# BULLETIN

# UNIVERSITY OF DEBRECEN

## ACADEMIC YEAR 2018/2019

# FACULTY OF MEDICINE

Coordinating Center for International Education

# Table of Contents

# CHAPTER 1
# WELCOME FROM THE DEAN

Welcome from the Dean

The history of higher education in Debrecen goes back to the 16th century. The city established the Calvinist College of Debrecen in 1538. The College became soon the most important cultural center of the whole country, where a great number of writers, scientists and politicians received their education. In the 18th century the schools of Law and Theology were founded and although no separate School of Medicine existed, physicians were also trained in the College. The Faculty of Medicine is rooted in this spiritual heritage. The present day Debrecen is also famous for its schools and higher educational establishments. The Faculty of Medicine of the University of Debrecen was Central Europe's first campus medical school. It was in the year of the millennium (1896) of Hungary's foundation when the establishment of a modern University was decided upon in Debrecen. The University was officially inaugurated on October 23, 1918 and at that time consisted of four faculties: Arts, Science, Theology and Medicine. The Faculty of Medicine became an independent University Medical School under the supervision of the Ministry of Health in 1951. In 2000 the formerly independent universities of Debrecen formed the University of Debrecen, therefore today the Faculty of Medicine is part of the University of Debrecen. It has 22 departments of basic sciences and 25 clinical departments specializing in various fields e.g. clinical chemistry, internal medicine, surgery, orthopedics, radiology, neurology, neurosurgery, psychiatry, pediatrics, obstetrics and gynecology, cardiology and pulmonology, otorhino-laryngology, dermatology, ophthalmology, stomatology and urology. Our hospitals serve as city hospitals for Debrecen therefore students may also obtain their clinical training here.
The Faculty of Medicine started MD training in English in 1987 with 49 students. The current number of students in the English Program exceeds 1500. Besides educating medical students, the Faculty also coordinates the BSc in Medical Diagnostics and MSc programs in Clinical Laboratory Research, Molecular Biology and Nutrition.

The curriculum described in this Bulletin provides a firm background for a future physician. Learning all these subjects requires highly motivated, devoted students. Please take your studies seriously, and enjoy the process of becoming a medical doctor.

Best wishes,

László Mátyus

Dean, Faculty of Medicine

# CHAPTER 2
# INTRODUCTION

The aim 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 21st 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 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 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 University of Debrecen is already internationally recognized in the fields of both basic and clinical research, and the clinicians and scientists of the University 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 serving the community, all faculty members 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, 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 21st 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 16th century Debrecen became the center of the Reformed Church in Hungary and later it was referred to as the "Calvinist Rome". The 17th 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 16th 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 23rd, 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 2000.
The Faculty of Medicine celebrated the 90th anniversary of its foundation in October 2008 with a highly successful international scientific conference.

Education at the University of Debrecen
Debrecen, the second largest city of Hungary, is situated in Eastern Hungary. Students enrolled in the various programs (e.g. 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. The new programs – with specialized training for paramedics – will help 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 Medicine or Dentistry programs.
International students must pass an entrance exam 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. 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 (1st and 2nd year), pre-clinical subjects (3rd year) and clinical subjects (4th and 5th year) followed by the internship (6th 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 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 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 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 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 6th 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 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 led by more than 100 accredited, highly qualified coordinators and tutors.

Medical Activity at the Faculty of Medicine
The Faculty of Medicine 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. It 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.
The Kenézy Gyula County Hospital (with some 1,400 beds) is strongly affiliated with the University of Debrecen and plays an important role in teaching the practical aspects of medicine. There are also close contacts between the University and other health care institutions, mainly (but not exclusively) in its closer region. The University of Debrecen has a Teaching Hospital Network consisting of 24 hospitals in Israel, Japan and South Korea.
It is also of importance that the University of Debrecen 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 Faculty of Medicine

Scientific research is performed both at the departments for basic sciences and at the laboratories of clinical departments. The faculty members publish about 600 scientific papers every year in international scientific journals. According to the scientometric data, the Faculty 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).

# CHAPTER 3
# ORGANISATION STRUCTURE

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# CHAPTER 4
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| | Ms. | Ildikó Lakatos M.A.<br>(Admission, Visa Issues) |
| | Ms. | Krisztina Németh M.Sc.<br>(Bulletin) |
| | Ms. | Enikő Sallai M.Sc.<br>(Tuition fee, Health Insurance) |
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| IT Project Coordinator | | Imre Szűcs B.Sc. |

# CHAPTER 5
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| Lecturer | | Zsolt Bacsó M.D., Ph.D. |
| | | Péter Hajdu M.Sc., Ph.D. |
| | | Tamás Kovács M.D. |
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| | | László Mátyus M.D., Ph.D., D.Sc. |
| | Ms. | Enikő Nizsalóczki M.Sc. |
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| | | Ferenc Papp M.Sc., Ph.D. |
| | | G. Tibor Szántó M.Sc., Ph.D. |
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| | Ms. | Ágnes Tóth M.Sc., Ph.D. |
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## BASIC MEDICINE COURSE - INTRODUCTION TO MEDICAL CHEMISTRY

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| | Ms. | Anita Boratkó M.Sc., Ph.D. |
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| | | Tibor Docsa M.Sc., Ph.D. |
| | | Viktor Dombrádi M.Sc., Ph.D., D.Sc. |
| | | Ferenc Erdődi M.Sc., Ph.D., D.Sc. |
| | Ms. | Ilona Farkas M.Sc., Ph.D. |
| | | Csaba Hegedűs M.Sc., Ph.D. |
| | Ms. | Andrea Kiss M.Sc., Ph.D. |
| | Ms. | Katalin Kovács M.Sc., Ph.D. |
| | Ms. | Edit Mikó M.Sc., Ph.D. |
| | Ms. | Magdolna Szántó D.Pharm., Ph.D. |
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# CHAPTER 6
# FACULTY OF MEDICINE - DEPARTMENTS OF BASIC SCIENCES

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| | | Botond Gaál M.Sc., Ph.D. |
| | | Zoltán Hegyi M.Sc., Ph.D. |
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| | Ms. | Andrea Gajtkó M.Sc. |
| | | Tibor Hajdú M.D. |
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| | Ms. | Fariba Javdani M.D. |
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### Division of Rare Diseases

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| | Ms. | Erika Papp M.D. |
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| | Ms. Tímea Kincső Zoltán M.D. |
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| | Ms. | Zsófia Oláh M.A. |
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| | Ms. | Éva Anna Szabados M.A. |
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| | Zoltán Záborszky M.D., Ph.D. |

| | | |
|---|---|---|
| Chief Surgeons of the Kenézy Hospital | | József Balázs M.D. |
| | | Béla Barta M.D. |
| | Ms. | Danie Czakó M.D. |
| | | Zoltán Dézsi M.D. |
| | | István Frendl M.D. |
| | | Péter Horkay M.D. |
| | | Árpád Kiss M.D. |
| | | Bojko Lazarov Szeferinkin M.D. |
| | | László Molnár M.D. |
| | | Levente Molnár M.D. |
| | | András Nagy M.D. |
| | | Árpád Németh M.D. |
| | | Dániel Rezes M.D. |
| | | István Szarukán M.D. |
| | | Zsigmond Varga M.D. |
| Surgeons of the Kenézy Hospital | | Árpád Barkaszi M.D. |
| | | Péter Berényi M.D. |
| | | Miklós Bíró M.D. |
| | | Aurél Bogdán M.D. |
| | | Balázs Cs. Kiss M.D. |
| | | Subuh Deeb Mahmoud M.D. |
| | | Márton Árpád Fésüs M.D. |
| | | Szabolcs Gorzsás M.D. |
| | | Gergely Huszanyik M.D. |
| | | Sándor Imre Kiss M.D. |
| | | László Kiss M.D. |
| | | Csaba Körei M.D. |
| | | Ádám Lőrincz M.D. |
| | | Lóránt Mike M.D. |
| | Ms. | Katalin Muraközy M.D. |
| | | Zoltán Németi M.D. |
| | | Zoltán Domokos Pap M.D. |
| | | József Papp M.D. |
| Resident | | Gyula Diós M.D. |
| | | Károly Elek M.D. |

