject: **NEUROBIOLOGY (NEUROANATOMY, NEUROBIOCHEMISTRY, NEUROPHYSIOLOGY)**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **62**

Seminar: **15**

Practical: **52**

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

**Lecture:** The histology of the nervous system. I. The neuron. The histology of the nervous system. II. The neuroglia. Relations of neurons and neuroglial cells. The development of the nervous system – neurohistogenesis. Parts of the nervous system. The development and structure of the spinal cord and brain stem I.

**Seminar:** See practical.

**Practical:** a. Dissection of the brain: part one. Dissection of the brain: demonstration of the cerebral hemispheres and lateral ventricles. Flechsig's cut. Demonstration of the cerebral blood vessels and cisterns. Main steps in the dissection: removing of the membranes is followed by surface demonstration. At the right hemisphere a horizontal section is to be made at the level of corpus callosum. The position of the lateral ventricle can be felt on this side. First the central portion of the lateral ventricle, then its frontal and occipital horns are to be opened. After removing the operculum, the insula and the superior temporal gyrus become visible. Establish the position of the temporal horn with the aid of a probe then open the horn. On the left hemisphere the so-called Flechsig's section is made to explore the basal ganglia. Remove the trunk of the corpus callosum, cut and fold back the fornix. Demonstration of the tela choroidea of the 3<sup>rd</sup> ventricle. b. Dissection of the brain: part two. The third ventricle, diencephalon. Midsagittal section of the brain. Explore the brainstem by removing the remaining parts of the hemisphere. Demonstration of the midbrain. In order to explore the cerebellar nuclei, a section is made directed from the superior cerebellar peduncle to the ventral surface of the cerebellum. Cut out a wedge-shaped part of the cerebellum for the observation of the 4<sup>th</sup> ventricle. Make a schematic drawing of the floor of the 4<sup>th</sup> ventricle. Demonstration of the pons and the medulla. Histology: Nervous tissue 1. Peripheral nerve (HE stain) 2. Peripheral nerve (OsO<sub>4</sub> + H stain) 3. Spinal ganglion (HE stain) 4. Sympathetic ganglion (Bielschowsky's silver method) 5. Neuroglia: Astrocyte from cerebral cortex and medulla

(Cajal's gold method)

### 2<sup>nd</sup> week:

**Lecture:** The development and structure of the spinal cord and brain stem II. The fourth ventricle The development and structure of the diencephalon. The third ventricle. The development and structure of the telencephalon. The lateral ventricles. The structure of the cerebral cortex.

**Seminar:** See practical.

**Practical:** Anatomy: a. Dissection of the brain - part three. Gross anatomy of the brain stem and its structures. Cranial nerve nuclei. Attachment of cranial nerves to the brain. Structure of the brainstem - discussion. b. Dissection of the spinal cord. Opening of the vertebral canal on a separate torso. Gross anatomy of the spinal cord and its structure - discussion. Scalp. Meninges. Blood supply of the brain. Cerebrospinal fluid. Opening of the cranial cavity. Structure of the scalp and vault, meninges. Demonstration: blood supply of the brain. Discussion of the flow of the cerebrospinal fluid. Histology: Spinal cord 1. Spinal cord (HE stain) 2. Spinal cord (Bielschowsky's silver method) 3. Spinal cord (Golgi impregnation) 4. Only for demonstration: b. Frog spinal cord labelled with cobalt lysine 1. dorsal root filling 2. ventral root filling 3. intracellular labelling

### 3<sup>rd</sup> week:

**Lecture:** The structure of the cerebellum. The structure and pathways of the medulla oblongata. The structure and pathways of the pons and mesencephalon. The structure of the diencephalon. The thalamus.

**Seminar:** See practical.

**Practical:** Anatomy: a. Dissection of the brain - part four. Dissection on in situ brain. Follow the instructions given at the dissection of the excised brain. b. Dissection of the brain - part five. Preparation of the brainstem in situ. Cranial and dural exits of the cranial nerves. Histology: Structure of the cerebellar and cerebral cortex. 1. Cerebellum (HE stain) 2. Cerebellum (AgNO<sub>3</sub>)

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impregnation according to Bielschowsky) 3. Cerebellum (Golgi impregnation) 4. Cerebrum (Nissl stain) 5. Cerebrum (Golgi impregnation)

**4<sup>th</sup> week:**

**Lecture:** The anatomy and histology of the eye. The muscles of the eyeball, conjunctiva, eyelids, lacrimal apparatus. The oculomotor apparatus. The structure of the retina. The optic pathway. The gross anatomy of the middle ear and the inner ear.

**Seminar:** See practical.

**Practical:** Anatomy: a. Dissection of the brain - part six. Conclusion of brain dissections. Structures of the cranial base. Venous sinuses of the dura mater. Cranial exits of the cranial nerves. Review of cranial nerves (n. V) b. Dissection of the brain - part seven. Coronal sections of the brain. Review of cranial nerves (n. VII) Histology: Sense organs: part one 1. Eye (HE) 2. Eyelid (HE) 3. Lacrimal gland (HE)

**5<sup>th</sup> week:**

**Lecture:** The vestibular system. The auditory system. The development of the eye. The development of the vestibulocochlear system. The taste and olfactory systems.

**Seminar:** See practical.

**Practical:** Anatomy: a. Dissection of the brain - part eight. General review. Review of cranial nerves (n. IX, X, XI, XII) b. Dissection of the visual organs. Dissection of the eye and orbital structures. Review of the visual system and the control of eye movements Dissection of the middle and inner ear. Review of the vestibular and auditory systems Histology: Sense organs: part three. 1. Inner ear (HE)

**6<sup>th</sup> week:**

**Practical:** Anatomy: a. SELF CONTROL b. Histology: SELF CONTROL

**7<sup>th</sup> week:**

**Lecture:** Axonal transport, degeneration, regeneration. Signal transduction in the nervous system. Synaptic and non-synaptic neurotransmission. Interneuronal synapses. Ultrastructure and molecular architecture.

**Practical:** Anatomy: a. SELF CONTROL b. Histology: SELF CONTROL

**8<sup>th</sup> week:**

**Lecture:** Receptors. Primary afferents. Sensory functions of the spinal cord. The somatosensory and viscerosensory system.

**10<sup>th</sup> week:**

**Lecture:** Optics of the vision. Factors determining visual acuity. (P) Retinal mechanisms of the vision. (P) Central processing of the visual information. (P) Physiology of the auditory function. (P)

**11<sup>th</sup> week:**

**Lecture:** Signal generation in sensory organs. (B) Information storage. (B) Somatomotor functions of the spinal cord. The motor endplate. The motor unit. The spinal motor apparatus. (A) Reflex functions of the spinal cord and brain stem. Proprioceptive reflexes and nociceptive reflexes. (A)

**12<sup>th</sup> week:**

**Lecture:** The somatomotor system. The hierarchy of the motor system. The basal ganglia and the cerebellum as parts of the somatomotor system. (A) The visceromotor system. (A) Spinal control of skeletal muscle activity I. (P) Spinal control of skeletal muscle activity II. (P) Vestibular apparatus and movement coordination. (P) Roles of the brain stem and cerebellum in the coordination of movements. (P) Roles of the basal ganglia and cerebral cortex in the coordination of movements. (P) Physiology of taste and smell. (P)

**13<sup>th</sup> week:**

**Lecture:** Central vegetative regulation I. (P) Central vegetative regulation II. (P) EEG, sleep. (P) Learning, memory. (P) The monoaminergic system. (A) The limbic system. (A)

## Requirements

The neurobiology course is an integrated one, delivered as a joint effort of three departments (Departments of Anatomy, Histology and Embryology; Biochemistry; Physiology). The educational activities of the Neurobiology course include lectures, seminars and practices. Most of the regulations concerning these activities are specific to the individual departments and will be introduced by the respective educational officers. In the detailed program of the course (which, in fact, corresponds to the list of requirements) as well as here, both the compulsory and suggested textbooks are listed. Note, however, that the requirements of the course include material delivered in the lecture hall only, not necessarily available in the recommended textbooks, while in other cases some information in the suggested textbook is not regarded as part of the exam material. Attendance of the lectures, seminars and practices is compulsory, although one may have five absences from lectures, and four absences from seminars and practices in the following distribution: neuroanatomy and neurohistology: two absences; neurophysiology seminars and practices: two absences. If one collects six or more lecture absences (regardless of the reason of the absences) all the exam advantages are withdrawn without further notice. In the case of three or more absences from either the practices or seminars, the acceptance of the academic performance may be refused. Making up the missed seminars and practices may be possible (the individual departments determine the actual procedure). In case of the Department of Anatomy, Histology and Embryology, compensation of three missed practices is allowed with make-up classes (including anatomy and histology). During the term, three self-controls (SCs) are organised. If one meets the passing conditions (see below), the end of semester exam

may be substituted with the result achieved on the basis of these tests (i.e. exemption of the final exam). The maximum achievable score is 100 points in the following distribution: Neuroanatomy: 50 points, Neurobiochemistry 11 points, Neurophysiology 39 points. The first SC (week 6) is organised by the Department of Anatomy, Histology and Embryology. It has two parts: neurohistology practicum and neuroanatomy oral/practicum. All three departments participate, however, in the second (week 10) and third (week 14) self-controls (both of them are written tests). The first SC can be repeated once, on the 7th week. Either the 2nd or the 3rd SCs may also be repeated at the end of the semester (15th week), but not both. In this case, all subjects (neuroanatomy, neurophysiology and neurobiochemistry) of either the 2nd or the 3rd SCs have to be repeated and the previously achieved scores are lost. The points collected in the frame of the three SCs will be summed on a subject and departmental basis. If someone collects at least 60 % of the total number of points for all five subjects individually provided by the departments, she/he will be exempted of the end of semester exam (ESE). Please, note that in the case of the Department of Anatomy, Histology and Embryology, the 60 % limit is separately applicable for the neurohistology practicum, neuroanatomy oral/practicum and the cumulative written score achieved in the frame of the 2nd and 3rd SCs. If someone fails to reach the 60 % in the case of any of the subjects of a department then the student must take the examination on the appropriate subject(s) during the examination period (the actual dates will be determined later). If someone reaches the 60 % limit of all departmental scores (i.e. all subjects), the ESE result can be calculated the following way: Total number of points score 0 – 59 points; fail 60 – 69 points pass; 70 – 79 points satisfactory; 80 – 89 points good; 90 – 100 points excellent. If someone wishes to improve the result of her/his ESE, it can be done on any of the exam days (registration is required). Please note, that in this case all previous exam results are lost.

Details of the self-controls on a departmental basis: Anatomy (neuroanatomy, neurohistology): The total number of points available in the frame of the first SC: Neurohistology practicum: 10 points, Neuroanatomy oral/practicum: 20 points.

If the score of the first SC is less than 60 % (regarding either part of the SC) it can be repeated on the following week. Additional 20 points can be collected in the frames of the 2nd and 3rd SCs. The preconditions of the exam exemption: at least 6 points on histology practicum; at least 12 points on neuroanatomy oral/practicum and at least 12 points on the written tests. Biochemistry (neurobiochemistry): Altogether 11 points can be collected in the frames of the 2nd and 3rd SCs. One must have at least 6.6 points for the exemption. Physiology (neurophysiology): Altogether 39 points can be collected in the frames of the 2nd and 3rd SCs. One must have at least 23.4 points for the exemption. Four extra points can be collected from neurophysiology practicals during the 14th academic week in the frame of a practical examination (held together with the physiology closing lab). In case of a failer on the practical examination there is no possibility for improvement. Nevertheless, the maximum achievable neurophysiology score is 39 points, and the extra 4 points are valid exclusively in the current academic year (Student repeating Neurobiology can also sign up for the end of semester neurophysiology closing lab).

## Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY II.**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **45**

Seminar: **15**

Practical: **30**

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

**Lecture:** Levels of eucariotic gene expression. The active chromatin. Regulation of transcription. Regulation at the mRNA level. Translational regulation. Posttranslational events. Gene therapy.

**Practical:** Introduction to the practicals.

### 2<sup>nd</sup> week:

**Lecture:** Term and levels of regulation. Significance and interrelationship between metabolic, cytokine, hormonal and neuronal regulation. Forms of external signals. Receptors and transducers. Systems increasing the sensitivity of regulation: allosteria, substrate cycle, interconversion cycle, cascades. Signalling pathways of nonpenetrating signals. Ionchannel receptors. Seven transmembrane domain receptors G proteins and GTP-

ases. The adenylate cyclase and the phospholipase C signalling pathway. G proteins and GTP-ases. The adenylate cyclase and the phospholipase C signalling pathway. Control of enzyme activity.

**Practical:** Study on blood clotting

### 3<sup>rd</sup> week:

**Lecture:** Other phospholipases. cGMP phosphodiesterase system. Signalling via one-hydrophobic domain proteins: the cGMP system. Coupling of tyrosin kinase receptors to the signalling pathways, raf, MAP kinases. Metabolic effects of insuline.

**Practical:** Study on blood clotting

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**4<sup>th</sup> week:**

**Lecture:** Signals acting via cytoplasmatic targets : the NO system. Coupling of signalling pathways to the regulation of genes and to the actin filament movement. Nuclear receptors. Signal crosstalks.

**Practical:** Study on blood clotting

**5<sup>th</sup> week:**

**Lecture:** Biochemistry of cell proliferation. Mitotic cascade. M-phase kinase. Products and biochemical function of protooncogenes. Mechanism of oncogene formation.

**Practical:** Fractionation and quantitative determination of plasma proteins.

**6<sup>th</sup> week:**

**Lecture:** Tumor suppressor genes and their biochemical function. Biochemical features of terminal differentiation. Biochemistry of programmed cell death.

**Practical:** Fractionation and quantitative determination of plasma proteins.

**7<sup>th</sup> week:**

**Lecture:** Stress proteins and enzymes in eukariotic cells. Heat shock proteins and their functions under normal circumstances. Hsp 70 and hsp 60 protein families. Role of chaperones and chaperonins. Thermotolerance of the cell. Hsp 90 protein family and their role in the cells. Transcriptional regulation of heat shock genes. Stress signals.

**Practical:** Fractionation and quantitative determination of plasma proteins.

**8<sup>th</sup> week:**

**Lecture:** Biochemistry of the liver. Biotransformation. Biochemical consequences of ethanol consumption.

**Practical:** Study on neurotransmitters

**9<sup>th</sup> week:**

**Lecture:** Biochemistry of the blood. Metabolism of red blood cells. Genetic diseases leading to haemolysis. Hemoglobin; structure, function and regulation. Pathological forms of hemoglobin. Specific biochemical reactions of leukocytes. Leukocytes and inflammation. Serum proteins.

**Practical:** Study on neurotransmitters

**10<sup>th</sup> week:**

**Lecture:** Uroporphynoids, hem-proteins. Synthesis of hem, regulation of the synthesis in eukariotic cells.

Degradation of hem: formation, conjugation and excretion of bile pigments. Hem oxygenase. Disorders in hem metabolism. Iron transport, storage and distribution in the human body. Molecular regulation of the iron level in cells: stability of transferrin receptor and ferritin mRNA, IRE binding protein. Risk of the free iron and intracellular hemolysis.

**Practical:** Study on neurotransmitters

**11<sup>th</sup> week:**

**Lecture:** Cellular, humoral and vascular aspects of blood clotting. Structure, activation, adhesion and aggregation of thrombocytes. Classification of blood clotting factors and their role. Factors depending on vitamin K.

**Practical:** Evaluation of the results of practicals. Control test. Visit of the department.

**12<sup>th</sup> week:**

**Lecture:** Contact phase of blood coagulation. Blood clotting in the test tube and in the body. Classification of blood coagulation. Role of thrombocytes and the vascular endothel. Limiting factors , inhibitors and activators of blood coagulation. Fibrinolysis.

**13<sup>th</sup> week:**

**Lecture:** Biochemistry of the extracellular matrix: function and components. Glucosaminoglycans and proteoglycans. Collagens: structure, function and genetic origin. Synthesis of type I. collagen. Macromolecular organization of collagen monomers. Disorders in the synthesis of collagen. Collagenases. Structure and function of elastin. Elastase. Structure and functional domains of fibronectins. Plasma and tissue fibronectins, genetic background: alternative splicing. Receptors of fibronectins: integrins and other type of receptors. Role of fibronectins. Other adhesion proteins (laminin, entactin, thrombospondin, von Willebrand factor, tenascin, etc).

**14<sup>th</sup> week:**

**Lecture:** Biochemistry of the sport. Biochemistry of the cytoskeleton. Proteins of myofibrils. Molecular mechanism for the generation of force. Metabolic fuel of muscle. Metabolism of muscle in various work load. Effect of exercise. Special metabolism of the skin.

**15<sup>th</sup> week:**

**Lecture:** Adaptation, health, disease.

## Requirements

**Requirements for signing the subject:** participation in each practical, in the seminars and in the obligatory lectures. Only one absence is accepted from the obligatory lectures; in case of more absences the subject will not be signed.

**Content of Biochemistry II.:** topics of cell- and organ biochemistry presented at the lectures (available at the <http://bmbi.med.unideb.hu> web site, username:student, password:student2011) and discussed on the seminars.

On the seminars the lectures of the previous week can be discussed. New scientific information, connected to the lectures will also be presented on the seminars; this material will be asked on the exams, too. In case of the seminars maximum three absences are accepted.



Every practical must be performed, if someone is absent because of any serious reason, the missing experiment have to be performed within the three weeks practical period joining to another group (after previous discussion with the laboratory teachers). In case of more than one remedial practical, students can not get any points for that practical. Practicals are not obligatory for repeaters.

Achievement during the semester will be evaluated in term of points. During the semester 100 + 6 points can be collected for the laboratory test (10 points), note book (3 x 5 points) and by the control tests from the material of the lectures (75 points). Control tests consist of single- and multiple choice test questions. Bonus points earned by scientific essay will be added to the total points collected during the semester (half of these bonus points can be added to the result of the written exam.)

**Bonus points:** Those students who reach 70 points in this semester, will get 5 bonus points, those who reach 80 points will get 8 bonus points that will be added to the results of the written part of the exam. Further bonus points can be collected with good results on the biochemistry competition.

Bonus points can be earned also by writing scientific essay. This essay (which is not obligatory) should be a summary of scientific papers, based on the newest scientific information connected to the material of the lectures (3-6 pages). Only those articles can be used which were published between 1st September 2012 – 28th February 2013! If the quality of the essay reaches the appropriate level, max. 6 bonus points can be earned (students can get help and advices from the practical teachers). Essays must be given to the practical teachers on the last manual practical. The final deadline: Wednesday on the 10th week.

Those students, who reach at least 220 points during the three semesters (Molecular Biology, Biochemistry I., II.), will be exempted from the written part of the final exam (for this exemption at least 60 points must be collected separately in each semester).

**Final exam.** The final exam consists of a written and oral part for everyone. On the written exam 50 points can be collected, it consists of 25 single- and multiple choice test questions (25x1 points), 5 essay questions (5x5 points: four from the theoretical part: 1 molecular biology, 1 metabolism, 2 cell- and organ biochemistry and one from the practicals of the three semesters).

Oral exam can be taken only if the student collects at least 60 % (30 points) in the written part. The successful result of the written part is valid for the “B” and “C” exams. In case of unsuccessful written “C” exam, students will get oral questions, too.

The oral part of the examination starts with one basic question of medical orientation, which should be answered immediately. The list of these questions will be given to students at the beginning of the second semester together with the exam titles of the final exam. After properly answering the medical question, students will have three theoretical questions (from metabolism, from cell- and from organ biochemistry).

Students must register for the exams on the NEPTUN until the end of the 15th week.

Please follow the announcements of the department for reviewing the results of the self-control examination tests. The results will be announced anonymously on the institute web site and on the announcement table of the department (LSB downstairs, 1st corridor).

## Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE II/2.**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** Revision.

**2<sup>nd</sup> week:**

**Practical:** Felszólító mód. (Imperative) (Ch. 14.)

**3<sup>rd</sup> week:**

**Practical:** Members of a family. (Ch 15.)

**4<sup>th</sup> week:**

**Practical:** Comparative of adjectives. (Ch. 15.)

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**5<sup>th</sup> week:**
**Practical:** Possession. (Ch. 16.)

**6<sup>th</sup> week:**
**Practical:** "To have" (Ch. 16.)

**7<sup>th</sup> week:**
**Practical:** Revision. Practice. Mid-term test.

**8<sup>th</sup> week:**
**Practical:** Basic complaints. Body parts (Ch. 17.)

**9<sup>th</sup> week:**
**Practical:** Types of drugs. (Ch. 18.)

**10<sup>th</sup> week:**
**Practical:** Instructions to the patient. Definite/indefinite article. (Ch. 18.)

**11<sup>th</sup> week:**
**Practical:** Giving advice. Healthy lifestyle. (Ch. 19.)

**12<sup>th</sup> week:**
**Practical:** Describing diseases. Expressions of probability, possibility etc. (Ch. 20.)

**13<sup>th</sup> week:**
**Practical:** Describing diseases 2. (Ch. 20.)

**14<sup>th</sup> week:**
**Practical:** Revision. Mid-term test.

**15<sup>th</sup> week:**
**Practical:** Oral minimal exam. Evaluation.

## Requirements

### Requirements of the language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each Hungarian language course, students have to sit for 2 written language tests and a short minimal requirement oral exam.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. There is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class, every week. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect at least 6 points at to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score. Based on the final score the tests are graded according to the following table:

Final score	Grade
0 – 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60, the student once can take an oral remedial exam covering the material of the whole semester.

#### Consultation classes

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes

are optional for the students.

**Coursebook:** Halász, Renáta: Hogy van?

**Website:** Oral exam topics and vocabulary minimal lists are available from the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Physiology

Subject: **MEDICAL PHYSIOLOGY II.**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **36**

Seminar: **18**

Practical: **27**

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

**Lecture:** 1. Preparation for laboratory practices. 2. Principles in renal physiology 3. Quantitative description 4. Glomerular filtration

### 2<sup>nd</sup> week:

**Lecture:** 5. Regulation of GFR 6. Tubular transport I. 7. Tubular transport II. 8. Urinary concentration & dilution

### 3<sup>rd</sup> week:

**Lecture:** 9. Water-balance, osmoregulation 10. Control of body fluid volume 11. Acid-base balance 12. Acid-base disturbances, K-homeostasis 13. Ca-homeostasis, physiology of bone 14. Micturition, diuretics, clinical correlates

### 8<sup>th</sup> week:

**Lecture:** 15. General principles of endocrinology 16. Mechanisms of hormone action 17. Hypophysis 18. Growth hormone

### 9<sup>th</sup> week:

**Lecture:** 19. Glucocorticoids I. 20. Glucocorticoids II. 21.

The thyroid gland I. 22. The thyroid gland II. 23. The hormones of adrenal medulla 24. The actions of catecholamines

### 10<sup>th</sup> week:

**Lecture:** 25. The hormones of pancreatic islets I 26. The hormones of pancreatic islets II

### 11<sup>th</sup> week:

**Lecture:** 27. Regulation of the function of pancreatic islets 28. Endocrine regulation of metabolism 29. Stem cells and cardiac muscle 30. Hormones of the skin

### 14<sup>th</sup> week:

**Lecture:** 31. General principles in the regulation of gonadal functions 32. Male gonadal functions 33. Female gonadal functions 34. Pregnancy, lactation 35. Physiology of the auditory function 36. Neural mechanism subserving audition

## Requirements

### 1. Signature of Lecture Book

Attendance of lectures, laboratory practices and seminars is compulsory. The signature of the Lecture Book may be refused for the semester in case of more than four absences from the seminars and/or more than two absences from the laboratory practices. In cases of more than four lecture absences special advantages are withdrawn (see below). All missed laboratory practices must be made up, whereas the completion of a missed seminar with a different group is not possible. Completion of all topic sheets in the Exercise Book, each verified by the signature of the teacher, is also a precondition of the signature of the Lecture Book.

Each student must attend seminars and practices with the group specified by the Education Office. For continuous updates on all education-related matters, please check the departmental web-site (<http://phys.dote.hu>)

### 2. Evaluation during the semester

The knowledge of students will be tested 2 times during the 2nd semester in the form of a written test (multiple choice questions). Participation on mid-semester written tests is compulsory and the results of all mid-semester tests will be presented to the examiner during the final exam. During this semester there will be no remedial test. We do not provide

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any possibilities to improve or make-up for missed tests.

Laboratory practical knowledge of the students will be tested at the end of the semester as part of the Closing Lab, evaluation with two level marks (accepted or not accepted). As a precondition of attending the Closing Lab, the fully completed Exercise Book (with all the verified topics) must be presented during the Closing Lab. Students are expected to perform the given experiment on their own and must be familiar with theoretical background also. In case of a negative result, the Closing Lab can be repeated, but only once. If the final evaluation of the Closing lab is "not accepted", then the student will be given laboratory practical questions in the written part of the final exam and the student will lose the advantages which are detailed below.

### 3. Examination

The second semester is closed by the final exam (FE), which is composed of a written test plus an oral section, covering the topics of all lectures, seminars and laboratory practices of the full academic year. The result of the exam is failed if the student fails either on the written part or on the oral part. The list of exam questions is available on the departmental website (<http://phys.dote.hu>).

If the final evaluation of the Closing lab is "not accepted", then the student will be given laboratory practical questions in the written part of the final exam. The laboratory practical questions cover the material of both semesters and the student will lose the advantages what are detailed below.

Depending on the average result of the five self-controls of 2012/2013 academic year, the following special advantages are granted:

The average score of the five mid term tests (three in the first term and two in the second semester) is calculated. (If one took the end-semester examination, the calculation of his/her average is detailed below.)

- a). If the average score is 80% or higher, there is no need to take the written part of the final exam, and only the oral examination will be performed.
- b). If the average score is between 70% and 80%, 10 bonus points will be added to the result of the written part of the final examination.
- c). If the average score is between 60% and 70%, 5 bonus points will be awarded.

-If the final evaluation of the Closing lab is "not accepted" or the Department of Physiology refuses to sign the lecture book or in case of more than four lecture absences these special advantages are withdrawn!

- If the result of the written examination together with the bonus points does not reach the 60% limit, the examination attempt will be regarded as a failed exam, without giving the chance to perform the oral part.

If one took the end-semester examination during the 2012/2013 academic year, the mark of the oral exam is converted into percentage scores in the following way (each 1st term self-control will be replaced with these percentage scores):

- If the end-semester examination was taken in order to improve on an otherwise valid grade, the conversion is: 2: 69%; 3: 79%; 4: 89%, and 5: 100%.
- If the examination was attempted because no score could be offered (i.e. one had to take the exam): 2: 65%; 3: 75%; 4: 85%; 5: 95%.

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## CHAPTER 11

### ACADEMIC PROGRAM FOR THE 3RD YEAR

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#### Department of Foreign Languages

Subject: **MEDICAL HUNGARIAN I.**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** Személyi adatok.

**2<sup>nd</sup> week:**

**Practical:** Családi anamnézis.

**3<sup>rd</sup> week:**

**Practical:** Gyermekkori betegségek, súlyosabb betegségek.

**4<sup>th</sup> week:**

**Practical:** Szokások (dohányzás, alkohol, kávé).

**5<sup>th</sup> week:**

**Practical:** Fájdalom (helye, jellege, időtartama).

**6<sup>th</sup> week:**

**Practical:** Egyéb tünetek (1).

**7<sup>th</sup> week:**

**Practical:** Egyéb tünetek (2).

**8<sup>th</sup> week:**

**Practical:** Mid-course exam.

**9<sup>th</sup> week:**

**Practical:** Gyógyszerek (adagolás, hatás, mellékhatás).

**10<sup>th</sup> week:**

**Practical:** Utasítások a betegeknek.

**11<sup>th</sup> week:**

**Practical:** Szimulációs párbeszéd.

**12<sup>th</sup> week:**

**Practical:** Szívritmuszavar.

**13<sup>th</sup> week:**

**Practical:** Szívelégtelenség.

**14<sup>th</sup> week:**

**Practical:** Angina pectoris.

**15<sup>th</sup> week:**

**Practical:** End-course exam.

### Requirements

**Attendance**

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

Students are not allowed to take Medical Hungarian course before entering 3rd year.

Students in the 4th, 5th, or 6th year have to pay an additional tuition fee of 500 USD per semester for taking mandatory Hungarian language courses. These students are organized into a separate group from the 3rd year students.

**Testing, evaluation**

In Medical Hungarian course, students have to sit for a mid-term and an end-term written language tests and 2 short minimal requirement oral exams.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. Every week there is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect 6 points at least to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a

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vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score.

Based on the final score the tests are graded according to the following table:

<b>Final score</b>	<b>Grade</b>
0 - 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60 the student once can take an oral remedial exam covering the material of the whole semester.

### Consultation classes

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** Lampé, Judit, Ph.D.: Jobbulást kívánok

**Website:** Vocabulary minimal lists and further details are available on the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Immunology

Subject: **IMMUNOLOGY**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **40**

Seminar: **8**

Practical: **12**

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

**Lecture:** 1. Introduction, immunology and other disciplines 2. Design principles of the immune system 3. Mechanisms of innate immune recognition 4. Effector mechanisms of innate immunity

**Seminar:** Cells and molecules involved in immune mechanisms.

### 2<sup>nd</sup> week:

**Lecture:** 5. Characteristics of acquired immunity, clonal selection theory 6. Organization of the lymphoid organs and tissues 7. Tissue stem cells 8. Circulation of the lymph, antigen recognition sites in the immune system

**Seminar:** Characteristics of antigens and pathogens, inflammation and acute-phase response.

### 3<sup>rd</sup> week:

**Lecture:** 9. Genetic background of the variability of antigen recognizing receptors 10. Antigen-independent development of B-lymphocytes 11. Antigen-dependent development of B-lymphocytes 12. Molecular basis of antigen recognition by B-cells and antibodies

**Seminar:** Characteristics and effector functions of antibodies, application of antibodies for immunological techniques.

### 4<sup>th</sup> week:

**Lecture:** 13. Activation of B-lymphocytes, development and function of antibody isotypes 14. Structure of proteins encoded by the major histocompatibility gene complex (MHC) 15. Genetics of MHC molecules 16. Functions of MHC molecules

**Seminar:** Functions of the complement system, methods

based on secondary interactions following antigen-antibody binding.

**5<sup>th</sup> week:**

**Lecture:** 17. Molecular basis of antigen recognition by T-cells 18. Antigen processing and presentation 19. Requirements and consequences of T-lymphocyte activation 20. Effector functions of T-lymphocytes  
**Practical:** Precipitation, agglutination and complement activation.

**6<sup>th</sup> week:**

**Lecture:** 21. Regulatory T-lymphocytes 22. Development of T-lymphocytes 23. Generation of central tolerance 24. Mechanisms of peripheral immunological tolerance  
**Seminar:** Methods based on primary interaction of antigen with antibody.

**7<sup>th</sup> week:**

**Lecture:** 25. Generation of immunological memory 26. Regulation of the immune responses 27. Infectious diseases 28. Immune responses to extracellular pathogens  
**Practical:** Immunosorbent assay, ELISA, flow cytometry, immunoblot, immunohisto-chemistry, fluorescence microscopy.

**8<sup>th</sup> week:**

**Lecture:** 29. Immune responses to intracellular pathogens 30. Inherited immune deficiencies I (B cell deficiencies)

31. Inherited immune deficiencies II (T cell deficiencies) 32. Mechanisms of allergic reactions  
**Practical:** Characterization of immune competent cells by cell surface markers, isolation and separation of immune competent cells.

**9<sup>th</sup> week:**

**Lecture:** 33. Hypersensitivity reactions I 34. Hypersensitivity reactions II 35. Mechanisms involved in the development of autoimmune diseases 36. Characteristics of some autoimmune diseases  
**Practical:** Functional study of immune competent cells, blastic transformation (activation with LPS or ConA), polyclonal B- and T-lymphocyte activation, HLA typing, ELISPOT assay.

**10<sup>th</sup> week:**

**Lecture:** 37. Tumor immunology, tumor antigens and immune responses against tumors 38. Tumor escape mechanisms, immune therapy against tumors 39. Immune reactions following tissue and organ transplantation 40. The immunological aspects of bone marrow transplantation  
**Practical:** Activation of T-lymphocytes, detection of cytokines (measurement of IL-2 production), mast cell degranulation, passive cutaneous anaphylaxis

## Requirements

Participation in 30% of the lectures is obligatory. The obligatory lectures will be marked during week 1. Participation in the Seminars and the Practical Courses is obligatory.

The Department shall refuse to sign the students' Lecture book if they are absent from more than two practices or seminars in a semester. Students can make up for a missed seminar or practice with another group only within the same week. The 1st oral exam exemption test is held during week 8 and includes the topics of Basic Immunology and Seminars (1-4 weeks). The date of the 2nd oral exam exemption test is on week 11 and includes the topics of Immune Pathology and of Practical Courses. Zero score of any of the oral exam exemption tests due to absence or to low performance would not be accepted and the final grade would not be offered. A final grade will be offered based on the average results of the two oral exam exemption tests which are accepted over 51%. If the average of scores of the two oral exam exemption tests does not reach 51% of the total score an exam will have to be taken during the exam period. This exam consists of a written entry test and an oral exam. If a student has an average result over 51%, but she/he does not accept the offered grade, she/he can take an oral exam during the exam period. In the oral exam the final grade can be better or worse than the offered grade.

## Department of Internal Medicine

Subject: **PROPEDEUTICS OF INTERNAL MEDICINE**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **30**

**1<sup>st</sup> week:**

**Lecture:** Introduction to clinical medicine. History taking, physical examination I.

**Practical:** The right behaviour of a physician. Physician-

patient relationship, how to approach a patient. Physician - medical staff relationship. The physicians ethical, clinical, human and legal accountability towards the patient. History taking (family and patient's). General symptoms

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and the compulsory questions

**2<sup>nd</sup> week:**

**Lecture:** History taking, physical examination II. Diagnosis of the diseases of respiratory system.

**Practical:** The right behaviour of a physician. Physician-patient relationship, how to approach a patient. Physician - medical staff relationship. The physicians ethical, clinical, human and legal accountability towards the patient. History taking (family and patient's). General symptoms and the compulsory questions.

**3<sup>rd</sup> week:**

**Lecture:** Physical examination of the thorax I. Physical examination of the thorax II.

**Practical:** Inspection, palpation, percussion, auscultation: physical examination. Stature, nourishment, skin, hair. Parenchymal organs: borders, consistency. Normal physical findings. Auscultation of lungs and heart. Blood pressure.

**4<sup>th</sup> week:**

**Lecture:** Examination of the cardiovascular system I. Examination of the cardiovascular system II.

**Practical:** Inspection, palpation, percussion, auscultation: physical examination. Stature, nourishment, skin, hair. Parenchymal organs: borders, consistency. Normal physical findings. Auscultation of lungs and heart. Blood pressure.

**5<sup>th</sup> week:**

**Lecture:** Examination of the cardiovascular system III. Central and peripheral insufficiency of circulation.

**Practical:** Thorax and respiratory system: inspection, palpitation, percussion, auscultation. Thorax deformities and variations. Pectoral fremitus. Bronchophony. Percussion of the lungs. Auscultation: bronchial, bronchovesicular, vesicular, tubular respiration. Rales (crepitant, sonorous, clicking, coarse, fine, subcrepitant, medium, bubbling, moist, dry). Pulmonary syndromes (infiltration, atelectasias, pleural effusion, pleuritis, pneumonia). Transsudates and exsudates, differences.

**6<sup>th</sup> week:**

**Lecture:** Physical examination of the abdomen. Examination of the kidney and urinary tract.

**Practical:** Thorax and respiratory system: inspection, palpitation, percussion, auscultation. Thorax deformities and variations. Pectoral fremitus. Bronchophony. Percussion of the lungs. Auscultation: bronchial, bronchovesicular, vesicular, tubular respiration. Rales (crepitant, sonorous, clicking, coarse, fine, subcrepitant, medium, bubbling, moist, dry). Pulmonary syndromes (infiltration, atelectasias, pleural effusion, pleuritis, pneumonia). Transsudates and exsudates, differences.

**7<sup>th</sup> week:**

**Lecture:** Kidney failure, glomerulopathic syndromes. Gastrointestinal syndromes I.

**Practical:** Physical examination of the heart (inspection,

palpation, percussion, auscultation). Percussion of cardiac dullness. Normal heart sounds and murmurs. The six qualities of the peripheral pulse. Clinical signs of cardiac failure (left and right ventricular failure).

**8<sup>th</sup> week:**

**Lecture:** Gastrointestinal syndromes II. Gastrointestinal syndromes III.

**Practical:** Physical examination of the heart (inspection, palpation, percussion, auscultation). Percussion of cardiac dullness. Normal heart sounds and murmurs. The six qualities of the peripheral pulse. Clinical signs of cardiac failure (left and right ventricular failure).

**9<sup>th</sup> week:**

**Lecture:** Examination of the liver, biliary tract and pancreas I. Examination of the liver, biliary tract and pancreas II.

**Practical:** Abdominal examination (inspection, palpation, percussion, topography). Resistances, enlargement of the liver and spleen, ascites. Differential diagnosis of abdominal pain. The importance of stool.

**10<sup>th</sup> week:**

**Lecture:** Physical examination of peripheral vessels. Bleeding disorders. History taking, diagnostics.

**Practical:** Abdominal examination (inspection, palpation, percussion, topography). Resistances, enlargement of the liver and spleen, ascites. Differential diagnosis of abdominal pain. The importance of stool.

**11<sup>th</sup> week:**

**Lecture:** Thromboembolism. History taking, diagnosis. Haematological disorders: history taking and diagnosis I.

**Practical:** Examination of locomotor and nerve system. Practicing skills, repetition.

**12<sup>th</sup> week:**

**Lecture:** Haematological disorders: history taking and diagnosis II. Diagnosis of rare diseases.

**Practical:** Case histories (2-3 students/case), file preparation with special focus of learned skills.

**13<sup>th</sup> week:**

**Lecture:** Diagnosis of metabolic disorders I. Emergency medicine.

**Practical:** Case histories (2-3 students/case), file preparation with special focus of learned skills.

**14<sup>th</sup> week:**

**Lecture:** Examination of the locomotor system. Examination of the neuroendocrin system.

**Practical:** Case histories (2-3 students/case), file preparation with special focus of learned skills.

**15<sup>th</sup> week:**

**Lecture:** Examination of the neurological system. Psychiatric examination of the patients.

**Practical:** practical exam (own patient's file, questions/answers).



## Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY I.**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **15**

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

**Lecture:** 1. Introduction: pathobiochemistry, clinical biochemistry, laboratory diagnostics. 2. Different levels of laboratory diagnostics (reference values, requesting test, interpretation of result).

### 2<sup>nd</sup> week:

**Lecture:** 3. Pathobiochemistry and laboratory signs of cell damage. 4. Pathobiochemistry of inflammation

### 3<sup>rd</sup> week:

**Lecture:** 5. Clinical biochemistry of tumor metastasis 6. Pathobiochemical alterations in association with tumor growth and metastasis formation and their laboratory detection I.

### 4<sup>th</sup> week:

**Lecture:** 7. Pathobiochemical alterations in association with tumor growth and metastasis formation and their laboratory detection II. 8. Tumormarkers in the diagnosis of malignant diseases

### 5<sup>th</sup> week:

**Lecture:** 9. Inherited metabolic diseases and their laboratory diagnostics I. 10. Inherited metabolic diseases and their laboratory diagnostics II.

### 6<sup>th</sup> week:

**Lecture:** 11. Inherited metabolic diseases and their laboratory diagnostics III. 12. Pathobiochemistry of plasma proteins

### 7<sup>th</sup> week:

**Lecture:** 13. Disorders of iron metabolism. Laboratory diagnostics of microcytic anemias. 14. Laboratory diagnostics of hemoglobinopathies

### 8<sup>th</sup> week:

**Lecture:** 15. Laboratory diagnostics of macrocytic and hemolytic anemias 16. Laboratory diagnostics of quantitative platelet disorders.

### 9<sup>th</sup> week:

**Lecture:** 17. Laboratory diagnostics of acute and chronic leukemias and lymphomas I. 18. Laboratory diagnostics of acute and chronic leukemias and lymphomas II.