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| | László Gubik M.D. |
| | Ádám Kristóf Gulyás M.D. |
| | Ákos Haby M.D. |
| | Zoltán Mikó M.D. |
| | Konrád Ökrös M.D. |
| | Márton József Séber M.D. |
| | Máté Sulik M.D. |
| | Bence Gellért Urbán M.D. |
| Ms. | Katalin Kitti Vass M.D. |
| Consultant | István Szarukán M.D. |
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## DEPARTMENT OF UROLOGY

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| Associate Professor | Attila Varga M.D., Ph.D. |
| Assistant Professor | Mátyás Benyó M.D., Ph.D. |
| | Csaba Berczi M.D., Ph.D. |
| | Antal Farkas M.D., Ph.D. |
| Assistant Lecturer | Gyula Drabik M.D. |
| Chief Physician | László Lőrincz M.D. |
| Clinical Specialist | József Zoltán Kiss M.D. |
| | Mihály Murányi M.D. |
| | Krisztián Szegedi M.D. |
| | Sándor Árpád Tóth M.D. |
| Clinical Assistant | Dániel Varga M.D. |
| Responsible for Educational Matters | Gyula Drabik M.D. |

# CHAPTER 8
# OTHER DEPARTMENTS

## DEPARTMENT OF BIOMATERIALS AND PROSTHETIC DENTISTRY

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| Assistant Professor | | Tamás Bistey D.M.D., Ph.D. |
| | Ms. | Melinda Szalóki M.Sc., Ph.D. |
| Assistant Lecturer | | József Bakó M.Sc., Ph.D. |
| | Ms. | Edit Hrubi D.M.D. |
| | Ms. | Rita Mohácsi D.M.D. |
| | Ms. | Anita Pétercsák D.M.D. |
| | | László Póti D.M.D. |
| | Ms. | Márta Szegedi D.M.D. |
| | | Ferenc Tóth M.Sc. |
| Clinical Specialist | Ms. | Katalin Bukovinszky D.M.D. |
| Resident | Ms. | Gerda Dani D.M.D. |
| | Ms. | Marianna Dóró D.M.D. |
| | Ms. | Tímea Kulcsár D.M.D. |
| | | Péter Suta D.M.D. |
| | | Márton Suta D.M.D. |
| | Ms. | Kitti Török D.M.D. |
| Chemist | Ms. | Tünde Rente M.Sc. |
| Molecular Biologist | Ms. | Ágnes Bartháné Szabó M.Sc. |
| Academic Advisor | | István Lampé D.M.D. |

## INSTITUTE OF BEHAVIOURAL SCIENCES, FACULTY OF PUBLIC HEALTH

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| Associate Professor, Head of Division of Clinical And Health Psychology | Ms. | Ildikó Kuritárné Szabó M.A., Ph.D. |
| Associate Professor, Head of Division of | | Attila Bánfalvi M.A., Ph.D., C.Sc. |

Humanities For Health Care

| | | |
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| Titular Professor | | Antal Bugán M.A., Ph.D. |
| Professor Emeritus | | Péter Molnár M.D., D.Sc. |
| Assistant Professor | Ms. | Mónika Andrejkovics M.A., Ph.D. |
| | | Péter Kakuk M.A., Ph.D. |
| | Ms. | Judit Molnár M.A., Ph.D. |
| | | Roland Tisljár M.A., Ph.D. |
| Assistant Lecturer | | János Kristóf Bodnár M.A., Ph.D. |
| | Ms. | Beáta Kovács-Tóth M.A. |
| | | Sándor Kőmüves M.A., Ph.D. |
| | Ms. | Eszter Tisljár - Szabó M.A., Ph.D. |
| Research Assistant | Ms. | Adrienn Kaszás M.Sc. |
| PhD Student | Ms. | Enikő Csikai M.Sc. |
| | | Balázs Fábián M.Sc. |
| | Ms. | Cintia Katona M.Sc. |
| | Ms. | Eszter Labancz M.Sc. |
| | Ms. | Alexandra Sándor M.Sc. |
| Invited Lecturer | | Bence Döbrőssy M.A. |
| Intern | Ms. | Erika Gabnai-Nagy M.Sc. |
| | Ms. | Kitti Katona B.Sc. |
| | Ms. | Bettina Muha M.Sc. |
| | Ms. | Anikó Nagy M.Sc. |
| | Ms. | Anna Eszter Velkey-Rácz M.Sc. |
| | Ms. | Diána Virág M.Sc. |
| Academic Advisor | Ms. | Mónika Andrejkovics M.A., Ph.D.<br>(5th year, Behavioural Science Final Exam) |
| | | Péter Kakuk M.A., Ph.D.<br>(4th year, Bioethics) |
| | Ms. | Judit Molnár M.A., Ph.D.<br>(5th year Pharmaceutical Psychology) |
| | | Roland Tisljár M.A., Ph.D.<br>(1st year Basics of Behavioural Sciences, Communication Skills, 3rd year Medical Psychology) |

## DEPARTMENT OF FAMILY AND OCCUPATIONAL MEDICINE, FACULTY OF PUBLIC HEALTH

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| Assistant Professor | | Zoltán Jancsó M.D., Ph.D. |
| Senior Lecturer | | László Róbert Kolozsvári M.D., MBA, Ph.D. |
| Assistant Lecturer | Ms. | Anna Nánási M.D. |
| | Ms. | Judit Szidor M.D. |
| | Ms. | Hajnalka Tamás M.D. |
| | Ms. | Tímea Ungvári M.Sc. |
| PhD Student | Ms. | Csilla Semanova M.Sc. |
| Clinical Specialist | Ms. | Emőke Lengyel M.D. |
| | Ms. | Izabella Szilágyi M.D. |
| | Ms. | Erzsébet Tóth M.D. |
| Undergraduate educational officer | Ms. | Tímea Ungvári M.Sc. |
| Postgraduate educational officer | Ms. | Anna Nánási M.D. |
| Other Invited Lecturers | | István Erdei M.D. |
| | | János Hintalan M.D. |
| | Ms. | Eszter Kovács M.D. |
| | Ms. | Hajnalka Márton M.D. |
| | | Csaba Sárkány M.D. |
| | | Attila Simay M.D., Ph.D. (Hon. Associate Professor) |
| | | Péter Szerze M.D. |
| | Ms. | Margit Szövetes M.D. |

## INSTITUTE OF SPORT SCIENCE OF UNIVERSITY OF DEBRECEN

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| | | Miklós Magyarits M.A. |
| | | Ágoston Nagy Ph.D. |

| | | |
|---|---|---|
| | Ms. | Katalin Varga M.Sc. |

## DEPARTMENT OF PREVENTIVE MEDICINE, FACULTY OF PUBLIC HEALTH

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| Associate Professor, Head of Occupational Health Division | | Balázs Ádám M.D., M.Sc., Ph.D. |
| Full Professor | Ms. | Róza Ádány M.D., Ph.D., D.Sc. |
| Full professor, Head of Biomarker Analysis Division | Ms. | Margit Balázs M.Sc., Ph.D., D.Sc. |
| Associate Professor, Head of Biostatistics and Epidemiology Division | | János Sándor M.D., Ph.D. |
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| | Ms. | Szilvia Fiatal M.D., Ph.D. |
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| PhD Student | Ms. | Orsolya Bujdosó M.Sc. |
| | Ms. | Llanaj Erand M.Sc. |
| | Ms. | Nóra Kovács M.Sc. |
| | | Szabolcs Lovas M.Sc. |
| | Ms. | Gabriella Pénzes M.Sc. |
| | Ms. | Beáta Soltész M.Sc. |
| | | Gergő József Szőllősi M.Sc. |
| | | Ferenc Vincze M.Sc. |
| Resident | | Gergely Fürjes M.D. |
| | Ms. | Márta Füzi M.D. |
| Invited Lecturer | | József Legoza M.D. |

| | | |
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| Hungarian Academy of Sciences University of Debrecen Public Health Research Group Fellow | Ms. | Judit Diószegi Ph.D. |
| | Ms. | Krisztina Jámbor M.Sc. |
| | Ms. | Viktória Koroknai M.Sc. |
| | | Werissa Abebe Nardos M.Sc. |
| | | Péter Pikó M.Sc. |
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| | | Szabolcs Varga Ph.D. |
| | Ms. | Valéria Vinczéné Sipos M.Sc. |
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| | | Sándor Szűcs M.Sc., Ph.D. |

## DEPARTMENT OF FOREIGN LANGUAGES

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| | Ms. | Judit Kovács, M.A. |
| | Ms. | Mónika Krasznai M.A. |
| | Ms. | Zsuzsa Lívia Mezei M.A. |
| | | László Répás M.A. |
| | Ms. | Katalin Rozman M.A. |
| | | Ben Schutz M.A. |
| Academic Advisor | Ms. | Katalin Rozman M.A. |

## KENÉZY LIFE SCIENCES LIBRARY, UNIVERSITY OF DEBRECEN

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| Collection Development | Ms. | Éva Fórián M.Sc. |
| | Ms. | Georgina Molnár M.Sc. |
| Head of Circulation | Ms. | Katalin Kéri Tornyi B.Sc. |

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| Circulation | Ms. | Dorina Balázsi B.Sc. |
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| | Ms. | Erika Kiss B.Sc. |
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| | Ms. | Kornélia Kulcsár M.Sc. |
| | Ms. | Anett Tar-Apáti B.Sc. |
| Reference Librarian, Web | Ms. | Melinda Korpás Szűcs M.Sc. |
| | Ms. | Boglárka Legeza B.Sc. |
| Stack Attendant | | Ferenc Bacskai |
| | | Csaba Horváth |
| | | Máté Orosz |

# CHAPTER 9
# UNIVERSITY CALENDAR

## UNIVERSITY CALENDAR FOR MEDICINE PROGRAM
## 2018/2019 ACADEMIC YEAR

**CRASH COURSE OF HUNGARIAN LANGUAGE: August 27 – September 7, 2018**
**OPENING CEREMONY: September 9, 2018**
**GRADUATION CEREMONY: September 15, 2018; December 2018; June 2019;**

**1st SEMESTER**

| Year | Course | Examination Period |
|---|---|---|
| Basic Medicine Course | September 10 – December 14, 2018 (14 weeks) | December 17, 2018 – February 1, 2019 (7 weeks) |
| 1st year Medicine<br>2nd year Medicine<br>3rd year Medicine | September 10 – December 14, 2018 (14 weeks) | December 17, 2018 – February 1, 2019 (7 weeks) |
| 4th year Medicine<br>5th year Medicine | September 10 – December 14, 2018 (14 weeks – 4 weeks block practice included) | December 17, 2018 – February 1, 2019 (7 weeks) |

**2nd SEMESTER**

| Year | Course | Spring Break | Examination Period |
|---|---|---|---|
| Basic Medicine Course | February 11 – April 19, 2019<br>April 29 – May 24, 2019 (14 weeks) | April 22 – 26, 2019 (1 week) | May 27 – June 21, 2019 (4 weeks) |
| Basic Medicine Course II. | January 7 – April 19, 2019<br>April 29 – June 21, 2019<br>(23 weeks) | April 22 – 26, 2019 (1 week) | June 24 – July 12, 2019 (3 weeks) |
| 1st year Medicine<br>2nd year Medicine<br>3rd year Medicine | February 11 – April 19, 2019<br>April 29 – May 24, 2019 (14 weeks) | April 22 – 26, 2019 (1 week) | May 27 – July 12, 2019 (7 weeks) |
| 4th year Medicine | February 11 – April 19, 2019<br>April 29 – May 24, 2019<br>(14 weeks – 3 or 4 weeks block practice included) | April 22 – 26, 2019 (1 week) | May 27 – July 12, 2019 (7 weeks) – 4th year |
| 5th year Medicine | | April 22 – 26, 2019 (1 week) | May 27 – July 19, 2019 (8 weeks) – 5th year |

**SUMMER HOSPITAL PRACTICE**

| Year | Dates in 2019 |
|---|---|
| 1st or 2nd year Medicine (Nursing Practice) | July 15 – August 9 or Aug 12 – September 6, 2019 (4 weeks) |
| 3rd year Medicine (Internal Medicine) | July 15 – August 2 or August 5 – August 23, 2019 (3 weeks) |
| 4th year Medicine (Freely Chosen clinical department) | |

# CHAPTER 10
# ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

**ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE**

**Basic Medicine Course (BMC, Premedical Studies)**

**Duration of studies:** 1 year (2 semesters)

The one-year premedical Basic Medicine Course is recommended to those students who do not have sufficient knowledge in Biology, Physics and Chemistry from high school. 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 an Intensive BMC in January as well.

### Class Behavior

Students must not use cell phones to talk or text during class. Cell phones must be switched off or kept in silence mode during class. In seminars, students will be expected to participate in seminar discussions. Students are encouraged to ask questions related to the topic of the lectures discussed, and participate in solving problems related to the topic of the seminar. Some professors will ask for students to volunteer information, but some professors call on students randomly. It is, thus, a good idea to come to class prepared so as not to be embarrassed in front of the class. Students should not disrupt the class by talking to each other. If one continues to disrupt the class, the student may be asked to leave. The usage of electronic devices, textbooks and any form of interaction between students during the tests is strictly forbidden. Electronic devices (cell phones, tablets, dictionaries, etc.), except for approved simple calculators, must not be within the reach (in pocket, in the desk, etc.) of students during tests. It is the students' responsibility to stow these items before the test begins without specific warning by the supervising teachers. Violation of these above mentioned regulations results in an immediate and unconditional dismissal from the program.

### Requirements

The 2-semester course consists of lectures and seminars. Attending lectures is strongly recommended, attendance of seminars is compulsory and recorded. Everyone must attend the seminars with the group designated by the Registrar's Office.

Absence can significantly affect your understanding and can have serious implications of progression in your studies. One might have a maximum of three seminar absences per semester to have the opportunity to get exemption. Students missing 4 seminars per semester cannot be exempted from the End of Semester Examination (ESE) or Final Examination (FE), regardless of their score reached on the Self Control Tests. Students missing 5 or more seminars per semester are dismissed from the course. Missed seminars cannot be made up, unless one obtains prior permission to be absent.