**Practical:** Notes on Laboratory Safety. Molecular genetic methods in clinical biochemistry.

**Self Control Test**

### 10<sup>th</sup> week:

**Lecture:** 19. Laboratory diagnostics of acute and chronic leukemias and lymphomas III. 20. History of blood transfusion, blood group serology

**Practical:** Hematology I. Blood sampling, anticoagulation. Preparation of blood smears, staining.

### 11<sup>th</sup> week:

**Lecture:** 21. Biochemistry, inheritance and antigens of ABO blood group system and its clinical significance 22. Biochemistry, inheritance and antigens of Rh blood group system and its clinical significance

**Practical:** Hematology II. Morphology of red blood cells in different disorders and reticulocyte counting.

### 12<sup>th</sup> week:

**Lecture:** 23. Other blood group system (Kell, Kidd, Duffy, MN, Ss, Ii) 24. Laboratory diagnostics of central nervous system diseases. Laboratory investigation of the cerebrospinal fluid

**Practical:** Hematology III. Manual cell counting in Bürker's chamber. Hematology analyzers.

### 13<sup>th</sup> week:

**Lecture:** 25. Clinical biochemistry and laboratory diagnostics of porphyrias 26. Clinical biochemistry at the extremes of ages 19. Laboratory diagnostics of acute and chronic leukemias and lymphomas III.

**Practical:** Hematology IV. Investigation of peripheral blood smears in hematological malignancies. Myeloma multiplex.

### 14<sup>th</sup> week:

**Lecture:** 27. Therapeutic drug monitoring I. 28. Therapeutic drug monitoring II.

**Practical:** Transfusiology, ABO and Rh blood group determination.

### 15<sup>th</sup> week:

**Lecture:** 29. Pharmacogenetics 30. Disorders of vitamin metabolism

**Practical:** Detection of irregular antibodies. Antibody screening and compatibility testing.

**Self Control Test**

## Requirements

Participation at practicals: Attendance of practicals is obligatory. Altogether one absence in the first semester and two absences in the second semester are permitted. In case of further absences, the practicals should be made up for by attending the practicals with another group in the same week, or a medical certificate needs to be presented. Please note that strictly only a maximum of 3 students are allowed to join another group to make up for an absence.

Requirements for signing the Lecture book: The Department may refuse to sign the Lecture book if the student is absent from practicals more than allowed in a semester.

Assessment: The whole year 5 written examinations are held, based on the material taught in the lectures and practicals. At the end of the first semester the written examinations are summarized and assessed by a five grade evaluation. If the student failed - based on the results of written exams - he must sit for an oral examination during the examination period. At the end of the year the written examinations are summarized and assessed. The student is exempt from written minimum entry test if her/his evaluation based on the 1st and 2nd semester points average is equal to or above 70% of the whole year total points. The final exam at the end of the second semester consists of two parts: a written minimum entry test and an oral exam. Those who fail the minimum entry test, are not allowed to take the oral exam and they have to repeat the minimum entry test part as well. Those who fail the oral exam only, do not have to take the written test on the B or C chance. There is no written entry test on C chance.

Requirements for examinations: The examination (written and oral) is based on the whole lecture and practical material (Practicals in Laboratory Medicine, eds.: János Kappelmayer and László Muszbek 2010.) as well as the textbook of Marshall and S.K. Bangert: Clinical Chemistry (6th edition, 2008.). Suggested reading : Hoffbrand A.V., Pettit J.E.: Essential Haematology, 3rd edition, 1999.

## Department of Medical Microbiology

Subject: **MEDICAL MICROBIOLOGY I.**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **30**

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

**Lecture:** 1. The microbial world. The major groups of bacteria

2. Prokaryotic cell structure

**Practical:** Visualizing bacteria. Examination of unstained and stained specimens

### 2<sup>nd</sup> week:

**Lecture:** 3. The physiology of bacteria

4. Bacterial genetics

**Practical:** Rules for collecting clinical specimens. Culture techniques. Anaerobic culture

### 3<sup>rd</sup> week:

**Lecture:** 5. Sterilization and disinfection

6. Principles of antimicrobial chemotherapy

**Practical:** Biochemical activities of bacteria

### 4<sup>th</sup> week:

**Lecture:** 7. Antimicrobial drugs for systemic administration

8. Bacterial pathogenesis I

**Practical:** Sterilization and disinfection

### 5<sup>th</sup> week:

**Lecture:** 9. Bacterial pathogenesis II

10. Antibacterial immunity. Hypersensitivity

**Practical:** Determining the sensitivity of bacteria to antibiotics

### 6<sup>th</sup> week:

**Lecture:** 11. Active and passive immunization

12. The Staphylococci

**Practical:** Serological reactions

### 7<sup>th</sup> week:

**Lecture:** 13. The Streptococci

14. Mycobacterium genus

**Practical:** 1<sup>st</sup> WRITTEN EXAMINATION (General Bacteriology)

### 8<sup>th</sup> week:

**Lecture:** 15. Causative agents of respiratory tract infections

16. Enterobacteriaceae I

**Practical:** Overview of human pathogenic bacteria

### 9<sup>th</sup> week:

**Lecture:** 17. Enterobacteriaceae II

18. Vibrio, Campylobacter, Helicobacter

**Practical:** Wound, skin and soft tissue infections caused by bacteria

### 10<sup>th</sup> week:

**Lecture:** 19. Pseudomonas and other non-fermentative Gram negative bacilli

20. Neisseria, Legionella, Brucella

**Practical:** Bacterial respiratory tract diseases

**11<sup>th</sup> week:**

**Lecture:** 21. The Clostridia  
22. Non-Clostridial anaerobic infections  
**Practical:** Agents of bacterial intestinal infections and food poisoning

**12<sup>th</sup> week:**

**Lecture:** 23. Treponema  
24. Borrelia, Leptospira  
**Practical:** 2<sup>nd</sup> WRITTEN EXAMINATION (Bacteriology with the exception of Spirochaetaceae, Chlamydiae, Rickettsiae and Mycoplasmas)

**13<sup>th</sup> week:**

**Lecture:** 25. Chlamydia and Mycoplasma  
26. Rickettsiae

**Practical:** Urinary tract infections. Bacterial sexually transmitted diseases (STD)

**14<sup>th</sup> week:**

**Lecture:** 27. Mycology I  
28. Mycology II  
**Practical:** Central nervous system diseases caused by bacteria

**15<sup>th</sup> week:**

**Lecture:** 29. Normal microbial flora of the human body.  
Nosocomial infections  
30. Consultation  
**Practical:** Consultation

## Requirements

The student is required to attend the practices. The Department may refuse to sign the students' Lecture book if they are absent from more than two practices in a semester. Missed practice may be made up in the practice with another group only in the same week. During the 1st semester, two mid-semester tests are written. Students are offered an ESE grade based on the cumulative score of the two mid-semester tests. Those who are below the passing level or who are not satisfied with the offered grade, must sit for an oral end of semester examination (ESE) (A-chance) during the examination period. In the 2nd semester two additional tests are to be written by the student. At the end of the 2nd semester the student is required to take the final examination (FE), based on the whole material taught in Medical Microbiology. The student's performance will be assessed on a five-grade scale. The FE consists of a written entry test and an oral examination, consisting of three theoretical and one practical question. A list of questions and the examination rules will be announced in the Department at the beginning of the 2nd semester.

## Department of Operative Techniques and Surgical Research

Subject: **BASIC SURGICAL TECHNIQUES**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **15**

Seminar: **18**

Practical: **12**

**1<sup>st</sup> week:**

**Lecture:** Surgical deontology. Administration, ethical and legal respects. Basic Surgical Techniques.  
**Seminar:** Administration of operations (operation report, list of interventions). Ethical problems.

**2<sup>nd</sup> week:**

**Lecture:** Surgical armamentarium. Terminology for surgery. Surgical indications/contraindications.  
**Seminar:** Cutting, hemostatic, grasping-retracting, special and suturing instruments. Clips and staplers. Order of the instrumental trays and tables.

**3<sup>rd</sup> week:**

**Lecture:** Surgical suture materials, sutures, knotting techniques.  
**Seminar:** Knotting techniques on different knotting pads. Conventional hand suturing techniques (interrupted, continuous sutures on gauze models). Special knotting and

suturing techniques on surgical training models.

**4<sup>th</sup> week:**

**Lecture:** Asepsis, antisepsis. Operating room environment. Preparation for operation personnel. Hand and arm disinfection (Scrubbing). Gowning. Gloving. Isolation. Sterilization techniques.  
**Seminar:** Instrumental order on the big operating table and on the Sonnenburg table. Isolation of the operative field.  
**Practical:** Scrubbing, gowning and gloving. Wound closure with different suturing techniques on biopreparate models.

**5<sup>th</sup> week:**

**Lecture:** Surgical hemostasis. Punction of the vessels. Dissection and cannulation of blood vessels.  
**Seminar:** Demonstration of the steps of the venous cutdown technique.  
**Practical:** Ligation of vessels on gauze models. Vein

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preparation, cannulation, introduction of infusion on phantom models. Wound closure with different suture techniques on surgical training models.

**6<sup>th</sup> week:**

**Lecture:** Injection techniques for diagnostic and therapeutical aim. Infusions.

**Seminar:** Written test I. Taking blood samples, intramuscular and intravenous injection, infusion set - video-demonstration on models.

**Practical:** Taking blood samples, intramuscular and intravenous injection on phantom models. Repeat: Vein preparation, cannulation, introduction of infusion on phantom models.

**7<sup>th</sup> week:**

**Lecture:** Laparotomies.

**Seminar:** Paramedian laparotomy - video-demonstration.

**Practical:** Laparotomy on surgical training models.

Repeat: Taking blood samples, injection techniques on phantom models. Vein preparation, cannulation, introduction of infusion on phantom models.

**8<sup>th</sup> week:**

**Lecture:** Tracheostomy, conicotomy.

**Seminar:** Conicotomy and tracheostomy - video-demonstration.

**Practical:** Conicotomy on phantom model. Scrubbing. Wound closure with different suturing techniques on biopreparate model. Vein preparation, cannulation, introduction of infusion on phantom models.

**9<sup>th</sup> week:**

**Lecture:** Techniques of the intestinal anastomosis

**Seminar:** End-to-end one layer small bowel anastomosis - video-demonstration.

**Practical:** Scrubbing. End-to-end one layer small bowel anastomosis on isolated biopreparate model.

**10<sup>th</sup> week:**

**Lecture:** Basic principles of vascular surgery.

**Seminar:** Vascular suture lines (arteriotomy and suturing) - video-demonstration.

**Practical:** Scrubbing. Suturing techniques of the aorta biopreparate models.

**11<sup>th</sup> week:**

**Lecture:** Surgery of the parenchymal organs. Organ

saving methods.

**Seminar:** Video-demonstration of spleen resection and spleen autotransplantation.

**Practical:** Scrubbing. Wound closure with different suturing techniques on biopreparate models. Taking stitches into spleen biopreparate model.

**12<sup>th</sup> week:**

**Lecture:** Bioplasts and tissue adhesivs.

**Seminar:** Application of surgical tissue adhesives and bioplasts.

**Practical:** Repeat: Vein preparation, cannulation, introduction of infusion on phantom models. Taking blood samples, injection techniques on phantom models. Wound closure with different suture techniques on surgical training models.

**13<sup>th</sup> week:**

**Lecture:** Principles of wound care. Drains and catheters. Basic principles of catheterization.

**Seminar:** Written test II. Different types of catheters and dressings. Catheterization of the urinary bladder on phantom model - videodemonstration.

**Practical:** Catheterization of the urinary bladder on phantom models. Repeat: Taking blood samples, injection techniques on phantom models. Vein preparation, cannulation, introduction of infusion on phantom models.

**14<sup>th</sup> week:**

**Lecture:** New surgical techniques, procedures: laparoscopy, NOTES, da Vinci. Basic principles of microsurgery.

**Seminar:** Basic surgical procedures - video-demonstration.

**Practical:** Repeat: Wound closure with different suture techniques on surgical training models. Vein preparation, cannulation, introduction of infusion on phantom models. Taking blood samples, injection techniques on phantom models.

**15<sup>th</sup> week:**

**Lecture:** Repeating of all practices by video-demonstration.

**Seminar:** Repeating of all practices.

**Practical:** Practical exam

## Requirements

The lectures and seminars/practices are built on each other. Consequently, it is difficult to substitute missed classes. The substitution of the 2-4 practices is obligatory. Compensation for missed seminars on the first five weeks should be paid for the teacher's fee only. After that the students have to pay the costs of the operating theatre and the staff, too. If the student is absent from more than 2 seminars/practices in a semester (without any acceptable reason), the Department may refuse to sign the Lecture Book. There will be two written tests during the semester (6th and 13th week) At the end of the semester the student is required to take the end of semester exam (ESE), which consists of a practical and an oral part. A list of topics will be announced two weeks before the ESE.

## Department of Pathology

Subject: **PATHOLOGY I.**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **45**

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

**Lecture:** -INTRODUCTION TO ANATOMICAL PATHOLOGY. -SURGICAL PATHOLOGY: METHODS AND REPORTING

**Practical:** Introduction

### 2<sup>nd</sup> week:

**Lecture:** -ADAPTATION AT CELLULAR LEVEL. -MORPHOLOGY OF THE REVERSIBLE CELL INJURY AND CELL DEATH (SWELLING, FATTY CHANGE AND NECROSIS)

**Practical:** 1. Myocardial infarction. 2. Gangrene in the lower extremity. 3. Fat necrosis in the pancreas. 4. Caseous necrosis (lymphadenitis tuberculosa).

### 3<sup>rd</sup> week:

**Lecture:** -REGENERATION OF DIFFERENT TISSUES. STEM CELL THERAPY. CONNECTIVE TISSUE REPARATION. WOUND HEALING. -AMYLOIDOSIS

**Practical:** 5. Fatty liver. 6. Fatty liver (Oil-Red-O staining). 7. Cholesterolosis in the gallbladder mucosa. 8. Atrophia brunea cordis (brown atrophy).

### 4<sup>th</sup> week:

**Lecture:** -HAEMORRHAGIA, THROMBOSIS, EMBOLISATION, DIC -EDEMA. HYPERAEMIA. CONGESTION

**Practical:** 9. Simplex endometrial hyperplasia. 10. Atrophia + hyperplasia endometrii. 11. Nodular hyperplasia of the prostate gland. 12. Bile stasis in the liver due to extrahepatic bile duct obstruction.

### 5<sup>th</sup> week:

**Lecture:** -MORPHOLOGIC PATTERNS OF THE ACUTE INFLAMMATORY RESPONSE. -THE ROLE OF MACROPHAGES IN INFLAMMATION. GRANULOMATOUS INFLAMMATION.

**Practical:** 13. Amyloidosis in the kidney with Congo red staining. 14. Seborrhoeic keratosis of the skin with melanin hyperpigmentation. 15. Hemosiderosis (Prussian blue). 16. Arterial thrombus. 17. End stage lesion in Buerger's disease.

### 6<sup>th</sup> week:

**Lecture:** -DYSPLASIA, PRENEOPLASTIC CONDITIONS -CHARACTERISTICS OF TUMOR CELL POPULATIONS (CLONALITY, HETEROGENEITY AND PROGRESSION)

**Practical:** 18. Necrosis of the small bowel due to incarceration. 19. Nutmeg liver. 20. Hemorrhagic infarct in the lung 21. Pulmonary edema.

### 7<sup>th</sup> week:

**Lecture:** -CHARACTERISTICS OF BENIGN AND MALIGNANT TUMORS. DIFFERENTIATION AND ANAPLASIA. -MECHANISMS OF LOCAL AND DISTANT SPREAD OF TUMORS.

**Practical:** 22. Acute suppurative appendicitis. 23. Purulent meningitis. 24. Septic abscesses in the myocardium due to systemic fungal infection (PAS). 25. Chronic non-specific salpingitis.

### 8<sup>th</sup> week:

**Lecture:** -THE BIOLOGY OF TUMOR GROWTH: KINETICS, ANGIOGENESIS. -HISTOLOGICAL ESTIMATION OF MALIGNANCY. MITOTIC RATE. PROLIFERATION RATE. GRADING. STAGING.

**Practical:** 26. Tuberculous lymphadenitis. 27. Foreign body granulomas. 28. Subcutaneous rheumatoid nodule. 29. Organized pneumonia.

### 9<sup>th</sup> week:

**Lecture:** -DIAGNOSTIC IMMUNOHISTOCHEMISTRY. MARKERS OF DIFFERENTIATION. -PROGNOSTIC AND THERAPY-ASSOCIATED MARKERS.

**Practical:** 30. Hypersensitive vasculitis. 31. Polyarteritis nodosa in the skin. 32. Synoviti chronica. Rheumatoid arthritis. 33. Polymyositis. 34. SLE lymphadenopathy.

### 10<sup>th</sup> week:

**Lecture:** -HUMORAL IMMUNOPATHOLOGICAL MECHANISMS. -CELLULAR IMMUNOPATHOLOGICAL MECHANISMS

**Practical:** 35. Gaucher's disease. 36. Gouty tophus. 37. Signet ring cell carcinoma in the stomach (PAS). 38. Metastatic carcinoma of the ovary (Krukenberg tumor).

### 11<sup>th</sup> week:

**Lecture:** -THE PATHOLOGY OF TRANSPLANTATION. -SYSTEMIC AUTOIMMUNE DISEASES.

**Practical:** 39. Condyloma. 40. Bowen's disease (intraepithelial squamous cell carcinoma of the vulva). 41. Keratoacanthoma. 42. Squamous cell carcinoma of the penis.

### 12<sup>th</sup> week:

**Lecture:** -VASCULITIS -PATHOLOGY OF THE LYMPHATIC SYSTEM

**Practical:** 43. Basal-cell carcinoma of the face. 44. Compound nevus. 45. Superficial-spreading malignant melanoma. 46. Nodular-type malignant melanoma.

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**13<sup>th</sup> week:**
**Lecture:** -MALIGNANT LYMPHOMAS -LEUKEMIAS

**Practical:** 47. Leiomyoma with bizarre foci. 48. Schwannoma. 49. Neurofibroma. 50. Embryonal rhabdomyosarcoma (botryoid type).

**14<sup>th</sup> week:**
**Lecture:** -AML. MYELOYDYSPLASIA -CHRONIC MYELOPROLIFERATIVE DISORDERS.

**Practical:** 51. Toxoplasma-lymphadenitis 52. Focal infiltration by chronic lymphocytic leukemia of the bone marrow. 53. Follicular lymphoma. 54. Diffuse large B-cell

lymphoma

**15<sup>th</sup> week:**
**Lecture:** -ANEMIAS -MONO- AND POLYGENIC DISORDERS

**Practical:** 55. Gastric lymphoma of mucosa associated lymphoid tissue (MALT) origin. 56. Classical Hodgkin-lymphoma. 57. Extramedullary hematopoiesis. Class revision.

## Requirements

**Validation of Semester in Pathology:**

Missing two practicals (histopathology and gross pathology together) is tolerable. Intracurricular replacement of histopathological and/or gross pathological classes is possible on the same week.

**Examination:**

On the 15th week written and practical exams on both semester (these exams are parts of the ESE and FE - the student is released from the written and/or practical part of ESE or FE if her/his evaluation is: pass). In case of failure student can repeat these parts of the exam during the exam period.

 At the end of the 1st semester the student is required to take **End of Semester Examination** (ESE) based on the material taught in the semester.

**The Exam consists of:** written, practical exam (15th week) and theoretical parts. The student get 10 minimal questions (can be found on the Department's website). In the 2nd semester 4 questions from the 1st and 6 questions from the 2nd semester minimal. The student has to reach 70% to pass this part of the exam.

The practical exam takes place in the autopsy room. An acceptable result in the practical exam is mandatory to apply for the oral part. During the theoretical exam 3 titles are to be worked out and presented orally and one slide has to be described and diagnosed also orally. The knowledge of students is assessed on a five-grade evaluation scale.

 At the end of the 2nd semester the student is required to take **Final Exam** (FE).

**The Exam consists of:** written, practical (15th week) and theoretical parts. The practical exam is same as above. During the theoretical exam 3 titles are to be worked out (one from the material of the 1st semester, and two from the material of the 2nd semester). One slide has to be described and diagnosed (from the whole year). At least a (2) level of gross pathological examination and recognition of the histopathological alteration achieved in the course of a previous unsuccessful examination is acceptable without repeating for the next (B or C chance) examination.

 For further information: <http://pathol.med.unideb.hu>

## Department of Preventive Medicine

 Subject: **BASIC ONCOLOGY**

 Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

 Lecture: **13**
**1<sup>st</sup> week:**
**Lecture:** Tumor initiation and progression

**2<sup>nd</sup> week:**
**Lecture:** The effect of lifestyle and social factors on tumorigenesis and tumor progression

**3<sup>rd</sup> week:**
**Lecture:** Role of the radioactive and UV radiations in the malignant transformation

**4<sup>th</sup> week:**
**Lecture:** The effect of nutrition on tumorigenesis

**5<sup>th</sup> week:**
**Lecture:** Role of viruses in the malignant transformation.I. Carcinogenic DNA viruses.

**6<sup>th</sup> week:**
**Lecture:** Role of viruses in the malignant transformation.

## II. Carcinogenic RNA viruses.

**7<sup>th</sup> week:**

**Lecture:** Chemical carcinogenesis. Carcinogenic chemicals in the environment

**8<sup>th</sup> week:**

**Lecture:** Tumor immunology in clinical practice

**9<sup>th</sup> week:**

**Lecture:** Molecular biological techniques in cancer diagnosis and to search for alterations in the cancer genome

**10<sup>th</sup> week:**

**Lecture:** Cancer stem cells

**11<sup>th</sup> week:**

**Lecture:** Epidemiology of malignant diseases

**12<sup>th</sup> week:**

**Lecture:** Cancer screening. Cancer registries

**13<sup>th</sup> week:**

**Lecture:** Prevention strategies in cancer

## Department of Behavioural Sciences

Subject: **MEDICAL PSYCHOLOGY II.**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **20**

**1<sup>st</sup> week:**

**Lecture:** Medical psychology as a discipline. Approaches to doctor-patient interaction.

**2<sup>nd</sup> week:**

**Lecture:** Psychological causes and consequences of disease. Age dependent illness behaviour. Psychological determinants of health and disease concepts.

**3<sup>rd</sup> week:**

**Lecture:** Pain: psychological and sociocultural aspects. Suffering as a therapeutic motive.

**4<sup>th</sup> week:**

**Lecture:** Stress and coping. Occupational dangers of helping professionals. The helper attitude and the burnout syndrome.

**5<sup>th</sup> week:**

**Lecture:** Psychological crisis: presuicidal syndrome.

**6<sup>th</sup> week:**

**Lecture:** Death and dying. Psychological support of

patient and family. Bereavement: the psychology of loss.

**7<sup>th</sup> week:**

**Lecture:** The seeking of professional help. The first encounter: psychological characteristics and functions of history taking and of the diagnostic process.

**8<sup>th</sup> week:**

**Lecture:** Psychological characteristics of doctor-patient interaction. Empathy: an interdisciplinary analysis.

**9<sup>th</sup> week:**

**Lecture:** Disfunctional aspects of doctor-patient interaction, the "difficult patient".

**10<sup>th</sup> week:**

**Lecture:** Psychologist in the medical team. Basic psychodiagnostic and therapeutic issues in general practice.

## Requirements

**Requirements for signing the lecture book:**

By signing the Lecture Book the Department confirms that the student has met the academic requirements of the course and this enables him/her to take the examination. The Head of the Department may refuse to sign the Lecture Book if a student: is absent more than twice from practices even if he/she has an acceptable reason.

**Evaluation:** third year students should pass "End of Semester Examination" (ESE) at the end of the semester. The Department of Behavioural Sciences will adhere to the requirements of the General Academic Regulations and Rules of Examinations. The student must be present on the examination at the designated time. (He/she must explain the reason for any absence from the examination to the Departmental Adviser within 1 days of the day of examination.)

## Department of Foreign Languages

 Subject: **MEDICAL HUNGARIAN II.**

 Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Practical: **30**
**1<sup>st</sup> week:**
**Practical:** Hasnyálmirigy-gyulladás.

**2<sup>nd</sup> week:**
**Practical:** Gyomorfekély.

**3<sup>rd</sup> week:**
**Practical:** Vakbélgyulladás.

**4<sup>th</sup> week:**
**Practical:** Epehólyaggyulladás.

**5<sup>th</sup> week:**
**Practical:** Cukorbetegség.

**6<sup>th</sup> week:**
**Practical:** Pajzsmirigy-túlműködés.

**7<sup>th</sup> week:**
**Practical:** Oral mid-course exam

**8<sup>th</sup> week:**
**Practical:** Magas vérnyomás.

**9<sup>th</sup> week:**
**Practical:** Szívinfarktus.

**10<sup>th</sup> week:**
**Practical:** Tüdőgyulladás.

**11<sup>th</sup> week:**
**Practical:** Reumás artritisz.

**12<sup>th</sup> week:**
**Practical:** Scleroderma.

**13<sup>th</sup> week:**
**Practical:** SLE.

**14<sup>th</sup> week:**
**Practical:** Sjögren szindróma.

**15<sup>th</sup> week:**
**Practical:** Veseke betegség.

## Requirements

### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

Students are not allowed to take Medical Hungarian course before entering 3rd year.

Students are required to take final exam in Medical Hungarian by the end of the 3rd year 2nd semester examination period. If a student fails or misses to take this final exam within the given period he/she has to repeat the 3rd year 2nd semester Medical Hungarian course in the next year.

Students in the 4th, 5th, or 6th year have to pay an additional tuition fee of 500 USD per semester for taking mandatory Hungarian language courses. These students are organized into a separate group from the 3rd year students.

### Testing, evaluation

In Medical Hungarian course, students have to sit for a mid-term and an end-term written language tests and 2 short minimal requirement oral exams.

Further minimal requirement is the knowledge of 200 words in each semester announced on the first week. Every week there is a (written or oral) word quiz from 20 words in the first 5-10 minutes of the class. In each word quiz students can be given 1 point if they know at least 80 % of the words asked and they have to collect 6 points at least to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 200 words along with the oral minimal exam. The bonus points awarded for the



successful word quizzes (maximum 10) are added to the average score of the written tests.

The oral minimal exam consists of a role-play randomly chosen from a list of situations announced in the beginning of the course. Failing the oral minimal results in failing the whole course. The score of the oral minimal exam is added to the average score of the mid-term and end-term tests (maximum 10 bonus points).

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and the scores of the oral minimal exam (maximum 10) are added to the average score of the mid-term and end-term tests, resulting the final score.

Based on the final score the tests are graded according to the following table:

Final score	Grade
0 - 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60 the student once can take an oral remedial exam covering the material of the whole semester.

### Consultation classes

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** Lampé, Judit, Ph.D.: Jobbulást kívánok

**Website:** Vocabulary minimal lists and further details are available on the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Internal Medicine

Subject: **INTERNAL MEDICINE II. (IMMUNOLOGY AND RHEUMATOLOGY)**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **27**

Practical: **18**

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

**Lecture:** 1. Pathogenesis of autoimmune disease. General characteristics of autoimmune disease. 2. Mixed connective tissue disease (MCTD). Non-differentiated autoimmune (NDC) 3. Systemic lupus erythematosus.

**Practical:** Laboratory diagnosis of immunopathologic disorders.

### 2<sup>nd</sup> week:

**Lecture:** 4. Systemic sclerosis. 5. Raynaud's syndrome. 6. Sjögren's disease.

**Practical:** Case report of SLE and MCTD.

### 3<sup>rd</sup> week:

**Lecture:** 7. Dermato/polymyositis. 8. Systemic vasculitides. 9. Laboratory diagnostics of allergic diseases.

**Practical:** Case report on PSS and Raynaud's syndrome. Capillary microscopy and laserdoppler.

### 4<sup>th</sup> week:

**Lecture:** 10. Respiratory allergic diseases. Food allergy. 11. Organspecific autoimmune diseases. 12. Secondary immunodeficiency.

**Practical:** Case report on Sjögren's disease and vasculitis.

### 5<sup>th</sup> week:

**Lecture:** 13. Immunity and pregnancy. Antiphospholipid syndrome. 14. Immunological consequences of organ and stem cell transplantation. 15. Cancer immunology.

**Practical:** Case report on DM/PM.

### 6<sup>th</sup> week:

**Lecture:** 16. Immunomodulation in the treatment of autoimmune diseases. 17. Introduction to rheumatology: history taking, physical exam, diagnostics and therapy. 18. Rheumatoid arthritis.

**Practical:** Physical examination. Presentation of case with RA and other types of arthritis.

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**7<sup>th</sup> week:**

**Lecture:** 19. Rheumatoid arthritis: special forms. Juvenile arthritis. Prerheumatoid syndromes. 20. Spondyloarthritides. 21. Differential diagnosis of arthritides and autoimmune diseases.

**Practical:** Presentation of a case with RA and spondyloarthritides.

**8<sup>th</sup> week:**

**Lecture:** 22. Crystal deposition diseases. 23. Reactive and septic arthritides. 24. Oseoarthritis, spondylosis. Low back

pain.

**Practical:** Presentation of a case with gout, osteoporosis and other arthritides.

**9<sup>th</sup> week:**

**Lecture:** 25. Differential diagnosis of osteoporosis and metabolic bone disease. 26. Physiotherapy, balneotherapy. 27. Rehabilitation.

**Practical:** Presentation of physiotherapy and exercise.

## Requirements

Conditions of signing the Lecture book:

The student is required to attend the practices. Should they miss a practice, however, they will be obliged to provide a well-documented reason for it. Missed practices should be made up for at a later date, to be discussed with the tutor. The student is expected to be able to communicate with the patient in Hungarian, including history taking. At the end of the semester the student is required to sit for the end of semester examination (ESE). The ESE covers all the topics of the lectures and those in the recommended books. At week 5 demonstration in writing must be performed.

## Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY II.**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **45**

Practical: **30**

**1<sup>st</sup> week:**

**Lecture:** 1. Coagulopathies, (general introduction), haemophilias . 2. von Willebrand disease 3. Other coagulopathies, platelet function disorders

**Practical:** Laboratory informatics

**2<sup>nd</sup> week:**

**Lecture:** 4. Inherited thrombophilias 5. Acquired thrombophilias 6. Prethrombotic state, thromboembolias, consumption coagulopathies

**Practical:** Laboratory diagnostics of coagulopathias

**3<sup>rd</sup> week:**

**Lecture:** 7. Disorders of sodium and water metabolism I 8. Disorders of sodium and water metabolism II 9. Disorders of sodium and water metabolism III.

**Practical:** Laboratory diagnostics of Thrombophilia. Laboratory monitoring of anticoagulant therapy

**4<sup>th</sup> week:**

**Lecture:** 10. Disorders of potassium metabolism 11. Pathobiochemistry of the renal function I. 12. Pathobiochemistry of the renal function II.

**Practical:** Laboratory diagnostics of platelet function disorders. Laboratory monitoring of antiplatelet therapy

**5<sup>th</sup> week:**

**Lecture:** 13. Disturbances of the acid-base balance 14. Laboratory diagnostics of renal disorders 15. Pathogenesis

and pathomechanism of diabetes mellitus

**Practical:** Laboratory diagnostics of renal disorders

**6<sup>th</sup> week:**

**Lecture:** 16. Laboratory diagnostics of diabetes mellitus 17. Pathobiochemistry and clinical biochemistry of the acute complications of diabetes mellitus 18.

Hypoglycaemias

**Practical:** Examination of urine sediment

**Self Control Test**

**7<sup>th</sup> week:**

**Lecture:** 19. Disorders of lipid metabolism 20. Laboratory diagnostics of hyperlipidemia 21. Laboratory diagnostics of acute coronary syndrome I.

**Practical:** Basic laboratory methods in metabolic diseases

**8<sup>th</sup> week:**

**Lecture:** 22. Laboratory diagnostics of acute coronary syndrome II. 23. Risk factors of atherosclerosis 24.

Laboratory diagnostics of hyperuricaemia and gout

**Practical:** Case presentation

**9<sup>th</sup> week:**

**Lecture:** 25. Pathobiochemistry of liver disorders I. 26. Pathobiochemistry of liver disorders II. 27. Laboratory

diagnostics of liver disorders. Pathobiochemistry of acute hepatic disorders

**Practical:** Serum lipid measurements

**10<sup>th</sup> week:**

**Lecture:** 28. Pathobiochemistry and laboratory diagnostics of cholestasis and cirrhosis 29. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract I. 30. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract II.

**Practical:** Chromatography, respiratory test

**Self Control Test**

**11<sup>th</sup> week:**

**Lecture:** 31. Laboratory diagnostics of acute pancreatitis 32. Clinical biochemistry of hypothalamus and hypophysis 33. Pathobiochemistry of thyroid disorders

**Practical:** Laboratory diagnostics of myocardial infarction

**12<sup>th</sup> week:**

**Lecture:** 34. Laboratory diagnostics of thyroid functions 35. Clinical chemistry of parathyroid disorders 36.

Disorders of calcium, phosphate and magnesium metabolism

**Practical:** POCT

**13<sup>th</sup> week:**

**Lecture:** 37. Pathobiochemistry and laboratory diagnostics of adrenal cortex disorders 38. Pathobiochemistry and laboratory diagnostics of adrenal medulla disorders 39. Clinical biochemistry of gonadal functions

**Practical:** Laboratory evaluation of liver and pancreas function

**14<sup>th</sup> week:**

**Lecture:** 40. Laboratory diagnostics of muscle disorders 41. Laboratory diagnostics of bone disorders 42.

Demonstration of practical pictures

**Practical:** Laboratory evaluation of liver and pancreas function - case presentation

**Self Control Test**

**15<sup>th</sup> week:**

**Lecture:** 43. Summary of laboratory methods

**Practical:** Immunoassay

## Requirements

Participation at practices: Participation at practices is obligatory. One absence during the first semester and two absences during the second semester are allowed. In case of further absences practices should be repeated by attending practices of another group on the same week.

Requirements for signing the Lecture book: The Department may refuse to sign the Lecture book if the student is absent from practices more than allowed in a semester.

Assessment: In the whole year 5 written examinations are held, based on the material taught in the lectures and practicals. At the end of the first semester the written examinations are summarized and assessed by a five grade evaluation. If the student failed - based on the results of written exams - he must sit for an oral examination during the examination period. At the end of the year the written examinations are summarized and assessed. The student is exempt from written minimum entry test if her/his evaluation based on the 1st and 2nd semester points average is equal to or above 70% of the whole year total points. The final exam at the end of the second semester consists of two parts: a written minimum entry test and an oral exam. Those who fail the minimum entry test, are not allowed to take the oral exam and they have to repeat the minimum entry test part as well. Those who fail the oral exam only, do not have to take the written test on the B or C chance. There is no written entry test on C chance.

Requirements for examinations: The examination (written and oral) is based on the whole lecture and practical material (Practicals in Laboratory Medicine, eds.: János Kappelmayer and László Muszbek 2010.) as well as the textbook of Marshall and S.K. Bangert: Clinical Chemistry (6th edition, 2008.).

Suggested reading : Hoffbrand A.V., Pettit J.E.: Essential Haematology, 3rd edition, 1999.

## Department of Medical Microbiology

Subject: **MEDICAL MICROBIOLOGY II.**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **30**

**1<sup>st</sup> week:**

**Lecture:** 1. The protozoal diseases

2. The cestodes

**Practical:** Bacterial zoonotic infections

**2<sup>nd</sup> week:**

**Lecture:** 3. The nematodes I.

4. The nematodes II.

**Practical:** Anaerobic infections

**3<sup>rd</sup> week:**

**Lecture:** 5. The structure and classification of viruses

6. The replication of viruses

**Practical:** Infections of sterile body sites (sepsis,

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bacteriemia, endocarditis, osteomyelitis)

**4<sup>th</sup> week:**
**Lecture:** 7. The pathogenesis of viral diseases. Host defenses in viral infections

8. Prevention and treatment of viral diseases

**Practical:** Diagnosis of mycotic infections

**5<sup>th</sup> week:**
**Lecture:** 9. Orthomyxoviruses

10. Paramyxoviruses, Coronaviruses, Rubellavirus

**Practical:** 3<sup>rd</sup> WRITTEN EXAMINATION (Clinical Bacteriology and Mycology)

**6<sup>th</sup> week:**
**Lecture:** 11. Hepatitis viruses

**Practical:** The protozoal diseases

**7<sup>th</sup> week:**
**Lecture:** 12. Herpesviruses I

**Practical:** Cestodes, Nematodes

**8<sup>th</sup> week:**
**Lecture:** 13. Herpesviruses II

**Practical:** Laboratory diagnosis of viral infections

**9<sup>th</sup> week:**
**Lecture:** 14. Adenoviridae, Parvoviridae

**Practical:** Respiratory tract infections caused by viruses

**10<sup>th</sup> week:**
**Lecture:** 15. Picornaviridae, Reoviridae

**Practical:** Agents of viral skin rash. Congenital virus infections

**11<sup>th</sup> week:**
**Lecture:** 16. Rabies, slow virus infections

**Practical:** Agents of viral gastroenteritis. Hepatitis viruses

**12<sup>th</sup> week:**
**Lecture:** 17. Arbo- and Roboviruses

**Practical:** 4<sup>th</sup> WRITTEN EXAMINATION (Parasitology, Virology)

**13<sup>th</sup> week:**
**Lecture:** 18. AIDS viruses

**Practical:** Clinical cases I.

**14<sup>th</sup> week:**
**Lecture:** 19. Human tumor viruses

**Practical:** Clinical cases II.

**15<sup>th</sup> week:**
**Lecture:** 20. Consultation

**Practical:** Consultation

## Requirements

The student is required to attend the practices. The Department may refuse to sign the students' Lecture book if they are absent from more than two practices in a semester. Missed practice may be made up in the practice with another group only in the same week. During the 1st semester, two mid-semester tests are written. Students are offered an ESE grade based on the cumulative score of the two mid-semester tests. Those who are below the passing level or who are not satisfied with the offered grade, must sit for an oral end of semester examination (ESE) (A-chance) during the examination period. In the 2nd semester two additional tests are to be written by the student. At the end of the 2nd semester the student is required to take the final examination (FE), based on the whole material taught in Medical Microbiology. The student's performance will be assessed on a five-grade scale. The FE consists of a written entry test and an oral examination, consisting of three theoretical and one practical question. A list of questions and the examination rules will be announced in the Department at the beginning of the 2nd semester.

## Department of Pathology

 Subject: **PATHOLOGY II.**

 Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Lecture: **45**

 Practical: **45**
**1<sup>st</sup> week:**
**Lecture:** -SOFT TISSUE TUMORS I. -SOFT TISSUE TUMORS II. -MELANIN PRODUCING TUMORS

**Practical:** 58. Diabetic nephropathy. 59. Chronic pyelonephritis. 60. Crescentic glomerulonephritis. 61. Polycystic kidney.

**2<sup>nd</sup> week:**
**Lecture:** -DISEASES AFFECTING TUBULES AND INTERSTITIUM. KIDNEY STONES.

HYDRONEPHROSIS. -GLOMERULAR DISEASES. -CYSTIC DISEASES OF THE KIDNEY. TUMORS OF THE KIDNEY.

**Practical:** 62. Nasal polyp. 63. Hyalin membrane disease in the neonatal lung. 64. Obstructive alveolitis. 65.

Bronchopneumonia complicated by lung abscesses. 66. Asthmatic bronchitis.

**3<sup>rd</sup> week:**

**Lecture:** -PATHOLOGY OF THE URINARY TRACT. -DIABETES MELLITUS. -ARTERIOSCLEROSIS. HYPERTENSION AND HYPERTENSIVE VASCULAR DISEASE.

**Practical:** 67. Anthracosilicosis (pneumoconiosis). 68. Boeck's sarcoidosis of the lung. 69. Squamous cell carcinoma in the bronchus. 70. Intra-bronchial carcinoid tumor.

**4<sup>th</sup> week:**

**Lecture:** -ISCHEMIC HEART DISEASE, CORONARY HEART DISEASE. -CARDIOMYOPATHIES. MYOCARDITIS. -DISEASES OF THE ENDOCARDIUM AND CARDIAC VALVES.

**Practical:** 71. Ulcus chronicum pepticum ventriculi. 72. Zollinger-Ellison syndrome of the stomach. 73. Crohn's disease (regional ileitis). 74. Ulcerative colitis.

**5<sup>th</sup> week:**

**Lecture:** -CHRONIC OBSTRUCTIVE PULMONARY DISEASES -INTERSTITIAL LUNG DISEASE. -ARDS.PNEUMONIA.

**Practical:** 75. Hyperplastic polyp of the stomach. 76. Colon adenocarcinoma based on a polyp. 77. Mucinous adenocarcinoma of the large bowel. 78. Liver cirrhosis with hepatocellular carcinoma.

**6<sup>th</sup> week:**

**Lecture:** -TUMORS OF THE LUNG AND PLEURA. -TUBERCULOSIS. -BENIGN PRENEOPLASTIC AND NEOPLASTIC LESIONS IN ORAL CAVITY.

**Practical:** 79. Transitional cell carcinoma of the urinary bladder. 80. Prostatic cancer. 81. Tuberculous epididymitis. 82. Seminoma with testicular atrophy.