The knowledge of students will be tested 4 times during each semester using a written test system by **Self Control Tests (SCT).** The first semester is ended with an **End of Semester Examination** (ESE) covering the topics of all lectures and seminars of the first semester. Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). Non-repeater students who fail even the 3rd ESE (C chance) may continue their study in the second semester however they lose their chance to be exempted from the final examination and to receive bonus points. Exam exemption and bonus point policy is used to improve the students' performance on SCTs. Exact details of these policies will be described below. Students repeating the course must successfully pass the first semester either with exemption or at least with a score of 60% of ESE, otherwise their studies will be terminated. It is not compulsory to take the ESE, if one gets exemption under the following circumstances:

- one's average score of the three best first semester SCTs is at least 75%, AND
- (s)he successfully completed all the SCTs at least with 40% score, AND
- (s)he has a maximum of 3 seminar absences for each subject in the first semester.

The course ends with a **Final Exam (FE)** covering the whole material of the first and second semesters. A minimum of four FE dates will be set during the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances, and the latter ends up with an oral examination part). Exemption from FE is offered for students who achieve excellent academic performance during their studies on the following base:

- the average score of the six best SCTs (out of 8) of the two semesters is at least 75%, AND
- passed all the SCTs with at least 40%, AND
- (s)he has a maximum of 3 seminar absences for each subject per semester.

OR

- the average of the ESE score taken 3 times plus the scores of the 3 best SCTs in the 2nd semester is at least 75%, AND
- passed all the SCTs with at least 40% in the 2nd semester, AND
- (s)he has a maximum of 3 seminar absences for a given subject per semester.

Bonus points will be added to the FE score (in %) of eligible students and calculated as follows:

| The average of the ESE score three times and the best 3 2nd semester SCTs<br><br>**OR** the average of the best 6 SCTs | Bonus points<br>(%) |
|---|---|
| 51.00-54.99 | 1 |
| 55.00-59.99 | 2 |
| 60.00-64.99 | 3 |
| 65.00-69.99 | 4 |
| 70.00-74.99 | 5 |

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. The participation shall be preceded by ID confirmation (i.e. student's card, passport or driving license) before all forms of tests.

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

| **Percentage (%)** | **Mark** |
|---|---|
| 0 – 59.99: | fail (1) |
| 60.00 – 74.99: | pass (2) |
| 75.00 – 79.99: | satisfactory (3) |
| 80.00 – 89.99: | good (4) |
| 90.00 – 100: | excellent (5) |

Absence for any reason counts as 0%.

Course coordinator: Dr. Beáta Lontay, Department of Medical Chemistry

Subject: **INTRODUCTION TO BIOLOGY I.**

Year, Semester: Basic Medicine Course, 1st semester

Number of teaching hours:
Lecture: **56**
Seminar: **28**

**1st week:**
**Lecture:**
The chemistry of life 1
Proteins, carbohydrates and lipids 1.
Proteins, carbohydrates and lipids 2.
Proteins, carbohydrates and lipids 3.

**2nd week:**
**Lecture:**
Proteins, carbohydrates and lipids 4.
Nucleic acids
Cells: the working units of life 1. Prokaryotes*
Cells: the working units of life 2.

**3rd week:**
**Lecture:**
Cells: the working units of life 3.
Cells: the working units of life 4.
Cells: the working units of life 5.
Cell membranes 1.

**4th week:**
**Lecture:**
Cell membranes 2.
Cell membranes 3.
Cell membranes 4.
Energy, enzymes and metabolism 1.

**5th week:**
**Lecture:**
Energy, enzymes and metabolism 2.
Energy, enzymes and metabolism 3.
Energy, enzymes and metabolism 4.
Pathways that harvest chemical energy 1.

**6th week:**
**Lecture:**
Pathways that harvest chemical energy 2
Pathways that harvest chemical energy 3.
Pathways that harvest chemical energy 4.
Pathways that harvest chemical energy 5.

**7th week:**
**Lecture:**
Cellular signaling and communication 1.
Cellular signaling and communication 2.
Cell cycle and cell division 1.
Cell cycle and cell division 2.

**8th week:**
**Lecture:**
Cell cycle and cell division 2.
Cell cycle and cell division 2.
Inheritance, genes and chromosomes 1.
Inheritance, genes and chromosomes 2.

**9th week:**
**Lecture:**
Inheritance, genes and chromosomes 3.
Inheritance, genes and chromosomes 4.
Inheritance, genes and chromosomes 5.
Inheritance, genes and chromosomes 6.

**10th week:**
**Lecture:**
Inheritance, genes and chromosomes /Pop. Gen 7
DNA and its role in heredity 1.
DNA and its role in heredity 2.
DNA and its role in heredity 3.

**11th week:**
**Lecture:**
From DNA to protein: gene expression 1.
From DNA to protein: gene expression 2.
From DNA to protein: gene expression 3.
From DNA to protein: gene expression 4.

**12th week:**
**Lecture:**
From DNA to protein: gene expression 4.
From DNA to protein: gene expression 5.
Gene mutation and molecular medicine 1.
Gene mutation and molecular medicine 2.

**13th week:**
**Lecture:**
Gene mutation and molecular medicine 3.
Gene mutation and molecular medicine 4.
Regulation of gene expression 1. (Prokaryotic reg.)
Regulation of gene expression 2. (Eukaryotic reg.)

**14th week:**
**Lecture:**
Regulation of gene expression 3.(Eukaryotic reg.)
Regulation of gene expression 4. (Eukaryotic reg.)
The mechanism of evolution 1.
The mechanism of evolution 2.

Contact person: Dr. András Penyige, Associate Professor, Department of Human Genetics
Recommended book: Sadava-Hillis-Heller-Berenbaum: Life, Sinauer-Macmillam

Subject: **INTRODUCTION TO BIOLOGY II.**
Year, Semester: Basic Medicine Course, 2nd semester
Number of teaching hours:
Lecture: **42**
Seminar: **28**

**1st week:**
**Lecture:**
Tissues, Organs and Organ Systems 1.
Tissues, Organs and Organ Systems 2.
Tissues, Organs and Organ Systems 3.

**2nd week:**
**Lecture:**
Physiology, Homeostasis and Temperature Regulation.
Blood, a fluid tissue 1.
Blood, a fluid tissue 2.

**3rd week:**
**Lecture:**
Circulatory systems 1.
Circulatory systems 2.
The human circulatory system 1.

**4th week:**
**Lecture:**
The human circulatory system 2.
The lymphatic system.
Natural Defenses against Disease 1.

**5th week:**
**Lecture:**
Natural Defenses against Disease 2.
Natural Defenses against Disease 3.
Nutrition, Digestion and Absorption 1.

**6th week:**
**Lecture:**
Nutrition, Digestion and Absorption 2.
Nutrition, Digestion and Absorption 3.
Nutrition, Digestion and Absorption 4.

**7th week:**
**Lecture:**
Gas exchange in Animals.
Human respiration.
Salt and Water Balance and Nitrogen Excretion 1.

**8th week:**
**Lecture:**
Salt and Water Balance and Nitrogen Excretion 2.
Hormones 1.
Hormones 2.

**9th week:**
**Lecture:**
Hormones 3.
Hormones 4.
Hormones 5.

**10th week:**
**Lecture:**
Neurons and Nervous system 1.
Neurons and Nervous system 2.
Neurons and Nervous system 3.

**11th week:**
**Lecture:**
Neurons and Nervous system 4.
Neurons and Nervous system 5.
Sensory systems 1.

**12th week:**
**Lecture:**
Sensory systems 2.
Effectors: making Animals move 1.
Effectors: making Animals move 2.

**13th week:**
**Lecture:**
Effectors: making Animals move 3.
Animal reproduction and Animal Development 1.
Animal reproduction and Animal Development 2.

**14th week:**
**Lecture:**
Animal reproduction and Animal Development 3.
The human Reproduction System and Sexual Behavior.

Contact person: Dr. Norbert Szentandrássy, Department of Physiology
Recommended book: Sadava, Hills, Heller, Berenbaum: Life (10th edition)

Subject: **INTRODUCTION TO PHYSICS I.**

Year, Semester: Basic Medicine Course, 1st semester

Number of teaching hours:

Lecture:56

Seminar: 28

**1st week:**
**Lecture:**
Introduction, requirements. Standards of length, mass, time. Significant figures. Prefixes. Conversion of units. Coordinate systems, trigonometry.

Radians, vectors and scalars, geometry, equation solving, problem solving, graphing. Functions, calculator usage

**2nd week:**
**Lecture:**
Motion in one dimension, displacement, velocity, acceleration, motion diagrams.

Freely falling objects.

**3rd week:**
**Lecture:**
Vectors and their properties. Components of vectors. Displacement, velocity and acceleration in two dimensions.

Motion in two dimensions. Projectile motion.

**4th week:**
**Lecture:**
The laws of motion. Newton's First, Second and Third Law.

Applications of Newton's Laws. Forces of friction.

**5th week:**
**Lecture:**
Energy. Work. Kinetic energy and the work-energy theorem. Gravitational potential energy. Spring potential energy. System and energy conservation. Power. Work done by varying forces.

**6th week:**
**Lecture:**
Momentum and impulse. Conservation of momentum. Collisions. Elastic and inelastic collisions.
Angular speed and angular acceleration. Rotational motion under constant angular acceleration.

**7th week:**
**Lecture:**
Centripetal acceleration. Newtonian gravitation. Kepler's laws.
Torque and the two conditions for equilibrium. The center of gravity.

**8th week:**
**Lecture:**
Rotational kinetic energy. Angular momentum.
States of matter. Deformation of solids. The Youngs's, shear and bulk modulus. Density and pressure. Variation of pressure with depth. Pressure measurements.

**9th week:**
**Lecture:**
Buoyant forces and Archimedes's principle. Fluids in motion.
HP equation, Circulation, blood pressure measurement, transport phenomena, diffusion, osmosis, calculations with cont. eq + HP eq.

**10th week:**
**Lecture:**
Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids. Macroscopic description of an ideal gas. The kinetic theory of gases.
Energy in thermal processes. Heat and internal energy.

**11th week:**
**Lecture:**
Specific heat. Calorimetry. Latent heat and phase change.
The first law of thermodynamics. The second law of thermodynamics. Entropy. Refrigerators and heat pumps.

**12th week:**
**Lecture:**
Elastic potential energy. Hook's law. Simple harmonic motion. Motion of a pendulum.
Waves. Frequency, amplitude and wavelength. Interference of waves. Reflection of waves

**13th week:**
**Lecture:**
Sound. Energy and intensity of sound waves. Doppler effect
Ultrasound. Shock waves, standing waves. The ear and the principles of hearing.

**14th week:**
**Lecture:**
Interactive seminar and preparation for the ESE.

Contact person: Dr. Zoltán Varga, Associate Professor, Department of Biophysics
Recommended book: Serway-Vuille: College Physics, Brooks/Cole

Subject: **INTRODUCTION TO PHYSICS II.**
Year, Semester: Basic Medicine Course, 2nd semester
Number of teaching hours:
Lecture: **56**
Seminar: **28**

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

2nd **week:**
**Lecture:**
Electrical energy and capacitance. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

3rd **week:**
**Lecture:**
Electric current. Current and voltage measurements in circuits. Resistance and Ohm's law. Resistivity, temperature variation of resistance. Semiconductors and superconductors. Electrical activity of the heart. Defibrillators.

4th **week:**
**Lecture:**
Direct current circuits. Resistors in parallel and series. Kirchhoff's rules and complex DC

circuits. RC circuits. Conduction of electrical signals by neurons.

5th **week:**
**Lecture:**
Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Toque on current loop and electric motors. Magnetic field of a long straight wire and Ampere's law. Magnetic field

6th **week:**
**Lecture:**
Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law. Generators. Self-inductance RL circuits.

7th **week:**
**Lecture:**
Alternating current. Resistors, capacitors and inductors in AC circuits. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves.

8th **week:**
**Lecture:**
The nature of light. Reflection, refraction and dispersion. Prisms. The rainbow. Huygen's principle. Total internal reflection and its medical applications.

9th **week:**
**Lecture:**
Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. Thin lenses. Images formed by lenses. Lens aberrations.

10th **week:**
**Lecture:**
Wave optics. Conditions for interference, polarization of light. Diffraction. The camera, the simple magnifier, the compound microscope, the telescope and the eye.

11th **week:**
**Lecture:**
Quantum physics. Blackbody radiation. Photoelectric effect. Particle theory of light. The production and attenuation of X-ray. Characteristic X-ray.

12th **week:**
**Lecture:**
Atomic physics. Early model of the atom. Quantum mechanics and the hydrogen atom. The spin magnetic quantum numbers. Lasers and holography.

13th **week:**
**Lecture:**
Some properties of the nuclei. Binding energy. Radioactivity, the decay processes. Medical application of radioactivity. Nuclear reactions. Nuclear fission and fusion. Positron and other antiparticles.

14th **week:**
**Lecture:**
Preparation for the final exam.

Contact person: Dr. Zoltán Varga, Associate Professor, Department of Biophysics
Recommended book: Serway-Vuille: College Physics, Brooks/Cole

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

Year, Semester: Basic Medicine Course, 1st semester

Number of teaching hours:

Lecture: **56**

Seminar: **28**

**1st week:**
**Lecture:**
Introduction to Chemistry. Symbols of the elements. Physical and chemical properties
The SI system of measurement

**2nd week:**
**Lecture:**
The atomic theory. Structure of the atom, nuclear arithmetic
Mixtures and chemical compounds. Chemical formulas. Naming chemical compounds.

**3rd week:**
**Lecture:**
Atomic, molecular and molar mass relationships.
Percent composition and empirical/molecular formulas. Chemical equations, stoichiometry

**4th week:**
**Lecture:**
Summary of general chemistry 1
**Test #1**

**5th week:**
**Lecture:**
The electromagnetic spectrum. Atomic spectra. The Bohr model of hydrogen atom. The quantum mechanical model of the atom.
Electron configurations and the periodic table. Classification of the elements

**6th week:**
**Lecture:**
Periodic properties
Chemical bonds: metallic, ionic, and covalent bon. Electron-dot structures

**7th week:**
**Lecture:**
VSEPR and valence bond theory
Intermolecular forces

**8th week:**
**Lecture:**
Summary of general chemistry 2
**Test #2**

**9th week:**
**Lecture:**
The gaseous state
Liquid and solid state, phase changes. The chemistry of water

**10th week:**
**Lecture:**
Solutions. Electrolytes and nonelectrolytes
Chemical equilibrium

**11th week:**
**Lecture:**
Summary of general chemistry 3
**Test #3**

**12th week:**
**Lecture:**
Acids and bases 1
Acids and bases 2

**13th week:**
**Lecture:**
Thermochemistry: internal energy and state functions. Enthalpy. Hess's law
Redox reactions. Activity series of the elements.