**7<sup>th</sup> week:**

**Lecture:** -ESOPHAGEAL DISEASES. GASTRITIS. GASTRODUODENAL ULCERS. -GASTRIC TUMORS. -DISEASES OF SALIVARY GLANDS.

**Practical:** 83. Embryonal carcinoma with choriocarcinoma. 84. Granulosa-cell tumor of the ovary. 85. Papillary serous carcinoma of the ovary. 86. Adenocarcinoma of the endometrium. 87. Perineal endometriosis.

**8<sup>th</sup> week:**

**Lecture:** -ENTERITIS, ENTEROCOLITIS. -COLORECTAL CANCER. -INTRA-, AND EXTRAHEPATIC BILIARY TRACT DISEASES.

**Practical:** 88. Tubal abortion. 89. Squamous cell carcinoma in situ in the uterine cervix. 90. Benign fibrocystic disease of the breast with epithelial hyperplasia.

91. Invasive lobular carcinoma of the breast.

**9<sup>th</sup> week:**

**Lecture:** -VIRAL HEPATITIS. DRUG INDUCED LIVER DISEASES. -LIVER CIRRHOSIS. -TUMORS AND CIRCULATORY DISORDERS OF THE LIVER.

**Practical:** 92. Fibroadenoma. 93. Paget's disease of the nipple associated with intraductal carcinoma. 94. Hashimoto's thyroiditis. 95. Graves' disease.

**10<sup>th</sup> week:**

**Lecture:** -INBORN ERRORS OF METABOLISM AND PEDIATRIC LIVER DISEASES. -THE PATHOLOGY OF THE PANCREAS. -PATHOLOGY OF THE HYPOPHYSIS.

**Practical:** 96. Papillary carcinoma of the thyroid. 97. Follicular carcinoma of the thyroid. 98. Adrenal cortical adenoma. 99. Islet-cell tumor of the pancreas.

**11<sup>th</sup> week:**

**Lecture:** -PATHOLOGY OF THE THYROID AND PARATHYROID -PATHOLOGY OF THE ADRENALS -HYPERPLASIA AND CARCINOMA OF THE PROSTATE.

**Practical:** 100. Normal and osteoporotic bone. 101. Acute osteomyelitis. 102. Aneurysmal bone cyst. 103. Ganglion.

**12<sup>th</sup> week:**

**Lecture:** -TESTICULAR TUMORS. -NON-NEOPLASTIC AND PRENEOPLASTIC CONDITIONS OF THE BREAST. -BREAST CANCER.

**Practical:** 104. Glioblastoma multiforme. 105. Retinoblastoma. 106. Meningioma. 107. Neuroblastoma.

**13<sup>th</sup> week:**

**Lecture:** -UTERINE TUMORS. -TUMORS OF THE OVARIUM. -PATHOLOGY OF THE PREGNANCY. PATHOMORPHOLOGICAL ASPECTS OF MOST FREQUENT OF DISEASES OF THE NEWBORN

**Practical:** 108. Osteosarcoma. 109. Spina bifida with myeloschisis. 110. Cyst post encephalomalaciam.

**14<sup>th</sup> week:**

**Lecture:** -NON-NEOPLASTIC LESIONS OF THE BONES. PATHOLOGY OF JOINTS AND MUSCLES. -BONE TUMORS. -VASCULAR DISEASES OF THE CNS.

**Practical:** CLASS REVISION I.

**15<sup>th</sup> week:**

**Lecture:** -INFECTIVE DISEASES OF THE CNS. -TUMORS OF THE CNS. -OCULAR PATHOLOGY.

**Practical:** CLASS REVISION II.

## Requirements

**Validation of semester in Pathology:**

Missing two practicals (histopathology and gross pathology together) is tolerable. Intracurricular replacement of

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histopathological and/or gross pathological classes is possible on the same week.

**Examination:**

On the 15th week written and practical exams on both semester (these exams are parts of the ESE and FE - the student is released from the written and/or practical part of ESE or FE if her/his evaluation is: pass). In case of failure student can repeat these parts of the exam during the exam period.

At the end of the 1st semester the student is required to take **End of Semester Examination (ESE)** based on the material taught in the semester.

**The Exam consists of:** written, practical exam (15th week) and theoretical parts. The student get 10 minimal questions (can be found on the Department's website). In the 2nd semester 4 questions from the 1st and the 2nd semester minimal a 6 dentistry questions. The student has to reach 70% to pass this part of the exam.

The practical exam takes place in the autopsy room. An acceptable result in the practical exam is mandatory to apply for the oral part. During the theoretical exam 3 titles are to be worked out and presented orally and one slide has to be described and diagnosed also orally. The knowledge of students is assessed on a five-grade evaluation scale.

At the end of the 2nd semester the student is required to take **Final Exam (FE)**.

**The Exam consists of:** written, practical(15th week) and theoretical parts. The practical exam is same as above. During the theoretical exam 3 titles are to be worked out (one from the material of the 1st semester, one from the material of the 2nd semester, and one dentistry topic). One slide has to be described and diagnosed (from the whole year – dentistry slides included). At least a (2) level of gross pathological examination and recognition of the histopathological alteration achieved in the course of a previous unsuccessful examination are acceptable without repeating for the next (B or C chance) examination.

For further information: <http://pathol.med.unideb.hu>

## Division of Clinical Physiology

Subject: **CLINICAL PHYSIOLOGY**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **15**

Seminar: **30**

**1<sup>st</sup> week:**

**Lecture:** Introduction, cellular and molecular factors of pathologic cardiac excitability.

**Seminar:** The basics of ECG.

**2<sup>nd</sup> week:**

**Lecture:** Pathologic contractile function of the heart (contractile proteins, intracellular Ca<sup>2+</sup>-homeostasis and cardiac pumping).

**Seminar:** ECG diagnosis of arrhythmias I.

**3<sup>rd</sup> week:**

**Lecture:** Myocardial ischemia, myocardial infarction and new ischemic syndromes (hibernation, preconditioning, stunning).

**Seminar:** ECG diagnosis of arrhythmias II.

**4<sup>th</sup> week:**

**Lecture:** Cardiac hypertrophy and failure.

**Seminar:** Differential diagnostics of arrhythmias, evaluation of ECG recordings.

**5<sup>th</sup> week:**

**Lecture:** Heart failure (molecular pathophysiology).

**Seminar:** Conduction disorders, ECG signs of volume and pressure overload.

**6<sup>th</sup> week:**

**Lecture:** Endothelium, smooth muscle, vessels.

**Seminar:** Angina pectoris, myocardial infarction.

**7<sup>th</sup> week:**

**Lecture:** Hypertension.

**Seminar:** Exercise stress test ECG, Holter ECG.

**8<sup>th</sup> week:**

**Lecture:** Cellular and molecular background of cardiovascular drugs.

**Seminar:** Electronic pacemakers, mechanisms of arrhythmias.

**9<sup>th</sup> week:**

**Lecture:** Stem cells in cardiovascular medicine.

**Seminar:** ECG signs of electrolyte disorders, differential diagnostics, practicing.

**Self Control Test (Bonus points for the exam can be collected during the written mid-semester clinical physiology test during the 9th week.)**

**10<sup>th</sup> week:**

**Lecture:** Cellular and molecular elements of the respiratory system with clinical significance.

**Seminar:** Evaluation of ECG recordings.

**11<sup>th</sup> week:**

**Lecture:** Clinical physiology of the respiratory system.

**Seminar:** Echocardiography I., standard views, normal values.

**12<sup>th</sup> week:**

**Lecture:** Clinical physiology of nutrition and metabolism I.

**Seminar:** Echocardiography II., consequences of myocardial infarction, stress echocardiography, TEE.

**13<sup>th</sup> week:**

**Lecture:** Clinical physiology of nutrition and metabolism II.

**Seminar:** Respiratory function tests.

**14<sup>th</sup> week:**

**Lecture:** Clinical physiology of the nervous system I.

**Seminar:** Cardiac catheterisation.

**15<sup>th</sup> week:**

**Lecture:** Clinical physiology of the nervous system II.

**Seminar:** Consultation.

**Self Control Test (Result of the 9th and 15th weeks tests will form the basis for a recommended final mark.)**

## Requirements

Students are expected to attend lectures and obliged to attend seminars. The Department may refuse to sign the students' Lecture Book if a student is absent for more than two seminars. The successful oral mid-semester ECG test (during the 10th week of the second semester) is also a requirement for the signature of the students' Lecture Book. Third year students are invited to participate in two written midsemester tests ("Assessment of the work" (AW)) during the 9<sup>th</sup> and 15<sup>th</sup> weeks organized by the Division of Clinical Physiology. Results of these tests will form the basis for a recommended final mark. Single choice test questions (single right or single false answer should be chosen from five possibilities) will address students' proficiency from the material of all lectures and seminars. If a final grade cannot be recommended, written exams will be performed during the examination period. Failed exams are repeated in a written test (B chance) and in an oral test (C chance). Students may also improve their mark in an oral exam. Lecture Books are signed by the head of the Division of Clinical Physiology.

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## CHAPTER 12

### ACADEMIC PROGRAM FOR THE 4TH YEAR

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#### Department of Behavioural Sciences

Subject: **BIOETHICS**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Seminar: **10**

**1<sup>st</sup> week:**

**Lecture:** Introduction to bioethics. The development of bioethics. Ethics and morality. Morality and ethical theory, types of ethical theory: deontological (utilitarianism). Kant's supreme moral law. Universal and applied ethics. Moral and legal regulation of the medical practice. The Hippocratic Oath. International Code of Medical Ethics.

**2<sup>nd</sup> week:**

**Lecture:** What is bioethics? Medical ethics and the four Principles: beneficence, nonmaleficence, respect for autonomy, justice. The ethics of medical decision making. Case analysis.

**3<sup>rd</sup> week:**

**Lecture:** The doctor-patient relationship. Paternalism and the new ethos of patient autonomy. Informed consent and proxy consent. The therapeutic privilege. Truth-telling. Rules of Privacy and confidentiality. Patients' Rights.

**4<sup>th</sup> week:**

**Lecture:** Abortion and ethics. A critical analysis of the main arguments. The human reproductive technologies and ethics. Reproduction and genetic technology. Embryo experimentation. Case analysis.

**5<sup>th</sup> week:**

**Lecture:** What is death? Death and dying. Euthanasia and suicide. Ethics of the terminal care. Justice in the health care system (macro- and micro allocation).

**6<sup>th</sup> week:**

**Lecture:** Issues in organ transplantation. Research ethics. Ethical problems in human and animal research.

**7<sup>th</sup> week:**

**Lecture:** Ethical question of genetic technology. Genetic screening and counselling. Written ethical workup.

### Requirements

Requirements for signing the lecture book: regular attendance at the seminars.

Evaluation: AW5. Marks will be given to the ethical workup. The students will prepare ethical analysis, and written answers to questions.

Teacher: László Nemes M.A., Ph.D.

Course leader: Péter Kakuk, M.A., Ph.D.

Course objectives: 1. This discipline involves a complex approach of development and problems in ethical aspects of medicine. Its goals are giving basic knowledge on issues of the most important fields of medical ethics, and to introduce students to the central concepts and decision making procedures in medical ethics. 2. The course aims to draw attention to and increase the moral sensitivity of students with regards to a critical reflection on own values and future medical duties.

Course outline: Samuel Gorovitz defined bioethics as the "critical examination of the moral dimensions of decision - making in health - related contexts and in contexts involving the biological sciences". This definition highlights the interdisciplinary and social dimensions of bioethics. It points us in the right direction of bioethics. The course will present and overview the issues in the major problem areas of bioethics.

Professional codes and statutes.



## Department of Internal Medicine

Subject: **INTERNAL MEDICINE III. (CARDIOLOGY, ANGIOLOGY)**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

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

**Lecture:** 1. Epidemiology of cardiac diseases. Risk factors, primary and secondary prevention. Lipid metabolism, treatment of lipid metabolic diseases. 2. Differential diagnosis of chest pain.

**Practical:** Ischaemic heart disease, angina pectoris symptoms, treatment and differential diagnosis

### 2<sup>nd</sup> week:

**Lecture:** 3. Diagnosis and treatment of chronic ischaemic heart diseases. 4. Unstable angina - Acute coronary syndrome in patients without persistent ST-segment elevation

**Practical:** Acute myocardial infarction-diagnosis, differential diagnosis and management

### 3<sup>rd</sup> week:

**Lecture:** 5. Management of acute myocardial infarction in patients presenting with ST-segment elevation and complications 6. Percutaneous cardiac interventions

**Practical:** Clinical signs, diagnosis and treatment of congestive heart failure

### 4<sup>th</sup> week:

**Lecture:** 7. Case report 8. Arterial hypertension (Symptoms, classification, and treatment)

**Practical:** Carditis/endocarditis. Arterial hypertension—symptoms, classification, treatment and prevention of complications

### 5<sup>th</sup> week:

**Lecture:** 9. Treatment of intracardiac thrombosis (thrombolysis, anticoagulation) 10. Cardiomyopathies  
**Practical:** Clinical aspects, symptoms and management of arrhythmias. Differential diagnosis of syncope

### 6<sup>th</sup> week:

**Lecture:** 11. Clinical signs, diagnosis and treatment of cardiac failure 12. Diagnosis and treatment of arrhythmias

### 7<sup>th</sup> week:

**Lecture:** 13. Non pharmacological treatment of arrhythmias (Pacemaker, ICD, ablation) 14. Syncope, sudden cardiac death, cardiopulmonary resuscitation

### 8<sup>th</sup> week:

**Lecture:** 15. Congenital heart diseases in adults and acquired cardiac valve diseases 16. Myocarditis, pericarditis, infective endocarditis

### 9<sup>th</sup> week:

**Lecture:** 17. Cardiac surgery (CABG, complications of myocardial infarction, congenital heart diseases, cardiac valve surgery 18. Case report

### 10<sup>th</sup> week:

**Lecture:** 19. Rehabilitation of patients with heart and vascular diseases 20. Thrombosis of the venous system. Acute and chronic occlusion of arteries.

### 11<sup>th</sup> week:

**Lecture:** Scientific competition

**Practical:** Block practice

### 12<sup>th</sup> week:

**Practical:** Block practice

### 13<sup>th</sup> week:

**Practical:** Block practice

### 14<sup>th</sup> week:

**Practical:** Block practice

### 15<sup>th</sup> week:

**Practical:** Block practice

## Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

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

**Lecture:** Introduction to obstetrics and gynaecology.

**Practical:** Introduction of the Department. Taking history. Structured case record.

### 2<sup>nd</sup> week:

**Lecture:** Menstrual disturbances at fertile age.

**Practical:** Physical examination in obstetrics and

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gynaecology. Instrumentation, common procedures.  
Practice on pelvic simulator.

**3<sup>rd</sup> week:**

**Lecture:** Infertility and sterility. Assisted reproduction.  
**Practical:** Examination of pregnant patients. Diagnosis of pregnancy. Dating the pregnancy. Antenatal care. Miscarriage.

**4<sup>th</sup> week:**

**Lecture:** Contraception. Family planning  
**Practical:** Physical examination in the third trimester: lie, presentation, position, attitude, station. Course of normal labour and delivery. Malpresentation. Instrumental delivery: demonstration on pelvic simulator.

**5<sup>th</sup> week:**

**Lecture:** Cancer screening in gynaecology - cervix, endometrium, ovary  
**Practical:** High risk pregnancy. Fetal surveillance.

**6<sup>th</sup> week:**

**Lecture:** Conception and the normal pregnancy.

**7<sup>th</sup> week:**

**Lecture:** Maternal diseases and pregnancy. Pathological pregnancy.

**8<sup>th</sup> week:**

**Lecture:** Assessment of fetal well-being, during pregnancy and labour.

**9<sup>th</sup> week:**

**Lecture:** Normal and abnormal labour, delivery.

**10<sup>th</sup> week:**

**Lecture:** Emergency cases in obstetrics.

**11<sup>th</sup> week:**

**Self Control Test (Oral exam exemption test)**

**12<sup>th</sup> week:**

**Practical:** Block practical - 1<sup>st</sup> group, first week

**13<sup>th</sup> week:**

**Practical:** Block practical - 1<sup>st</sup> group, second week

**14<sup>th</sup> week:**

**Practical:** Block practical - 2<sup>nd</sup> group, first week

**15<sup>th</sup> week:**

**Practical:** Block practical - 2<sup>nd</sup> group, second week

## Requirements

Attending practices is mandatory. Absences must be made up even if resulting from medically documented illness or similar, by joining other group, but not more than twice in a semester, as significant unplanned changes of group size will worsen the quality of practical teaching. For the same reason, if more than 3 students from another group will come, the instructor will refuse those who arrived the latest, except if still less than 5 students per one instructor are present.

Signature in the lecture book will be declined if arrears exist at the end of semester.

White lab coat in clean, neat condition should be brought and worn when visiting wards or outpatient clinics. If forgotten, a limited number of spare lab coats is available against student cards. It must be arranged with the storekeeper well before (10 min) the starting time to prevent delays.

Attendance at lectures is also highly recommended as certain aspects may be covered only there, and will be asked either in the written or in the oral exam.

End of semester exams (ESE) (oral) are taken in the exam period of both 1<sup>st</sup> and 2<sup>nd</sup> semester, covering two titles. List of titles are in accordance with the current textbook, and are shown on the noticeboard in front of the lecture hall.

The Department offers oral exam exemption tests in both semesters. If passed, and the lecture book has been signed, the mark will be offered as a final ESE grade. If the student decides not to accept the offered grade, the above described oral exam can be taken as exam "A". The final grade can be better or worse than the offered grade.

## Department of Pediatrics

Subject: **CLINICAL GENETICS**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

**1<sup>st</sup> week:**

**Lecture:** The fundamentals of classical genetics. Terminology and classification of congenital abnormalities.

**2<sup>nd</sup> week:**

**Lecture:** Clinical cytogenetics. Numerical and structural chromosome aberrations, autosomal and X - linked

disorders.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Molecular genetics of neuromuscular diseases.
<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Genetic counselling. Prenatal diagnosis. Biology of amniotic fluid, AFP, amniocentesis.	<b>8<sup>th</sup> week:</b> <b>Lecture:</b> Inborn errors of metabolism. Neonatal screening studies.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Cancer genetics. Tumorspecific chromosome aberrations, cellular oncogenes, tumor suppressor genes. Activation of cellular oncogenes by chromosome aberrations.	<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Prenatal ultrasound diagnosis. Fetal structural abnormalities.
<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Tumorspecific chromosome aberrations and their clinical importance. Tumorigenesis.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Environmental mutagens, carcinogens. Prevention.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Molecular biological methods in clinical diagnosis. PKU, CF, haemophilia.	<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Pedigree analysis, case reports. Genetic counselling.

## Requirements

Requirements for signing the lecture book. In case of more than one absence the Lecture Book will not be signed except in case of documented illness or other reasonable cause. Absences may be compensated on the basis of agreement with the tutor.

Evaluation: Students take the oral examination (two titles) during the examination period.

## Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOLOGY I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Practical: **20**

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

**Lecture:** Introduction to autonomic pharmacology. Cholinceptor-activating and cholinesterase-inhibiting drugs. Cholinceptor-blocking drugs.

**Seminar:** Basic principles 1.

### 2<sup>nd</sup> week:

**Lecture:** Adrenoceptor-activating and other sympathomimetic drugs I. Adrenoceptor-activating and other sympathomimetic drugs II. Adrenoceptor-blocking drugs.

**Seminar:** Basic principles 2. Autonomic nervous system 1.

### 3<sup>rd</sup> week:

**Lecture:** Diuretics and antidiuretics 1. Diuretics and antidiuretics 2. Calcium antagonists.

**Seminar:** Basic principles 3. Autonomic nervous system 2.

### 4<sup>th</sup> week:

**Lecture:** Antihypertensive agents 1. Antihypertensive agents 2. Agents used in hyperlipidemia, insulin resistance.

**Seminar:** Basic principles 4. Cardiovascular system 1.

### 5<sup>th</sup> week:

**Lecture:** Agents used in cardiac arrhythmias 1. Agents used in cardiac arrhythmias 2. Myocardial ischemia, antianginal drugs.

**Seminar:** Basic principles 5. Cardiovascular system 2.

### 6<sup>th</sup> week:

**Lecture:** Positive inotropic drugs 1. Positive inotropic drugs 2. NO donors and inhibitors.

**Seminar:** Basic principles 6. Cardiovascular system 3.

### 7<sup>th</sup> week:

**Lecture:** Vasodilators Bronchodilators and other agents used in asthma. Drugs used in disorders of coagulation.

**Seminar:** Basic principles 7. Cardiovascular system 4.

### 8<sup>th</sup> week:

**Lecture:** Agents used in anemias, hemopoietic growth factors. Regulation of the appetite. Pharmacotherapy of obesity. Drugs used in acid-peptic disease.

**Seminar:** Basic principles 8. Drug formulae and prescription writing 1.

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**9<sup>th</sup> week:**

**Lecture:** Drugs promoting gastrointestinal motility. Antiemetic drugs. Laxatives. Antidiarrheal drugs. Drugs used in the treatment of chronic inflammatory bowel disease.

**Seminar:** Basic principles 9. Drug formulae and prescription writing 2.

**10<sup>th</sup> week:**

**Lecture:** Pancreatic enzyme replacement products. Pharmacology of the liver. Botanical (herbal) remedies.

**Seminar:** Respiratory system. Gastrointestinal system.

## Requirements

Prerequisites: Biochemistry, Physiology

Attendance at lectures is highly recommended, since the topics in examination cover the lectured topics. Attendance register will be performed regularly.

Attendance at seminars is compulsory. The Department may refuse to sign the student's Lecture Book if he/she is absent from more than 2 seminars.

At the end of the 1st semester the students are required to take the End of Semester Examination (written and oral), based on the material taught in the semester.

## Department of Preventive Medicine

Subject: **PREVENTIVE MEDICINE AND PUBLIC HEALTH I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **30**

Seminar: **40**

**1<sup>st</sup> week:**

**Lecture:** 1. The history, scope and methods of public health and preventive medicine 2. Introduction to human ecology 3-4. Global environmental pollution (class seminar)

**Seminar:** 1. Effects of environmental pollution – POPs (case study) 2. Health effects of foodborne exposures (case study)

**2<sup>nd</sup> week:**

**Lecture:** 5. Air pollution and health 6. Water pollution and health 7-8. Toxicology of persistent organic pollutants, pesticides and organic solvents (class seminar)

**Seminar:** 3. Health effects of exposures of drinking water sources (case study) 4. Health effects of workplace-related exposures (case study)

**3<sup>rd</sup> week:**

**Lecture:** 9. Nutritional deficiency diseases 10. Food borne diseases 11-12. Diet related diseases. The role of diet in the pathogenesis of cardiovascular diseases and malignant neoplasm (class seminar)

**Seminar:** 5. Physical and chemical examination of drinking water and food (lab practice for small group) 6. Bacteriological and mycological examination of water and food (lab practice for small group)

**4<sup>th</sup> week:**

**Lecture:** 13. Introduction to occupational toxicology 14. Scope of occupational health 15-16. Occupational diseases (class seminar)

**Seminar:** 7. Diet and risk of chronic diseases 8.

Diagnosing occupational diseases (case studies)

**5<sup>th</sup> week:**

**Lecture:** 17. Health effects of noise 18. Heavy metals in the human environment 19. Bioterrorism and possible tools of prevention (class seminar) 20. Genetic susceptibility to chronic diseases at individual and population levels (class seminar)

**Seminar:** 9. Water quality control laboratory (visit) 10. Environmental radiation controlling laboratory (visit)

**6<sup>th</sup> week:**

**Lecture:** 21. The history, definition and scope of epidemiology 22. Epidemiological investigations

**Seminar:** 11. Basic biostatistics 12. Biostatistical methods in epidemiological investigations

**7<sup>th</sup> week:**

**Lecture:** 23. Frequency measures in epidemiology 24. Study design

**Seminar:** 13. Validity of epidemiological studies 14. Types of epidemiological studies

**8<sup>th</sup> week:**

**Lecture:** 25. Analyses based on aggregate statistics 26. Conclusions of the epidemiological studies

**Seminar:** 15. Using research results in clinical practice 16. Using epidemiological measures in practice

**9<sup>th</sup> week:**

**Lecture:** 27. Interventional studies 28. Randomized controlled trials

**Seminar:** 17. Clinical trials 18. Critical evaluation of the epidemiological literature

**10<sup>th</sup> week:**

**Lecture:** 29. Preventive strategies 30. Screening

**Seminar:** 19. Preventive strategies 20. Screening programs

## Requirements

Requirements for signing the lecture book:

Attendance of lectures and class seminars is highly recommended. Only those can participate at the Endre Jenev Memorial Competition at the end of the 2<sup>nd</sup> semester, who has participated at least 60% of lectures and class seminars both semester separately. The competition will be held from the materials of lectures and class seminars of the full academic year.

The slides of lectures and class seminars can be downloaded from our website ([www.publichealth.hu/pdf](http://www.publichealth.hu/pdf)).

Attendance of the laboratory practices, visits and group seminars is obligatory. The head of the department may refuse to sign the Lecture Book if a student is absent more than twice from practices or seminars in a semester even if he/she has an acceptable excuse. The absences at seminars should be made up with another group only in the same week.

Requirements for the exam:

During the last week of the first semester (week 10) students are required to take a written test which will cover the topics of all lectures and seminars of the first semester. Evaluation of the written test is assessed on a five-grade scale, successful pass of the exam is a prerequisite of the commencement of the second semester.

## Department of Radiology

Subject: **RADIOLOGY AND NUCLEAR MEDICINE I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

**1<sup>st</sup> week:**

**Lecture:** Imaging methods in radiology (X-ray, CT, MRI).

**Practical:** Demonstration of US, X-ray laboratories.

**2<sup>nd</sup> week:**

**Lecture:** Principles of radiotherapy.

**Practical:** Demonstration (LINAC, Teleradiotherapy).

**3<sup>rd</sup> week:**

**Lecture:** The thorax (lungs and pleura).

**Practical:** Diseases of the lungs, pleura and diaphragm.

**4<sup>th</sup> week:**

**Lecture:** The thorax (heart and pericardium).

**Practical:** Diseases of the heart and pericardium.

**5<sup>th</sup> week:**

**Lecture:** The abdomen (liver, biliary tract).

**Practical:** Diseases of the liver and the biliary tract.

**6<sup>th</sup> week:**

**Lecture:** The pancreas and the spleen.

**Practical:** Diseases of the pancreas.

**7<sup>th</sup> week:**

**Lecture:** The abdomen (esophagus, stomach).

**Practical:** Diseases of the gastrointestinal tract.

**8<sup>th</sup> week:**

**Lecture:** The abdomen (small bowel, large bowel).

**Practical:** Diseases of the gastrointestinal tract. Acute abdomen.

**9<sup>th</sup> week:**

**Lecture:** Traumatology and the examination of the extremities.

**Practical:** Traumatology.

**10<sup>th</sup> week:**

**Lecture:** The diseases of the bones.

**Practical:** The bone diseases.

## Department of Traumatology and Hand Surgery

Subject: **TRAUMATOLOGY I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

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

**Lecture:** 1. The role of trauma surgery in the medicine. The bone healing process (biology, biomechanics). The diagnostics and treatment of fractures. Classifications of closed and open fractures. The basic principle of the fractures treatment. The types of conservative and operative bone fracture treatment. 2. Open fractures and septic complications. 3. The wound healing process. Closed and open soft tissue injuries, wound treatment. Types of bleeding. Diagnostics and treatment of closed and open vessel injuries.

### 2<sup>nd</sup> week:

**Lecture:** 1. Injuries of the thorax. Rib fractures. Pulmonal contusion. Pneumothorax, haemothorax. Heart and pericardial injuries. Indications of drainage of the thorax and thoracotomy. 2. Closed and open abdominal injuries. Diagnostics and operative treatment of abdominal organ injuries. Diaphragmatic muscle reapture. Retroperitoneal organ injuries. 3. Ligament, bone and joint replacement. Metals and plastics in the trauma surgery. Biological osteosyntheses.

### 3<sup>rd</sup> week:

**Lecture:** 1. The role of arthroscopy in the diagnostics and operative treatment of joints. Knee injuries. 2. Indications, techniques and evaluation of replantations. Revascularisation syndrome. Skin defects, covering of skin defects. 3. Trauma in childhood. Injuries and treatment of the growing bone.

### 4<sup>th</sup> week:

**Lecture:** 1. Craniocerebral injuries. Calvarial fractures. Brain oedema. Diagnostics treatment of intracranial bleedings. 2. Diagnostics and treatment of vertebral fractures with or without nervous system injuries. Physiology of nerve regeneration. Diagnostics and treatment of periferal nerve injuries. 3. Diagnostics and treatment of posttraumatic complications. Compartment syndrome. Sudeck dystrophy. Delayed bone union, nonunion. Posttraumatic arthrosis.

### 5<sup>th</sup> week:

**Lecture:** 1. Mass injuries. Trauma severity scales. Poly and multiple trauma. 2. Classification of pelvic fractures, conservative and operative treatment. Fractures of the acetabulum. Traumatic hip dislocations. 3. Treatment algorithm of severely injured patients. ATLS. Intensive care. Traumatic haemorrhagic shock. Liquid and electrolyte treatment.

### 6<sup>th</sup> week:

**Practical:** Physical examination of the trauma patient. Anemnesis. General physical examination. Functional examination of the extremities (neutral 0 method). Examination of circulation and inervation. Imageing in the trauma treatment. Basic principle of x-ray examinations. Special investigations (CT, MRI, DSA, Color-Doppler, ultrasound). How to ask for imaging. Evaluation of X-rays.

### 7<sup>th</sup> week:

**Practical:** The basic principle of wound treatment. Sutures, knot tying, suture removal. Bandage. Tetanus and Lyssa profilaxis.

### 8<sup>th</sup> week:

**Practical:** Types of conservative fracture treatment. Roles of application of plasters. Soft bandages, braces, orthesises. Traction treatment.

### 9<sup>th</sup> week:

**Practical:** Operative fracture treatment. Implantations. Metallosis, corrosion, metal allergy. Types of osteosyntheses. Diagnostic and operative arthroscopy. Basic principles of osteosyntheses.

### 10<sup>th</sup> week:

**Practical:** Treatment of seriously injured patients. ATLS (Advanced Trauma Life Support). Resuscitation.

## Requirements

The lectures will take place in the Augustza big lecture hall. We strongly advise to participate on the lectures, because the official tesxtbook include not all the diagnostic and therapeutic knowledge. The practices will take place two hours a week at he Department of Trauma and Hand Surgery (4031 Debrecen, Bartók B. u. 2-26). Participation on the partices is obligatory.

In one semester one absent is acceptable, but the student has to come to the trauma duty to compensate it (confirmed and signed by the chief of the trauma duty). In case of not justified absent the lecture book will not signed, and the student can not go to the exam. Sign of the lecture book will take place the week before the exam period, at the

secretariat of the Department of Trauma and Hand Surgery.

Type of the exam: emphasised mode oral exam (ESE). Registration to the exam should be done the day before the exam till 12.00 hour on the internet Neptun3 program.

At the repeated exam the student should present the certification of the Education Department.

The Bulletin and Schedule can be found at the website of Department of Trauma and Hand Surgery ([www.traumatologia.deoec.hu](http://www.traumatologia.deoec.hu)).

## Institute of Surgery

Subject: **SURGERY I.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

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

**Lecture:** The history of surgery

**Practical:** Introduction to the various departments of the Institute. Case presentations

### 2<sup>nd</sup> week:

**Lecture:** Patient counseling, informed consent. Ethical and legal aspects.

**Practical:** The role of history taking and physical examination in surgical diseases. Case presentations

### 3<sup>rd</sup> week:

**Lecture:** Wound healing, surgical infections. Tetanus, gas gangrene

**Practical:** Indications for surgery, issues of operability. Case presentations

### 4<sup>th</sup> week:

**Lecture:** Diseases of the esophagus

**Practical:** Differential diagnosis of acute abdominal diseases. Case presentations

### 5<sup>th</sup> week:

**Lecture:** Benign gastric lesions. Gastric cancer

**Practical:** Imaging diagnostics in surgery. Case presentations

### 6<sup>th</sup> week:

**Lecture:** Diseases of the biliary tract and gall bladder

### 7<sup>th</sup> week:

**Lecture:** Hepatic surgery

### 8<sup>th</sup> week:

**Lecture:** Pancreatitis, pancreas malignancies

### 9<sup>th</sup> week:

**Lecture:** Diseases of the spleen. Laparoscopy in surgery

### 10<sup>th</sup> week:

**Lecture:** Hernia surgery

## Requirements

During the first semester students have to complete 10 practices in 5 weeks. One missing a practice has to make it up with another group on the same week. The Head of the Department may refuse to sign the Lecture Book if a student was absent from more than one practice during the semester without an acceptable reason.

Mid-year practice block: Students complete two weeks of practice in the Institute under the supervision of an assigned tutor. Following the daily schedule of their tutor, students are encouraged to participate in the ward activities and the outpatient care. Tutorial consultations and evaluation meetings are available once per week. Practice hours are between 7.30 AM and 1.30 PM (weekdays only).

Examination: written test covering the topics of the first semester.

## Department of Behavioural Sciences

Subject: **BEHAVIOURAL SCIENCES FINAL EXAM**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

### Requirements

The final examination of behavioural sciences covers all the materials of medical psychology, bioethics, medical anthropology, medical sociology and behavioural medicine.

In the written „A” exam 100 test questions should be solved. All of the students must solve the medical psychological and bioethical tests but only **two subjects**’ tests should be chosen from medical anthropology, medical sociology and behavioural medicine.

0-50%	fail,
51%-60%	pass,
61%-70%	satisfactory,
71%-80%	good,
81%-100%	excellent.

In the case of „B” and „C” oral exams the students have to answer an item on the list of questions in front of a teachers’ board.

## Department of Internal Medicine

Subject: **INTERNAL MEDICINE IV. (ENDOCRINOLOGY, NEPHROLOGY)**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

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

**Lecture:** 1. Diagnostic approach to thyroid diseases. Iodine metabolism. Iodine deficiency. 2. Hyperthyroidism, signs and symptoms. Graves'disease. Graves' ophthalmopathy. Toxic adenoma. Thyroid storm.  
**Practical:** Endocrinology I.

#### 2<sup>nd</sup> week:

**Lecture:** 3. Hypothyroidism. Thyroiditis. 4. The thyroid nodule. Thyroid cancer. Multiple endocrine neoplasia. The carcinoid syndrome. Hypoglycemic disorders.  
**Practical:** Endocrinology II.

#### 3<sup>rd</sup> week:

**Lecture:** 5. Adrenal insufficiency. Hypadrenic crisis. Cushing's disease and syndrome. 6. Case presentation  
**Practical:** Nephrology I.

#### 4<sup>th</sup> week:

**Lecture:** 7. Mineralocorticoid excess. Congenital adrenal hyperplasia. Pheochromocytoma 8. Diseases of the anterior pituitary. Hypo and hyperfunction. Posterior pituitary, diabetes insipidus, SIADH.  
**Practical:** Nephrology II.

#### 5<sup>th</sup> week:

**Lecture:** 9. Hyper and hypoparathyroidism. Hypercalcemic states. 10. Case presentation  
**Practical:** Renal replacement therapy /Department of Nephrology

#### 6<sup>th</sup> week:

**Lecture:** 11. Clinical examination of renal patients. History talking. Symptoms and syndromes. 12. Chronic glomerulonephritis

#### 7<sup>th</sup> week:

**Lecture:** 13. Acute and rapidly progressive glomerulonephritis 14. Tubulointerstitial nephritis.

#### 8<sup>th</sup> week:

**Lecture:** 15. Acute renal insufficiency 16. Case presentation

#### 9<sup>th</sup> week:

**Lecture:** 17. Pregnancy and the kidney 18. Chronic renal insufficiency

#### 10<sup>th</sup> week:

**Lecture:** 19. Diabetes nephropathy. Vascular nephropathy.



20. Renal replacement therapy	<b>13<sup>th</sup> week:</b> <b>Practical:</b> Block practice
<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Scientific competition. <b>Practical:</b> Block practice	<b>14<sup>th</sup> week:</b> <b>Practical:</b> Block practice
<b>12<sup>th</sup> week:</b> <b>Practical:</b> Block practice	<b>15<sup>th</sup> week:</b> <b>Practical:</b> Block practice

## Requirements

Requirements for signing the lecture book: Nobody should be absent from any practice unless due to well-documented reasons. All missed practises should be repeated some other time, discussed by the tutor. Everyone must be able to communicate with patients including history taken in Hungarian. The official material of examinations may include materials of all lectures and recommended books.

## Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY II.**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **5**

Practical: **10**

<b>1<sup>st</sup> week:</b> <b>Lecture:</b> Psychosomatics in obstetrics and gynaecology	Principles of surgical treatment. Systemic antibiotics and topical anti-inflammatory therapy in gynecology
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Ovarian cancer	<b>9<sup>th</sup> week:</b> <b>Practical:</b> Case presentations: Gynecological malignancies
<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Endometrial cancer	<b>10<sup>th</sup> week:</b> <b>Practical:</b> Case presentations: Uterovaginal prolapse and urinary incontinence
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Inflammation and infection of the pelvic organs	<b>11<sup>th</sup> week:</b> <b>Practical:</b> Block practice - 1 <sup>st</sup> group, first week
<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Menopause and postmenopause	<b>12<sup>th</sup> week:</b> <b>Practical:</b> Block practice - 1 <sup>st</sup> group, second week
<b>6<sup>th</sup> week:</b> <b>Practical:</b> Special aspects of practical gynecology. Common gynecological procedures.	<b>13<sup>th</sup> week:</b> <b>Practical:</b> Block practice - 2 <sup>nd</sup> group, first week
<b>7<sup>th</sup> week:</b> <b>Practical:</b> Case presentations: Management of abnormal uterine bleeding. Contraception counseling. The infertile couple: practical approach.	<b>14<sup>th</sup> week:</b> <b>Practical:</b> Block practice - 2 <sup>nd</sup> group, second week
<b>8<sup>th</sup> week:</b> <b>Practical:</b> Case presentations: Evaluation of pelvic mass.	<b>15<sup>th</sup> week:</b> <b>Self Control Test (Oral exam exemption test)</b>

## Requirements

As in 1st semester.

## Department of Orthopedic Surgery

Subject: **ORTHOPAEDIC SURGERY**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **16**

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

**Lecture:** Frequency, pathology and diagnosis, conservative and operative treatment of congenital/developmental dysplasia, dislocation of the hip (DDH, CDH).

**Practical:** Basic principles of examination methods in orthopaedic surgery. Part I. Patient history. Methods of physical examinations of different joints (hip, knee, ankle, foot).

### 2<sup>nd</sup> week:

**Lecture:** Perthes' disease. Transient synovitis of the hip joint. Slipped capital femoral epiphysis. Coxa vara.

**Practical:** Basic principles of examination methods in orthopaedic surgery. Part II. X-ray pictures evaluation. Methods of physical examinations of different joints (shoulder, elbow, wrist, hand, spine, chest).

### 3<sup>rd</sup> week:

**Lecture:** Osteoarthritis of the hip. Aseptic necrosis of the femoral head. Replacement of the hip joint.

**Practical:** Introduction of the orthopaedic implants to the students. X-ray pictures evaluation. The use of hip ultrasonography in pediatric patients. Examination of patients by students and discussion.

### 4<sup>th</sup> week:

**Lecture:** Functional anatomy of the foot. Congenital deformities and diseases of the foot.

**Practical:** Introduction of the orthopaedic implants to the students. X-ray pictures evaluation. The use of hip ultrasonography in pediatric patients. Examination of patients by students and discussion.

### 5<sup>th</sup> week:

**Lecture:** Postural kyphosis. Scoliosis and its treatment.

**Practical:** Introduction of the orthopaedic implants to the students. X-ray pictures evaluation. Basic physiotherapy and rehabilitation. The use of hip ultrasonography in pediatric patients. Examination of patients by students and discussion.

### 6<sup>th</sup> week:

**Lecture:** Spondylolysis and spondylolisthesis. Congenital anomalies of the spine. Scheuermann's disease and its treatment. Degenerative changes of the spine. Spinal stenosis. Disc degeneration and prolapse. Sciatica. Ankylosing spondylitis.

### 7<sup>th</sup> week:

**Lecture:** Diseases of the neck and upper extremities.

### 8<sup>th</sup> week:

**Lecture:** Knee disorders. Knock knee and bow legs. Congenital, habitual and recurrent dislocation of the patella. Chondromalacia patellae. Osteoarthritis of the knee. Replacement of the knee joint.