Galvanic cells

**14th week:**

**Lecture:**
Summary of general chemistry 4
**Test #4**

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

Year, Semester: Basic Medicine Course, 2nd

Number of teaching hours:

Lecture: **56**

Seminar: **28**

**1st week:**
**Lecture:**
The main-group elements. s-, p-, d-block metals
Nonmetals: hydrogen, halogens and noble gases

**2nd week:**
**Lecture:**
Nonmetals: oxygen and sulfur
Nonmetals: nitrogen, phosphorus and carbon

**3rd week:**
**Lecture:**
**Test #5**
Covalent bonding in organic compounds.
Classification of organic compounds

**4th week:**
**Lecture:**
Alkanes. Nomenclature and isomerism of alkanes
Reactions of alkanes. Cycloalkanes

**5th week:**
**Lecture:**
Unsaturated hydrocarbons
Aromatic compound: structure and properties

**6th week:**
**Lecture:**
Heteroaromatic compounds. Reactions of benzene and its derivatives
Organic halogen compounds

**7th week:**
**Lecture:**
Summary of organic chemistry 1
**Test #6**

**8th week:**
**Lecture:**
Alcohols and phenols
Ethers, thioethers.

**9th week:**
**Lecture:**
Organic sulfur compounds
Aldehydes, ketones and quinones

**10th week:**
**Lecture:**
Nitrogen containing organic compounds: aliphatic amines
Nitrogen containing organic compounds: heterocyclic nitrogen compounds. Amines of biological importance

**11th week:**
**Lecture:**
Summary of organic chemistry 2
**Test #7**

**12th week:**
**Lecture:**
Carboxylic acids

Substituted carboxylic acids. Carboxylic acid derivatives: esters and amides

**13th week:**
**Lecture:**
Carboxylic acid derivatives: halides and anhydrides; salts and detergents
Stereochemistry

**14th week:**
**Lecture:**
Summary of organic chemistry 3
**Test #8**

Contact person: Dr. Endre Kókai, Department of Medical Chemistry
Recommended books: McMurry, Fay: Chemsitry (7th edition)
Erdődi, Csortos: Organic chemistry for premedical students (2010)

Subject: **HUNGARIAN LANGUAGE FOR BMC STUDENTS**
Year, Semester: Basic Medicine Course 2nd
Number of teaching hours:
Practical: **36**

**1st week:**
**Practical:** 1. lecke, 2. lecke I. rész

**2nd week:**
**Practical:** 2. lecke II. rész
**3rd week:**
**Practical:** 3. lecke

**4th week:**
**Practical:** 4. lecke, 5. lecke I. rész

**5th week:**
**Practical:** 5. lecke II. rész, 6. lecke I. rész

**6th week:**
**Practical:** 6. lecke II. rész, 7. lecke (Összefoglaló) + midterm test
**Self Control Test**

**7th week:**
**Practical:** 8. lecke

**8th week:**
**Practical:** 9. lecke

**9th week:**
**Practical:** 10. lecke

**10th week:**
**Practical:** 11. lecke, 12. lecke

**11th week:**
**Practical:** 13. lecke

**12th week:**
**Practical:** 14. lecke (Összefoglalás) + end term test
Oral exam

## Requirements

**Attendance**
Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, (no matter why) the final signature will be refused and the student must repeat the course.
Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the

coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Hungarian language course, students must sit for 2 written language tests and an oral exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their written test and have to take a vocabulary exam that includes all 100 words before the midterm and end term tests. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.

Based on the final score the grades are given as follows.

| 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 of the written tests is below 60, the student can take a written remedial exam once covering the whole semester’s material.

**Course book**: See the website of the Department of Foreign Languages: **ilekt.med.unideb.hu.**

Oral exam topics and vocabulary minimum lists are also available on the website.

Reading materials: Gerő Ildikó-Kovács Judit: Színesen magyarul. 2017

# CHAPTER 11
# ACADEMIC PROGRAM FOR THE SHORT BASIC MEDICINE COURSE

## ACADEMIC PROGRAM FOR THE INTENSIVE BASIC MEDICINE COURSE

**Intensive Basic Medicine Course (Intensive BMC, Premedical Studies)**
**Duration of studies:** 1 semester

The six-month intensive premedical Basic Medicine Course is recommended to those students who do not have thorough knowledge in Biology, Physics and Chemistry from high school. The requirements of these condensed premedical science subjects are very rigorous, thus preparation prior to the beginning the General Medicine, Dentistry or Pharmacy Program is recommended. Students successfully completing the course are directly admitted to their chosen program. The Intensive Basic Medicine Course starts in January.

### Class Behavior

Students should not use cell phones to talk or text during class. Cell phones must be switched off or kept in silence mode during class. In seminars, students will be expected to participate in seminar discussions. Students are encouraged to ask questions related to the topic of the lectures discussed, and participate in solving problems related to the topic of the seminar. Some professors will ask for students to volunteer information, but some professors call on students randomly. It is, thus, a good idea to come to class prepared so as not to be embarrassed in front of the class. Students should not disrupt the class by talking to each other. If one continues to disrupt the class, the student may be asked to leave. The usage of electronic devices, textbooks and any form of interaction between students during the tests is strictly forbidden. Electronic devices (cell phones, tablets, dictionaries, etc.), except for approved simple calculators, must not be within the reach (in pocket, in the desk, etc.) of students during tests. It is the students' responsibility to stow these items before the test begins without specific warning by the supervising teachers. Violation of these above mentioned regulations results in an immediate and unconditional dismissal from the program.

### Requirements

The course consists of lectures and seminars. Attending lectures is strongly recommended, attendance of seminars is compulsory and recorded. Everyone must attend the seminars with the group designated by the Registrar’s Office.

Absence can significantly affect your understanding and can have serious implications for progression in your studies. One might have a maximum of six seminar absences to have the opportunity to get exemption. Students missing 7-8 seminars cannot be exempted from the Final Examination (FE), regardless of their score reached on the Self Control Tests. Students omitting 9 or more seminars are dismissed from the course. Missed seminars cannot be made up unless one obtains prior permission to be absent.

The knowledge of the students will be tested 6 times during the entire course using a written test system by **Self Control Tests (SCT).** The course ends with a **Final Exam (FE)** from the whole material of the course and a minimum of four FE dates will be set during the summer examination period. Unsuccessful students may repeat the FE twice (B and C chances, and the latter ends up with an oral examination part). Exam exemption and bonus point policy are used to improve the students’ performance on SCTs. Exact details of these policies will be described below.

Exemption from FE is offered for students who achieve excellent academic performance during their studies under the following circumstances:

- the average score of the five best SCTs (out of 6) is at least 75%, AND
- passed all the SCTs with at least 40%, AND
- (s)he has a maximum of 6 seminar absences for a given subject.

Bonus points will be added to the FE score of eligible students and calculated as follows:

| The average of the best 6 SCTs | Bonus points (%) |
|---|---|
| 51.00-54.99 | 1 |
| 55.00-59.99 | 2 |
| 60.00-64.99 | 3 |
| 65.00-69.99 | 4 |
| 70.00-74.99 | 5 |

Students who could not meet the above described conditions for exemption must sit for the FE from the whole material of the course.
The participation shall be preceded by ID confirmation (i.e. student's card, passport or driving license) before all forms of tests. Self Control Tests, End of Semester Exams, and Final Exams will be assessed as follows.

| **Percentage (%)** | **Mark** |
|---|---|
| 0 – 59.99: | fail (1) |
| 60.00 – 74.99: | pass (2) |
| 75.00 – 79.99: | satisfactory (3) |
| 80.00 – 89.99: | good (4) |
| 90.00 – 100: | excellent (5) |

Absence for any reason counts as 0%.

Course coordinator: Dr. Beáta Lontay, Department of Medical Chemistry

Subject: **INTRODUCTION TO BIOLOGY**
Year, Semester: Intensive Basic Medicine Course
Number of teaching hours:
Lecture: **92**
Seminar: **92**

**1st week:**
**Lecture:** Small molecules and the chemistry of life 1.
Small molecules and the chemistry of life 2.
Proteins, carbohydrates and lipids 1.
Proteins, carbohydrates and lipids 2.

**2nd week:**
**Lecture:** Proteins, carbohydrates and lipids 3.
Nucleic acids and the origin of life.
Cells: the working units of life 1.
Cells: the working units of life 2.

**3rd week:**
**Lecture:** Cells: the working units of life 3.
Cells: the working units of life 4.
Bacterial cell structure
Cell membranes 1.

**4th week:**
**Lecture:** Cell membranes 2.
Cell membranes 3.
Energy, enzymes and metabolism 1.

Energy, enzymes and metabolism 2.

**5th week:**
**Lecture:** Pathways that harvest chemical energy 1.
Pathways that harvest chemical energy 2.
Pathways that harvest chemical energy 3.
The cell cycle and cell division 1.

**6th week:**
**Lecture:** The cell cycle and cell division 2.
The cell cycle and cell division 3.
The cell cycle and cell division 4.
Inheritance, genes and chromosomes 1.

**7th week:**
**Lecture:** Inheritance, genes and chromosomes 2.
Inheritance, genes and chromosomes 3.
Inheritance, genes and chromosomes 4.
Inheritance, genes and chromosomes 5.

**8th week:**
**Lecture:** DNA and its role in heredity 1.
DNA and its role in heredity 2.
DNA and its role in heredity 3.
DNA and its role in heredity 4.

**9th week:**
**Lecture:** From DNA to protein: gene expression 1.
From DNA to protein: gene expression 2.
From DNA to protein: gene expression 3.
From DNA to protein: gene expression 4.

**10th week:**
**Lecture:** Gene mutation and molecular medicine 1.
Gene mutation and molecular medicine 2.
Gene mutation and molecular medicine 3.
Gene mutation and molecular medicine 4.

**11th week:**
**Lecture:** Regulation of gene expression 1.
Regulation of gene expression 2.
Regulation of gene expression 3.
Regulation of gene expression 4.

**12th week:**
**Lecture:** The cellular signaling and communication 1.
The cellular signaling and communication 2.
The mechanism of evolution 1.
The mechanism of evolution 2.

**13th week:**
**Lecture:** Tissues, organs and organ systems 1-4.

**14th week:**
**Lecture:** Physiology, Homeostasis and Temperature Regulation
Blood, a fluid tissue 1-2. Circulatory systems.

**15th week:**
**Lecture:** The human circulatory system 1-3.
Immunology: gene expression and natural defenses 1.

**16th week:**
**Lecture:** Self control test.
Immunology: gene expression and natural defenses 2.
Nutrition, Digestion and Absorption 1-2.

**17th week:**
**Lecture:** Energy balance, vitamins and minerals.
Gas exchange in Animals.
Human Respiration.
Salt and Water Balance Nitrogen Excretion 1.

**18th week:**
**Lecture:** Salt and Water Balance Nitrogen Excretion 2.
Hormones 1-3.

**19th week:**
**Lecture:** Hormones 4.
Neurons and Nervous system 1.
Self Control Test
Neurons and Nervous system 2.

**20th week:**
**Lecture:** Neurons and Nervous system 3-5.
Sensory systems 1.

**21st week:**
**Lecture:** Sensory systems 2.
Effectors: How animals get things done 1-3.

**22nd week:**
**Lecture:** Animal reproduction and Animal Development 1-2.
The human reproduction system1-2.

**23rd week:**
**Lecture:** Self Control Test

Academic advisors: Dr. András Penyige, Department of Human Genetics
Dr. Norbert Szentandrássy, Department of Physiology
Recommended book: Sadava, Hills, Heller, Berenbaum: Life (10th edition)

Subject: **INTRODUCTION TO BIOPHYSICS**
Year, Semester: Intensive Basic Medicine Course
Number of teaching hours:
Lecture: 92
Seminar: 138

**1st week:**
**Lecture 1-2:** Introduction to modern physics. Standard of lengths, mass, time. Conversion of units. Useful mathematics. Trigonometry. Motion in one dimension, displacement, velocity, acceleration, motion diagrams.

**2nd week:**
**Lecture 3-4:** Freely falling objects. Vectors and their properties. Components of vectors. Displacement, velocity and acceleration in two dimensions. Motion in two dimensions. Relative velocity.

**3rd week:**
**Lecture 5-6:** The laws of motion. Newton's First, Second and Third Law. Application of Newton's Laws. Forces of friction.

**4th week:**
**Lecture 7-8:** Kinetic energy and the work-energy theorem. Gravitational potential energy. Spring potential energy. System and energy conservation. Power. Work done by varying forces.

**5th week:**
**Lecture 9-10:** Momentum and impulse. Conservation of momentum. Collisions. Elastic and inelastic collisions.

**6th week:**
**Lecture 11-12:** Angular speed and angular acceleration. Rotational motion under constant angular acceleration. Centripetal acceleration. Newtonian gravitation. Kepler's laws.

**7th week:**
**Lecture 13-14:** Torque and the two conditions for equilibrium. The center of gravity. Rotational kinetic energy. Angular momentum.

**8th week:**
**Lecture 15-16:** States of matter. Deformation of solids. The Youngs’s, shear and bulk modulus. Density and pressure. Variation of pressure with depth. Pressure measurements. Buoyant forces and Archimedes’s principle.

**9th week:**
**Lecture 17-18:** Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids. Macroscopic description of an ideal gas. The kinetic theory of gases.

**10th week:**
**Lecture 19-20:** Energy in thermal processes. Heat and internal energy. Specific heat. Calorimetry. Latent heat and phase change. The first law of thermodynamics.

**11$^{th}$ week:**
**Lecture 21-22:** The second law of thermodynamics. Entropy. Refrigerators and heat pumps. Elastic potential energy. Hook's law. Simple harmonic motion. Motion of a pendulum.

**12$^{th}$ week:**
**Lecture 23-24**: Waves. Frequency, amplitude and wavelength. Interference of waves. Reflection of waves. Sound. Energy and intensity of sound waves. Shock waves, standing waves, standing waves. Doppler effect. The ear and the principles of hearing.

**13$^{th}$ week:**
**Lecture 26-27:** Properties of electric charges. Insulators and conductors. Coulomb's law. Electric field. Electric field lines. Electric flux and Gauss's law.

**14$^{th}$ week:**
**Lecture 28-29:** Electrical energy and capacitance. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

**15$^{th}$ week:**
**Lecture 30-31:** Electric current. Current and voltage measurements in circuits. Resistance and Ohm's law. Resistivity, temperature variation of resistance. Semiconductors and superconductors. Electrical activity of the heart. Defibrillators.

**16$^{th}$ week:**
**Lecture 32-33:** Direct current circuits. Resistors in parallel and series. Kirchhoff's rules and complex DC circuits. RC circuits. Conduction of electrical signals by neurons.

**17$^{th}$ week:**
**Lecture 34-35:** Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on a current loop and electric motors. Magnetic field of a long straight wire and Ampere's law. Magnetic field between two parallel conductors. Magnetic field of loops and solenoids.

**18$^{th}$ week:**
**Lecture 36-37:** Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law. Generators. Self-inductance RL circuits.

**19$^{th}$ week:**
**Lecture 38-39:** Alternating current. Resistors, capacitors and inductors in AC circuits. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves.

**20$^{th}$ week:**
**Lecture 40-41:** The nature of light. Reflection, refraction and dispersion. Prisms. The rainbow. Huygen's principle. Total internal reflection and its medical applications.