### 9<sup>th</sup> week:

**Lecture:** Bone tumours and tumour - like lesions

### 10<sup>th</sup> week:

**Lecture:** Bone infection. Acute and chronic osteomyelitis. Suppurative arthritis.

## Requirements

Participation at practicals and compensation for absences from practicals and the requirements of signatures in lecture-books in orthopaedic surgery are not different from the general rules. Besides the textbook and the recommended book the material of lectures is included in the questions of the final examination. Order of verbal exams: The students have to register for the exam on the NEPTUN system. The students pick two titles, from the title list available at the beginning of the Semester. This list can be found on the web site of the Orthopaedic Clinic. Students who attended at least 70 % of the lectures have to answer one title only. In case of a B or C exam the student is not entitled to the above advantage.

## Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOLOGY II.**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **50**

Practical: **20**

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

**Lecture:** Introduction to CNS pharmacology. Neurotransmission and the CNS. Antiepileptics. Sedativehypnotics. Alcohols. Antipsychotics and lithium.  
**Seminar:** Repetition of the pharmacology of the autonomic drugs and the prescription writing.

### 2<sup>nd</sup> week:

**Lecture:** Antidepressants. Antiparkinsonian agents. Pharmacotherapy of Alzheimer's disease. Drugs of abuse 1. Drugs of abuse 2.  
**Seminar:** Pharmacology of the cardiovascular drugs. Antiepileptics and sedativehypnotics.

### 3<sup>rd</sup> week:

**Lecture:** Centrally and peripherally acting skeletal muscle relaxants. Local anesthetics. General anesthetics. Opioid analgesics and antagonists-I. Opioid analgesics and antagonists-II.  
**Seminar:** Pharmacology of the gastrointestinal drugs. Antidepressants. Antiparkinsonian agents.

### 4<sup>th</sup> week:

**Lecture:** Serotonin, agonists and antagonists, the ergot alkaloids and the therapy of migraine. Histamine and antihistaminic drugs. Non-steroidal antiinflammatory drugs 1. Non-steroidal antiinflammatory drugs 2. Pharmacotherapy of rheumatoid arthritis.  
**Seminar:** Muscle relaxants and the pharmacology of anesthesia.

### 5<sup>th</sup> week:

**Lecture:** Pharmacotherapy of gout. Uterotonics, tocolytics, smooth muscle relaxants. Pharmacology of vasoactive peptides. Principles of antimicrobial drug action. Beta-lactam antibiotics.  
**Seminar:** Serotonin, histamine, NSAIDs and RA.

### 6<sup>th</sup> week:

**Lecture:** Chloramphenicol, tetracyclines,

aminoglycosides. Macrolides. (Fluor)quinolones. Antifungal agents. Antiviral chemotherapy and prophylaxis 1.

**Seminar:** Gout. Uterotonics, tocolytics, smooth muscle relaxants. Pharmacology of vasoactive peptides.

### 7<sup>th</sup> week:

**Lecture:** Antiviral chemotherapy and prophylaxis 2. Antiparasitic chemotherapy: Basic principles. Antiprotozoal drugs. Antiparasitic chemotherapy: Antihelminthic drugs. Introduction to endocrine pharmacology. Thyroid and antithyroid drugs. Parathyroid hormone.

**Seminar:** Antibacterial chemotherapy.

### 8<sup>th</sup> week:

**Lecture:** Adrenocorticosteroids and adrenocortical antagonists 1. Adrenocorticosteroids and adrenocortical antagonists 2. Pancreatic hormones and antidiabetic drugs 1. Pancreatic hormones and antidiabetic drugs 2. Pancreatic hormones and antidiabetic drugs 3.  
**Seminar:** Antibacterial chemotherapy. Antihelminthic and antiprotozoal agents.

### 9<sup>th</sup> week:

**Lecture:** The gonadal hormones and inhibitors 1. The gonadal hormones and inhibitors 2. Agents that affect bone mineral homeostasis. Cancer chemotherapy 1. Cancer chemotherapy 2.  
**Seminar:** Antifungal and antiviral agents. Pharmacotherapeutic approach to diabetes mellitus.

### 10<sup>th</sup> week:

**Lecture:** Cancer chemotherapy 3. Immunopharmacology 1. Immunopharmacology 2. Toxicology 1. Toxicology 2.  
**Seminar:** Cancer chemotherapy. Immunopharmacology. Toxicology.

## Requirements

Prerequisites: Pharmacology I.

Attendance at lectures is highly recommended, since the topics in examination cover the lectured topics. Attendance register will be performed regularly.

Attendance at seminars is compulsory. The Department may refuse to sign the student's Lecture Book if he/she is absent from more than 2 seminars.

At the end of the 2nd semester the students are required to take the Final Examination written and oral, based on the material taught in Pharmacology in both semesters.

## Department of Preventive Medicine

Subject: **PREVENTIVE MEDICINE AND PUBLIC HEALTH II.**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **30**

Seminar: **20**

Practical: **15**

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

**Lecture:** 1. Introduction to the epidemiology and surveillance of communicable diseases 2. Characteristics of infectious diseases, steps of outbreak investigation 3. Vaccines and immunization

**Seminar:** 1. Dynamics of infection

**Practical:** 1. Using Epiinfo in epidemiological research

### 2<sup>nd</sup> week:

**Lecture:** 4. Epidemiology of gastrointestinal infections 5. Epidemiology of sexually transmitted diseases 6. Epidemiology of hepatitis

**Seminar:** 2. Outbreak investigation of hepatitis B virus infection in clinical setting

**Practical:** 2. Community emergency care

### 3<sup>rd</sup> week:

**Lecture:** 7. Epidemiology of HIV/AIDS 8. Epidemiology and control of airborne infections 9. Re-emerging infections

**Seminar:** 3. Concept and methods of health monitoring

**Practical:** 3. Control of nosocomial infections (visit)

### 4<sup>th</sup> week:

**Lecture:** 10. Prion diseases: facts and theories in preventive medicine 11. Epidemiology of nosocomial infections 12. Epidemiology and control of zoonoses

**Seminar:** 4. Nosology (filling a death certificate)

**Practical:** 4. Public health databases 1

### 5<sup>th</sup> week:

**Lecture:** 13. Introduction to the epidemiology of non-communicable diseases 14. Epidemiology and control of cardiovascular diseases 15. Epidemiology of cancers

**Seminar:** 5. Priority setting in health care

**Practical:** 5. Public health databases 2

### 6<sup>th</sup> week:

**Lecture:** 16. Epidemiology of chronic respiratory diseases

17. Epidemiology and control of metabolic, gastrointestinal and liver diseases 18. Health status in developing and developed countries

**Seminar:** 6. Health education in primary care

**Practical:** 6. Health education techniques

### 7<sup>th</sup> week:

**Lecture:** 19. Epidemiology of mental disorders and behavioral problems 20. Lifestyle and health: the effects of personal factors on health 21. Lifestyle and health: the effects of alcohol and drug use on health

**Seminar:** 7. Concept and practice of health promotion

**Practical:** 7. Prioritising using public health database

### 8<sup>th</sup> week:

**Lecture:** 22. Environment and health: the effects of socio-economical factors on health 23. Domestic violence 24. Health policy principles in developed countries

**Seminar:** 8. Introduction to health policy

**Practical:** 8. Health systems financing

### 9<sup>th</sup> week:

**Lecture:** 25. Needs, demand and use of health service 26. Methods of financing health services 27. Organization of public health services

**Seminar:** 9. Assessing and improving quality of health services

**Practical:** 9. Interpretation of public health database (computer exam)

### 10<sup>th</sup> week:

**Lecture:** 28. Quality assurance in health systems. Quality measurement and development in health care 29. Improvement of clinical effectiveness 30. Major challenges of preventive medicine and public health

## Requirements

Requirements for signing the lecture book:

Attendance of lectures is highly recommended. Only those can participate at the Endre Jeney Memorial Competition at the end of the 2<sup>nd</sup> semester, who has participated at least 60% of lectures and class seminars both semester separately. The competition will be held from the materials of lectures and class seminars of the full academic year. The slides of lectures and class seminars can be downloaded from our website ([www.publichealth.hu/pdf](http://www.publichealth.hu/pdf)).

Attendance of group seminars, visits and laboratory practices is obligatory. The head of the department may refuse to sign the lecture book if a student is absent more than two times from practices or seminars in a semester even if he/she has an acceptable excuse. The absences at seminars should be made up for with another group in the same week.

Requirements for the final exam:

The final exam (at the end of the second semester) consists of a written part and a practical exam. The final mark of the practical exam is the average of the mark given for the interpretation of public health databases and the mark obtained for the oral exam. The oral exam will cover the topics of all laboratory practices and seminars of the full academic year. The written exam covers the topics of all lectures and group seminars of the full academic year. It is composed of three parts: environmental health, epidemiology and health policy (the three parts will be evaluated separately). The mark of the final exam will be calculated on the basis of the average of the mark given for the practical exam and for the written exam.

The final exam will be failed if either the practical or any part of the written exam is graded unsatisfactory. The student is obliged to repeat only the failed part of the final exam. The mark of the final exam will be calculated on the basis of the average of the repeated part and the previous parts of the exam.

## Department of Pulmonology

Subject: **PULMONOLOGY**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

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

**Lecture:** Respiratory symptoms and signs. Commonly used therapy in pulmonology.

**Practical:** History taking of pulmonary patients. Physical examination. The cardinal respiratory symptoms, signs and complaints.

### 2<sup>nd</sup> week:

**Lecture:** Lung function tests, blood gas analysis.

Laboratory examinations in pulmonary disease.

**Practical:** Bronchoscopy.

### 3<sup>rd</sup> week:

**Lecture:** Chest X-ray, CT scan, tomography, CT.

**Practical:** Lung function test, blood gas analysis.

### 4<sup>th</sup> week:

**Lecture:** COPD I.

**Practical:** Allergy test, skin test. Asthma bronchiale.

### 5<sup>th</sup> week:

**Lecture:** COPD II.

**Practical:** Chronic obstructive lung disease, emphysema, chronic bronchitis.

### 6<sup>th</sup> week:

**Lecture:** Pleural disorders

**Practical:** Pneumonia.

### 7<sup>th</sup> week:

**Lecture:** Lung cancer, symptoms, signs, diagnosis

**Practical:** Demonstration of patients with lung cancer. Differential diagnosis, treatment, prevention.

### 8<sup>th</sup> week:

**Lecture:** Tuberculosis

**Practical:** Tuberculosis/Controll test.

### 9<sup>th</sup> week:

**Lecture:** Pleural disorders

**Practical:** Respiratory failure.

### 10<sup>th</sup> week:

**Lecture:** Lung cancer therapy

**Practical:** Collection of chest X-ray for the exam.

### 11<sup>th</sup> week:

**Lecture:** Occupational lung disease and immunpathogenetic based pulmonary disease. Interstitial lung disease, sarcoidosis

**Practical:** Collection of chest X-ray for the exam.

### 12<sup>th</sup> week:

**Lecture:** Pulmonary embolism, cor pulmonale, pulmonary hypertension

### 13<sup>th</sup> week:

**Lecture:** Asthma bronchiale.

### 14<sup>th</sup> week:

**Lecture:** Chronic respiratory failure.

### 15<sup>th</sup> week:

**Lecture:** Collection of chest X-ray for the exam.

## Department of Radiology

 Subject: **RADIOLOGY AND NUCLEAR MEDICINE II.**

 Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Lecture: **10**

 Practical: **30**
**1<sup>st</sup> week:**
**Lecture:** Principles of radionuclide imaging.

**Practical:** Bone scintigraphy. Visit to the Nuclear Medicine Department.

**2<sup>nd</sup> week:**
**Lecture:** Radionuclide imaging of the central nervous system.

**Practical:** Thyroid, brain, neuroendocrin studies.

**3<sup>rd</sup> week:**
**Lecture:** Radionuclide imaging of the heart and lung.

**Practical:** Heart and lung studies.

**4<sup>th</sup> week:**
**Lecture:** Radionuclide imaging of the genitourinary and gastrointestinal tract.

**Practical:** Dynamic studies: kidney, hepatobiliary, oesophageal, gastric and inflammation.

**5<sup>th</sup> week:**
**Lecture:** Nuclear medicine in oncology.

**Practical:** Oncologic cases.

**6<sup>th</sup> week:**
**Lecture:** The contrast media and the examination of the

breast.

**Practical:** The diseases of the breast.

**7<sup>th</sup> week:**
**Lecture:** The kidney.

**Practical:** The diseases of the urinary tract.

**8<sup>th</sup> week:**
**Lecture:** The skull (the examination of the brain except for MRI).

**Practical:** The diseases of the brain (except for the tumors).

**9<sup>th</sup> week:**
**Lecture:** The brain (MR).

**Practical:** The brain tumors.

**10<sup>th</sup> week:**
**Lecture:** The spine and the spinal cord.

**Practical:** The diseases of the spine and the spinal cord.

**11<sup>th</sup> week:**
**Lecture:** The vascular and lymphatic system.

**Practical:** The vascular diseases.

## Department of Urology

 Subject: **UROLOGY**

 Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester, 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

 Lecture: **10**

 Practical: **16**
**1<sup>st</sup> week:**
**Lecture:** Tumors of the urinary bladder.

**Practical:** Introduction to urological clinical practice, describing the place of urology among all fields of medicine. Visiting the wards and operating theatres.

**2<sup>nd</sup> week:**
**Lecture:** Disorders of the testis, scrotum and spermatic cord. Penile cancer.

**Practical:** Clinical investigation of genitourinary tract, urological laboratory and imaging examinations. Uro-radiological case presentations.

**3<sup>rd</sup> week:**
**Lecture:** Tumors of the prostate.

**Practical:** Differential diagnosis and treatment of the

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obstruction of the urine collecting system: transurethral and suprapubic bladder catheter, uretercatheter, DJ stent, nephrostomy tube. Video demonstration of catheter insertion.

**4<sup>th</sup> week:**
**Lecture:** Female urology. Urodynamics study.

**Practical:** Endoscopy and laparoscopy in urology: indications, methods, benefits, disadvantages, complications. Demonstration of the special instruments.

**5<sup>th</sup> week:**
**Lecture:** Injuries to the genitourinary tract, emergency diagnosis. Male infertility. Male sexual problems.

**Practical:** BPH and prostate cancer: diagnosis, treatment and follow up. Defining differences between the two

diseases. Touching prostate on probe.

**6<sup>th</sup> week:**

**Lecture:** Tumors of the kidney.

**Practical:** Differential diagnosis of scrotal disorders: varicocele, hydrocele, retention of the testicle, testicular atrophy, epididymitis, orchitis, trauma, torsion, testicular cancer, inguinal hernia, oedema. Case presentations at the ward.

**7<sup>th</sup> week:**

**Lecture:** Tumors of the testis.

**Practical:** Urological infections, prevention. When to treat bacteruria. Nosocomial infections. Urine analysis at our laboratory.

**8<sup>th</sup> week:**

**Lecture:** BPH. Retention urine. Clinical assessment and treatment.

**Practical:** Urinary stone disease: etiology, diagnosis, treatment. Discussing the problematic titles of urology.

**9<sup>th</sup> week:**

**Lecture:** Nonspecific infections. Specific infection. Pediatric urology. Congenital anomalies.

**10<sup>th</sup> week:**

**Lecture:** Urinary tract stones. Surgical and non surgical treatment. Radiomorphologic investigation in urology.

## Requirements

Students have to attend all (10) urological practices during the semester. In case of absence the student must compensate for the missing practice (either with joining another group or asking the supervisor about his duty.)

Visiting the lectures is strongly advisable and at least two of them are compulsory. The list of participants is registered on every lecture. The schedule of presentations is available at the website of the department:

[www.urology.med.unideb.hu](http://www.urology.med.unideb.hu).

The official textbook is Nyirády/Romics: Textbook of Urology. The list of topics is based on this book. It is recommended to know the following reading material Paragh/Hajnal: Tessék mondani, since during practice students have to have the ability to communicate with patients.

Our website is regularly updated, so it is advisable to check for exams and other study information as well.

[www.urology.med.unideb.hu](http://www.urology.med.unideb.hu)

## Faculty of Dentistry

Subject: **STOMATOLOGY**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **16**

**6<sup>th</sup> week:**

**Lecture:** Dental caries and diseases of the dental pulp. Focal infections. Development of the teeth and the face. Developmental anomalies.

**Practical:** Anatomy of teeth and identification of teeth in the oral cavity.

**7<sup>th</sup> week:**

**Lecture:** Disorders of the TMJ. Facial pain. Oral Medicine.

**Practical:** Recognising and treatment of orthodontic disorders. Anomalies of the occlusion and dental arches.

**8<sup>th</sup> week:**

**Lecture:** Diseases of the salivary glands. Periodontal diseases. Inflammatory diseases of the maxillo-facial region.

**Practical:** Oral symptoms of organs' diseases. Picture of

healthy and pathologic oral mucosa. Treatment and prevention of periodontal diseases.

**9<sup>th</sup> week:**

**Lecture:** Stomato-oncology. Pediatric Dentistry. Preventive Dentistry.

**Practical:** Dental and maxillo-facial traumatology. Treatment and prevention of stomato-oncological diseases.

**10<sup>th</sup> week:**

**Lecture:** Traumatic injuries of the teeth and surrounding soft tissues. Fractures of the jaws, injuries of the face. Prosthetic dentistry. Implantology.

**Practical:** Local anaesthesia in the dentistry. Simple tooth extraction and possible complications. Instruments of the tooth extraction.

## Requirements

Students who are absent from the practice lessons will not have their lecture-books signed. Compensation of absence: The student has to attend the missed topic with the other group with the agreement of the chief educational officer. The number of compensated or uncompensated practical occasion can not exceed **one** (3 hours).

Topic of exam: textbook + lectures + topic of practice lessons

Exam-days will be announced 4 weeks before the exam-period. Students are required to register for the exam through the NEPTUN system.

Information:

Mon.- Thurs. 1.30-3 pm., Fri. 1.30-2 pm in the Educational Office of the Faculty of Dentistry

Minimum number of students for an exam day is 5, the maximum is 10.

## Institute of Surgery

Subject: **SURGERY II.**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

**1<sup>st</sup> week:**

**Lecture:** Inflammatory Bowel Diseases

**2<sup>nd</sup> week:**

**Lecture:** Surgical treatment of colorectal cancer

**3<sup>rd</sup> week:**

**Lecture:** Bowel obstruction. Proctology

**4<sup>th</sup> week:**

**Lecture:** Acute abdomen. Surgical emergencies

**5<sup>th</sup> week:**

**Lecture:** Diseases of the thyroid and parathyroid gland

**6<sup>th</sup> week:**

**Lecture:** Adrenal surgery. Carcinoid, GIST

**7<sup>th</sup> week:**

**Lecture:** Benign breast lesions. Breast cancer

**8<sup>th</sup> week:**

**Lecture:** Vascular surgery (arterial and venous diseases)

**9<sup>th</sup> week:**

**Lecture:** Thoracic surgery

**10<sup>th</sup> week:**

**Lecture:** Transplantation surgery

## Requirements

There are no weekly practices during the second semester.

Mid-year practice block: Students complete two weeks of practice in the Institute under the supervision of an assigned tutor. Following the daily schedule of their tutor, students are encouraged to participate in the ward activities and also in the outpatient care. Tutorial consultations and evaluation meetings are available once per week. Practice hours are between 7.30AM and 1.30PM (weekdays only).

Examination: written test covering the topics of both semesters.



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## CHAPTER 13

### ACADEMIC PROGRAM FOR THE 5TH YEAR

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#### Department of Anesthesiology and Intensive Care

Subject: **ANESTHESIOLOGY AND INTENSIVE CARE**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **20**

**1<sup>st</sup> week:**

**Lecture:** General guidelines of anesthesiology and intensive care. Severity scoring systems.

**Practical:** Securing airways.

**2<sup>nd</sup> week:**

**Lecture:** Respiratory insufficiencies: definition, causes, types and basic guidelines of treatment

**Practical:** Monitoring ventilation

**3<sup>rd</sup> week:**

**Lecture:** Oxygen therapy and artificial ventilation

**Practical:** Practical demonstration of oxygen therapy and mechanical ventilation. Practical conduct of mechanical ventilation

**4<sup>th</sup> week:**

**Lecture:** Intensive treatment of the hemodynamically unstable critically ill

**Practical:** Possibilities of hemodynamic monitoring: CVP, pulmonary artery catheter, PiCCO, NICO, central venous oxygen saturation etc.

**5<sup>th</sup> week:**

**Lecture:** Life-threatening disturbances of fluid-electrolyte balance. Guidelines of volume therapy

**Practical:** Indications and practice guidelines of clinical nutrition

**6<sup>th</sup> week:**

**Lecture:** The treatment of the acid-base disturbances

**Practical:** The diagnostic steps and treatment of acid-base disturbances

**7<sup>th</sup> week:**

**Lecture:** Sepsis and multiple organ failure

**Practical:** Intrahospital transport of the critically ill

**8<sup>th</sup> week:**

**Lecture:** Brain death and donor conditioning

**Practical:** The daily anesthesiological and intensive care work at the place of your practicals

**9<sup>th</sup> week:**

**Lecture:** General (intravenous and inhalational) anesthesia

**Practical:** Anesthesiological risk. Premedication

**10<sup>th</sup> week:**

**Lecture:** Regional anesthesia

**Practical:** The anesthesia working place

### Requirements

Conditions of signing the Lecture book: The student is required to attend the practicals, two absences are allowed in a semester. Any further absences are accepted if the student attends the practical of another group and certifies his/her absence. Exam: The exam consists of two parts. MCQ-s have to be filled first as minimal requirements. In order to continue the exam at least 60% of the answers must be correct. The oral part contains questions related to the lectures and practicals. Every student has to answer two oral questions. In case of uncertainty, the examiner might ask other questions related to other topics in order to make sure his decision on the mark given.

## Department of Dermatology

Subject: **DERMATOLOGY**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **15**

Seminar: **10**

Practical: **20**

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

**Lecture:** Anatomy, physiology and pathology of the skin.

Introduction to dermatology

**Seminar:** Bacterial infections

**Practical:** Introduction to dermatology: dermatological anamnesis. Primary and secondary lesions, dermatological status, moulages

### 2<sup>nd</sup> week:

**Lecture:** Ekzemas, atopic dermatitis

**Seminar:** Mycotic infections

**Practical:** Practicing primary and secondary lesions, dermatological status, patient examination

### 3<sup>rd</sup> week:

**Lecture:** Autoimmune disorders (LE, scleroderma, dermatomyositis)

**Seminar:** Syphilis, gonorrhoea, other sexually transmitted diseases

**Practical:** Oral test: primary and secondary lesions, patient examination

### 4<sup>th</sup> week:

**Lecture:** Papulosquamous disorders

**Seminar:** Drug allergy, cutaneous

**Practical:** Patient examination, mycological examination

### 5<sup>th</sup> week:

**Lecture:** Chronic vein insufficiency

**Seminar:** Skin tumors originating from non-pigment cells

**Practical:** Patient examination, STD laboratory testing

### 6<sup>th</sup> week:

**Lecture:** Seborrhoea, acne, rosacea, perioral dermatitis  
The skin and internal diseases

**Seminar:** Naevuses, Malignant melanoma

**Practical:** Patient examination, local treatments I, dermatological prescriptions, burn

### 7<sup>th</sup> week:

**Lecture:** Topical and systemic therapy in dermatology  
Dermatosurgery, histology

**Seminar:** Psoriasis

**Practical:** Local treatments II (written test), patient examination (oral test), phototherapy

### 8<sup>th</sup> week:

**Lecture:** Viral and parasitic dermatoses AIDS

**Seminar:** Urticaria

**Practical:** Local treatments III, patient examination,

allergological skin tests

### 9<sup>th</sup> week:

**Lecture:** Hair and nail diseases Kaposi-sarcoma, cutaneous lymphomas, and common benign tumors

**Seminar:** Bullous autoimmune diseases

**Practical:** Dermatoscopy, patient examination (written test)

### 10<sup>th</sup> week:

**Lecture:** The skin and internal disease. Autoimmune disorders (LE, scleroderma, dermatomyositis)

**Practical:** Consultation. Possible written test - compensations

### 11<sup>th</sup> week:

**Practical:** Blok of parctice I. (practice at the inpatient clinic and block of practice):

- visit at the inpatient clinic (general dermatology department, burn department)

- outpatient clinic (in a rotational system: general dermatology, mycology-STD, allergology-immunology, psoriasis, cosmetology, naevus-melanoma)

- practice at the inpatient clinic

### 12<sup>th</sup> week:

**Practical:** Block of Parctice I. (practice at the inpatient clinic and block of practice)

- visit at the inpatient clinic (general dermatology department, burn department)

- outpatient clinic (in a rotational system: general dermatology, mycology-STD, allergology-immunology, psoriasis, cosmetology, naevus-melanoma)

- practice at the inpatient clinic

### 13<sup>th</sup> week:

**Practical:** Block of practice II. (practice at the inpatient clinic and block of practice)

- visit at the inpatient clinic (general dermatology department, burn department)

- outpatient clinic (in a rotational system: general dermatology, mycology-STD, allergology-immunology, psoriasis, cosmetology, naevus-melanoma)

- practice at the inpatient clinic

### 14<sup>th</sup> week:

**Practical:** Block of practice II. (practice at the inpatient clinic and block of practice)

- visit at the inpatient clinic (general dermatology department, burn department)  
 - outpatient clinic (in a rotational system: general dermatology, mycology-STD, allergology-immunology, psoriasis, cosmetology, naevus-melanoma)  
 - practice at the inpatient clinic

**15<sup>th</sup> week:**
**Lecture:** Examination week

**Seminar:** Examination week

**Practical:** Examination week

## Requirements

Requirements for signing the lecture book:

Presence of the students is recorded at all practices and compulsory lectures assigned.

Attendance is obligatory at all practicals and compulsory lectures. Presence can be checked up during as well as at the end of the occasions. If the student is not present at the control, it is considered as an absence.

The number of missed practicals can not exceed 1 occasions (2 practical hours). Absences superior to this number are subjects to compensation. A maximum of 2 practicals (4 practical hours) can be compensated during one semester. Compensations performed beyond the semester will be charged for each occasion.

No signature will be given in lecture book with more than 1 uncompensated practice and 2 unattended compulsory lectures..

The written tests (prescription test, patient admission test) have to be completed, otherwise no signature will be given in lecture book.

Lectures are very important sources of information. No regard will be taken to anyone's absence, with other words: at any test during the semester, including the final exam, questions concerning topics that were discussed only at a lecture, where the student was absent, may and will be asked from any student.

## Department of Family and Occupational Medicine

Subject: **FAMILY MEDICINE**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Seminar: **10**

**1<sup>st</sup> week:**

**Seminar:** 1. Primary health care. General practice/family medicine.

**2<sup>nd</sup> week:**

**Seminar:** 2. Doctor-patient consultation in general practice/family medicine. Diagnosis and treatment in primary care.

**3<sup>rd</sup> week:**

**Seminar:** 3. Working with families in primary health care.

**4<sup>th</sup> week:**

**Seminar:** 4. Prevention in primary care.

**5<sup>th</sup> week:**

**Seminar:** 5. Quality in general practice: Medical audit, practice guidelines in general practice.

## Requirements

Requirements for signing the lecture book: The grade is calculated according to the result of the written exam and activity during the seminars.

## Department of Forensic Medicine

Subject: **FORENSIC MEDICINE I.**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

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

**Lecture:** Introduction to Forensic Medicine.

**Practical:** Getting to know the Department of Forensic Medicine.

Practices between 1<sup>st</sup> - 11<sup>th</sup> week: Usual and special autopsy techniques, external examination of dead person autopsy cases and case studies on the above mentioned topics.

### 2<sup>nd</sup> week:

**Lecture:** Forensic autopsies.

### 3<sup>rd</sup> week:

**Lecture:** Time of death. Postmortem changes after death I.

### 4<sup>th</sup> week:

**Lecture:** Postmortem changes after death II.

### 5<sup>th</sup> week:

**Lecture:** Types of injuries and wounds I.

### 6<sup>th</sup> week:

**Lecture:** Types of injuries and wounds II. Vital injuries.

### 7<sup>th</sup> week:

**Lecture:** Traffic accident victims.

### 8<sup>th</sup> week:

**Lecture:** Craniocerebral trauma. Electrical injuries.

### 9<sup>th</sup> week:

**Lecture:** Firearm injuries. Effects of heat and cold. Fire deaths.

### 10<sup>th</sup> week:

**Lecture:** Death due to asphyxia I-II.

### 11<sup>th</sup> week:

**Lecture:** Physical and biological trace evidences.

## Department of Infectious Diseases and Pediatric Immunology

Subject: **INFECTOLOGY**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **20**

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

**Lecture:** 1. Infection and immunity; antimicrobial host defense mechanisms. 2. Infection control in hospital settings. Influenza

**Practical:** Nosocomial infections in hematology/oncology units.

### 2<sup>nd</sup> week:

**Lecture:** 3. Differential diagnosis of exanthematous diseases. Immunization. 4. Infections by herpesviruses and enteroviruses.

**Practical:** Catheter-related and invasive infections in intensive care units.

### 3<sup>rd</sup> week:

**Lecture:** 5. HIV infection and AIDS. 6. Gastrointestinal infections.

**Practical:** Infectious diseases practice. (Kenézy Hospital, Adult Infectology)

### 4<sup>th</sup> week:

**Lecture:** 7. Respiratory tract infections. 8. Infections by pyogenic bacteria.

**Practical:** Infectious diseases practice. (Kenézy Hospital, Adult Infectology)

### 5<sup>th</sup> week:

**Lecture:** 9. Anaerob infections. 10. Zoonoses.

**Practical:** Infectious diseases practice. (Kenézy Hospital, Adult Infectology)

### 6<sup>th</sup> week:

**Practical:** Infectious diseases practice. (Department of Infectious and Pediatric Immunology)

### 7<sup>th</sup> week:

**Practical:** Infectious diseases practice. (Department of Infectious and Pediatric Immunology)

**8<sup>th</sup> week:**

**Practical:** Infectious diseases practice. (Department of Infectious and Pediatric Immunology)

**9<sup>th</sup> week:**

**Practical:** Infectious diseases practice. (Department of Infectious and Pediatric Immunology)

**10<sup>th</sup> week:**

**Practical:** Infectious diseases practice. (Department of Infectious and Pediatric Immunology)

## Requirements

Attendance of seminars and practices are obligatory for students. In case of more than one absence the Lecture Book will not be signed except in case of documented disease or other reasonable cause. Absences may be compensated on the basis of agreement with the tutor. Students must take examination at the end of the semester. The type of examination can be written or oral.

Homepage: [http:// www.infekt.gyermekimmun.deoec.hu](http://www.infekt.gyermekimmun.deoec.hu)

## Department of Neurology

Subject: **NEUROLOGY I.**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

**1<sup>st</sup> week:**

**Lecture:** 1. Epidemiology and characteristics of neurological disorders  
 2. Neurological examination, neurodiagnostic procedures I.

**2<sup>nd</sup> week:**

**Lecture:** 3. Neurological examination, neurodiagnostic procedures II.  
 4. Differential diagnosis of consciousness

**3<sup>rd</sup> week:**

**Lecture:** 5. Headache  
 6. Headache

**4<sup>th</sup> week:**

**Lecture:** 7. Stroke  
 8. Stroke

**5<sup>th</sup> week:**

**Lecture:** 9. Vertigo

10. Vertigo

**6<sup>th</sup> week:**

**Lecture:** 11. Epilepsy I

**7<sup>th</sup> week:**

**Lecture:** 12. Epilepsy II.

**8<sup>th</sup> week:**

**Lecture:** 13. Multiple sclerosis

**9<sup>th</sup> week:**

**Lecture:** 14. Movement disorders I.

**10<sup>th</sup> week:**

**Lecture:** 15. Movement disorders II.

## Requirements

1. Attending lectures is highly recommended.
2. Material covered in the lectures may be asked during practical and oral exams.
3. Please arrive at the practicals on time. Due to the limited time available, tutors begin the practicals promptly. If this does not happen, please notify your tutor.
4. Participation in the practicals is obligatory. A maximum of two excused absences is allowed and should be made up. If the student misses more than two practicals in a semester, his or her lecture book will not be signed. If the student misses more than two practicals, the student must repeat the semester regardless of the reason.
5. Participation in the practical is verified by the group tutor.
6. Please ensure that your lecture book has been submitted to the department for signing within 3 weeks after finishing each semester. If you fail to comply with this requirement, special personal written permission from your tutor must be obtained to have your lecture book signed.
7. The 6th academic year may not be started without signatures for both the first and second semesters of the 5th year.

**CHAPTER 13**

8. Please be considerate of the dignity of the patients when visiting the wards, laboratories and outpatient units. Inappropriate behavior (laughing, expressing boredom, etc.) during patient demonstration or examination is embarrassing for the patients and should be avoided. All patient data must be treated confidentially. The patient's chart is a legal document. It may be used only on the ward. The patient's chart may not be copied or removed. If you make notes for yourself, please use only the patients' initials.
9. After the first semester written practical exam must be taken. Lecture book will be signed after successful written practical exam.
10. Requests for 6th year practical training in another Hungarian institution or at neurology departments abroad must be submitted to the director of the department in advance. Only half of the 6th year neurological period may be spent abroad. Certificates of practical training performed outside Hungary will not be accepted unless the training has been approved in advance by the director of the department.

## Department of Pediatrics

Subject: **PEDIATRICS I.**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

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

**Lecture:** 1. The field of pediatrics. Pediatric epidemiology. The healthy newborn infant. Anatomical and physiological features. 2. Cardiopulmonary adaptation. Pediatric emergencies in the delivery room. Lecturer: György Balla M.D., Ph.D., D.Sc.

### 2<sup>nd</sup> week:

**Lecture:** 3. Principles and practice of mechanical ventilation. Birth injuries, intracranial bleeding. Lecturer: Tamás Kovács M.D. 4. Respiratory distress syndrome (IRDS, BPD). Lecturer: Andrea Nagy M.D.

### 3<sup>rd</sup> week:

**Lecture:** 5. Special problems of perinaturity (ROP, NEC, DAP). Lecturer: György Balla M.D., Ph.D., D.Sc. 6. Techniques of natural and artificial feeding. Special formulas. Vomiting in Neonates and infants. Lecturer: Judit Kovács M.A.

### 4<sup>th</sup> week:

**Lecture:** 7. Hemolytic disease of the newborn. Jaundice in the neonatal and infant period. Lecturer: Éva Oláh M.D., Ph.D., D.Sc. 8. The Hemorrhagic Disease of the Newborn. Lecturer: Csongor Kiss M.D., Ph.D., D.Sc.

### 5<sup>th</sup> week:

**Lecture:** 9. Central nervous system in newborns. Periventricularis bleeding. Lecturer: Andrea Nagy M.D. 10. Seizures in infants and newborns. Hypoxic damage, Periventricular leukomalatia. Habilitation. Lecturer: Ilona György M.D., Ph.D.

### 6<sup>th</sup> week:

**Lecture:** 11. Birth injuries. Lecturer: Éva Oláh M.D., Ph.D., D.Sc. 12. Neonatal characteristics of renal function, urinary tract disorders. Lecturer: Tamás Szabó M.D., Ph.D.

### 7<sup>th</sup> week:

**Lecture:** 13. National Holiday - No Lecture. 14. Hypo- and hyperglycemia, metabolic diseases, screening. Lecturer: Enikő Felszeghy M.D., Ph.D.

### 8<sup>th</sup> week:

**Lecture:** 15. Fluid and electrolyte balance. Acid-base balance disorders: acidosis, alkalosis. Lecturer: Tamás Kovács M.D. 16. Neonatal immunological characteristics. Vaccinations. Lecturer: Rita Káposzta M.D., Ph.D.

### 9<sup>th</sup> week:

**Lecture:** 17. Intrauterine and neonatal infections. Lecturer: György Balla M.D., Ph.D., D.Sc. 18. Cardiac emergencies in newborns and infants. Lecturer: Gábor Mogyorósy M.D., Ph.D.

### 10<sup>th</sup> week:

**Lecture:** 19. Congenital and aquired diseases of the gastrointestinal tract requiring surgical intervention in neonates and young infants. Lecturer: István Csízy M.D., Ph.D. 20. Disorders of the Ca metabolism. Rickets, tetany, hypercalcemia. Lecturer: István Ilyés M.D., M.Sc., Ph.D.

## Requirements

Place: Lecture Hall of Dept. Pediatrics

Lectures: Tuesday: 09:00-10:00; Friday 12:00-13:00 (1-5 weeks), 11:00-12:00 (6-10 weeks).

Requirements for signing the lecture book: Attendance of practices is mandatory. In case of more than one absence, the

signature of the lecture book will be refused except in case of documented serious disease or other reasonable cause to be discussed with the senior lecturer in charge for the 5th year English curriculum. Absences should be made up, compensation will be arranged individually by the senior tutors of the groups. Development of proper skills in pediatric patient's examination is expected as checked by the senior tutors on the last practice.

Requirements of examination: Obtaining signature of the lecture book. Prearranged exam appointment strictly within the exam period as given by the Department of Education (to be obtained from the secretary of the Department, students are kindly requested to come to do the exam in a group of 5-15 students in an exam day; changes in the exam schedule should be made at least 24 hours -1 working day - prior to the scheduled exam). Type of examination: AW5 - oral exam, two titles.

## Department of Psychiatry

Subject: **PSYCHIATRY I.**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **20**

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

**Lecture:** Historical background of psychiatry. The psychiatric illness. The psychiatric interview, history. Signs and symptoms of mental disorders.

**Practical:** The doctor-patient relationship. Examination of the psychiatric patient.

### 2<sup>nd</sup> week:

**Lecture:** Liaison psychiatry. Overlap between psychiatry and other medical fields. Psychological tests. Clinical rating scales in psychiatry.

**Practical:** Anamnesis. Mental state examination I.

### 3<sup>rd</sup> week:

**Lecture:** Organic mental syndromes and disorders I. Delirium. Organic mental syndromes and disorders II. Dementia.

**Practical:** Mental state examination II. Psychological and clinical rating tests.

### 4<sup>th</sup> week:

**Lecture:** Substance-Related Disorders. General principles. Alcohol, Cannabis-, Caffeine-, Cocaine-, Opioid-Related Disorders. Impulse control disorders. Gambling.

**Practical:** Drug dependent states. Alcohol related disorders.

### 5<sup>th</sup> week:

**Lecture:** Mood disorders I. Major Depressive Disorders. Dysthymic Disorders. Mood disorders II. Bipolar and Cyclothymic Disorders.

**Practical:** Mood disorders.

### 6<sup>th</sup> week:

**Lecture:** Schizophrenia I. Schizophrenia II. Etiology. Treatment.

**Practical:** Examination of the schizophrenic patient.

### 7<sup>th</sup> week:

**Lecture:** Anxiety disorders. Generalised anxiety disorder. Posttraumatic stress disorder. Panic disorder and agoraphobia.

**Practical:** Examination of the anxious patient.

### 8<sup>th</sup> week:

**Lecture:** Neurochemical basis of normal and abnormal behavior. Laboratory tests in psychiatry. Delusional disorder and other psychotic disorders.

**Practical:** Examination of the anxious patient.

### 9<sup>th</sup> week:

**Lecture:** Normal and pathological sexual behavior. Sleep and disorders of sleeping. Eating disorders.

**Practical:** Examination of the neurotic patient.

### 10<sup>th</sup> week:

**Lecture:** Obsessive-compulsive disorder and phobias. Dissociative disorder. Somatoform disorders.

**Practical:** Psychiatric symptoms related to general medical conditions.

## Division of Emergency Medicine

Subject: **EMERGENCY MEDICINE**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **20**

### 6<sup>th</sup> week:

**Lecture:** General approach (special circumstances of emergency management, pre-hospital emergency care, urgency levels, transportation trauma, etc). Cardiac arrest, levels of cardiopulmonary resuscitation, basic life support, professional basic life support, advanced life support, post resuscitation care.

**Practical:** The position of emergency care. Pre-hospital specialties. Diagnostic and therapeutic specialties. Airway management. Symptoms of airway obstruction. Airway management with and without tools.

### 7<sup>th</sup> week:

**Lecture:** Chest pain, acute coronary syndromes, pulmonary embolism, aortic dissection. Cardiac rhythm disturbances. Hypertensive emergencies. Metabolic and acid-base emergencies.

**Practical:** BLS. Electrical accidents, burning, smoke inhalation, drowning, disorders due to heat and cold.

### 8<sup>th</sup> week:

**Lecture:** Shock. Acute severe allergic manifestations, anaphylaxis. Respiratory failure. Stroke, headache, subarachnoid hemorrhage, convulsions, acute confusional

state, coma.

**Practical:** Indications and limitations of peripheral vein maintaining. The vein puncture. The intraosseous way. Central vein catheterization Wound care. Care of different bleedings. Techniques of fixation. Laying positions.

### 9<sup>th</sup> week:

**Lecture:** Poisoning Psychiatric emergencies. Trauma of the head, vertebral column, chest, abdomen and extremities. The multiply injured patient). Management of mass casualties.

**Practical:** Rautek maneuvers. Rapid trauma survey. Delivery in the field. Gastric lavage. Safe defibrillation. AEDs, manual defibrillators.

### 10<sup>th</sup> week:

**Lecture:** Abdominal pain. Gastrointestinal tract bleeding. Vomiting and diarrhea. Obstetric and gynecologic emergencies. Pediatric emergencies -cardiac arrest in childhood, acute circulatory and respiratory failure, seizures, etc.

**Practical:** CPR practice. Consultation.

## Requirements

Requirements for signing the lecture book:

For obtaining the signature at the end of the semester you are required to attend all practices. In case of absence you have to do the practice at a chosen time, written excuse is not accepted. Concerning the supplementary practice you have to contact your physician responsible for the practices. Facilities for maximum 2 (two) complementary practices are available at the Ambulance station in Debrecen. If somebody will have more than 2 missed practices will get no signature. Evaluation: The students write a test every week about previous week lectures topic. The final examination consists of an oral and a practical part. Students can only go for the oral exam in case they pass the practical exam. You can register for the exam before the beginning of the examination period. In case you fail to register for the exam we consider it as a failed A chance and a B chance is required.

## Department of Forensic Medicine

Subject: **FORENSIC MEDICINE II.**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

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

**Lecture:** Sudden death I.

**Practical:** Practices between 1<sup>st</sup> - 11<sup>th</sup> week: Autopsy cases, case studies and consultation on the above mentioned topics.

### 2<sup>nd</sup> week:

**Lecture:** Sudden death II.



**3<sup>rd</sup> week:**

**Lecture:** Sudden infant death syndrome. Non-accidental injuries to children. Child abuse.

**4<sup>th</sup> week:**

**Lecture:** Abortion. Infanticide.

**5<sup>th</sup> week:**

**Lecture:** Sex crimes and problems.

**6<sup>th</sup> week:**

**Lecture:** Unidentified and missing persons. Forensic anthropology.

**7<sup>th</sup> week:**

**Lecture:** Legal aspects of medical practice.

**Practical:** Visiting the Toxicology lab.

**8<sup>th</sup> week:**

**Lecture:** Deaths due to medical treatment. Forensic toxicology.

**9<sup>th</sup> week:**

**Lecture:** Alcohol intoxication. Legal aspects. Forensic toxicology.

**10<sup>th</sup> week:**

**Lecture:** Drug related death. Forensic toxicology

**11<sup>th</sup> week:**

**Lecture:** Forensic psychiatry.

## Department of Internal Medicine

Subject: **INTERNAL MEDICINE VI. (HAEMATOLOGY, HAEMOSTASEOLOGY)**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

**1<sup>st</sup> week:**

**Lecture:** 1. Haemopoiesis. Basic principles, normal values, aplastic anaemia, agranulocytosis. (Dr. G. Pfliegler) 2. Haemolysis. PNH. (Prof. A. Kiss)

**Practical:** Bone marrow failure: aplasia, agranulocytosis, neutropenia, deficiency anaemias (Responsible: Dr. L. Rejtő)

**2<sup>nd</sup> week:**

**Lecture:** 3. Myeloproliferative syndrome: PV, ET, MF, MDS (Dr. Gy. Reményi) 4. Chronic myelogenous leukaemia (Prof M. Udvardy)

**Practical:** Leukocytosis. Benignant and malignant haematologic disorders with special focus on AML, ALL, CLL and CML. (Responsible: Prof. M. Udvardy)

**3<sup>rd</sup> week:**

**Lecture:** 5. Acute myelogenous leukaemia (Prof A. Kiss) 6. Acute lymphoblastic leukaemia (Dr. B. Telek)

**Practical:** Lymphoma patients. Hodgkin-, and Non-Hodgkin Lymphomas. (Responsible: Prof. A.Kiss)

**4<sup>th</sup> week:**

**Lecture:** 7. Lymphogranulomatosis (Dr. Á. Illés) 8. Non-Hodgkin Lymphomas I. (Prof M. Udvardy)

**Practical:** Thrombophilia, thromboembolism. Clinical signs, diagnosis, therapy. (Responsible: Prof. Z. Boda)

**5<sup>th</sup> week:**

**Lecture:** 9. Non-Hodgkin Lymphomas II. (Prof M.

Udvardy) 10. Chronic lymphocytic leukaemia. Myeloma multiplex. Waldenström macroglobulinaemia. (Dr. G. Pfliegler)

**Practical:** Bleeding tendency (ITP, TTP, DIC, HIT, haemophilia, Willebrand-disease). A practical approach. Diagnosis, therapy. (Responsible: Á. Schlammadinger)

**6<sup>th</sup> week:**

**Lecture:** 11. Haemopoietic stem cell transplantation (Prof. A. Kiss)

**7<sup>th</sup> week:**

**Lecture:** 12. Thrombocytopenias (ITP, DIC, TTP, HIT). Platelet disorders. (Prof Z. Boda)

**8<sup>th</sup> week:**

**Lecture:** 13. Coagulopathies (haemophilia, von Willebrand disease) (Dr. Á. Schlammadinger)

**9<sup>th</sup> week:**

**Lecture:** 14. Inherited and acquired trombophilias. (Prof Z. Boda)

**10<sup>th</sup> week:**

**Lecture:** 15. Antithrombotic drugs induced bleeding. Therapy, antidotes. (Prof Z. Boda)

## Requirements

Leader of Block Practice: G. Pfliegler MD  
 Deputy leader: P. Batár MD

### PROGRAM

- Working hours: 7:45 am – 13:45 pm, from Monday to Friday
- Each day 5 students from 4th year and 3 students from 5th year should attend Morning discussion at 8:15 am., Rak Library (2nd floor of the old wing of 2nd Dept. Med.)
- Students participate in the everyday practice of their tutor's ward. Beside this they attend visits, outpatient services, laboratories (endoscopy, haemostasis, haematology).
- They have to attend one shift (8 am – 2 pm – 8 pm) at the Emergency Outpatient Service (1st Department of Internal Medicine), as well as one afternoon duty at the 2nd Department of Internal Medicine (2-10 pm).
- Names of Tutors see below!
- Exact dates with the names for Emergency Ward see below, afternoon duties in the 2nd Department of Internal Medicine will be made ready by the students for the second day of block practice.
- One day leave with good reasons is allowed but has to be replaced by an additional working shift.

### Detailed program

Location: Rak Library (2nd floor)  
 Working hours 7:45 am – 13:45 pm  
 Consultations, case presentations: 12 o'clock

1st Day (Monday): opening discussion 9 o'clock.

*Hematology/hemostaseology/rare diseases consultations*

3rd day, Wednesday: **consultation** (Dr. Pfliegler)  
 4th day, Thursday: **consultation**(Prof. Z. Boda)  
 9th day, Tuesday: **consultation**(Prof. A. Kiss.)  
 11th day, Thursday: **consultation**(Prof. M. Udvardy)  
**Closing session:**the last day of practice (Prof. Boda – Dr. Batár)

THE PARTICIPATION ON CONSULTATIONS OF THE APPROPRIATE YEAR IS **MANDATORY**(i.e. HEMATOLOGY-HEMOSTASIS-RARE DISEASES FOR 5th YEAR, ENDOCRINOLOGY-NEPHROLOGY FOR 4th YEAR) *but* STUDENTS ARE ALSO **ENCOURAGED**TO PARTICIPATE AT EACH CONSULTATION, i.e. 4th YEAR STUDENTS ON 5th YEAR CONSULTATIONS AND VICE VERSA.

**Each day's attendance must be signed by the tutor! At the end of the block practice the tutors handle the signed sheets to the Block Leader, who is entitled to present them to the Education Office!**

**It is mandatory for students to bring**

- Labcoat
- Stethoscope
- Pencil or pen, notepad

## Department of Neurology

Subject: **NEUROLOGY II.**  
 Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester  
 Number of teaching hours:  
 Lecture: **10**

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

**Lecture:** 1. Sleep disturbances

### 2<sup>nd</sup> week:

**Lecture:** 2. CNS: infectious diseases

### 3<sup>rd</sup> week:

**Lecture:** 3. CNS complications in internal med. diseases

<b>4<sup>th</sup> week:</b> <b>Lecture:</b> 4. Dementia	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> 7. Emergency in neurology I.
<b>5<sup>th</sup> week:</b> <b>Lecture:</b> 5. Rehabilitation: stroke and multiple sclerosis	<b>8<sup>th</sup> week:</b> <b>Lecture:</b> 8. Mono- and polyneuropathies
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> 6. Neuromuscular diseases	<b>9<sup>th</sup> week:</b> <b>Lecture:</b> 9. Emergency in neurology II.

## Requirements

1. Attending lectures is highly recommended.
2. Material covered in the lectures may be asked during practical and oral exams.
3. Please arrive at the practicals on time. Due to the limited time available, tutors begin the practicals promptly. If this does not happen, please notify your tutor.
4. Participation in the practicals is obligatory. A maximum of two excused absences is allowed and should be made up. If the student misses more than two practicals in a semester, his or her lecture book will not be signed. If the student misses more than two practicals, the student must repeat the semester regardless of the reason.
5. Participation in the practical is verified by the group tutor.
6. Please ensure that your lecture book has been submitted to the department for signing within 3 weeks after finishing each semester. If you fail to comply with this requirement, special personal written permission from your tutor must be obtained to have your lecture book signed.
7. The 6th academic year may not be started without signatures for both the first and second semesters of the 5th year.
8. Please be considerate of the dignity of the patients when visiting the wards, laboratories and outpatient units. Inappropriate behavior (laughing, expressing boredom, etc.) during patient demonstration or examination is embarrassing for the patients and should be avoided. All patient data must be treated confidentially. The patient's chart is a legal document. It may be used only on the ward. The patient's chart may not be copied or removed. If you make notes for yourself, please use only the patients' initials.
9. The end semester exam at the end of the first semester consists of practical and written parts. The practical exam will be administered by your tutor.
10. Requests for 6th year practical training in another Hungarian institution or at neurology departments abroad must be submitted to the director of the department in advance. Only half of the 6th year neurological period may be spent abroad. Certificates of practical training performed outside Hungary will not be accepted unless the training has been approved in advance by the director of the department.

## Department of Ophthalmology

Subject: **OPHTHALMOLOGY**  
 Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester  
 Number of teaching hours:  
 Lecture: **10**  
 Practical: **20**

**1<sup>st</sup> week:**  
**Lecture:** Diseases of the conjunctiva and the cornea.  
**Practical:** Physical examination of the eye and the adnexa. Ocular history.

**2<sup>nd</sup> week:**  
**Lecture:** Diseases of the lacrimal apparatus.  
**Practical:** Basic Ophthalmologic Examinations. Visual Acuity. Slitlamp.

**3<sup>rd</sup> week:**  
**Lecture:** Orbit and the Lids.  
**Practical:** Visual fields. Perimetry.

**4<sup>th</sup> week:**  
**Lecture:** Lens, Cataract.  
**Practical:** The ocular fundus I. Ophthalmoscopy.

**5<sup>th</sup> week:**  
**Lecture:** Diseases of the retina.  
**Practical:** Tonometry. Irrigation of the lacrimal system.

**6<sup>th</sup> week:**  
**Lecture:** Tumors.  
**Practical:** Binocular vision. Strabismus.

**7<sup>th</sup> week:**  
**Lecture:** Strabismus.

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**Practical:** Ophthalmo-echography, biometry, corneal topography.

**8<sup>th</sup> week:**

**Lecture:** Diseases of the uvea and the vitreous.

**Practical:** Refractive errors. Correction with lenses. Astigmatism.

**9<sup>th</sup> week:**

**Lecture:** Glaucoma

**Practical:** Color vision. Nagel anomaloscope.

**10<sup>th</sup> week:**

**Lecture:** Injuries.

**Practical:** The ocular fundus II. Ophthalmoscopy.

**11<sup>th</sup> week:**

**Practical:** Ocular pads and patches.

## Requirements

Conditions of signing the Lecture book: Concerning attendance, the rules laid out of the University are clear. Attendance at practices and lectures is compulsory. The Head of the Department may refuse to sign the Lecture book if the student is absent from the practices and lectures. Missed practices and lectures should be made up for by the student at a later date to be discussed with their tutor. After the student has made up for the missed classes, their Lecture book will be signed.

At the end of the semester the student is required to take the final examination (ESE), which consists of a practical and a theoretical part. In the practical examination the student is required to make the diagnosis of 5 ophthalmological diseases shown in pictures. The correct diagnosis is mandatory for commencing the theoretical examination. A set of pictures is available for study in the Department, the Kenezy Library and the 3rd Student Hostel. The student has to register for the ESE two weeks before the requested date. The secretary of the Department helps with registration. 5 days a week are appointed for examinations with the exceptions (e.g. the last Friday of every month) indicated. Any rescheduling of the registered days, or application for registration can only be made in person.

## Department of Otolaryngology and Head and Neck Surgery

Subject: **OTOLARYNGOLOGY**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

Practical: **20**

**1<sup>st</sup> week:**

**Lecture:** I. Anatomy and Physiology of the Ear. Tests of the Auditory Apparatus. II. Disorders of the Pinna, External Auditory Canal and Acute Otitis.

**Seminar:** Vertigo

**Practical:** Exposition of general methods in otorhinolaryngology. Demonstration of instruments required at basic examinations: practicing of their use. (Use of the head mirror, otological examination with aural speculum, examination with Otoscopy, rhinoscopy anterior, rhinoscopy posterior, laryngeal examination with mirror, pharyngeal examination). Physiology of hearing-practice in audiometry. Exposition of methods of audiometry (whispering speech, conversational speech, examinations with tuning-fork threshold audiometry, objective audiometry and special tests). Audiometrical methods in practice.

**2<sup>nd</sup> week:**

**Lecture:** III. Chronic Otitis Media. IV. Complications of Otitis Media.

**Seminar:** Hearing rehabilitation's methods. Hearing aids. Cochlear implants.

**Practical:** Symptomatology of ear diseases. Investigation of functioning of auditory tube (Valsalva's experiment,

Politzer's test, tympanometry). Vestibular examinations. Evaluation of spontaneous vestibular symptoms. Induced examinations. (Rotational examination, caloric examination, demonstration of electrical rotatory chair, electronystagmography, analysis of optokinetic and positional nystagmus). Demonstration of examination methods.

**3<sup>rd</sup> week:**

**Lecture:** V. Disorders of the Cochlea. VI. Rehabilitation of sensorineural hearing loss.

**Seminar:** Stridor. Symptoms of upper respiratory tract obstruction. Methods of conicotomy, tracheotomy.

**Practical:** Exposition and demonstration of ear operations. Tympanoplastical operations. Antrotomy, mastoidectomy, the essence of radical ear operation. (Operating theatre, videoprogram). Nose and paranasal sinus operations, nasal endoscopy (videoprogram). Demonstration of maxillary sinus puncture

Indications of tonsillectomy and adenotomy. Significance of the operation. Control method of epistaxis. Anterior nasal packing and Belloque-tamponade.

**4<sup>th</sup> week:**

**Lecture:** VII. Anatomy, Physiology and Disorders of the

nose. VIII. Malignant tumor of the nose & paranasal sinus.

**Seminar:** Physiology and pathophysiology of Waldeyer's rings.

**Practical:** Diff. diagnosis of cervical masses. Cervical nodes, cervical trigones. Importance of cryosurgery in otorhinolaryngological practice. Examination of patients. Malignant diseases of larynx. Presentation of larynx operations/video or Operating theatre/. Examination of patients. Examinations with eth endoscope in otorhinolaryngological practice.

**5<sup>th</sup> week:**

**Lecture:** IX. The Pharynx (Anatomy, Physiology, Inflammatory Disorders, Neoplasm). X. The Larynx (Anatomy, Physiology, Inflammatory diseases).

**Seminar:** Laryngeal tumors (ethiology, classification, and therapy of laryngeal tumours)

**Practical:** Demonstration of microlaryngoscopy and oesophagoscopy.

Laryngological connections of Laser surgery/video or

operating theatre/.

Use of laryngoscope.

Examinations of patients.

Practice otorhinolaryngological examination methods.

**6<sup>th</sup> week:**

**Lecture:** Rehabilitation of sensorineural hearing loss.

**7<sup>th</sup> week:**

**Lecture:** Anatomy, Physiology and Disorders of the nose.

**8<sup>th</sup> week:**

**Lecture:** Malignant tumor of the nose & paranasal sinus.

**9<sup>th</sup> week:**

**Lecture:** The Pharynx (Anatomy, Physiology, Inflammatory Disorders, Neoplasm).

**10<sup>th</sup> week:**

**Lecture:** The Larynx (Anatomy, Physiology, Inflammatory diseases).

## Requirements

At the end of the semester the student is required to take the oral (ESE\*). The examination contains three parts: written, practical and oral. The students can register for the ESE\*, if their Lecture book has been signed. The Lecture book is signed by the professor on condition that the student has made up for the missed practices. The Department will appoint 3 days a week for examinations.

## Department of Pediatrics

Subject: **PEDIATRICS II.**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

**1<sup>st</sup> week:**

**Lecture:** Congenital disorders of the central nervous system (CNS), neuromuscular diseases of infancy and childhood.

**Practical:** Practices, related to the topics of lectures, are being held in the Lecture Room of the Department and at the Wards.

**2<sup>nd</sup> week:**

**Lecture:** Inflammatory diseases of the CNS.

**3<sup>rd</sup> week:**

**Lecture:** Seizures in childhood.

**4<sup>th</sup> week:**

**Lecture:** Approach to the child with anemia. The hemolytic anemias in infancy and childhood.

**5<sup>th</sup> week:**

**Lecture:** Deficiency anemias and transfusion practice in infancy and childhood.

**6<sup>th</sup> week:**

**Lecture:** Disorders of hemostasis in childhood.

**7<sup>th</sup> week:**

**Lecture:** Leukemia and lymphoma in children.

**8<sup>th</sup> week:**

**Lecture:** Pediatric solid tumors. Approaches to diagnosis and treatment.

**9<sup>th</sup> week:**

**Lecture:** Treatment for children with type 1 (insulin-dependent) diabetes mellitus.

**10<sup>th</sup> week:**

**Lecture:** Highlights of pediatric endocrinology.

**11<sup>th</sup> week:**

**Lecture:** Differential diagnosis and treatment of infants and children with dyspnea (upper and lower respiratory

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stenosis, pneumonia).

**12<sup>th</sup> week:**
**Lecture:** Contemporary evaluation of pediatric gastrointestinal diseases. Chronic non specific inflammatory bowel diseases.

**13<sup>th</sup> week:**
**Lecture:** Frequent cardiac symptoms in childhood.

Pediatric cardiac arrhythmias.

**14<sup>th</sup> week:**
**Lecture:** Glomerular diseases. The nephrotic syndrome. Acute renal failure.

## Requirements

Requirements for signing the lecture book: Attendance of practices is mandatory. In case of more than one absence the signature of the lecture book will be refused except in case of documented serious disease or other reasonable cause to be discussed with the senior lecturer in charge for the 5th year English curriculum. Absences should be made up, compensation will be arranged individually by the senior tutors of the groups.

Exam: course evaluation through a 5 scale practical grade according to the last week test which is based on the practices and lectures.

## Department of Psychiatry

 Subject: **PSYCHIATRY II.**

 Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

 Lecture: **10**

 Practical: **20**
**1<sup>st</sup> week:**
**Lecture:** Psychosomatic disorders

**Practical:** Psychosomatic diseases

**2<sup>nd</sup> week:**
**Lecture:** Theories of Personality and Psychopathology. Psychoanalysis.

**Practical:** Examination of personality, personality tests

**3<sup>rd</sup> week:**
**Lecture:** Normal and pathological development of personality

**Practical:** Examination of personality, personality tests

**4<sup>th</sup> week:**
**Lecture:** Personality disorders

**Practical:** Examination of personality disorders

**5<sup>th</sup> week:**
**Lecture:** Psychoteherapies I.

**Practical:** Indication of psychotherapy

**6<sup>th</sup> week:**
**Lecture:** Psychoteherapies II.

**Practical:** Types of psychotherapies

**7<sup>th</sup> week:**
**Lecture:** Child psychiatry

**Practical:** Child psychiatry

**8<sup>th</sup> week:**
**Lecture:** Emergency cases in psychiatry (Crisis, suicide)

**Practical:** Crisis intervention

**9<sup>th</sup> week:**
**Lecture:** Emergency cases in psychiatry (Agressivity and restraining measure) Legal regulations in psychiatry

**Practical:** Management and treatment of the aggressive patient

**10<sup>th</sup> week:**
**Lecture:** Rehabilitation of psychiatric patients

**Practical:** Rehabilitation in psychiatry

## Division of Clinical Oncology

Subject: **CLINICAL ONCOLOGY**  
 Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester  
 Number of teaching hours:  
 Lecture: **20**  
 Seminar: **7**

**1<sup>st</sup> week:**

**Lecture:** Medical oncology: state of the art. Epidemiology.  
**Seminar:** The role of prevention and screening.

**2<sup>nd</sup> week:**

**Lecture:** Imaging technics in oncology  
**Seminar:** Radiotherapy

**3<sup>rd</sup> week:**

**Lecture:** Surgical aspects in oncology.

**4<sup>th</sup> week:**

**Lecture:** Biological treatment.

**5<sup>th</sup> week:**

**Lecture:** Chemotherapy, hormonal therapy.

**6<sup>th</sup> week:**

**Lecture:** Palliative, supportive treatment. Psychooncology.  
 Head and neck cancer.  
**Seminar:** Case presentations, head and neck tumors.

**7<sup>th</sup> week:**

**Lecture:** Urooncology 1: renal cancer. Urooncology 2:  
 testicular, prostate, and vesical tumors. Lung cancer  
**Seminar:** Case presentations: lung cancer

**8<sup>th</sup> week:**

**Lecture:** Brain tumor. Gynecological tumors, Breast  
 cancer.  
**Seminar:** Case presentations: breast cancer.

**9<sup>th</sup> week:**

**Lecture:** Treatment of skin tumors. Treatment of  
 gastrointestinal tumors: non colorectal. Treatment of  
 gastrointestinal tumors: colorectal.  
**Seminar:** Case presentations: colorectal tumors.

**10<sup>th</sup> week:**

**Lecture:** Case presentations: urooncology. Case  
 presentations: gastrointestinal. Future of oncology.  
**Seminar:** Exam.

### Requirements

The student is required to attend the lectures and seminars. Two absences are allowed regarding seminars. Visiting the lectures is strongly advisable. The final exam will be a written test, covering the topics of oncology. The passing level is 60%.

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## CHAPTER 14

### ACADEMIC PROGRAM FOR THE 6TH YEAR

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Subject	Duration
Internal Medicine	10 weeks
Pediatrics	7 weeks
Surgery	5 weeks
Neurology	4 weeks
Psychiatry	4 weeks
Obstetrics and Gynecology	5 weeks

Subject: **INTERNAL MEDICINE**

#### Requirements of the internship in Internal Medicine

Duration: **10 weeks**

Working hours: **8 a.m. to 2 p.m.**

**Working regulations:** Students are entitled to work under the supervision of their tutors. The time schedule enables them to spend app. - 2 weeks in each special ward (e.g. hematology, outpatient service, gastroenterology, general medical, etc.) where they have to participate in the everyday clinical work - similarly to the residents. They will also get opportunities to become familiar with the laboratories (hematology, gastroenterology, hemostasis, clinical chemistry).

Duties: each week one duty (2 p.m. - 10 p.m.) is required.

Organized consultations: on special topics are also available.

Examination: consists of a practical, and an oral (two titles) part.

Notice: only those with a successful written and practical examination have the right to enter the oral part. In case of a failed exam the student must spend an additional practical period (5 weeks) plus 1 week preparation period according to the rules.

Subject: **NEUROLOGY**

#### REQUIREMENTS OF THE NEUROLOGY INTERNSHIP

Duration of the rotation is **4 weeks**.

Working hours are from **8 a.m. to 2 p.m.**

The students must work under the supervision of their tutor. They spend one week in each department including the outpatient department. They make daily rounds with the staff of the ward and take part in new patient work-ups.

The student must visit the laboratories: ultrasound laboratory, electrophysiology laboratories (EEG, EP, EMG), chemistry laboratory and neuropathology. Four night calls are required (from 2 p.m. to 10 p.m.) A selected topic should be presented at a morning meeting. Consultation is available.

The final examination consists of three parts: minimum questions (computer-based test), practical and oral. If the student fails the written or practical exam, he or she may not proceed to the oral exam.

If the student fails the exam, he or she must spend an extra two weeks of practice at the department.

The minimum questions can be found at: <http://www.neuropath.dote.hu/ideg/minimum.htm>

Subject: **PSYCHIATRY**

#### REQUIREMENTS OF THE PSYCHIATRY INTERNSHIP

Duration: **4 weeks**

Working hours: **8 a.m. to 2 p.m.**

The students must work under the supervision of their tutor. They spend 2 weeks in the man's ward and 2 weeks in the woman's ward. During this period they must spend 2 days in the outpatient's department. They make daily rounds with the staff of the ward, take part in the investigation of the new patients.

Students must visit the psychological laboratory, they must take part in group therapy and music therapy (weekly). Consultation is available.

The final examination consists of two parts:

Practical: They have to demonstrate how to make a case history, how to check the attention, etc.

Oral: three titles

If the student could not pass the examination, he/she must spend one more week with practice in our department.



Subject: **OBSTETRICS & GYNECOLOGY**

**Requirements of the internship in OB&GYNE**

Requirements for signing the lecture book: Participation in the clerkship program (Duration 5 weeks, to be accomplished in the Dept. of OB&GYNE or in one of the accredited Hungarian teaching Hospitals, or - based on the permission of the Educational Subcommittee - in the OB&GYNE department of an acknowledged hospital - maximum 3 weeks - 2 weeks are requested to be accomplished in the Dept. of OB&GYNE of the Medical and Health Science Center of the University of Debrecen. Students should work as resident clerks under the supervision of the assigned tutor from 8 am to 2 pm on every working day. Each student has a supervisor, but we give a rotation plan for the 5 weeks. In case of absence for more than two days the head of the Department may refuse the signature. One day-off is allowed except in case of documented serious disease or other reasonable cause to be discussed with the senior lecturer in charge for the 6<sup>th</sup> year English curriculum. Absences should be made up, compensation will be arranged individually by the tutors. Participation in 1 night-shift per week duties is also requested: from 2 pm to 8 am. Consultation is available on demand.

Requirements of examination: Obtaining signature of the lecture book.

Prearranged exam appointment strictly within the exam period as given by the Education Office (to be obtained from the secretary of the Department, students are kindly requested to come to do the exam in a group of 3-8 students in an exam day; changes in the exam schedule should be made at least 24 hours - 1 working day - prior to the scheduled exam).

Type of examination: Final exam, consisting of 2 parts:

practical exam (history taking, physical examination, building up diagnostic and therapeutical plans for the individual patient, evaluation of the results of the diagnostic procedures, bed-side laboratory skills)

theoretical exam (4 exam titles, from the „Obstetrics by Ten Teachers” edited by Stuart Cambell, 18<sup>th</sup> edition and „Gynecology by ten Teachers” edited by Stuart Cambell)

The student is requested to pass both parts of the exam for a successful final mark.

Repeating of the final exam is possible after 3 additional weeks of clerkship to be absolved exclusively in the Department of OB&GYNE of the UDMHSC.

Subject: **PEDIATRICS**

**Requirements of the internship in Pediatrics**

Requirements for signing the lecture book: Participation in the clerkship program (Duration 7 weeks, to be accomplished in the Department of Pediatrics or in one of the accredited Hungarian teaching Hospitals, or - based on the permission of the Educational Subcommittee - in the pediatric department of an acknowledged hospital - maximum 5 weeks - 2 weeks are requested to be accomplished in the Department of Pediatrics of the Medical and Health Science Center of the University of Debrecen. Students should work as resident clerks under the supervision of the assigned tutor from 8 am to 2 pm on every working day. One day-off is allowed except in case of documented serious disease or other reasonable cause to be discussed with the senior lecturer in charge for the 6<sup>th</sup> year English curriculum. Absences should be made up, compensation will be arranged individually by the tutors. Participation in night-shift duties is also requested according to the pre-set schedule: 2 pm to 10 pm on workdays, 8 am to 10 pm on holidays. Consultation is available on demand.)

Requirements of examination: Obtaining signature of the lecture book.

Prearranged exam appointment strictly within the exam period as given by the Department of Education (to be obtained from the secretary of the Department, students are kindly requested to come to do the exam in a group of 3-8 students in an exam day; changes in the exam schedule should be made at least 24 hours - 1 working day - prior to the scheduled exam).

Type of examination: Final exam, consisting of three parts:

test (credits can be obtained by successful self-check tests to be filled out in the 5<sup>th</sup> years lectures)

practical exam (history taking, physical examination, building up diagnostic and therapeutical plans for the individual patient, evaluation of the results of the diagnostic procedures, bed-side laboratory skills)

theoretical exam (4 exam titles)

The student is requested to pass each three part of the exam for a successful final mark.

Repeating of the final exam is possible after 3 additional weeks of clerkship to be absolved exclusively in the Department of Pediatrics of the Medical School of the University of Debrecen.

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Subject: **SURGERY**

Duration of the rotation is **5 weeks**. Students may spend 3 weeks in another (foreign) acknowledged institute; in this case a minimum of 2 weeks' practice must be spent in our Institute.

Practice hours are between **7.30AM and 1.30PM**(weekdays only).

Each student will be assigned to a tutor and a ward. Students should participate in the operational and ward activities, and also in the outpatient care. Students must work under the supervision of their tutor.

Every student should register for duty service (24-hour in-house call) once per week (weekend days included).

By the end of the rotation, students are expected to be familiar with the basics of surgical wound care, patient examination and history taking, the most common surgical interventions, postoperative management of the surgical patients and the basics of anesthesiology. Students will participate in the surgeries as second assistants.

Final examination consists of two parts: practical (physical examination and case presentation) and theoretical. Those who fail the final exam, should complete an additional 3 weeks of practice.

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## CHAPTER 15

### REQUIRED ELECTIVE COURSES

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#### Clinical Research Center

Subject: **PBL IN HAEMOSTASIS**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester, 4<sup>th</sup> year/2<sup>nd</sup> semester, 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Seminar: **20**

**1<sup>st</sup> week:**

**Seminar:** Studying of actual hemostasis cases by problem based learning methods.

**2<sup>nd</sup> week:**

**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**3<sup>rd</sup> week:**

**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**4<sup>th</sup> week:**

**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**5<sup>th</sup> week:**

**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**6<sup>th</sup> week:**

**Seminar:** Studying of actual haemostasis cases by problem based learning methods

#### Requirements

Entrance conditions: min. 5 - max. 20 students.

Clinical biochemistry I is a prerequisite.

Only 1 missed seminar is acceptable.

Students will have to work on and present hemostasis cases during the course.

Examination: Oral case evaluation.

#### Clinical Research Center

Subject: **CLINICAL BIOCHEMISTRY AND LABORATORY EVALUATION OF THROMBOPHILIA**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **12**

**1<sup>st</sup> week:**

**Lecture:** Control mechanisms of blood coagulation  
Biochemistry of antithrombin III. Laboratory diagnosis of antithrombin III deficiencies.

**2<sup>nd</sup> week:**

**Lecture:** Biochemistry of protein C and protein S.  
Laboratory diagnostics of protein C and protein S deficiencies

**3<sup>rd</sup> week:**

**Lecture:** Thrombophilias caused by APC resistance and prothrombin 20210 polymorphism and their laboratory diagnostics. Rare thrombophilias.

**4<sup>th</sup> week:**

**Lecture:** Hereditary thrombophilias in the clinical practice. Obstetric and gynecologic aspects of hereditary thrombophilias.

**5<sup>th</sup> week:**

**Lecture:** Laboratory diagnostics of antiphospholipid syndrom. Anti-phospholipid syndrome in the clinical practice

**6<sup>th</sup> week:**

**Lecture:** Factors influencing anticoagulation therapy.  
Novel anticoagulants.

**Self Control Test**

## Requirements

Min. 5, max. 50 students.  
 Clinical biochemistry II is a prerequisite  
 Only 1 missed seminar is acceptable.  
 At the end of the course there will be a written test.

## Department of Behavioural Sciences

Subject: **COMMUNICATION SKILLS**  
 Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester  
 Number of teaching hours:  
 Practical: **30**

## Requirements

Course objectives: The aim of the communication course is to enhance the student's sensitivity toward the most important elements of human communication and provide theoretical and practical help for understanding and developing different interactions. The course is semi-structured, highly interactive, conducted by psychologist tutors and concentrates on behavioural aspects of communication skills.

Course outline: Main learning units of seminars are video-analysis, observational tasks, students presentations, essay writing and role-plays. These educational methods are integrating by teacher and students together for developing face-to-face communication skills of participants. Facilitating self-reflections on communication skills, giving and accepting feedbacks are also important aspects of the interactive group development. The observational task is an important part of learning process. Students are asked to visit different wards of university hospitals or other places of campus and initiate observations on different human behaviours. Observations are managed by previously selected objectives and help students to enhance more awareness and sensitivity on human interactions. Students are asked to write an essay about their observations and to deliver a presentation for the class. Finally different role-plays are arranged to demonstrate some elementary aspects of doctor - patient relationship.

## Department of Behavioural Sciences

Subject: **MEDICAL ANTHROPOLOGY**  
 Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester  
 Number of teaching hours:  
 Seminar: **15**

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

**Seminar:** "Roots" and "shoots" of medical anthropology: the web of basic concepts.

### 2<sup>nd</sup> week:

**Seminar:** Historical - cultural determination of medical concept of man.

### 3<sup>rd</sup> week:

**Seminar:** Medical knowledge: cultural and epistemological background of its legitimacy.

### 4<sup>th</sup> week:

**Seminar:** Post-modern knowledge and concept of man in medicine: a critical-interpretive approach to medical anthropology.

### 5<sup>th</sup> week:

**Seminar:** Doctor-patient interaction: a cultural

anthropological aspect.

### 6<sup>th</sup> week:

**Seminar:** Explanatory models and illness narratives explaining doctor-patient bonds.

### 7<sup>th</sup> week:

**Seminar:** Cultural definition of anatomical and physiological concepts.

### 8<sup>th</sup> week:

**Seminar:** Medical treatments vs. alternative treatments: the concepts of alternative medicine.

### 9<sup>th</sup> week:

**Seminar:** Death and dying: anthropology of loss and bereavement.

<b>10<sup>th</sup> week:</b> <b>Seminar:</b> Biological and social death in Western societies.	<b>14<sup>th</sup> week:</b> <b>Seminar:</b> The nature of the scientific basis in medical knowledge: a text analysis.
<b>11<sup>th</sup> week:</b> <b>Seminar:</b> Rituals and their relation to health.	<b>15<sup>th</sup> week:</b> <b>Seminar:</b> Concluding discussion.
<b>12<sup>th</sup> week:</b> <b>Seminar:</b> Ethnomedicine and its European school.	
<b>13<sup>th</sup> week:</b> <b>Seminar:</b> The concept of man in medicine: a text analysis.	

## Requirements

Participating in seminars, giving a presentation on a given topic.

Evaluation: Based on the activity at seminars and on a 14th week test.

Course Objectives and Course Outline: The object of medical anthropology is the human being, as he/she appears in the context of health and disease, in the healing processes and in the health-care system. The basic method of medical anthropology is historic-hermeneutical in the sense that man is investigated by this discipline in historical and cross-cultural relations; it is an integrative study and in this role it uses the contributions of different forms of knowledge (philosophical anthropology, social philosophy, cultural anthropology, psychoanalysis, sociology, etc.); the problems of health-illness is discussed in socio-economic dynamics; it deals with biomedical approach as a cultural product and in this way it draws the attention to the relation between individual experience, cultural meaning and social structure. The medical anthropology semester consists of 15 hours seminar; these are organised in two-hour seminars in every second week.

Method: Every student should actively participate by presenting a short lecture on a chosen topic (possibly in group-work). One hour from the 15 hour course will be reserved for tutorial discussion with the instructor during the preparation period. Every student should read a given paper for every seminar and is expected to put the presenters questions concerning the topic a few days before the seminar. The seminars can only be successful, if students participate actively in the discussions.

Requirement for the AW5 evaluation: Passing the last week test/essay, which is based on the course textbook, the compilation of readings and seminar discussions.

## Department of Behavioural Sciences

Subject: **MEDICAL SOCIOLOGY**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **8**

Seminar: **7**

**1<sup>st</sup> week:**

**Lecture:** Introduction to medical sociology.

**2<sup>nd</sup> week:**

**Seminar:** The health of societies. System of social inequalities. Measurement. SES indicators.

**3<sup>rd</sup> week:**

**Lecture:** Health inequalities within societies. Sociological analyses of epidemiological data.

**4<sup>th</sup> week:**

**Seminar:** Health and health promotion. Hungarian and international programmes of WHO. Life style and change.

**5<sup>th</sup> week:**

**Lecture:** Sociology of behaviour modification. Social

aspect of health and illness.

**6<sup>th</sup> week:**

**Seminar:** Health seeking behaviour. Sick role and illness behaviour.

**7<sup>th</sup> week:**

**Seminar:** Medicine's professional autonomy. Physician's role and behaviour. Sociological approaches to doctor-patient relationship. Medicalisation and secularisation.

**8<sup>th</sup> week:**

**Lecture:** Health risks of various social groups. (the elderly, minorities women, unemployment etc...)

**9<sup>th</sup> week:**

**Seminar:** Health risk of social deviance (drug, alcohol, sex. deviancies, somatic deviancies, suicide etc..).

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**10<sup>th</sup> week:**

**Seminar:** Quality of life. Life chance QALY.

**11<sup>th</sup> week:**

**Lecture:** Comparative measurements of medical and sociological health status. Quality of life ranking of interventions based on cost - effectiveness analyses.

**12<sup>th</sup> week:**

**Seminar:** Structural and economic sociology of health care provision. Structural functionalism of health care. Redistribution, economic growth and the quality of life.

**13<sup>th</sup> week:**

**Lecture:** Survey research techniques. Subjective evaluation of health. International research protocols, and questionnaires.

**14<sup>th</sup> week:**

**Seminar:** Needs, demands and utilization of health care. Patients satisfaction. Patient education.

**15<sup>th</sup> week:**

**Lecture:** End of course test.

## Requirements

Requirements for signing the lecture book: Course evaluation through a five scale practical grade with the following point criteria:

fair: 34 point good: 35 - 60 point excellent: 61 - 70 point

Course objectives: To understand the health/illness/sickness problem in the modern civilization; to identify the inherence of health status and social status; to qualify the health outputs of health care.

## Department of Behavioural Sciences

Subject: **BEHAVIOURAL MEDICINE**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

**1<sup>st</sup> week:**

**Lecture:** Health illness representations.

**2<sup>nd</sup> week:**

**Lecture:** Perceived control in health changes.

**3<sup>rd</sup> week:**

**Lecture:** Role of personality in changes of health status.

**4<sup>th</sup> week:**

**Lecture:** Psychosocial aspects of hospitalisation.

**5<sup>th</sup> week:**

**Lecture:** Psychologically demanding treatments and their control.

**6<sup>th</sup> week:**

**Lecture:** Common psychological reactions to hospitalisation.

**7<sup>th</sup> week:**

**Lecture:** Children in hospital.

**8<sup>th</sup> week:**

**Lecture:** Chronically ill patient and his/her illness.

**9<sup>th</sup> week:**

**Lecture:** The stigmatised patient.

**10<sup>th</sup> week:**

**Lecture:** Social support.

## Requirements

Fourth year students should pass the exam at the end of the first semester (AW5). This examination includes the materials of the lectures. Materials of all lecture will be given to students before the examination. The Department of Behavioural Sciences will adhere to the requirements of the Rules and Regulations for English Program Students. The student must be present and take the examination at the designated time. (He/she must explain the reason for any absence from the examination to the Departmental Adviser within 1 days of the day of examination.)

## Department of Biochemistry and Molecular Biology

Subject: **MOLECULAR MECHANISM OF DISEASES CONCERNING GREAT POPULATIONS**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **25**

**1<sup>st</sup> week:**

**Lecture:** Introduction to molecular medicine

**2<sup>nd</sup> week:**

**Lecture:** Genomic medicine

**3<sup>rd</sup> week:**

**Lecture:** Diabetes

**4<sup>th</sup> week:**

**Lecture:** Obesity

**5<sup>th</sup> week:**

**Lecture:** Vitamin D and immunodefects

**6<sup>th</sup> week:**

**Lecture:** Cancer I.

**7<sup>th</sup> week:**

**Lecture:** Cancer II.

**8<sup>th</sup> week:**

**Lecture:** Cancer II.

**9<sup>th</sup> week:**

**Lecture:** Osteoporosis

**10<sup>th</sup> week:**

**Lecture:** Immunodeficiencies

### Requirements

Attendance on the lectures is compulsory.

## Department of Biophysics and Cell Biology

Subject: **COMPUTER SCIENCE**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester, 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** Test.

**2<sup>nd</sup> week:**

**Practical:** Fundamentals and basic concepts of informatics.

**3<sup>rd</sup> week:**

**Practical:** Operating system.

**4<sup>th</sup> week:**

**Practical:** The Windows operating system.

**5<sup>th</sup> week:**

**Practical:** Computerised networks.

**6<sup>th</sup> week:**

**Practical:** Word processor programs, MS Word I.

**7<sup>th</sup> week:**

**Practical:** Word processor programs, MS Word II.

**8<sup>th</sup> week:**

**Practical:** Spreadsheets programs, MS Excel I.

**9<sup>th</sup> week:**

**Practical:** Spreadsheet program, MS Excel II.

**10<sup>th</sup> week:**

**Practical:** Computerised presentation, MS PowerPoint I.

**11<sup>th</sup> week:**

**Practical:** Computerised presentation, Power Point II.

**12<sup>th</sup> week:**

**Practical:** Internet.

**13<sup>th</sup> week:**

**Practical:** Internet databases.

**14<sup>th</sup> week:**

**Practical:** Introducing into the editing of the web pages.

**15<sup>th</sup> week:**

**Practical:** Test.

## Requirements

The acquisition of fundamental theoretical and practical knowledge from the function of the modern personal computers.

Course description: PC architecture, operating systems, file management, network knowledge, internet and its opportunities of application, word processor, spreadsheet, the usage of presentational programs, the achievement of scientific databases and its use.

## Department of Biophysics and Cell Biology

Subject: **MODERN BIOPHYSICAL METHODS IN BIOLOGY AND MEDICINE**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **24**

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

**Lecture:** NMR and MRI.

### 2<sup>nd</sup> week:

**Lecture:** Structure of the cell membrane, functional consequences of the mobility (lateral and rotational movement) of proteins in the membrane. Novel models for the structure of the cell membrane, lipid domains. Time-dependent fluorescence and phosphorescence spectroscopy, fluorescence recovery after photobleaching (FRAP), fluorescence correlation spectroscopy.

### 3<sup>rd</sup> week:

**Lecture:** Luminescence spectroscopy. Theoretical background and principles of application of fluorescence spectroscopy to study the structure of proteins, nucleic acids and that of the cell membrane. Fluorescence conjugation of biomolecules, techniques based on fluorescence polarization and fluorescence resonance energy transfer.

### 4<sup>th</sup> week:

**Lecture:** Modern microscopic methods for structural and functional characterization of cells. Theoretical background of fluorescence microscopy and image processing. Generation of scanning and wide-field images. Detectors, analog/digital conversion and digital storage of images. Digital image analysis: principles and biological applications. Principles of confocal microscopy. High resolution non-linear optical microscopy.

### 5<sup>th</sup> week:

**Lecture:** LSC - Laser-Scanning Cytometry (imaging cytometry, slide-based imaging cytometry). Limitations of the flow cytometry and microscopy. Comparing flow cytometry, confocal microscopy and laser-scanning cytometry. How does laser-scanning cytometry work? Strength and limitations of the laser-scanning cytometry. Laser scanning-cytometry in cell biology and clinical research.

### 6<sup>th</sup> week:

**Lecture:** Principles and applications of flow cytometry. Structure of a flow cytometer and its application fields: immunogenetics, receptor and antigen research and diagnostics, DNA and cell cycle analysis, measurement of membrane potential, membrane permeability and determination of cytosolic pH and ion concentrations, application of fluorescence resonance energy transfer to determine protein associations. (FCET).

### 7<sup>th</sup> week:

**Lecture:** Modern electrophysiological techniques. Passive and active electrical properties of the cell membrane, structure and function of ion channels. Principles and application of the patch clamp technique: recording ionic currents and membrane potential.

### 8<sup>th</sup> week:

**Lecture:** Test.

## Requirements

**Aim of the course:** Based on the principles covered in biophysics and cell biology discussion of problems with special relevance to medical biology from a modern molecular biophysical and quantitative biological aspect. It has become evident in the past 15 years that a number of cellular parameters detectable via biophysical technology are of pivotal importance in the regulation of cell proliferation and differentiation. Especially in the field of immunology, these techniques and phenomena have entered routine medical practice and research. Thus, it is most important that students with adequate educational background shall receive further, higher level education in the theoretical and practical aspects of this field.

### Short description of the course topics:

1. Application of nuclear magnetic resonance spectroscopy (NMR) and imaging (MRI) in biology and medicine
2. Luminescence spectroscopy.



3. Flow cytometry and its applications.
4. Structure of the cell membrane, mobility of lipids and proteins in the plasma membrane.
5. Advanced microscopy.
6. Modern electrophysiological techniques
7. Slide-based cytometry.

**Compulsory literature:** course material and lecture slides published on the website of the Department

**Recommended reading:** Medical biophysics (Damjanovich, Fidy, Szöllösi Eds.), Medicina, 2009;

**Web address for the course material:**

**Requirements:**

*Conditions for signing*

*the lecture book:* attending 5 lectures out of 7 . Attention! Lecture books are handled exclusively by the study advisor during the dedicated office hours!

*Type of examination:* practical grade, 5 levels

*Examination:* Written test. The exam is during the 8<sup>th</sup> lecture.

*Grading:* below 50% fail

*Repeated/improved*

*exam:* during the examination period, one occasion, written test.

## Department of Biophysics and Cell Biology

Subject: **SELECTED TOPICS IN CELL BIOLOGY**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **24**

**1<sup>st</sup> week:**

**Lecture:** Something only your mother can give you: the mitochondrium

**2<sup>nd</sup> week:**

**Lecture:** Diseases through the spectacle of Cell Biology I. ABC transporters in pathological and physiological context

**3<sup>rd</sup> week:**

**Lecture:** Diseases through the spectacle of Cell Biology II. Leukemias and higher-order chromatin structure

**4<sup>th</sup> week:**

**Lecture:** What goes up, must come down: Degrading proteins and lipids - and the consequences of aberrant pathways

**5<sup>th</sup> week:**

**Lecture:** GFP and friends - the molecule that drew the Nobel Prize in Physiology or Medicine in 2008

**6<sup>th</sup> week:**

**Lecture:** From cell biology to preclinical models: CDKs as drug targets

**7<sup>th</sup> week:**

**Lecture:** Ion channels: cellular physiology and disease

**8<sup>th</sup> week:**

**Lecture:** Receptor tyrosine kinases: regulation by compartmentation of signaling components

**9<sup>th</sup> week:**

**Lecture:** Recycling and molecular interactions of ErbB2 – implications for cancer therapy

**10<sup>th</sup> week:**

**Lecture:** Recombination: Break the genome to save it!

**11<sup>th</sup> week:**

**Lecture:** A strict rule in multicellular development: cells must behave, otherwise their fate is apoptosis or ...

**12<sup>th</sup> week:**

**Lecture:** Targeting tumors with reprogrammed “designer” T cells

**Self Control Test (Grade offering exam after the lecture.)**

### Requirements

Cell biology is an ever expanding area fusing with classical biochemistry, molecular biology and biophysics at various interfaces. The speakers will give insight into selected "hot" and "cool" topics that are currently in the center of attention. The course is designed to capitalize on the basic cell and tissue biology syllabus and expand the knowledge of

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students with information that is of profound biomedical relevance.

2-hour classes, test: at the end of the last occasion (multiple choice and T/F type)

Requirement for signature: presence at minimally 5 occasions and writing the final test.

Grading: based on test and in-class activity during the course.

Requirements of admission: completed biophysics and cell biology courses

## Department of Biophysics and Cell Biology

Subject: **ADVANCED STUDENTS' SCIENTIFIC ACTIVITY**

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

### Requirements

Introduction to students' scientific activities, formerly presented lecture(s) at the students' scientific conference(s) and/or accepted thesis.

## Department of Dermatology

Subject: **WOUND HEALING**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Seminar: **12**

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

**Seminar:** 1. Modern concept of wound healing (phases of w.h., surgical-technical influencing factors, healing with primary and secondary intention 2. Frequent complications in w.h. (disruption, healing of infected wounds, wound bacteriology, scarring, late consequences) 3. Classification of wounds. Laser applications (types and role of laser, specificities of the laser wound) 4. Questions of asepsis/antiseptis, practical issues, surgical ward visit

#### 2<sup>nd</sup> week:

**Seminar:** 5. History of managing wounds, modern wound-care (synthetic materials, to facilitate w.h. 6.

Thermic trauma and its management 7. Skin replacement, biological materials and future possibilities 8. In vivo models to study w.h.

#### 3<sup>rd</sup> week:

**Seminar:** 9. CVI, therapy of ulcer cruris 10. Visit at the tissue-culture laboratory 11. Visit at the in vivo laboratory (facility for small experimental animals) 12. In vitro models to study w.h., cell- and tissue-culture possibilities  
Written test

### Requirements

Aim of the course is to classify trauma types affecting the skin; to present the modern concept of wound healing; to give information on the in vitro and in vivo experimental methods that are applied in wound healing studies; to present the clinical aspects of wound healing, special wound healing types and symptoms of various complications that arise during wound healing. Practical aspects of wound management will be discussed along with the presentation of modern wound care methods and newest available materials.

To be held at 17.00 at the Dermatology lecture hall in 12 hours (a combination of seminars and practicals) for 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> graders.

## Department of Foreign Languages

Subject: **LATIN LANGUAGE**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester, 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** The Latin alphabet and pronunciation. Introduction into medical terminology; Greek and Latin origins of nomenclature.

**2<sup>nd</sup> week:**

**Practical:** Parts and regions of the human body 1 Word building. Root words, prefixes and suffixes in medical terminology.

**3<sup>rd</sup> week:**

**Practical:** Parts and regions of the human body. Planes and directions in anatomical terminology.

**4<sup>th</sup> week:**

**Practical:** Nominative and Genitive suffixes. Plural forms and adjectives in Latin

**5<sup>th</sup> week:**

**Practical:** The skeleton

**6<sup>th</sup> week:**

**Practical:** The joints. Word formation.

**7<sup>th</sup> week:**

**Practical:** Revision, practice. Mid-term test

**8<sup>th</sup> week:**

**Practical:** Muscular system. Adjectives in terminology.

**9<sup>th</sup> week:**

**Practical:** The cardiovascular system 1.

**10<sup>th</sup> week:**

**Practical:** The cardiovascular system 2.

**11<sup>th</sup> week:**

**Practical:** Digestive system and some diseases affecting the GI system

**12<sup>th</sup> week:**

**Practical:** The lungs and respiratory system

**13<sup>th</sup> week:**

**Practical:** Genito-urinary system

**14<sup>th</sup> week:**

**Practical:** Revision. End-term test

**15<sup>th</sup> week:**

**Practical:** Evaluation

## Requirements

### Requirements of the Latin language courses

#### Attendance

The attendance is compulsory for the language classes. The maximum ratio of allowable absences is 10 % which is a maximum of 2 out of the weekly classes. The missed classes may be made up only in the same week. Maximum three language classes are allowed to be made up with an other group. Students arriving late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the signature is refused and the student has to repeat the course.

#### Testing, evaluation

In each language course, students have to sit for 2 written language tests.

Further minimal requirement is the knowledge of 300 words in each semester announced on the first week. Every week there is a (written or oral) word quiz from 30 words in the first 5-10 minutes of the class. In each word quiz students can be given 1 points if they know at least 80 % of the words asked and they have to collect 1 points at least to pass vocabulary minimal requirements. If a student has 5 or more failed or missed word quizzes he/she has to take a vocabulary exam from all the 300 words along with the oral minimal exam. The bonus points awarded for the successful word quizzes (maximum 10) are added to the average score of the written tests.

The minimal requirement for the mid-term and the end-term tests is 40 % each. If a student does not reach this score he/she has to repeat the test. If both test scores reach 40 % the bonus points awarded for word quizzes (maximum 10) and maximum 10 extra bonus points awarded by the instructor for individual contribution to the class are added to the

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average score of the mid-term and end-term tests, resulting the final score.

Based on the final score the tests are graded according to the following table:

<b>Final score</b>	<b>Grade</b>
0 - 59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the final score is below 60 the student once can take an oral remedial exam covering the material of the whole semester.

**Consultation classes**

In each language course once a week students may attend a consultation class with one of the teachers of that subject in which they can ask their questions and ask for further explanations of the material covered in that week. These classes are optional for the students.

**Coursebook:** Répás, László: Basics of medical terminology

**Website:** Vocabulary minimal lists and further details are available on the website of the Department of Foreign Languages: [ilekt.med.unideb.hu](http://ilekt.med.unideb.hu).

## Department of Human Genetics

Subject: **MEDICAL GENOMICS**

Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **16**

Practical: **4**

**9<sup>th</sup> week:**

- Lecture:** 1. Medical genome biology: relevance and history.  
 2. Application of genome biology for pharmaceutical and biotechnological research.  
 3. Introduction into bioinformatics. DNA sequence comparison, sequence data management and analysis.  
**Practical:** 1. Sequence alignment practical.  
 2. Browsing databases for human disease genes.

**10<sup>th</sup> week:**

- Practical:** 3. Association of DNA polymorphisms with complex diseases.  
 4. Using the public gene expression databases.

**12<sup>th</sup> week:**

- Lecture:** 4. Gene expression pattern changes in disease. The use of DNA microarrays in medical diagnosis.  
 5. Practical and technical aspects of gene expression analysis.  
 6. Immuno-proteomics, methods and applications.

**13<sup>th</sup> week:**

- Lecture:** 7. Technologies for testing human genome sequence and proteome variability.  
 8. Systems biology and medical diagnostics. Biotechnology.  
 9. Bioinformatics II. Protein sequence comparison, motifs, prediction of 3D structure, multiple sequence alignments.

**14<sup>th</sup> week:**

- Lecture:** 10. Modern genetic maps.  
 11. Genome databases, gene ontology. Genome analysis, practical examples.  
 12. Evolutionary genome biology.

**15<sup>th</sup> week:**

- Lecture:** 13-14. Genomescan technology, global genetic association and its relevance to multigenic diseases.  
 15. Nanotechnology and medicine.

## Requirements

Minimum requirements of the signature:

Electronic registration through Neptun.

Active participation on week 9 and 10 medical genomics seminars – proved with signed attendance-sheets.

Those, who do not meet these requirements, cannot take the examination.

It is very much recommended to attend the medical genomics lectures during week 9 and 12-15 and to take notes. To encourage the attendance of the lectures we give 1 bonus point for 1 attendance, which is proved by a signed attendance-sheet. Since there are 10 occasions (5 double and 5 single lectures), you may earn 10 bonus points altogether. These are percentage points that will be added to the result of the examination.

Only those students are eligible to sign the attendance-sheet and get bonus points, who registered for the subject Medical genomics electronically.

Those students, who want to receive bonus points have to take at least a one page handwritten lecture note of the lecture in question. The note may be checked by teachers any time.

The bonus points can be used only during the end-of-semester examination period (2013 May-July), cannot be transferred to the next school-year.

Students, who manipulate the attendance sheets will be denied signature in this semester.

Second year students may also register for medical genomics, they can even take the examination with their valid signature in their lecture book, even if they did not pass last year. Students not having a signature in the lecture book and/or in the Neptun, have to attend classes to earn a signature.

Students, who got signature can register for an examination through the Neptun. Without registration it is not possible to take the examination. Evaluation of the exam (AW5, assessment of work): fail (1), pass (2), satisfactory (3), good (4), excellent (5). Repeated examinations are possible according to general university rules.

Lectures will be held at times and locations given for medical genetics lectures, during week 9 and 12-15.

Practical: week 9-10, in a basement computer room of the Educational Center, according to the advertised timetable. (When possible, the seminars will be held the same time as the medical genetics seminars/practicals.)

For further details see [www.genetics.dote.hu](http://www.genetics.dote.hu), username: medical\_genomics, password: neurofibromatosis. Click on "Oktatás", Downloads/Information, Medical genomics.

## Department of Internal Medicine

Subject: **DIAGNOSIS AND THERAPY OF ACUTE LEUKAEMIAS**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester, 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **20**

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

**Lecture:** Classification of AML on the basis of morphology, cytochemistry and surface markers. WHO classification.

### 2<sup>nd</sup> week:

**Lecture:** Acute myelogenous leukaemia: cytogenetics, surface markers and oncogenes.

### 3<sup>rd</sup> week:

**Lecture:** Acute promyelocytic leukaemia.

### 4<sup>th</sup> week:

**Lecture:** Therapy of AML.

### 5<sup>th</sup> week:

**Lecture:** Minimal residual disease and multi- drug resistance

### 6<sup>th</sup> week:

**Lecture:** Morphological and cytochemical classification of ALL

### 7<sup>th</sup> week:

**Lecture:** Surface marker, cytogenetic findings and oncogenes in ALL

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**8<sup>th</sup> week:**

**Lecture:** Therapy of ALL

**9<sup>th</sup> week:**

**Lecture:** Secondary acute leukaemia and myelodysplastic syndrome

**10<sup>th</sup> week:**

**Lecture:** Diagnosing a specific case with the aid of clinical data. Therapeutic protocol. This work will mean the condition of acceptance.

## Requirements

Entrance conditions: successfully absolved 2nd year

## Department of Internal Medicine

Subject: **BASIC HOSPITALISATION TECHNIQUES FOR MEDICAL STUDENTS**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **5**

Practical: **5**

**1<sup>st</sup> week:**

**Lecture:** History - needs - health and diseases. Maslow hierarchy of needs. Assistance, duties of nurses: recreation, mobilisation, bedding.

**2<sup>nd</sup> week:**

**Lecture:** Assistance, duties of nurses: hygienic needs, defecation, catheters. Documentation. Inspection, observation, test results, public health laws concerning to nursing.

**3<sup>rd</sup> week:**

**Lecture:** Sterilisation, disinfection. Wound healing,

decubitus, decubitus prevention. Medication.

**4<sup>th</sup> week:**

**Lecture:** Infusion techniques, transfusion. Diagnostic examinations, getting up the patient. Drainage, bleeding, punctions.

**5<sup>th</sup> week:**

**Lecture:** Examination methods. Education of patients, mental hygiene. Psychology of nursing, dying patient, attendance of the dead.

## Requirements

Course description: Place of lectures: 3rd Department of Internal Medicine (Augusta). Educational responsible: Dr. Katalin Dankó Number of practicals: 5 and summer practice.

## Department of Internal Medicine

Subject: **RARE DISEASES**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

**1<sup>st</sup> week:**

**Lecture:** Rare disorders: introduction. (G. Pfliegler) Rare diseases: organizations Hungarian and international approach (J. Sándor)

**2<sup>nd</sup> week:**

**Lecture:** Molecular genetics in rare diseases (I. Balogh) Rare bleeding disorders - genotype, phenotype, laboratory and molecular genetics (Zs. Bereczki)

**3<sup>rd</sup> week:**

**Lecture:** Genetic disorders (É. Oláh) Manifestations of

rare diseases in the eye (V. Nagy)

**4<sup>th</sup> week:**

**Lecture:** The role of biochemical laboratory in the diagnosis of rare disorders. (J. Kappelmayer) Lysosomal diseases and immunodeficiency (L. Maródi)

**5<sup>th</sup> week:**

**Lecture:** Orphan drugs. (G. Blaskó) Case presentations (E. Kovács, K. Urbán) Closing remarks (G. Pfliegler)

Conditions for acceptance: test

## Department of Laboratory Medicine

Subject: **PROBLEM BASED LEARNING IN COMPLEX PATHOLOGY**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **30**

**1<sup>st</sup> week:**

**Lecture:** Problem based evaluation of anemias.

**2<sup>nd</sup> week:**

**Lecture:** Problem based evaluation of myeloproliferative disorders.

**3<sup>rd</sup> week:**

**Lecture:** Problem based evaluation of lymphoproliferative disorders.

**4<sup>th</sup> week:**

**Lecture:** Problem based evaluation of hemorrhagic diathesis.

**5<sup>th</sup> week:**

**Lecture:** Problem based evaluation of malignancy and tumor immunology.

**6<sup>th</sup> week:**

**Lecture:** Problem based evaluation of kidney diseases.

**7<sup>th</sup> week:**

**Lecture:** Problem based evaluation of diabetes mellitus.

**8<sup>th</sup> week:**

**Lecture:** Problem based evaluation of acute coronary syndrome.

**9<sup>th</sup> week:**

**Lecture:** Problem based evaluation in clinical cardiology.

**10<sup>th</sup> week:**

**Lecture:** Problem based evaluation in clinical cardiology - hypertension.

**11<sup>th</sup> week:**

**Lecture:** Problem based evaluation in autoimmunity and hypersensitivity reactions.

**12<sup>th</sup> week:**

**Lecture:** Problem based evaluation in infections and immune deficiencies.

**13<sup>th</sup> week:**

**Lecture:** Problem based evaluation in asthma allergy.

**14<sup>th</sup> week:**

**Lecture:** Problem based evaluation in gastrointestinal disorders.

**15<sup>th</sup> week:**

**Lecture:** Test.

### Requirements

Entrance conditions: at least 10 students.

Only in 2<sup>nd</sup> semester.

## Department of Laboratory Medicine

Subject: **PROBLEM BASED LEARNING IN ONCOHEMATOLOGY**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Seminar: **30**

**1<sup>st</sup> week:**

**Seminar:** Problem based evaluation of anemias

**2<sup>nd</sup> week:**

**Seminar:** Problem based evaluation of myeloproliferative disorders

**3<sup>rd</sup> week:**

**Seminar:** Problem based evaluation of lymphoproliferative disorders I.

**4<sup>th</sup> week:**

**Seminar:** Problem based evaluation of lymphoproliferative disorders II.

**5<sup>th</sup> week:**

**Seminar:** Problem based evaluation of myelodysplastic syndromes

**6<sup>th</sup> week:**

**Seminar:** Problem based evaluation of myeloma multiplex

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**7<sup>th</sup> week:**

**Seminar:** Problem based evaluation of tumors of the lung I.

**8<sup>th</sup> week:**

**Seminar:** Problem based evaluation of tumors of the lung II.

**9<sup>th</sup> week:**

**Seminar:** Problem based evaluation of tumors of the urinary tract

**10<sup>th</sup> week:**

**Seminar:** Problem based evaluation of prostate cancer

**11<sup>th</sup> week:**

**Seminar:** Problem based evaluation of gynecological

tumors

**12<sup>th</sup> week:**

**Seminar:** Problem based evaluation of endocrine tumors

**13<sup>th</sup> week:**

**Seminar:** Problem based evaluation of tumors of the gastrointestinal tract

**14<sup>th</sup> week:**

**Seminar:** Problem based evaluation of complications of cancer

**15<sup>th</sup> week:**

**Seminar:** Test.

## Requirements

Entrance conditions: min. 10 students

Only in 2nd semester

## Department of Medical Chemistry

Subject: **UNDERSTANDING MEDICAL PROBLEMS THROUGH EXPERIMENTS: A PROBLEM-BASED ELECTIVE PRACTICAL COURSE**

Year, Semester: 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **30**

**1<sup>st</sup> week:**

**Practical:** How to make fat and how to get rid of it? (Adipocyte differentiation. Lipid and energy metabolism.)

**2<sup>nd</sup> week:**

**Practical:** What cells "inhale" and "exhale"? What a seahorse can teach us about mitochondrial function and dysfunction? (Measuring the effects of metabolic drugs on oxygen consumption and glycolytic rate.)

**3<sup>rd</sup> week:**

**Practical:** Let's make bones! (Phosphate-induced mineralization in osteoblast cultures. Role of Vitamin C.)

**4<sup>th</sup> week:**

**Practical:** How to kill tumor cells? (Cellular effects of different classes of anticancer drugs on cancer cell lines.)

**5<sup>th</sup> week:**

**Practical:** A smoking gun. (How cigarette smoking causes lung injury?)

**6<sup>th</sup> week:**

**Practical:** Beware of the Sun! (Effects of UV radiation on skin cells.)

**7<sup>th</sup> week:**

**Practical:** A radical idea. (Generating and eliminating free

radicals by the cells.)

**8<sup>th</sup> week:**

**Practical:** About fruits and vegetables. (Testing the antioxidant effects of various fruits and vegetables.)

**9<sup>th</sup> week:**

**Practical:** Can the exhaust fumes of your car lower your blood pressure? (Cell biology of nitric oxide and peroxynitrite.)

**10<sup>th</sup> week:**

**Practical:** Show me your breath, I tell you who you are! (Measurements from exhaled breath concentrate.)

**11<sup>th</sup> week:**

**Practical:** Will your pain killer kill your liver? (Liver toxicity of acetaminophen.)

**12<sup>th</sup> week:**

**Practical:** Immunosuppression in action. (How does cyclosporine work?)

**13<sup>th</sup> week:**

**Practical:** You are what you eat! (Evaluation of the effects of lipid-rich diet by histology and biochemical essays.)



**14<sup>th</sup> week:**

**Practical:** Filling and emptying glycogen stores. (Determination of the glycogen stores in various alimentary conditions.)

**15<sup>th</sup> week:**

**Practical:** Watch your DNA! (Mutations/DNA damage and their detection.)

**16<sup>th</sup> week:**

**Practical:** Do your blood vessels leak? (Transendothelial permeability measurements by ECIS.)

**17<sup>th</sup> week:**

**Practical:** Interact with me! (How and why proteins "touch" each other? Methods used to study protein-protein interactions.)

**18<sup>th</sup> week:**

**Practical:** How to create green cells? (Transfection with GFP.)

**19<sup>th</sup> week:**

**Practical:** Heat shock (Induction of heat shock in cell lines: expression of Hsp-s. Protection from cytotoxic insults.)

**20<sup>th</sup> week:**

**Practical:** Where is my protein? (Subcellular localization of proteins by immunostaining+compartment-specific markers. Cell fractionation and Western blotting.)

**21<sup>st</sup> week:**

**Practical:** Inhibitors of protein phosphatases - dangerous biological weapons? (Phosphatase inhibitory and cytotoxic effects of microcystin and other biotoxins.)

**22<sup>nd</sup> week:**

**Practical:** Green tea - enemy of cancer cells? (Effect of polyphenolic compounds on proliferation of cancer cell.)

## Requirements

Min. 1, max. 10 students (Preference will be given to students who obtained good marks in Medical Chemistry.)

Aim of the course: The course provides a unique opportunity to investigate important medical problems at the cellular and the molecular level or in animal experiments. Enrolled students choose a topic from the list. Students will work in small groups (2-3 students/group) and will be assigned a tutor who will supervise their activities and labwork. First, students make a thorough literature search to understand the medical problems in question, its possible experimental approach and then discuss it in detail with their tutor. During the laboratory sessions, the students perform experiments related to the chosen problem and will learn how to collect data, interpret and evaluate results, how to analyze data statistically and how to draw conclusions. The students prepare essays (5 pages) on their achievements. In a closing session, the group and the tutor discuss the results and evaluate the project.

## Department of Neurosurgery

Subject: **NEUROSURGERY**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **6**

Practical: **8**

**1<sup>st</sup> week:**

**Lecture:** 1. Neurosurgery in general, the topic of the neurosurgery. Main symptoms of different localisations, diagnostic possibilities. Developmental anomalies of the central nervous system requiring neurosurgical intervention.

**2<sup>nd</sup> week:**

**Lecture:** 2. Intracranial tumours I. General review. Neuroepithelial tumors, meningioma, schwannoma, neurofibroma, haemangio-blastoma.

**3<sup>rd</sup> week:**

**Lecture:** 3. Intracranial tumors II. Pituitary adenoma, craniopharyngioma, epidermoid/dermoid cysts, colloid cyst, germinoma, teratoma, lipoma, primary malignant lymphoma, metastatic tumours. Causes and management

of hydrocephalus (obstructive, communicating, congenital, acquired).

**4<sup>th</sup> week:**

**Lecture:** 4. Spinal space-occupying lesions (tumors, disc prolapse and spondylosis). Tumours of peripheral nervous system.

**5<sup>th</sup> week:**

**Lecture:** 5. Neurotraumatology. Head, spinal and peripheral nerve injuries.

**6<sup>th</sup> week:**

**Lecture:** 6. Cerebrovascular diseases requiring neurosurgical treatment. Inflammatory processes, brain abscess.

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**7<sup>th</sup> week:**

**Practical:** 1. Diagnosis and treatment of intracranial space occupying lesions (except hematomas). Neurosurgical aspects of hydrocephalus and intracranial developmental anomalies. Shunt operations.

**8<sup>th</sup> week:**

**Practical:** 2. Neurosurgical aspects of vascular diseases. Causes and outcome of subarachnoid haemorrhage. Cerebral aneurysm, angioma and fistula, their surgical management.

**9<sup>th</sup> week:**

**Practical:** 3. Craniocerebral and spinal trauma, diagnosis and neurosurgical treatment. Management of unconscious neurosurgical patients. Brain herniations.

**10<sup>th</sup> week:**

**Practical:** 4. Degenerative and space occupying spinal lesions. Their diagnosis and surgical treatment. Operability of spinal developmental anomalies.

## Requirements

The fundamentals of neurological surgery can be found in the textbook. The convincing knowledge of this material and the active participation of each practical lesson are the condition of a successful examination. The six lectures will complete the textbook with new data and stress the importance of the symptomatology and diagnostic possibilities of the more frequent neurosurgical diseases, mainly from practical points of view. These will facilitate the understanding of the textbook and the theses of the examination as well. The task of the practicum is the collection of personal practical experience of the neurosurgical diseases at bedside. The active participation in all practicum is obligatory. Omission of a single practicum results in unsigned index, unless the student writes a correct case history of a personally examined neurosurgical patient. The skill and knowledge will be controlled during the practicum and in oral examination at the end of the 2nd semester. Students will get the theses of examination in the beginning of the 2nd semester.

## Department of Operative Techniques and Surgical Research

Subject: **BASIC LAPAROSCOPIC SURGICAL TRAINING**

Year, Semester: 5<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **5**

Practical: **15**

**1<sup>st</sup> week:**

**Lecture:** History of laparoscopic surgery. Basic principles of laparoscopic surgery. Laparoscopic equipments: insufflator, video-camera, monitor, laparoscopic instrumentation (slide and video demonstration).

**2<sup>nd</sup> week:**

**Practical:** Practising the use of laparoscopic instruments in open pelvi-box. Operating in a three-dimensional field viewing two-dimensional structure through video-imaging instrumentation.

**3<sup>rd</sup> week:**

**Practical:** Intracorporeal knotting technique in open and

closed pelvi-box on surgical training model.

**4<sup>th</sup> week:**

**Practical:** Preparation of chicken thigh and intracorporeal knotting technique in open and closed pelvi-box and in MATT (Minimal Access Therapy Technique) trainer.

**5<sup>th</sup> week:**

**Practical:** Cholecystectomy on isolated liver-gallbladder biopreparate model and/or phantom model in open and closed pelvi-box and in MATT (Minimal Access Therapy Technique) trainer. WRITTEN TEST.

## Requirements

Students have to learn the laparoscopic equipment and instruments and to perform basic laparoscopic interventions working in open and closed pelvi-box, MATT (Minimal Access Therapy Technique) trainer on surgical training models, phantom models and biopreparate models.

History and basic principles of endoscopic surgery. The use laparoscopic equipment and instruments. Intracorporeal knotting technique in open and closed pelvi-box on phantom models and biopreparate models.

Cholecystectomy in closed pelvi-box and MATT-trainer on liver-gallbladder phantom model and biopreparate model.

## Department of Operative Techniques and Surgical Research

Subject: **SURGICAL OPERATIVE TECHNIQUES**

Year, Semester: 3<sup>rd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: 4

Practical: 8

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

**Lecture:** Revision of basic surgical knowledge: handling surgical instruments, basic surgical techniques, pitfalls in suturing techniques. Surgical suture materials. Advanced knotting and suturing techniques.

**Practical:** Practising knotting techniques on knotting pads and different suturing techniques on gauze models and on surgical training models (simple interrupted suture line, special interrupted suture line - Donati sutures, simple continuous suture line, suture removal). Evaluation of the suture lines, discussion of pitfalls.

### 2<sup>nd</sup> week:

**Lecture:** Scrubbing. Possible mistakes. Vein preparation, cannulation, introduction of infusion. Injection techniques and taking blood samples.

**Practical:** Practising vein preparation and cannulation, introduction of infusion, injection techniques and taking blood samples. Scrubbing. Practising of different suturing

and knotting techniques on skin bioprepate models - in team work.

### 3<sup>rd</sup> week:

**Lecture:** Anastomosis techniques in the surgery of the gastrointestinal tract. Suturing techniques in vascular surgery.

**Practical:** Urinary bladder catheterization. End-to-end one layer small bowel anastomosis on small bowel bioprepate models. Vascular sutures on aorta bioprepate models.

### 4<sup>th</sup> week:

**Lecture:** Laparotomies. Conicotomy, tracheostomy.

**Practical:** Conicotomy on phantom model. Laparotomy, venous cutdown technique and tracheostomy on phantom models and/or on living tissue. WRITTEN TEST.

## Requirements

Evoking, deepening, extending and training of basic surgical knowledge acquired during the "Basic Surgical Techniques" subject, working on different surgical training models, phantom models and bioprepate models working in "dry" circumstances.

Revision of basic surgical techniques. Repeating and practising basic life saving methods -hemostasis, venous cutdown technique, conicotomy, tracheostomy - and basic interventions: -wound closure with different suturing techniques, taking blood samples and injection (i.m., i.v.) techniques- on phantom models and bioprepate models.

## Department of Operative Techniques and Surgical Research

Subject: **BASIC MICROSURGICAL TRAINING. INTRODUCTION TO MICROSURGERY**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: 2

Practical: 10

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

**Lecture:** General principles of microsurgery (video and slide presentation). Operating microscopes. Microsurgical instruments (scissors, forceps, needle-holders, approximating vessel clamps). Microsurgical suture materials and needles. Clinical and experimental application of microsurgery.

### 2<sup>nd</sup> week:

**Practical:** Adaptation to the operating microscope by different magnifications. Harmony between eyes and hands. Scraping letter by letter with needle and microsurgical forceps.

### 3<sup>rd</sup> week:

**Practical:** Preparation and pulling of textil fibers with microsurgical forceps (dry and wet method) by different magnifications. Microsurgical knotting technique with needle-holders and forceps under the microscope.

### 4<sup>th</sup> week:

**Practical:** Different suture and knotting techniques on pieces of rubber glove

### 5<sup>th</sup> week:

**Practical:** Arterial anastomosis: end-to-end vascular anastomosis on femoral artery bioprepate model. WRITTEN TEST.

## Requirements

To learn how to use microscope and microsurgical instruments and to perform different microsurgical interventions. Students learn how to use microscope and microsurgical instruments, suture materials and needles. Basic interventions under the microscope by different magnifications to make harmony between eyes and hands. Knotting technique on training pads and performing end-to-end vascular anastomosis on femoral artery biopreparate model.

## Department of Operative Techniques and Surgical Research

Subject: **SURGICAL BIOMATERIALS**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **12**

**1<sup>st</sup> week:**

**Lecture:** Definition of surgical biomaterials. Different types and their clinical application.

**2<sup>nd</sup> week:**

**Lecture:** Surgical suture materials, classification of them and the main aspects in selection of the appropriate suture material related to different organs.

**3<sup>rd</sup> week:**

**Lecture:** Surgical clips, surgical staplers (clip applying machines) and their application fields.

**4<sup>th</sup> week:**

**Lecture:** Surgical meshes and their application fields.

**5<sup>th</sup> week:**

**Lecture:** Bioplasts - method of action, types, application fields.

**6<sup>th</sup> week:**

**Lecture:** Tissue adhesives - mode of action, types, application fields.

**Self Control Test (WRITTEN TEST)**

## Requirements

Aim of the course:

Evoking, deepening, extending the knowledge of surgical biomaterials acquired during the "Basic Surgical Techniques" subject including their clinical application possibilities.

Course description:

Review of the different surgical biomaterials: extending the knowledge of suture materials, surgical clips, surgical staplers, surgical meshes, bioplasts and surgical tissue adhesives showing a lot of slides and video recordings demonstrating the experimental and veterinarian clinical use on different organs.

## Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOTHERAPY**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **30**

**1<sup>st</sup> week:**

**Lecture:** Metabolic diseases I: Diabetes mellitus

**2<sup>nd</sup> week:**

**Lecture:** Metabolic diseases II: Hyperlipidaemias

**3<sup>rd</sup> week:**

**Lecture:** Diseases of the biliary tract and the pancreas

**4<sup>th</sup> week:**

**Lecture:** Pharmacotherapy of cardiac arrhythmias

**5<sup>th</sup> week:**

**Lecture:** Pharmacotherapy of hypertension

**6<sup>th</sup> week:**

**Lecture:** Myocardial infarction and unstable angina

<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Pharmacotherapy of ischaemic heart disease Angina pectoris, AMI	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Cancer therapy
<b>8<sup>th</sup> week:</b> <b>Lecture:</b> Pharmacotherapy of rheumatic diseases	<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Test writing
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Chronic obstructive airway disease	

## Department of Physical Medicine and Rehabilitation

Subject: **PRINCIPLES OF PHYSICAL MEDICINE AND REHABILITATION**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: 16

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

**Lecture:** 1. Theory of medical rehabilitation. Functional assessments of people with disabilities. - Zsuzsanna Vekerdy-Nagy M.D, Ph.D 2. Service delivery in rehabilitation (inpatient, outpatient and community-based services) - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

### 2<sup>nd</sup> week:

**Lecture:** 3. The role of physical therapy in medical rehabilitation - Ilona Balajti Mrs. Veres, PT

### 3<sup>rd</sup> week:

**Lecture:** 4. Basic principles of therapy approaches in medical rehabilitation. - Zsuzsanna Vekerdy-Nagy M.D, Ph.D 5. Measuring the effects of rehabilitation. Quality of Life - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

### 4<sup>th</sup> week:

**Lecture:** 6. Orthotics and prosthetics in rehabilitation - Lajos Ágoston C.P.O. 7. Medical assistive devices - Lajos Ágoston C.P.O.

### 5<sup>th</sup> week:

**Lecture:** 8. Autonomy and compliance - János Kollár Ph.D 9. Principles of psychodiagnostics and therapy in

psychiatric rehabilitation - János Kollár Ph.D

### 6<sup>th</sup> week:

**Lecture:** 10. Characteristics of motor rehabilitation in rheumatic diseases - Zoltán Szekanecz M.D. Ph.D, D.Sc. 11. Cardiac rehabilitation - István Czuriga M.D.Ph.D

### 7<sup>th</sup> week:

**Lecture:** 12. Characteristics of neuro-rehabilitation - Zsuzsanna Vekerdy-Nagy M.D, Ph.D 13. Special features of pediatric rehabilitation - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

### 8<sup>th</sup> week:

**Lecture:** 14. Pulmonary rehabilitation - Mária Szilasi M.D. PhD 15. Social service system in rehabilitation. Educational rehabilitation. Vocational rehabilitation. - János Kollár Ph.D

### 9<sup>th</sup> week:

**Lecture:** 16. Consultation - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

## Requirements

Course description: The aims of the course are understanding the basic principles of the rehabilitation medicine and a special approach to acute medicine with acknowledging the importance of rehabilitation. The main fields of medical rehabilitation. Methods of assessment and therapy.

Announced for 5th year students, Semester: 2nd, no. of lessons: 16 x 45 min.

Credit points: 2 points

Exam: AW5

## Department of Physical Medicine and Rehabilitation

Subject: **SOCIAL ACCEPTANCE OF PEOPLE WITH DISABILITIES**

Year, Semester: 3<sup>rd</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **20**

Practical: **2**

### Requirements

Intended learning outcomes:

To promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities and to promote respect for their inherent dignity. Multidimensional introduction into the world of people with disabilities.

Target group: foreign and Hungarian students of medicine, students of psychology, pedagogy, social workers, physiotherapists, student of Faculty of Public Health.

Announced for students in year: from 3<sup>th</sup> year students semester: 1<sup>st</sup> semester, to 5<sup>th</sup> year semester: 2<sup>nd</sup>

Coordinator: Janos Kollar, PhD.

no. of lessons: 20 x 45 min no. of practices: 2 x 45 min

Credit points: 2

Time schedule:

Theory: Friday afternoon (1.00-4.00 p.m.)

Practice: in small groups (min. 3, max. 6 students) during the academic year (summer included)

## Department of Physiology

Subject: **THE REGULATORY ROLE OF THE CELL MEMBRANE IN PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **20**

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

**Lecture:** 1. Introduction, a general characterisation of the cell membrane. 2. The electrical and biochemical characteristics of the surface membrane.

#### 2<sup>nd</sup> week:

**Lecture:** 3. General description of cardiac ionic currents. 4. The connection between excitatory processes and the regulation of intracellular calcium

#### 3<sup>rd</sup> week:

**Lecture:** 5. Calcium-dependent excitatory processes in the surface membrane of cardiac cells. 6. The effect of ischemia on the excitability of the cardiac muscle.

#### 4<sup>th</sup> week:

**Lecture:** 7. The structure of the skeletal muscle. Ionic channels underlying the excitability of the skeletal muscle. 8. Molecular structure of ionic channels.

#### 5<sup>th</sup> week:

**Lecture:** 9. Changes in surface membrane function in inherited skeletal muscle disorders: degenerative forms (muscle dystrophies). 10. Changes in surface membrane function in inherited skeletal muscle disorders: alterations in the muscle tone (myotonies).

#### 6<sup>th</sup> week:

**Lecture:** 11. The permeability of the surface membrane of non-excitabile cells. 12. Ionic channels characteristic for non-excitabile cells and their role in cellular function.

#### 7<sup>th</sup> week:

**Lecture:** 13. The role of intra- and extracellular calcium in regulating surface membrane permeability in non-excitabile cells. 14. Changes in membrane permeability of non-excitabile cells under pathological conditions

#### 8<sup>th</sup> week:

**Lecture:** 15. Excitatory processes and synaptic connections of CNS neurones. 16. Pathological conditions arising from the hyperexcitability of neurones

#### 9<sup>th</sup> week:

**Lecture:** 17. The role of the surface membrane in the regulation of calcium homeostasis in neurones. 18. Pathological conditions arising from abnormal calcium handling in neurones.

#### 10<sup>th</sup> week:

**Lecture:** 19. The integrative function of the surface membrane, an overview. 20. A summary of pathological changes in membrane function.

## Requirements

### 1. Signature of Lecture Book

Lecture attendance may be followed up by the Department. The lecture will not be delivered, if 5 or fewer students show up. Nevertheless, the lecture material is going to be asked in the final assessment. For continuous updates on all education-related matters, please, check the departmental web-site (<http://phys.dote.hu>)

### 2. Evaluation during the semester

None.

### 3. Examination

At the end of the course a written final assessment will be organised in the form of a test with multiple choice questions. The result of this assessment will determine the verification mark of the credit course using the following conversion table:

0-39.9%	Fail
40-54.9%	Pass
55-69.9%	Satisfactory
70-84.9%	Good
85-100%	Excellent

There will be no remedial test or any other way to improve the final score.

## Department of Physiology

Subject: **MODERN TECHNIQUES ALLOWING THE INVESTIGATION OF PHYSIOLOGICAL PHENOMENA**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **24**

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

**Lecture:** 1. Application of electrophysiological techniques in the investigation of the electric activities of living cells.

#### 2<sup>nd</sup> week:

**Lecture:** 2. Methods allowing the monitoring of the intracellular calcium concentration in living cells.

#### 3<sup>rd</sup> week:

**Lecture:** 3. Analysis, evaluation and interpretation of current recordings.

#### 4<sup>th</sup> week:

**Lecture:** 4. Biostatistics.

#### 5<sup>th</sup> week:

**Lecture:** 5. Ionic channels expressed by neurons. Molecular organization, classification and subunit composition of the ion channels and the possible methods to reveal these secrets.

#### 6<sup>th</sup> week:

**Lecture:** 6. Preparation of neurons for functional investigation. Possible advantages and disadvantages of the applicable methods.

#### 7<sup>th</sup> week:

**Lecture:** 7. Isolation of contractile proteins by using

biochemical methods.

#### 8<sup>th</sup> week:

**Lecture:** 8. Measurements conducted on isolated ion channels: the bilayer technique.

#### 9<sup>th</sup> week:

**Lecture:** 9. Cell and tissue culture (primary cultures, cell lines, organocultures).

#### 10<sup>th</sup> week:

**Lecture:** 10. Investigation of the signal transducing proteins at the levels of proteins, RNA or DNA (immunocytochemistry, immunohistochemistry, confocal microscopy, Western blot, quantitative [real-time] PCR).

#### 11<sup>th</sup> week:

**Lecture:** 11. Investigation of the in vitro and in vivo proliferation (radioactive and non-radioactive assays) differentiation (Western blot, flow cytometry) and mediator production (ELISA).

#### 12<sup>th</sup> week:

**Lecture:** 12. Molecular biology techniques in the investigation of signal transduction (vectors, expression systems).

## Requirements

### 1. Signature of Lecture Book

Lecture attendance may be followed up by the Department. The lecture will not be delivered, if 5 or fewer students show up. Nevertheless, the lecture material is going to be asked in the final assessment. For continuous updates on all education-related matters, please, check the departmental web-site (<http://phys.dote.hu>)

### 2. Evaluation during the semester

None.

### 3. Examination

At the end of the course a written final assessment will be organised in the form of a test with multiple choice questions. The result of this assessment will determine the verification mark of the credit course using the following conversion table:

0-39.9%	Fail
40-54.9%	Pass
55-69.9%	Satisfactory
70-84.9 %	Good
85-100%	Excellent

There will be no remedial test or any other way to improve the final score.

## Department of Physiology

Subject: **PROBLEM BASED LEARNING IN PHYSIOLOGY**

Year, Semester: 2<sup>nd</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **30**

## Requirements

### PROBLEM BASED LEARNING (PBL) CREDIT COURSE

- The course can be done in the second semester between the 3<sup>rd</sup> and the 11<sup>th</sup> week. Students must have a tutor. A tutor can be the student's own lab teacher as well as any other professors by prearrangements. It is the professional liability of a professor to accept or reject tutoring an applicant.
- Admission requirements:
  - satisfactory or better grade at the first semester Physiology course;
  - passing the closing lab and the permission of the education officer.
  - **Special rule:** only the tutor can sign up the student for the program.
- There are three different program types: project work, journal club and laboratory visit. Two students should prepare one PBL report in the project work. In the journal club and laboratory visit programs students work individually.
- Participants of the program should prepare a written report based on the results of project work or laboratory visit. The report should be submitted to the education officer in PDF form until the end of the program. The evaluation of the written report or performance on the journal club will be made using a five grade scale (Grade 1-5).
- The list and a short description of topics can be found in the practical Hall of the department.
- Deadline for signing up for the program is the end of the second week.
- Detailed information of the program can be accessed on the website of the Department (<http://phys.dote.hu>).



## Department of Traumatology and Hand Surgery

Subject: **TRAUMATOLOGY II.**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **10**

### 6<sup>th</sup> week:

**Lecture:** 1. Treatment of femoral neck fractures. Specialty of fractures in the elderly patients. Garden classifications. Minimal invasive treatment: cannulated screw osteosynthesis. Indications of hip replacement endoprosthesis. Diagnostics, classification and treatment of per- and subtrochanteric fractures 2. Treatment of femoral diaphysis and distal femoral fractures. Treatment of patella fractures.

### 7<sup>th</sup> week:

**Lecture:** 1. Classification and treatment of tibial condylar fractures. Basic principle of the treatment of closed and open diaphyseal crural fractures. 2. Diagnostics, classification and treatment of malleolar fractures. Pylon fractures.

### 8<sup>th</sup> week:

**Lecture:** 1 November, Public Holiday - NO LECTURE

### 9<sup>th</sup> week:

**Lecture:** 1. Injury of the shoulder. Fractures and dislocations. Etiology and treatment of muscle and tendon injuries. Diaphyseal fractures of the upper arm. 2. Fractures of the distal humerus. Dislocations of the elbow. Fractures of the radial head and neck. Fractures of the olecranon. Diaphyseal fractures of the forearm.

### 10<sup>th</sup> week:

**Lecture:** 1. Fractures of the distal third of the forearm. Carpal instability, treatment of the fractures of the carpal bones. 2. Fractures and dislocations of the metacarpals and phalanges. The seriously mangled hand.

## Requirements

The lectures will take place in the Augustza big lecture hall. We strongly advise to participate on the lectures, because the official textbook doesn't include all the diagnostic and therapeutic knowledge.

Sign of the lecture book will take place the week before the exam period, at the secretariat of the Department of Trauma and Hand Surgery.

Type of the exam: oral exam (AW5).

In case of the unsatisfactory mark, the student can repeat the exam with the certification of the Education Department.

The Bulletin and Schedule can be found at the website of the Department of Trauma and Hand Surgery ([www.traumatologia.deoec.hu](http://www.traumatologia.deoec.hu)).

## Division of Emergency Medicine

Subject: **COURSE ON PROBLEM-BASED LEARNING AND SKILLS' TRAINING**

Year, Semester: 5<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Seminar: **22**

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

**Seminar:** Dept. of Internal Medicine. Tutor: Dr. Gergely Nagy

### 2<sup>nd</sup> week:

**Seminar:** Dept. of Internal Medicine. Tutor: Dr. Gergely Nagy

### 3<sup>rd</sup> week:

**Seminar:** Dept. of Neurology. Tutor: Dr. László Oláh

### 4<sup>th</sup> week:

**Seminar:** Dept. of Neurology. Tutor: Dr. László Oláh

### 5<sup>th</sup> week:

**Seminar:** Dept. of Pediatrics. Tutor: Dr. Gábor Mogyorósi

### 6<sup>th</sup> week:

**Seminar:** Dept. of Pediatrics. Tutor: Dr. Gábor Mogyorósi

### 7<sup>th</sup> week:

**Seminar:** Dept. of Surgery. Tutor: Dr. Tamás Dinya

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**8<sup>th</sup> week:**
**Seminar:** Dept. of Surgery. Tutor: Dr. Tamás Dinya

**9<sup>th</sup> week:**
**Seminar:** Dept. of Gynecology. Tutor: Dr. Zoárd Krasznai

**10<sup>th</sup> week:**
**Seminar:** Dept. of Gynecology. Tutor: Dr. Zoárd Krasznai

## Requirements

Pre-existing knowledge and skills acquired during the first years of the medical curriculum are practiced and widened in this course. The aims are to establish an active, student-oriented, problem-solving course, to integrate the students' knowledge gained in different medical fields so far, and to develop a problem-oriented attitude. The program is very intensive, aiming to offer the best possible training on the basis of major problems. The cases presented are selected mainly so as to enable students to gain patient-oriented insight into various problems of internal medicine, pediatrics, neurology, surgery and gynecology, and to learn to solve them adequately. Skills' training means to master a number of the most common physical examination techniques, as well as laboratory and communication skills.

**I. Problem-Based Learning:**

## 1. Student-patient encounter

Every week under supervision of a clinical tutor, the students examine patients in a problem-oriented way. Then a week is at the students' disposal to look for additional information and develop it themselves on the basis of their existing knowledge and teaching materials to be specified by the tutor of the disciplines (listed above).

## 2. Tutorial group. Discussion of the cases demonstrated at the previous seminar.

**II. Skills' training:**

Objectives are: ability to perform, learn and interpret the basic clinical examinations properly as well as the most common diagnostic techniques and tests.

**In charge of the course:** Prof. **Irén Horkay** M.D., D.Sc., **course coordinator**, Dept. of Dermatology, phone ext.: 55856. Sign up: Neptun (code: AOP S242T9). Information and contact: Secretary at Dept. of Dermatology, phone: 55736, 55035.

**Period of course:** 1st semester (2nd - 11th weeks).

**No. of hours:** 20 hrs/semester (1x2 hrs/week, 10 seminars/semester).

**Type of course:** combination of seminars and practicals.

**Public target:** 5th and 6th year medical students; max. 10 persons/semester.

## Division of Metabolism

Subject: **DIETETICS IN THE EVERYDAY PRACTICE AND BEYOND. NUTRITIONAL THERAPY**

Year, Semester: 4<sup>th</sup> year/1<sup>st</sup> semester

Number of teaching hours:

Lecture: **24**

**1<sup>st</sup> week:**

**Lecture:** 1. Basics of nutritional physiology.

2. "Evaluation of nutritional status" (BMI, MUST, malnutrition).

**2<sup>nd</sup> week:**

**Lecture:** 3. "I do not eat margarine because I care for my health!" (Beneficial and detrimental effects of food industry)

4. "Everyday witch cooking: focus on fats and oils" (trans-fatty acids, n-3, n-6)

**3<sup>rd</sup> week:**

**Lecture:** 5. Guidelines of nutritional therapy of diabetes mellitus. (glycemic index, diet, drugs, insulin)

6. "Calculated freedom: insulin pump with the eye of the dietitian"

**4<sup>th</sup> week:**

**Lecture:** 7. Mediterranean diet - Role of nutrition in the cardiometabolic prevention.

8. What to eat for the health and well being of the fetus and newborn infant?

**5<sup>th</sup> week:**

**Lecture:** 9. "Afrodiziaks" (flavonoids, fibers, minerals, vitamins).

10. Dietetic aspects of the treatment of antibiotic induced dysbacteriosis (probiotics, prebiotics, candidiasis).

**6<sup>th</sup> week:**

**Lecture:** 11. Victoria Beckham or Marilyn Monroe? (anorexia, healthy slimming diet)

12. "Misbeliefs in the mirror of knowledge - pediatric obesity".

## REQUIRED ELECTIVE COURSES

**7<sup>th</sup> week:**

**Lecture:** 13. "I can resist to everything except the temptation" (diet in allergic diseases eg. celiakia).  
 14. Diet in gastrointestinal diseases (ulcerative colitis, pancreatitis, etc.).

**8<sup>th</sup> week:**

**Lecture:** 15. Nutritional aspects of anticancer therapy ("What to eat against cancer?").  
 16. Clinical nutriment and medical aids used for medical feeding. A practical approach (PEG, Button, Jejunocath, pump; enteral feeding).

**9<sup>th</sup> week:**

**Lecture:** 17-18. Actual aspects of prebiotic, probiotic, symbiotic therapy.

**10<sup>th</sup> week:**

**Lecture:** 19-20. Nutritional role of the milk.

**11<sup>th</sup> week:**

**Lecture:** 21-22. Bioactive materials.

**12<sup>th</sup> week:**

**Lecture:** 23-24. Nutrigenomics.

## Requirements

Aim of the course: To give an overall view about the diets pertinent to given diseases and different aspects of human nutrition.

Objectives of healthy nutrition:

- to spare the organism from every unnecessary digestive and detoxicative work.
- help to eliminate the accumulated excreta which burdens the immune system and the metabolism.
- the vitamins, minerals, enzymes, trace elements provided by the sterling nutrition optimize the resistivity of the organism.

## Division of Radiotherapy

Subject: **RADIOTHERAPY IN THE CLINICAL PRACTICE**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Seminar: **14**

**1<sup>st</sup> week:**

**Seminar:** Indication, contraindication of radiotherapy neoadjuvant, adjuvant, palliative treatment

**2<sup>nd</sup> week:**

**Seminar:** Equipment in radiotherapy

**3<sup>rd</sup> week:**

**Seminar:** Teletherapy

**4<sup>th</sup> week:**

**Seminar:** Special teletherapy techniques

**5<sup>th</sup> week:**

**Seminar:** Brachytherapy

**6<sup>th</sup> week:**

**Seminar:** Isotope therapy, eye plaque brachytherapy

**7<sup>th</sup> week:**

**Seminar:** The role of localization of tumor spreading, lymphnode regions and risk organs

## Requirements

The goal is to get to know the process and clinical considerations of radiotherapy (indications, contraindications, equipments).

## Division of Rheumatology

Subject: **VASCULAR AND MICROCIRCULATION ABNORMALITIES IN SYSTEMIC SCLEROSIS**

Year, Semester: 4<sup>th</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Lecture: **10**

**1<sup>st</sup> week:**

**Lecture:** Ethnopathogenesis of systemic sclerosis. (2 hours)

**2<sup>nd</sup> week:**

**Lecture:** Classification, manifestations of systemic sclerosis. (2 hours)

**3<sup>rd</sup> week:**

**Lecture:** Diagnostic methods for abnormal microcirculation.

**4<sup>th</sup> week:**

**Lecture:** Raynaud-syndrome.

**5<sup>th</sup> week:**

**Lecture:** Macroangiopathy in systemic sclerosis.

**6<sup>th</sup> week:**

**Lecture:** Homocysteine in systemic sclerosis.

**7<sup>th</sup> week:**

**Lecture:** Vascular therapy in systemic sclerosis: practice and experimental drugs.

**8<sup>th</sup> week:**

**Lecture:** Case reports.

## Kenézy Life Sciences Library

Subject: **LIBRARY SYSTEM**

Year, Semester: 1<sup>st</sup> year/1<sup>st</sup> semester, 1<sup>st</sup> year/2<sup>nd</sup> semester

Number of teaching hours:

Practical: **10**

**1<sup>st</sup> week:**

**Practical:** Introduction to the Library and library use:  
 - Traditional services (registration, rules of library usage, loans, reading room, computer lab).  
 - Electronic services (the Library's home page, online catalogs, anatomy databases and links).

**2<sup>nd</sup> week:**

**Practical:** Electronic Information Resources:  
 - Electronic journals (EBSCO A-to-Z, Science Direct).  
 - EBSCOhost Research Data-bases.  
 - Link collections.

**3<sup>rd</sup> week:**

**Practical:** Databases:  
 - Medline.  
 - Impact Factors.

**4<sup>th</sup> week:**

**Practical:** Evidence Based Medicine Synopsis of information retrieval

**5<sup>th</sup> week:**

**Practical:** Test

## Requirements

Class attendance!

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## CHAPTER 16

### TITLES OF THESES

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#### **Department of Anatomy, Histology and Embryology**

1. Title: Inhibition mediated by GABAA and GABAB receptors in the superficial spinal dorsal horn in health and disease

2. Title: Molecular organization of the endogenous cannabinoid signaling apparatus in the superficial spinal dorsal horn in health and disease  
 Tutor: Miklós Antal M.D., Ph.D., D.Sc.

3. Title: Investigation of vestibular plasticity in the frog  
 4. Title: Termination of the vestibulospinal tract in the rat  
 Tutor: Klára Matesz M.D., Ph.D., D.Sc.

5. Title: Experimental reconstruction of the articular cartilage matrix

6. Title: Structural analysis of periodontal ligaments  
 Tutor: László Módos M.D., Ph.D., D.Sc.

7. Title: Correlation of the number and distribution of synapses on the dendritic tree with the postsynaptic potential evoked on the soma: a computer modelling.  
 Tutor: Ervin Wolf M.Sc., Ph.D.

8. Title: Dendritic integration of inhibitory and excitatory cortico-cortical inputs in the primary visual cortex

9. Title: Functional mapping of callosal inputs on the dendritic arbour of neurons in the visual cortex  
 Tutor: Zoltán Kisvárdy M.Sc., Ph.D., D.Sc.

10. Title: Investigation of signaling mechanisms that regulate cartilage maturation  
 Tutor: Róza Zákány M.D., Ph.D.

11. Title: Investigation of neuronal network development in the spinal cord  
 Tutor: Zoltán Mészár M.Sc., Ph.D.

12. Title: T helper cells in proteoglycan-induced arthritis  
 Tutor: Krisztina Holló M.Sc., Ph.D.

13. Title: Correlative physiological and morphological investigation of propriospinal connections in the spinal dorsal horn  
 Tutor: Zsófia Antal M.D.

#### **Department of Anesthesiology and Intensive Care**

1. Title: Sepsis associated encephalopathy  
 Tutor: Béla Fülesdi M.D., Ph.D., D.Sc.

#### **Department of Biochemistry and Molecular Biology**

1. Title: Epigenetic components of transcription regulation.  
 Tutor: Bálint Bálint L. M.D., Ph.D.

2. Title: Alterations in structural properties of the transcription machinery in relation to disease development

3. Title: Molecular factors in cell differentiation

4. Title: Studying the re-programming mechanisms of viral proteins.

5. Title: The role of signaling pathway perturbations in cancer development

Tutor: Mónika Fuxreiter M.Sc., Ph.D.

#### **Department of Cardiology**

1. Title: Electrical treatment modalities in heart failure

2. Title: Novel treatment modalities in atrial fibrillation (catheter ablation, surgery and pacemakers)  
 Tutor: Zoltán Csanádi M.D., Ph.D.

3. Title: Drug-eluting stents  
 Tutor: Zsolt Kőszegi M.D., Ph.D.

4. Title: Cardiovascular aspects of diabetes mellitus

5. Title: Left ventricular function of obese patients.  
 Tutor: Tibor Fülöp M.D., Ph.D.

6. Title: Antithrombotic therapy in patients with ischaemic heart disease.  
 Tutor: Tibor Szúk M.D.

7. Title: Supraventricular arrhythmias.  
 Tutor: Csaba Kun M.D.

8. Title: Intensive therapy in acute coronary syndrome.  
 Tutor: Miklós Szokol M.D.

9. Title: The role of echocardiography in staving off complication of myocardial infarction.  
 Tutor: Ildikó Rác M.D.

10. Title: Stem cell therapy after myocardial infarction.  
 Tutor: László Balogh M.D.

11. Title: Aspirin - resistency  
 Tutor: Nóra Homoródi M.D.

12. Title: Cardiovascular complications of dermatomyositis.  
 Tutor: Andrea Péter M.D.

13. Title: Secondary prevention after primary PCI.  
 Tutor: László Fülöp M.D., Ph.D.

## Division of Clinical Physiology

1. Title: Improvement of myocardial inotropy under physiological and pathological conditions  
 Tutor: Zoltán Papp M.D., Ph.D., D.Sc.

2. Title: The role of posttranslational modifications in the contractile regulation of the heart.

3. Title: The role of vanilloid receptors in cardiovascular regulatory mechanisms  
 Tutor: Attila Tóth M.Sc., Ph.D.

## Department of Biophysics and Cell Biology

1. Title: Investigation of cell surface distribution of ErbB-2 oncoprotein in breast tumor cell lines.

2. Title: Patch-clamp investigation of ion-channels in human lymphocytes.

3. Title: Role of CD45 isotypes in the signalling of lymphoid cells  
 Tutor: János Szöllösi M.Sc., Ph.D., D.Sc.

4. Title: Studying the inactivation of voltage gated kalium ion channels in heterologous expression systems.  
 Tutor: György Panyi M.D., Ph.D., D.Sc.

5. Title: Higher-order chromatin structure and leukemogenesis.

6. Title: Multidrug resistance: conformational and topological analysis of the P-glycoprotein.  
 Tutor: Gábor Szabó M.D., Ph.D., D.Sc.

7. Title: Mathematical analysis and computer modelling of the topology of cell surface proteins.

8. Title: Role of MHC in the organization of cell surface proteins.  
 Tutor: László Mátyus M.D., Ph.D., D.Sc.

9. Title: Effect of local anesthetics on the functions of potassium -, sodium -, and calcium ion channels of human T and B lymphocytes.

10. Title: Examination of the channel function properties of the P170 multidrug pump by patch-clamp.  
 Tutor: Zoltán Krasznai M.Sc., Ph.D.

11. Title: Cytometry of cytotoxic lymphocytes.

12. Title: Physiological roles of the multidrug resistance transporter P-glycoprotein.  
 Tutor: Zsolt Bacsó M.D., Ph.D.

13. Title: Elucidation of the conformational changes of ABCG2 protein by a conformation sensitive antibody.  
 Tutor: Katalin Goda M.Sc., Ph.D.

14. Title: Correlation between the metastatic propensity and chemoresistance of breast tumors with the association properties of ErbB proteins.

15. Title: Quantitative investigation of the association of ErbB proteins using biophysical and molecular biological techniques.

Tutor: Zsolt Fazekas M.Sc., Ph.D.

16. Title: Role of protein-protein interactions in the function of IL-2 and IL-15 receptors.

Tutor: Andrea Dóczy-Bodnár M.Sc., Ph.D.

17. Title: Role of membrane potential in transmembrane signalling via IL-2 and IL-15 receptors in human lymphocytes.

18. Title: Study of nuclear receptor-cofactor interactions by FRET and fluorescence correlation spectroscopy.  
 Tutor: György Vámosi M.Sc., Ph.D.

19. Title: In situ investigation of protein-protein interactions during cell signalling.

20. Title: Role of receptor tyrosine kinases in the pathogenesis of tumors.

Tutor: György Vereb M.D., Ph.D., D.Sc.

## Division of Cardiac Surgery

1. Title: Evaluation of the antibacterial effect of different skin preparation techniques in cardiac surgery

2. Title: The effect of carbon dioxide deairing during valve surgery - review of the literature  
 Tutor: Tamás Szerafin M.D., Ph.D.

3. Title: Evaluation of the effect of CO<sub>2</sub> field-flooding on neurological complications in connection with valve surgery

Tutor: Tamás Maros M.D.

4. Title: Mitral valve repair-review of the literature  
 Tutor: István Szentkirályi M.D.

5. Title: Mid-term results of aortic valve sparing operations  
 Tutor: Ambrus Horváth M.D.

6. Title: Comparison of the effects of different anticoagulation therapies after aortic bioprosthesis implantation.

Tutor: Lehel Palotás M.D.

## Department of Laboratory Medicine

1. Title: Investigation of thrombosis and inflammation in PSGL-1 deficiency.

2. Title: The effect of thrombotic and inflammatory stimuli on platelet activation  
 Tutor: János Kappelmayer M.D., Ph.D., D.Sc.

3. Title: Functional analysis of antimicrobial fusion proteins

4. Title: Molecular genetic diagnostics of hematological and other malignant diseases  
 Tutor: Péter Antal-Szalmás M.D., Ph.D.

5. Title: Molecular genetic diagnosis of cystic fibrosis

6. Title: Molecular genetic diagnosis of severe inherited disease

Tutor: István Balogh M.Sc., Ph.D.

7. Title: Analysis of stem cell mobility during peripheral stem cell transplantation

8. Title: Application of FXIII-A in the detection of minimal residual disease in acute lymphoblastic leukemia

Tutor: Zsuzsa Hevessy M.D., Ph.D.

9. Title: Laboratory diagnostic of osteoporosis

Tutor: Harjit Pal Bhattoa M.D., Ph.D.

10. Title: Investigation of G-CSF treatment in PSGL-1 deficient mice

11. Title: Laboratory diagnosis of hereditary spherocytosis

Tutor: Kornél Miszti-Blasius M.D.

12. Title: Applications of calculated GFR

Tutor: Anna Oláh M.Sc., Ph.D.

13. Title: Detection of minimal residual disease using flow cytometry

Tutor: László Csáthy M.D.

### Clinical Research Center

1. Title: Function of Factor XIII B subunit.

Tutor: László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc.

2. Title: Pathobiochemistry of a frequent bleeding disease (VWD)

Tutor: Jolán Hársfalvi M.Sc., Ph.D.

3. Title: Determination of oxidized hemoglobin in human samples by specific antibodies

Tutor: Éva Katona M.Sc.

4. Title: Inherited hemostasis disorders; laboratory and molecular genetic aspects

5. Title: New diagnostic methods in Protein S deficiency.

Tutor: Zsuzsanna Bereczky M.D., Ph.D.

6. Title: Novel biochemical and clinical aspects of the role of FXIII in fibrinolysis

7. Title: Studies on clopidogrel resistance by up-to-date laboratory methods

Tutor: Zsuzsa Bagoly M.D., Ph.D.

### Department of Dermatology

1. Title: Laser hair removal

2. Title: Sunscreens

Tutor: Éva Remenyik M.D., Ph.D., D.Sc.

3. Title: Importance of sentinel node dissection in the complex therapy of melanoma

4. Title: Modern moist wound dressing with simultaneous effective antibacterial properties in the treatment of difficult to heal wounds

Tutor: István Juhász M.D., Ph.D.

5. Title: Lymphodrainage treatment in Dermatology

Tutor: Éva Szabó M.D., Ph.D.

6. Title: Significance of compression therapy in treating venous leg ulcer

Tutor: Zoltán Péter M.D.

7. Title: Clinical and laboratory examinations in the chronic urticaria

Tutor: Beatrix Irinyi M.D., Ph.D.

8. Title: New approaches in the classification and therapy of chronic urticaria

Tutor: Krisztián Gáspár M.D.

9. Title: Photodynamic therapy in the treatment of multiple actinic keratoses and field cancerisation

Tutor: Lóránt Markó M.D.

10. Title: Skin symptoms with lipid abnormalities

Tutor: Dániel Töröcsik M.D., Ph.D.

11. Title: Comorbidities in psoriasis

12. Title: Different treatment modalities in psoriasis

Tutor: Andrea Szegedi M.D., D.Sc.

### Department of Human Genetics

1. Title: Characterization of factor-C protein family using sequence databases.

2. Title: Expression of WT1 and its splice variants in different diseases studied by real time PCR.

3. Title: Study of a gene regulating differentiation in bacteria.

4. Title: Study of the WT1 gene in urogenital malformations.

Tutor: Sándor Biró M.Sc., Ph.D., D.Sc.

5. Title: Human disease models in animals and lower eukaryotes (review).

Tutor: Zsigmond Fehér M.D., Ph.D.

6. Title: Chromosome-tracking studies in complex diseases

Tutor: György Vargha M.D., Ph.D.

### Department of Neurology

1. Title: Non-invasive investigation of endothelial dysfunction.

Tutor: László Csiba M.D., Ph.D., D.Sc.

2. Title: Chronic cerebrospinal venous insufficiency in Multiple Sclerosis.

Tutor: Tünde Csépany M.D., Ph.D.

**CHAPTER 16**

3. Title: Effect of nicotin on cerebral hemodynamics in smokers.

Tutor: László Oláh M.D., Ph.D.

**Department of Immunology**

1. Title: Phenotypic and functional properties of dendritic cells

Tutor: Éva Rajnavölgyi M.Sc., Ph.D., D.Sc.

2. Title: Functional properties of proteins of SLAM receptor family in dendritic cells

3. Title: Identification and functional analysis of adaptor proteins in dendritic cells

Tutor: Árpád Lányi M.Sc., Ph.D.

4. Title: Investigation of effects of adjuvant factors released by allergenic materials on epithelial cells

5. Title: Role of reactive oxygen species generated by pollen grains in the pathomechanisms of allergic reactions

Tutor: Attila Bácsi M.Sc., Ph.D.

6. Title: Cellular interactions between dendritic cells and CD1 specific T-lymphocytes

Tutor: Péter Gogolák M.Sc., Ph.D.

7. Title: Study of non-apoptotic cytotoxic processes during immune response, new way of killing apoptosis resistant tumor cells

Tutor: Gábor Koncz M.Sc., Ph.D.

**Department of Neurosurgery**

1. Title: Desmoplastic medulloblastoma.

2. Title: Epidemiology of brain tumors.

Tutor: Sándor Szabó M.D., Ph.D.

3. Title: Current treatment of hydrocephalus.

4. Title: Endoscopic treatment of intracranial cysts.

5. Title: Pediatric low grade gliomas.

Tutor: László Novák M.D., Ph.D.

6. Title: Connection of proteoglycans and cell membrane receptors in the peritumoral extracellular matrix

Tutor: Álmos Klekner M.D., Ph.D.

7. Title: History of neurosurgical radiosurgery.

Tutor: József Dobai M.D.

8. Title: Vertebroplasty.

Tutor: Péter Ruszthi M.D.

**Department of Medical Chemistry**

1. Title: Ser/Thr-specific protein phosphatases in the control of signal transduction of mammalian cells

Tutor: Pál Gergely M.Sc., Ph.D., D.Sc., M.H.A.Sc.

2. Title: Molecular biology of protein phosphatases.

Tutor: Viktor Dombrádi M.Sc., Ph.D., D.Sc.

3. Title: Interaction of protein phosphatase 1 catalytic subunit with regulatory proteins

Tutor: Ferenc Erdődi M.Sc., Ph.D., D.Sc.

4. Title: Mesenchymal Stem Cell differentiation

Tutor: László Virág M.D., Ph.D., D.Sc.

5. Title: Molecular biology of protein phosphatase 2A

Tutor: Csilla Csontos M.Sc., Ph.D.

6. Title: Functional study of the PPP family of plant protein phosphatases

Tutor: Ilona Farkas M.Sc., Ph.D.

7. Title: Investigation of the role of poli (ADP-ribose) polymerase-2 in adipose tissue function and in the metabolism.

Tutor: Péter Bai M.Sc., Ph.D.

8. Title: Study of the regulation of neurotransmitter release

Tutor: Beáta Lontay M.Sc., Ph.D.

9. Title: Interaction of protein phosphatases with inhibitory molecules

Tutor: Andrea Kiss M.Sc., Ph.D.

10. Title: High-Throughput Screening

Tutor: Csaba Hegedűs M.Sc., Ph.D.

11. Title: Molecular biology of calcineurin

Tutor: Éva Bakó M.Sc., Ph.D.

**Department of Nuclear Medicine**

1. Title: Multimodality investigation of tumors by PET/CT.

Tutor: László Galuska M.D., Ph.D.

2. Title: Development of interactive nuclear medicine e-learning resource

Tutor: József Varga M.Sc., Ph.D.

3. Title: The evolution of the MRI sequences during the past 30 years

4. Title: Comparisons of the automatic lesion detection algorithms in the nuclear medicine

Tutor: László Balkay M.Sc., Ph.D.

5. Title: Radiolabelling with <sup>68</sup>Ga

Tutor: István Kertész M.Sc., Ph.D.

6. Title: Posttherapeutic I-131 whole body SPECT/CT in patients with thyroid cancer

7. Title: The role of Tc99m-Tektrotyd SPECT/CT to evaluate metastatic neuroendocrine tumors

Tutor: Ildikó Garai M.D., Ph.D.

8. Title: Localisation of anatomical regions on CT scans with machine learning methods

Tutor: Zoltán Barta M.D.



9. Title: Screening of thyroid malignancy with scintigraphic methods (Tc99m pertechnetate and MIBI)  
 Tutor: Orsolya Sántha M.D.

### Department of Medical Microbiology

1. Title: Human papillomavirus infection and cervical atypia  
 Tutor: József Kónya M.D., Ph.D.
2. Title: Epidemiology and antibiotic resistance of Hemophilus influenzae strains isolated from respiratory specimens.
3. Title: Epidemiology and antibiotic resistance of Klebsiella pneumoniae strains isolated from respiratory specimens.
4. Title: Evaluation of in vitro efficacy of ertapenem against ESBL-producing strains of Klebsiella pneumoniae
5. Title: Evaluation of in vitro efficacy of tigecyclin against Gram-negative bacteria
6. Title: Study on epidemiological pattern of S. aureus by pulsed field electrophoresis
7. Title: Therapeutical possibilities against methicillin-resistant Staphylococcus aureus  
 Tutor: Judit Szabó M.D., Ph.D.
8. Title: HPV in head and neck cancers
9. Title: Human papillomaviruses in oral premalignances.
10. Title: Human papillomaviruses in oral squamous cell cancer.  
 Tutor: Krisztina Szarka M.Sc., Ph.D.
11. Title: Evaluation of fungicidal effect of antifungal agents using time-kill curves
12. Title: New and older agents in antifungal chemotherapy  
 Tutor: László Majoros M.D., Ph.D.
13. Title: Interaction between human herpesvirus 6 and human immunodeficiency virus  
 Tutor: Eszter Csoma M.Sc., Ph.D.
14. Title: Molecular epidemiology of aminoglycoside resistance in nosocomial Gram negative bacteria  
 Tutor: Gábor Kardos M.D., Ph.D.
15. Title: Transcriptional regulation and replication of human papillomaviruses  
 Tutor: György Veress M.Sc., Ph.D.

### Department of Obstetrics and Gynecology

1. Title: Meiotic abnormalities and their clinical significance in human reproduction  
 Tutor: Tamás Kovács M.D., Ph.D.
2. Title: Examination of genetic concerns about the safety of assisted reproduction
3. Title: Postmenopausal hormone therapy
4. Title: Role of pelvic ultrasound in infertility

5. Title: The evaluation and management of recurrent pregnancy losses in early pregnancy  
 Tutor: Attila Jakab M.D., Ph.D.

6. Title: Aetiology and pathophysiology of pre-eclampsia
7. Title: Aetiology, prevention and treatment of vaginal infections
8. Title: Management of pre-eclampsia
9. Title: The modern tocolysis
10. Title: The role of prostaglandins in induction of labour  
 Tutor: János Zatik M.D., Ph.D.

### Department of Physiology

1. Title: Alterations of [Ca<sup>2+</sup>]<sub>i</sub> in pathological conditions  
 Tutor: László Csernoch M.Sc., Ph.D., D.Sc.
2. Title: Electrophysiological properties of mammalian cardiac tissues
3. Title: Regional differences in the electrophysiological properties of cardiomyocytes  
 Tutor: Péter Nánási M.D., Ph.D., D.Sc.
4. Title: Significance of the alterations of the intracellular ion concentrations in the functional properties of neurones.  
 Tutor: Géza Szűcs M.D., Ph.D., D.Sc.
5. Title: Role of afterdepolarization mechanisms in the arrhythmogenesis  
 Tutor: Tamás Bányász M.D., Ph.D.
6. Title: Differential roles of protein kinase C isozymes in different cellular functions
7. Title: Studies on the vanilloid (capsaicin) receptor  
 Tutor: Tamás Bíró M.D., Ph.D., D.Sc.
8. Title: Expression and significance of the TASK channels in physiological and pathological conditions  
 Tutor: János Magyar M.D., Ph.D., D.Sc.
9. Title: Studies on ion channels incorporated into artificial membranes  
 Tutor: István Jóna M.Sc., Ph.D., D.Sc.

### Division of Gynecological Oncology

1. Title: Chemotherapy of ovarian cancer
2. Title: Prognostic relevance of HPV-infection in cervical cancer
3. Title: Surgical treatment of HPV-infection
4. Title: The prognostic role of CA-125 in ovarian cancer  
 Tutor: Zoltán Hernádi M.D., Ph.D., D.Sc.
5. Title: Chemotherapy of cervical cancer
6. Title: Epidemiology and therapy of vulvar cancer
7. Title: Epidemiology of metastatic ovarian cancer
8. Title: Follow-up of endometrial cancer patients, analysis of prognostic factors
9. Title: Prothrombotic states in gynaecologic cancer

**CHAPTER 16**

10. Title: Superoxid anion production of granulocytes in gynecologic cancer

Tutor: Róbert Póka M.D., Ph.D.

11. Title: Prognostic factors and treatment of cervical cancer

Tutor: Tamás Sáy M.D., Ph.D.

### Department of Pathology

1. Title: Molecular classification of glial neoplasms

2. Title: Overview of non-adenohypophysaer neoplastic lesion within and around the sella

3. Title: Use of IDH-1 immunohistochemistry in surgical neuropathology

Tutor: Péter Molnár M.Sc., Ph.D., D.Sc.

4. Title: Chromosome copy number and mutant allele density in cancer

5. Title: Expression of Aurora-kinases in lymphoproliferative diseases

6. Title: Mitotic rate and histone phosphorylation in cancer

Tutor: Gábor Méhes M.D., Ph.D.

7. Title: Clinicopathological studies in haemorrhagic stroke

8. Title: Clinicopathological studies in ischaemic stroke

9. Title: Molecular pathology of glial brain tumours

10. Title: Pathomechanisms of cell death in neurodegenerative diseases

Tutor: Tibor Hortobágyi M.D., Ph.D.

### Division of Clinical Oncology

1. Title: Clinical Oncology

Tutor: János Szántó M.D., Ph.D.

### Division of Radiotherapy

1. Title: Conformal radiotherapy of breast cancer

2. Title: FDG-PET CT-Dynamic CT in radiotherapy planing

3. Title: Neoadjuvant radio-chemotherapy of rectal cancer

Tutor: Kornélia Szluha M.D., Ph.D.

4. Title: Detection of lymphedema in breast cancer patients

Tutor: Imre Szabó M.D., Ph.D.

### Department of Pharmacology and Pharmacotherapy

1. Title: Cardiovascular risk factors

2. Title: Metabolic link between obesity and insulin resistance

Tutor: Zoltán Szilvássy M.D., Ph.D., D.Sc.

3. Title: Optional title in pharmacology

4. Title: Pharmacological and clinical significance of adenosine receptor antagonists

Tutor: József Szentmiklósi M.D., Ph.D.

5. Title: New trends in the treatment of diabetes

6. Title: Optional title in pharmacology

7. Title: Pharmacology of herbal remedies

8. Title: Possible pharmacological exploitations of TRPV1 receptors

Tutor: Róbert Pórszász M.D., Ph.D., MBA

9. Title: Effect of colony stimulating factors or other drugs on bone marrow-derived cell lines

Tutor: Ilona Benkő M.D., Ph.D.

10. Title: Investigation of insulin resistance and its cardiovascular complications

11. Title: Pharmacology of neurogenic inflammation

Tutor: Barna Peitl M.D., Ph.D.

12. Title: Optional title on cancer chemotherapy

Tutor: Attila Megyeri M.D., Ph.D.

13. Title: Optional title in pharmacology

Tutor: Ágnes Cseppentő M.D.

14. Title: Optional title on antibacterial chemotherapy

Tutor: Zsuzsanna Gál M.Sc., Ph.D.

### Department of Ophthalmology

1. Title: Immunological aspects of corneal transplantation

Tutor: László Módis M.D., Ph.D., D.Sc.

2. Title: Clinical management of uveitis

Tutor: Ádám Kemény-Beke M.D., Ph.D.

3. Title: Contact lens wear and complications

Tutor: Beáta Kettesy M.D.

4. Title: Cytokine analysis following penetrating keratoplasty

Tutor: Mariann Fodor M.D., Ph.D.

5. Title: Assessment of surgical induced corneal astigmatism

Tutor: Gábor Németh M.D., Ph.D.

6. Title: Injector implantation of foldable posterior chamber lens and four-point transscleral sulcus fixation: first human use of a new operating technique

Tutor: Timea Komár M.D.

7. Title: Fluorescein angiographic characteristics of choroidal melanoma

Tutor: Éva Surányi M.D.

8. Title: The outcome of intravitreal ranibizumab treatment in relation to baseline CNV characteristics, central retinal thickness, mean change in best corrected visual acuity and treatment-free interval of at least 3 month in age related macular degeneration

Tutor: Attila Vajas M.D.

### Department of Orthopedic Surgery

1. Title: Treatment of periprosthetic femoral fractures  
 Tutor: Zoltán Jónás M.D.

### Department of Otolaryngology and Head and Neck Surgery

1. Title: The role of contact endoscopy in the diagnosis of head and neck tumors  
 Tutor: László Tóth M.D., Ph.D.

2. Title: Cochlear implantation  
 3. Title: Middle ear implantation  
 4. Title: Pathology and treatment of Cholesteatoma  
 Tutor: István Sziklai M.D., Ph.D., D.Sc.

5. Title: Cartilage tympanoplasty  
 Tutor: István Jókay M.D., Ph.D.

6. Title: Methods of reconstruction in head and neck surgery  
 7. Title: Reconstruction of nasal deformities  
 Tutor: Attila Szűcs M.D., Ph.D.

### Department of Behavioural Sciences

1. Title: Medicalization and its social context  
 2. Title: Sandor Ferenczi: Clinical Diary and the philosophy of doctor-patient relationship  
 3. Title: The changing attitudes towards human phenomena in Western medicine  
 4. Title: The importance of the point of view of psychoanalysis for a humanistic medicine.  
 Tutor: Attila Bánfalvi M.A., Ph.D.

5. Title: Biological roots of behaviour: the horizon of evolutionary psychology.  
 6. Title: Culture, health illness: an interdisciplinary analysis.  
 7. Title: Differential analyses of patient education media and communicational strategies in sociocultural groups and disease groups. (Interdisciplinary research)  
 8. Title: Emotions and their relation to health.  
 9. Title: How does the body shape the mind? An interdisciplinary approach to the concept of embodiment  
 10. Title: Inborn sociality-socialized individuality: the theory and its roots.  
 11. Title: Non-verbal behaviour: comparative analysis of biological and social aspects.  
 12. Title: Theory and praxis of junior Bálint groups.  
 Tutor: Péter Molnár M.Sc., Ph.D., D.Sc.

13. Title: Alternative Methods for Pain Reduction in Dentistry  
 14. Title: Applications for Computer Assisted Rehabilitation  
 15. Title: Burnout Among Medical Doctors  
 16. Title: Burnout in Medical Students  
 17. Title: Medicine in Film Art  
 18. Title: Music Therapy in Dentistry  
 19. Title: Music Therapy in Medicine

20. Title: Psychological Characteristics of Doctor-Patient Interactions

21. Title: The Role of Proper communication on the Field of Medicine

22. Title: The Role of Psychology in Medical Practice  
 Tutor: János Kollár M.A., Ph.D.

23. Title: Effects of movement therapy on self-consciousness  
 Tutor: Antal Bugán M.A., Ph.D.

### Department of Preventive Medicine

1. Title: Detection of FXIII gene expression alterations during monocyta/macrophage differentiation

2. Title: Genetic susceptibility to diseases (cardiovascular and malignant) with high public health importance

3. Title: Production and organization of extracellular matrix components in fibroblast/tumor cell cocultures  
 Tutor: Róza Ádány M.D., Ph.D., D.Sc.

4. Title: Characterization of gene expression level of different subtypes of malignant melanoma

5. Title: Characterization of oncogene and tumor suppressor gene alterations in human malignant melanomas by fluorescence in situ hybridization

6. Title: Mapping of DNA gains and losses in human solid tumors using comparative genomic hybridization  
 Tutor: Margit Balázs M.Sc., Ph.D., D.Sc.

7. Title: Health behaviour of university students  
 Tutor: Karolina Kósa M.D., M.Sc., Ph.D.

8. Title: Effects of aliphatic alcohols on the functional state of polymorphonuclear leukocytes  
 Tutor: Sándor Szűcs M.Sc., Ph.D.

9. Title: Application of the single-cell microgel electrophoresis technique (comet-assay) to the quantitative evaluation of DNA strand-breaks  
 Tutor: Tímea Rózsa M.D.

### Department of Pediatrics

1. Title: Contemporary evaluation and treatment of medulloblastoma

2. Title: Thalassaemia minor in North-East Hungary  
 Tutor: Csongor Kiss M.D., Ph.D., D.Sc.

3. Title: Significance of surfactant proteins  
 Tutor: Béla Nagy M.D., Ph.D., D.Sc.

4. Title: Echocardiographic hemodynamic monitoring in childhood

5. Title: MRI in Pediatric Cardiology  
 Tutor: Gábor Mogyorósy M.D., Ph.D.

6. Title: Hydrocephaly of infants  
 Tutor: Andrea Nagy M.D.

## CHAPTER 16

7. Title: IgA nephropathy in childhood  
Tutor: Tamás Szabó M.D., Ph.D.

8. Title: Fungal infections in malignant hematology  
Tutor: István Szegedi M.D., Ph.D.

9. Title: Genetic studies using FISH in chronic lymphocytic leukaemia (CLL)  
Tutor: Anikó Ujfalusi M.D., Ph.D.

10. Title: Experience with tissue adhesives in lip cleft surgery  
Tutor: Ágnes Magyar M.D.

11. Title: Aldosteron producing suprarenal tumors in children

12. Title: Efficiency of Nordic Walking therapy in the case of obese children regarding motivation for slimming

13. Title: Physiotherapy of diabetic children - prevention of hypoglycemia  
Tutor: Enikő Felszeghy M.D., Ph.D.

### **Vascular Biology, Thrombosis and Haemostasis Group of H.A.Sc.**

1. Title: Alterations of coagulation Factor levels in autoimmune disorders  
Tutor: László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc.

2. Title: In silico investigation of blood coagulation factors.  
Tutor: István Komáromi M.Sc., Ph.D.

### **Department of Infectious Diseases and Pediatric Immunology**

1. Title: Principle and practice in the treatment of the lower respiratory tract infections

2. Title: Wiskott-Aldrich syndrome  
Tutor: Vera Gulácsy M.D.

3. Title: C.difficile infection in infectious pediatric care units

4. Title: Differential diagnosis in bloody diarrhoea of infectious origin  
Tutor: Leonóra Méhes M.D.

5. Title: Antimicrobial host defense mechanisms in mature newborns

6. Title: Conjugated vaccines in the pediatric practice

7. Title: DNA vaccines

8. Title: Mucocutaneous candida infections

9. Title: Nosocomial infections in pediatric care units

10. Title: Passive immunization with immunoglobulins

11. Title: Pediatric AIDS  
Tutor: László Maródi M.D., Ph.D., D.Sc.

12. Title: Familial hemophagocytic syndromes  
Tutor: János Sümegi M.D., Ph.D.

13. Title: Antifungal chemotherapy  
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14. Title: Clinical manifestations in hyper-IgE syndrome

15. Title: Complicated varicella infections

16. Title: EBV infection in children

17. Title: Enzyme replacement therapy in Gaucher disease

18. Title: Etiopathology of infections in hyper-IgM syndrome

19. Title: Expression and function of mutated proteins in Shwachman-Diamond syndrome

20. Title: Intravenous immunoglobulin therapy in autoimmune disorders

21. Title: Invasive pneumococcal infections in primary immunodeficiency disorders

22. Title: Lyme-disease

23. Title: Pneumococcal polysaccharide vaccines

24. Title: Principle and practice of antimicrobial therapy

25. Title: Selective antipolysaccharide antibody deficiency

26. Title: The clinics, pathomechanism and molecular genetics of Shwachman-Diamond syndrome

27. Title: WHIM syndrome

Tutor: Melinda Erdős M.D., Ph.D.

28. Title: Differential diagnosis of neutropenias

29. Title: Enzyme replacement therapy in Fabry disease

30. Title: Kawasaki-syndrome

Tutor: Annamária Székely M.D.

### **Department of Physical Medicine and Rehabilitation**

1. Title: Assessment of quality of life of people with disabilities or with the risk of disability

2. Title: Treatment of spasticity in children with cerebral palsy

Tutor: Zsuzsanna Vekerdy-Nagy M.D., Ph.D.

### **Department of Psychiatry**

1. Title: Evoked potentials in alcoholic patients.  
Tutor: Theodóra Glaub M.D.

2. Title: Cognitive theory and psychotherapy of psychosis

3. Title: Pharmacological non-compliance in schizophrenia

4. Title: The cognitive psychotherapy and fundamental principles of schema therapy

5. Title: The theory, the aim and use of cognitive-behavior psychotherapy in Obsessive-compulsive disorder

Tutor: Anikó Égerházi M.D., Ph.D.

6. Title: Brain imaging in psychiatry.

7. Title: The neurobiology of depression.

8. Title: The psychiatric and psychological sequelae of catastrophic trauma. Post-traumatic stress disorder and post-traumatic growth.

Tutor: Ede Frecska M.D., M.A., Ph.D.

### **Department of Pulmonology**

1. Title: New perspectives in the treatment of lung cancer.

Tutor: Andrea Fodor M.D.

2. Title: New perspectives in the treatment of community acquired pneumonia  
 Tutor: László Brügös M.D.

3. Title: Molecular target therapy of NSCLC  
 Tutor: Tamás Kardos M.D.

### Department of Radiology

1. Title: X-ray examination of the developmental disorders of the aortic arch.  
 Tutor: József Kollár M.D., Ph.D.

2. Title: Dynamic computed tomography of the ischemic cerebral lesions.  
 Tutor: Judit Sikula M.D.

### Institute of Surgery

1. Title: Differentiated thyroid cancer in Graves' disease  
 Tutor: Ferenc Győry M.D.

2. Title: Surgical treatment of bowel obstruction in colorectal diseases  
 Tutor: László Damjanovich M.D., Ph.D.

3. Title: Surgical and endovascular interventions in critical limb ischemia  
 Tutor: Sándor Olvasztó M.D.

4. Title: Opportunistic infections within 6 months of kidney transplantation  
 Tutor: László Asztalos M.D.

5. Title: Surgical treatment of adrenal tumors  
 6. Title: Surgical treatment of hyperthyroidism complicated with endocrine orbitopathie  
 Tutor: Ferenc Juhász M.D., Ph.D.

7. Title: Surgery of pulmonary metastases  
 8. Title: Surgical treatment of severe acute pancreatitis  
 Tutor: Zsolt Szentkereszty M.D., Ph.D.

9. Title: Laparoscopic fundoplication  
 Tutor: László Orosz M.D.

10. Title: The role of one-day surgery  
 Tutor: Csaba Bánfi M.D.

11. Title: Cystic tumors of the pancreas  
 12. Title: The feasibility of intraoperative spectrometry in oncologic surgery.  
 Tutor: László Sasi Szabó M.D.

13. Title: Histopathologic examination of the carotid plaques regarding their possible prognostic value  
 Tutor: Krisztina Litauszky M.D.

14. Title: Liver resections for metastases of colorectal cancer  
 Tutor: János Pósn M.D.

15. Title: Prevention of bronchial stump insufficiency after lung resections  
 Tutor: István Takács M.D., Ph.D.

16. Title: The clinical significance of occult malignancies  
 Tutor: Zoltán Garami M.D.

17. Title: Different forms of hereditary colorectal cancer among our patients.  
 Tutor: Miklós Tanyi M.D., Ph.D.

18. Title: Mesh implantation in the surgical treatment of thoracic defects

19. Title: Surgical treatment of myasthenia gravis  
 Tutor: Attila Enyedi M.D.

20. Title: Assessment of risk factors associated with local recurrency in distal rectal cancer.

21. Title: Assessment of the results of hybrid operations during pelveo-femoral vascular reconstruction.

22. Title: Assessment of tumor regression after neoadjuvant chemo-irradiation in distal rectal cancer.  
 Tutor: Gábor Martis M.D.

### Department of Operative Techniques and Surgical Research

1. Title: New technical possibilities in surgery.  
 Tutor: Andrea Furka M.D., Ph.D.

2. Title: Famous surgeons and famous discoveries.  
 Tutor: Irén Mikó M.D., Ph.D.

3. Title: Investigation of hemorheological and microcirculatory changes in ischemia-reperfusion.  
 Tutor: Norbert Németh M.D., Ph.D.

4. Title: Anesthesia of experimental animals.  
 Tutor: Katalin Pető M.D., Ph.D.

5. Title: History of surgical asepsis.  
 Tutor: Ferenc Kiss M.D., Ph.D.

6. Title: New methods and techniques in microsurgery.  
 Tutor: Zoltán Klárik M.D.

### Department of Traumatology and Hand Surgery

1. Title: Postoperative physiotherapy of the knee fractures  
 Tutor: Károly Fekete M.D., Ph.D.

2. Title: Infection controlling in the traumatology

3. Title: Surgical and postoperative treatment of the soft tissue and bone injuries in the shoulder girdle

4. Title: Treatment of open fractures, role of the physiotherapists in the postoperative interventions  
 Tutor: Ferenc Urbán M.D.

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5. Title: Bone and ligament injuries of the hand  
Tutor: István Frendl M.D.

6. Title: Up-to-date operative treatment of femoral neck fractures  
Tutor: István Szarukán M.D.

7. Title: Operative treatment of severe skull injuries  
Tutor: Levente Molnár M.D.

8. Title: Fractures of the leg.  
Tutor: András Nagy M.D.

9. Title: Current treatment of intertrochanteric and subtrochanteric femoral fractures  
Tutor: Péter Horkay M.D.

10. Title: Current concept in operative treatment of proximal tibial fractures  
Tutor: Béla Turchányi M.D., Ph.D.

### Department of Urology

1. Title: Laparoscopic operations  
Tutor: Tibor Flaskó M.D., Ph.D.

2. Title: New challenges in treatment of renal cancer  
Tutor: Csaba Berczi M.D., Ph.D.

3. Title: Conservative treatment of uronary incontinence  
4. Title: Thrombosis prophylaxis for urological surgical procedures  
Tutor: Mátyás Benyó M.D.

5. Title: Non-invasive treatment of urolithiasis (ESWL)  
Tutor: Morshed Ali Salah M.D., Ph.D.

### Department of Internal Medicine

1. Title: Immunotherapy of B cell lymphomas.  
2. Title: Safety profile of prolonged rituximab therapy in lymphomas.

3. Title: Targeted therapy in non-Hodgkin's lymphomas  
Tutor: Lajos Gergely M.D., Ph.D., D.Sc.

4. Title: Clinical testing of sinus node function.  
Tutor: Péter Kovács M.D., Ph.D., D.Sc.

5. Title: Lipid abnormalities in hypothyroidism.

6. Title: The function of LDL in lipid metabolism  
Tutor: György Paragh M.D., Ph.D., D.Sc.

7. Title: Diagnostic tests and imaging techniques in endocrinology.  
Tutor: Endre Nagy M.D., Ph.D., D.Sc.

8. Title: Antiarrhythmic drug treatment.

9. Title: Cardiac arrhythmias in patients end-stage renal failure.

10. Title: Pacemaker treatment and myocardial infarction.

11. Title: Pathophysiology of neurocardiogenic syncope.

12. Title: Rhythm disturbances and the autonomic system of the heart.

13. Title: Ventricular repolarization and drugs.  
Tutor: István Lőrincz M.D., Ph.D.

14. Title: Investigations of lipoproteins in normo- and hypercholesterinemic patients.  
Tutor: Judit Boda M.D.

15. Title: Characteristics of rare systemic vasculitides

16. Title: Clinical aspects of Wegener-granulomatosis

17. Title: Regulatory T cells function in Sjögren's syndrome

18. Title: Sjögren's syndrome associated with other autoimmune disease

Tutor: Margit Zeher M.D., Ph.D., D.Sc.

19. Title: Danger of multidrug treatment in aged patients.

20. Title: Incidence of thyroid diseases in elderly.  
Tutor: Gyula Bakó M.D., Ph.D., D.Sc.

21. Title: The laboratory diagnosis of glutene sensitive enteropathies.

Tutor: Sándor Sipka M.D., Ph.D., D.Sc.

22. Title: Vascular involvement in mixed connective tissue disease.

23. Title: Vascular risk factors in undifferentiated connective tissue disease  
Tutor: Edit Bodolay M.D., Ph.D., D.Sc.

24. Title: Dermato/polymyositis overlap with antiphospholipide syndrome.

25. Title: Genetical study in myositis

26. Title: Improvement of quality of life in polymyositis and dermatomyositis patients by physiotherapy  
Tutor: Katalin Dankó M.D., Ph.D., D.Sc.

27. Title: Autoimmune disorders and GI tract  
Tutor: Zsolt Barta M.D., Ph.D.

28. Title: Ischemic colitis.

29. Title: Life quality of Raynaud syndrome  
Tutor: Zoltán Csiki M.D., Ph.D.

30. Title: Novel therapeutical approaches in multiple myeloma

31. Title: The impact of multi-drug resistance genes in the prognosis of lymphoproliferative disorders  
Tutor: László Váróczy M.D., Ph.D.

32. Title: Inherited and acquired thrombophilia

33. Title: New direct oral anticoagulants

34. Title: Stem cell therapy in peripheral arterial disorders  
Tutor: Zoltán Boda M.D., Ph.D., D.Sc.

35. Title: Gastric cancer: clinics and treatment

36. Title: Gastrointestinal bleeding

37. Title: Gluten sensitive enteropathy

38. Title: Inflammatory bowel diseases.

39. Title: Lymphomas in the gastrointestinal tract.  
 Tutor: István Altorjay M.D., Ph.D.

40. Title: Langerhans histiocytosis

41. Title: Osteosclerotic myeloma

42. Title: Therapeutic challenges in rare haemostatic disorders

Tutor: György Pfliegler M.D., Ph.D.

43. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C

44. Title: Pathomechanism of alcoholic hepatitis

45. Title: Signs, diagnostics and treatment of portal hypertension.

46. Title: Therapeutic options in primary sclerosing cholangitis

47. Title: Treatment of autoimmune hepatitis

Tutor: István Tornai M.D., Ph.D.

48. Title: A case history of an interesting acute myeloid leukaemia patient in the 2nd Department of Medicine (connection with the literature data)

Tutor: Attila Kiss M.D., Ph.D.

49. Title: Chronic neutrophilic leukaemia

Tutor: Béla Telek M.D., Ph.D.

50. Title: Therapeutic options of CML

Tutor: László Rejtő M.D., Ph.D.

51. Title: Biological treatment of ulcerative colitis

Tutor: Károly Palatka M.D., Ph.D.

52. Title: The role of Willebrand factor in various internal diseases.

Tutor: Ágota Schlammadinger M.D., Ph.D.

53. Title: Bacterial infection in liver cirrhosis

54. Title: Current therapeutic options of acute pancreatitis

Tutor: Zsuzsa Vitális M.D., Ph.D.

55. Title: Diagnosis and treatment of chronic lymphocytic leukemia

56. Title: Novel therapeutic approaches in the treatment of multiple myeloma

57. Title: Philadelphia negative chronic myeloproliferative neoplasms - novel genetic and therapeutic improvements

58. Title: Recent advances in the management of chronic ITP

Tutor: Péter Batár M.D., Ph.D.

59. Title: Heparin-induced thrombocytopenia

Tutor: Zsolt Oláh M.D.

60. Title: Are the bacterial infections predictable in liver cirrhosis?

61. Title: Role of serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases.

Tutor: Mária Papp M.D., Ph.D.

## Division of Dental Medicine

1. Title: Alcoholic liver diseases

2. Title: Diagnosis and treatment of primary biliary cirrhosis

3. Title: Diagnostics and therapy of chronic hepatitis B

4. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C

5. Title: Signs, diagnostics and treatment of portal hypertension

Tutor: István Tornai M.D., Ph.D.

## Division of Rheumatology

1. Title: Cardiopulmonary manifestation in systemic sclerosis

2. Title: Joint protection in rheumatoid arthritis

3. Title: Pulmonary arterial hypertension in systemic sclerosis.

4. Title: Treatment of systemic sclerosis.

Tutor: Gabriella Szücs M.D., Ph.D.

5. Title: Rheumatology 2009 - modern diagnostics and therapy.

Tutor: Zoltán Szekanez M.D., Ph.D., D.Sc.

6. Title: Extra-articular manifestations of ankylosing spondylitis.

7. Title: Modern treatment of seronegative spondyloarthritides

Tutor: Szilvia Szamosi M.D., Ph.D.

8. Title: Life quality in scleroderma

Tutor: Szilvia Szamosi M.D.

9. Title: Monoclonal gammopathy in rheumatoid arthritis.

10. Title: Role of physiotherapy in the treatment of idiopathic inflammatory myopathy (review)

Tutor: Andrea Vánca M.D., Ph.D.

## Faculty of Dentistry

1. Title: Caries indicates

2. Title: Common mistakes of composite filling

Tutor: László Nagy D.M.D.

3. Title: Advanced materials in Dentistry

4. Title: Degradable polymers in Dentistry

Tutor: Csaba Hegedűs M.Sc., Ph.D.

5. Title: Comparison of surgical and non-surgical periodontal therapy

6. Title: Essential oils in periodontal therapy

7. Title: Influences of risk factors on periodontal therapy

Tutor: István Varga D.M.D., Ph.D.

8. Title: Caloric restriction and chronic oral inflammatory diseases

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| <p>9. Title: The implications of the new paradigm of dental caries<br/>Tutor: Barna Kelentey D.M.D., Ph.D., C.Sc.</p> <p>10. Title: Modern rotary root canal enlargement</p> <p>11. Title: Monobloks in endodontics<br/>Tutor: Alexander Juhász D.M.D.</p> <p>12. Title: Ferrule-effect</p> <p>13. Title: The role of TRPV receptors in the physiologic and pathologic processes of the dental pulp<br/>Tutor: Vilmos Zolnai D.M.D.</p> <p>14. Title: Antimicrobial photodynamic therapy in dentistry</p> <p>15. Title: Endodontic flare-ups<br/>Tutor: Kinga Bágyi D.M.D., Ph.D.</p> <p>16. Title: Direct esthetical restaurations</p> <p>17. Title: Soft removable appliances<br/>Tutor: Renáta Martos D.M.D.</p> <p>18. Title: Composite posts and their clinical application</p> <p>19. Title: Psychological analysis of patients with dental allergy<br/>Tutor: Tünde Radics D.M.D., Ph.D.</p> <p>20. Title: Properties of dental impression materials</p> <p>21. Title: Prosthetic rehabilitation of oral cancer patient<br/>Tutor: István Lampé D.M.D.</p> <p>22. Title: Considerations of full ceramic restorations, concentrating on the types of ceramics</p> <p>23. Title: Polymerisation shrinkage problem in dentistry<br/>Tutor: Katalin Bukovinszki D.M.D.</p> <p>24. Title: CAD CAM technologies</p> <p>25. Title: Peroxide containing tooth whitening techniques<br/>Tutor: Tamás Bistey D.M.D., Ph.D.</p> <p>26. Title: Precision attachments</p> <p>27. Title: Temporary restorations in prosthetic dentistry<br/>Tutor: Rita Mohácsi D.M.D.</p> <p>28. Title: Cone-beam CT investigations in different areas of clinical dentistry</p> <p>29. Title: Traditional and digital imaging methods in dental practice<br/>Tutor: János Angyal D.M.D., Ph.D.</p> <p>30. Title: Microorganisms of the oral cavity</p> <p>31. Title: Xerostomy<br/>Tutor: Anna Cseh D.M.D.</p> | <p>32. Title: The importance of age groups in pediatric dentistry and prevention</p> <p>33. Title: The role of nutrition in pediatric cariology<br/>Tutor: Márta Alberth M.D., L.D.S., Ph.D.</p> <p>34. Title: Conscious sedation in pediatric dentistry</p> <p>35. Title: Space maintenance in the primary and mixed dentition<br/>Tutor: Judit Nemes D.M.D., Ph.D.</p> <p>36. Title: Complex treatment of the oligodontic cases</p> <p>37. Title: Presurgical infant orthopedic treatments<br/>Tutor: Judit Török D.M.D.</p> <p>38. Title: Minor oral surgery in childhood</p> <p>39. Title: Traumatic injuries in primary dentition<br/>Tutor: Gabriella Kovalecz D.M.D.</p> <p>40. Title: Orthodontic bonding materials</p> <p>41. Title: Periodontal aspects of orthodontic treatment<br/>Tutor: Géza Vitályos D.M.D.</p> <p>42. Title: Bisphosphonate related pathoses of the maxillofacial region</p> <p>43. Title: Temporomandibular arthropathy<br/>Tutor: Pál Redl M.D., L.D.S., Ph.D.</p> <p>44. Title: Actinomycosis in the maxillofacial region</p> <p>45. Title: Treatment of fractures of edentulous, atrophied mandible<br/>Tutor: Adrienne Szabó M.D., Ph.D.</p> <p>46. Title: Distraction osteogenesis in the maxillofacial region</p> <p>47. Title: Local flaps on the face<br/>Tutor: Róbert Boda M.D.</p> <p>48. Title: Benign odontogenic tumors</p> <p>49. Title: Update surgical endodontics<br/>Tutor: Enikő Gebri D.M.D.</p> <p>50. Title: Advanced diagnostic methods in periodontology</p> <p>51. Title: The role of herpes virus in oral disorders<br/>Tutor: Ildikó Tar D.M.D., Ph.D.</p> |
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## CHAPTER 17

### LIST OF TEXTBOOKS

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#### **BMC**

##### **Introduction to Biophysics I.:**

Serway/Vuille: College Physics.  
 9th edition. Brooks/Cole Cengage Learning, 2012. ISBN: 978-1-111-42745-0.  
 Gáspár R.: Physics for BMC students.  
 University of Debrecen, .

##### **Introduction to Medical Chemistry I.:**

McMurry, J., Fay, R.C.: Chemistry.  
 6th edition. Pearson Education, 2012. ISBN: 978-0-13232-1464.

##### **Introduction to Biology I.:**

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.  
 9th edition. Sinauer Associates, 2011. ISBN: 978-1-4292-1962-4.

##### **Introduction to Medical Chemistry II.:**

McMurry, J., Fay, R.C.: Chemistry.  
 6th edition. Pearson Education, 2012. ISBN: 978-0-13232-1464.  
 F., Erdődi, Cs., Csontos: Organic Chemistry for Premedical Students.  
 University of Debrecen, 2011.

##### **Introduction to Biology II.:**

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.  
 9th edition. Sinauer Associates, 2011. ISBN: 978-1-4292-1962-4.

##### **English for BMC students:**

Soars, John and Liz: Headway - Pre-Intermediate Students' Book and Workbook.  
 The 3rd edition. Oxford, .

##### **Hungarian Language for BMC students:**

Marschalkó, Gabriella: Hungarolingua Basic Level 1.  
 Debreceni Nyári Egyetem, 2011.

##### **Introduction to Biophysics II.:**

Serway/Vuille: College Physics.  
 9th edition. Brooks/Cole Cengage Learning, 2012. ISBN: 978-1-111-42745-0.  
 Gáspár R.: Physics for BMC students.  
 University of Debrecen, .

#### **SBMC**

##### **Introduction to Biology:**

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.  
 9th edition. Sinauer Associates, 2011. ISBN: 978-1-4292-1962-4.

##### **Introduction to Medical Chemistry :**

McMurry, J., Fay, R.C.: Chemistry.  
 6th edition. Pearson Education, 2012. ISBN: 978-0-13232-1464.  
 F., Erdődi, Cs., Csontos: Organic Chemistry for Premedical Students.  
 University of Debrecen, 2011.

##### **Introduction to Biophysics:**

Serway/Vuille: College Physics.  
 9th edition. Brooks/Cole Cengage Learning, 2012. ISBN: 978-1-111-42745-0.

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

##### **Biophysics:**

Biophysics laboratory manual.  
 Department of Biophysics and Cell Biology, 2001.  
 Wayne W. Daniel: Biostatistics. A foundation for Analysis in the Health Sciences.  
 John Wiley & Sons, . ISBN: 0-471-16386-4.  
 Edited by János Szöllősi: Medical Biophysics.  
 Medicina, 2009.

##### **Medical Psychology I.:**

Segerstrale, U., Peter Molnár: Nonverbal Communication: Where Nature Meets Culture.  
 Lawrence Erlbaum Mahwah N.J., 1997.  
 Alan Stoudemire: Human Behavior. An Introduction for Medical Students.  
 J.B. Lippincott Company, Philadelphia, 1994.  
 Márta Csabai and Péter Molnár: Medical Psychology.  
 Background material. Reprint University of Debrecen, 2008.

##### **Medical Chemistry:**

McMurry, J., Fay, R.C.: Chemistry.  
 6th edition. Pearson Education, 2012. ISBN: 978-0-13232-1464.  
 Gergely, P.: Organic and Bioorganic Chemistry for Medical Students.  
 3rd edition. Medical and Health Science Center, University of Debrecen, 2008.  
 Gergely, P.: Introduction to Bioinorganic Chemistry for Medical Students.  
 Medical and Health Science Center, University of Debrecen, 2008.

**CHAPTER 17**

Ed. Dombrádi, V.: Laboratory Practicals in Medical Chemistry.  
 Medical and Health Science Center, University of Debrecen, 2009.

**Hungarian Crash course:**

Marschalkó, Gabriella: Hungarolingua Basic Level 1.  
 Debreceni Nyári Egyetem, 2011.

**Latin language :**

Répás, L.: Basics of Medical Terminology.  
 Répás László, 2012.  
 Répás, László - Bóta, Balázs: E-learning site for students of Medical terminology.  
 URL: <http://www.medi-lingua.hu>

**Computer science:**

Greg Perry: Microsoft Office .  
 2007. ISBN: 9789-6396-3737-5.

**Biostatistics:**

Wayne W. Daniel: Biosatistics: a foundation for analysis in the health sciences.  
 7th edition. John Wiley and Sons, New York, 1991. ISBN: 0-471-52988-5.

**First aid and reanimation:**

The St. John Ambulance Association and Brigade, The British Red Cross society: First Aid Manual.  
 Dorling Kismetrsley Ltd., 1992. ISBN: 0-863-18-4.  
 Jerrold B. Leikin, Bernard J. Feldman: Handbook of First Aid and Emergency Care.  
 Random House, New York, 2000. ISBN: 0-375-75486-5.

**Anatomy, histology and embryology I.:**

K.L. More: Clinically Oriented Anatomy.  
 6th edition. Lippincott Williams & Wilkins, 2004. ISBN: 9781-60547-652-0.  
 M.H. Ross: Histology. A Text and Atlas.  
 5th edition. Lippincott Williams & Wilkins, 2006. ISBN: 0-781-75056-3.  
 Sobotta: Atlas of Human Anatomy I.-II..  
 14th edition. Urban & Schwarzenberg, . ISBN: 978-0-443-10349-0.  
 T. W. Sadler: Langman's Medical Embriology.  
 12th edition. Lippincott Williams & Wilkins, 2012. ISBN: 978-1-4511-4461-1.  
 E.K. Sauerland: Grant's Dissector.  
 11th edition. Williams & Wilkins, 2000. ISBN: 0-683-03701-3.

**Molecular Biology:**

Alberts et al.: Molecular Biology of the Cell.  
 5th edition. Garland Public Inc., 2007.  
 T. Á. Brown: Genomes.  
 3rd edition. Garland Public Inc., . ISBN: 0-8153-4138-5.  
 Lodish et al.: Molecular Cell Biology (recommended

book) download.

URL: <http://www.ncbi.nlm.nih.gov/books/bv.fegi?call=bv.View..ShowTOC&rid=mboc4.TOC&depth=2>  
 Ed. László Fésüs: Biochemistry and Molecular Biology on-line Syllabus Volume I.: Molecular Biology, 2009..  
 URL: <http://bmbi.med.unideb.hu>

**Cell Biology:**

Alberts et al.: Molecular Biology of the Cell.  
 5th edition. Garland Public Inc., 2007.  
 Alberts et al.: Essential Cell Biology.  
 3rd edition. Garland Public Inc., 2004. ISBN: 0-8153-3481-8.  
 Cell Biology Laboratory Manual.  
 Department of Biophysics and Cell Biology, 2003.  
 Lodish et al.: Molecular Cell Biology.  
 4th edition..

**Medical Genetics:**

Robert L. Nussbaum, Roderick R. McInnes, Huntington F. Willard, Ada Hamosh: Thompson and Thompson Genetics in Medicine.  
 7th edition. Saunders Elsevier, 2007. ISBN: 978-1-4160-3080-5.  
 Practical Courses in Genetics.  
 University Medical School of Debrecen, 2002.  
 Hartl D. L.: Essential Genetics: A Genomics Perspective.  
 5th edition. Jones & Bartlett Publishers, 2011. ISBN: 9780-7637-7364-9.  
 Thomas D. Gelehrter, Francis S. Collins, David Ginsburg: Principles of Medical Genetics.  
 2nd. Williams and Wilkins, 1998. ISBN: 0-683-03445-6.  
 Tom Strachan, Andrew P. Read: Human Molecular Genetics.  
 3rd. Garland Science, 2004. ISBN: 0-8153-4184-9.  
 Eberhard Passarge: Color Atlas of Genetics.  
 2nd edition. Georg Thieme Verlag, 2001. ISBN: 3-13-100362-6.

**Medical Genomics:**

Campbell, A. M., Heyer, L. J.: Discovering genomics, proteomics and bioinformatics.  
 Pearson Education Inc. , . ISBN: 0-8053-4722-4.

**Latin medical terminology:**

Répás, L.: Basics of Medical Terminology.  
 Répás László, 2012.  
 Répás, László - Bóta, Balázs: E-learning site for students of Medical terminology.  
 URL: <http://www.medi-lingua.hu>

**2<sup>nd</sup> year**
**Biochemistry I.:**

Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations.  
 6th edition. Wiley-Liss, 2006.  
 Lubert Stryer: Biochemistry.  
 6th edition. W.H. Freeman and Company, 2007.

Ed. László Fésüs: Biochemistry and Molecular Biology on-line Syllabus Volume II.: Metabolism, 2009.  
 URL: <http://bmbi.med.unideb.hu>

### Medical Physiology I.:

A. Fonyó: Principles of Medical Physiology. Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.  
 Physiological Practice, A Laboratory Guide. 2nd (revised) edition. 2007.  
 J. B. West: Best and Taylor's Physiological Basis of Medical Practice. 12th edition. Williams & Wilkins, 1990.  
 R. M. Berne, M. N. Levy, B. M. Koeppen, B. A. Stanton: Physiology. 5th edition. V.C. Mosby Co., 2003.  
 A.C. Guyton, J. E. Hall: Textbook of Medical Physiology. 11th edition. W.B. Saunders Co., 2005. ISBN: 1007-2160-240-1.  
 R. M. Berne, M. N. Levy: Principles of Physiology. 4th edition. V. C. Mosby Co., 2005. ISBN: 1003-2303-195-1.  
 Gillian Pocock, Christopher D. Richards: Human Physiology - The Basis of Medicine. 3rd edition. Oxford University Press, 2006. ISBN: 9780-1985-6878-0.  
 Physiology Practice. Exercise Book. revised edition. 2000.

### Hungarian language II/1. :

Halász, Renáta: Hogy tetszik lenni? Magyar orvosi szaknyelv kezdőknek.. 1st edition. Szerzői kiadás, 2010. ISBN: 978-963-06-9941-9.

### Anatomy, histology and embryology II.:

K. L. More: Clinically Oriented Anatomy. 4th edition. Lippincott Williams & Wilkins, 2004. ISBN: 0-683-06141-0.  
 Sobotta: Atlas of Human Anatomy I-II.. 14th edition. Urban & Schwarzenberg, . ISBN: 978-0-443-10349-0.  
 T. W. Sadler: Langman's Medical Embriology. 12th edition. Lippincott Williams & Wilkins, 2012. ISBN: 978-1-4511-4461-1.  
 E.K. Sauerland: Grant's Dissector. 11th edition. Williams & Wilkins, 2000. ISBN: 0-683-03701-3.  
 Ross, M.H., Romrell, L.J., Kaye, G.I.: Histology. A Text and Atlas. 5th edition. Lippincott Williams & Wilkins, 2006. ISBN: 0-781-75056-3.

### Multimodal imaging and virtual reality in neurosciences:

Fred A. Mettler: Essentials of Radiology . 2. Elsevier , 2005. ISBN: ISBN 0-7216-0527-3.

### Biochemistry II.:

Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations. 6th edition. Wiley-Liss, 2006.  
 Lubert Stryer: Biochemistry. 6th edition. W.H. Freeman and Company, 2007.  
 Ed. László Fésüs: Biochemistry and Molecular Biology on-line Syllabus Volume III.: Cell- and Organ Biochemistry, 2009. .  
 URL: <http://bmbi.med.unideb.hu>

### Medical Physiology II.:

A. Fonyó: Principles of Medical Physiology. Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.  
 Physiological Practice, A Laboratory Guide. 2nd (revised) edition. 2007.  
 J. B. West: Best and Taylor's Physiological Basis of Medical Practice. 12th edition. Williams & Wilkins, 1990.  
 R. M. Berne, M. N. Levy, B. M. Koeppen, B. A. Stanton: Physiology. 5th edition. V.C. Mosby Co., 2003.  
 A.C. Guyton, J. E. Hall: Textbook of Medical Physiology. 11th edition. W.B. Saunders Co., 2005. ISBN: 1007-2160-240-1.  
 R. M. Berne, M. N. Levy: Principles of Physiology. 4th edition. V. C. Mosby Co., 2005. ISBN: 1003-2303-195-1.  
 Gillian Pocock, Christopher D. Richards: Human Physiology - The Basis of Medicine. 3rd edition. Oxford University Press, 2006. ISBN: 9780-1985-6878-0.  
 Physiology Practice. Exercise Book. revised edition. 2000.

### Hungarian language II/2.:

Halász, Renáta: Hogy tetszik lenni? Magyar orvosi szaknyelv kezdőknek.. 1st edition. Szerzői kiadás, 2010. ISBN: 978-963-06-9941-9.

### Neurobiology (Neuroanatomy, Neurobiochemistry, Neurophysiology):

K. L. More: Clinically Oriented Anatomy. 4th edition. Lippincott Williams & Wilkins, 2004. ISBN: 0-683-06141-0.  
 Sobotta: Atlas of Human Anatomy I-II.. 14th edition. Urban & Schwarzenberg, . ISBN: 978-0-443-10349-0.  
 T. W. Sadler: Langman's Medical Embriology. 12th edition. Lippincott Williams & Wilkins, 2012. ISBN: 978-1-4511-4461-1.  
 A. Fonyó: Principles of Medical Physiology. Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.  
 Haines, D.E.: Fundamental Neuroscience Haines.

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3rd edition. Churchill Livingstone, 2006. ISBN: 0-443-06751-1.  
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