**21$^{st}$ week:**
**Lecture 42-43:** Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. Thin lenses. Images formed by lenses. Lens aberrations. Wave optics. Conditions for interference, polarization of light. Diffraction. The camera, the simple magnifier, the compound microscope, the telescope and the eye.

**23$^{rd}$ week 44-45:** Quantum physics. Blackbody radiation, photoelectric effect, generation of X-ray.
Some properties of the nuclei. Binding energy. Radioactivity, the decay processes. Medical application of radioactivity.

Academic advisor: Dr. Attila Jenei, Department of Biophysics and Cell Biology
Recommended book: Serway, Vuille: College Physics (11th edition)

Subject: **INTRODUCTION TO MEDICAL CHEMISTRY I-II.**
Year, Semester: Intensive Basic Medicine Course
Number of teaching hours:

Lecture: **56**
Seminar: **28**

**1st week:**
**Lecture:**
Introduction to Chemistry. Symbols of the elements. Physical and chemical properties
The SI system of measurement

**2nd week:**
**Lecture:**
The atomic theory. Structure of the atom, nuclear arithmetic
Mixtures and chemical compounds. Chemical formulas. Naming chemical compounds

**3rd week:**
**Lecture:**
Atomic, molecular and molar mass relationships
Percent composition and empirical/molecular formulas. Chemical equations, stoichiometry

**4th week:**
**Lecture:**
Summary of general chemistry 1
**Test #1**

**5th week:**
**Lecture:**
The electromagnetic spectrum. Atomic spectra. The Bohr model of hydrogen atom. The quantum mechanical model of the atom.
Electron configurations and the periodic table. Classification of the elements

**6th week:**
**Lecture:**
Periodic properties
Chemical bonds: metallic, ionic, and covalent bond. Electron-dot structures

**7th week:**
**Lecture:**
VSEPR and valence bond theory
Intermolecular forces

**8th week:**
**Lecture:**
The gaseous state
Liquid and solid state, phase changes. The chemistry of water

**9th week:**
**Lecture:**
Solutions. Electrolytes and nonelectrolytes
Summary of general chemistry 2
**Test #2**

**10th week:**
**Lecture:**
Chemical equilibrium
Acids and bases 1

**11th week:**
**Lecture:**
Acids and bases 2
Thermochemistry: internal energy and state functions. Enthalpy. Hess's law

**12th week:**
**Lecture:**
Redox reactions. Activity series of the elements.
Galvanic cells
Summary of general chemistry 3
**Test #3**

**13th week:**
**Lecture:**
The main-group elements. s-, p-, d-block metals
Nonmetals: hydrogen, halogens and noble gases

**14th week:**
**Lecture:**
Nonmetals: oxygen and sulfur
Nonmetals: nitrogen, phosphorus and carbon

**15th week:**
**Lecture:**
Covalent bonding in organic compounds.
Classification of organic compounds.
Alkanes. Nomenclature and isomerism of alkanes
Reactions of alkanes. Cycloalkanes

**16th week:**
**Lecture:**
Unsaturated hydrocarbons
Summary of organic chemistry 1
**Test #4**

**17th week:**
**Lecture:**
Aromatic compounds: structure and properties
Heteroaromatic compounds. Reactions of benzene and its derivatives

**18th week:**
**Lecture:**
Organic halogen compounds
Alcohols and phenols

**19th week:**
**Lecture:**
Ethers, thioethers. Organic sulfur compounds
Aldehydes, ketones and quinones

**20th week:**
**Lecture:**
Summary of organic chemistry 2
**Test #5**
Nitrogen containing organic compounds 1: aliphatic amines

**21st week:**
**Lecture:**
Nitrogen containing organic compounds 2: heterocyclic nitrogen compounds. Amines of biological importance
Carboxylic acids

**22nd week:**
**Lecture:**
Substituted carboxylic acids. Carboxylic acid derivatives 1: esters and amides
Carboxylic acid derivatives 2: halides and anhydrides; salts and detergents

**23rd week:**
**Lecture:**
Stereochemistry
Summary of organic chemistry 3
**Test #6**

Contact person: Dr. Krisztina Tar, Department of Medical Chemistry
Recommended books: McMurry, Fay: Chemistry (7th edition)
Erdődi, Csortos: Organic chemistry for premedical students (2010)

# CHAPTER 12
# ACADEMIC PROGRAM FOR CREDIT SYSTEM

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. The total of 360 credits should be accumulated by completing the compulsory (293 credits), required elective (37 credits), freely chosen (18 credits) and Hungarian language courses (12 credits).

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: 92-124, preclinical module: 44-64, and clinical module:136-188 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 16 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.

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.

16. 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.

**The model curriculum on the following pages applies to those students who started their studies on General Medicine Program in the academic year 2018/19.**

**For the previous years' curricula please visit the university's website: www.edu.unideb.hu**

## Compulsory courses for the 1. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Basics of Behavioural Sciences | AOPSZ02T1 | 20 | | | ESE | 2 | None |
| 1 | Biophysics Lecture | AOBIF05T1 | 28 | 28 | | ESE* | 4 | None |
| 1 | Biophysics Practical | AOBIF06T1 | | | 22 | AW5 | 2 | None |
| 1 | Biostatistics | AOBST02T1 | | 28 | | ESE | 2 | None |
| 1 | Communication Skills | AOKOM42T1 | | | 20 | AW5 | 1 | None |
| 1 | First aid and reanimation | AOELS03T1 | 6 | | 20 | AW5 | 2 | None |
| 1 | Hungarian Crash Course | AOG261008 | | | 36 | AW5 | 0 | None |
| 1 | Hungarian Language I/1. | AOHUN01T1 | | | 24 | AW5 | 2 | Hungarian Crash Course |
| 1 | Medical Chemistry Lecture | AOKEM05T1 | 45 | 56 | | ESE* | 8 | None |
| 1 | Medical Chemistry Practical | AOKEM06T1 | | | 42 | AW5 | 3 | None |

## Compulsory courses for the 1. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Anatomy, Histology and Embryology I. Lecture | AOANA07T2 | 28 | 28 | | ESE | 5 | None |
| 2 | Anatomy, Histology and Embryology I. Practical | AOANA08T2 | | | 56 | AW5 | 3 | None |
| 2 | Cell Biology Lecture | AOSEJ05T2 | 28 | 28 | | ESE* | 4 | None |
| 2 | Cell Biology Practical | AOSEJ06T2 | | | 20 | AW5 | 2 | None |
| 2 | First aid and reanimation | AOELS03T1 | 6 | | 20 | AW5 | 2 | None |
| 2 | Hungarian Language I/2. | AOHUN02T2 | | | 28 | AW5 | 2 | Hungarian language I/1. |
| 2 | Medical Genetics Lecture | AOGEN05T2 | 30 | | | ESE* | 2 | None |
| 2 | Medical Genetics Practical | AOGEN06T2 | | | 26 | AW5 | 2 | None |
| 2 | Molecular Biology Lecture | AOMBI05T2 | 42 | 14 | | ESE | 4 | None |
| 2 | Molecular Biology Practical | AOMBI06T2 | | | 15 | AW5 | 1 | None |

## Compulsory courses for the 2. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Anatomy, Histology and Embryology II. Lecture | AOANA11T3 | 56 | 48 | | FE | 7 | Cell biology Lecture, Anatomy, Histology and Embryology I. Lecture |
| 1 | Anatomy, Histology and Embryology II. Practical | AOANA12T3 | | | 84 | AW5 | 4 | Cell biology Lecture, Anatomy, Histology and Embryology I. Lecture |
| 1 | Biochemistry I. Lecture | AOBIK09T3 | 42 | 14 | | ESE | 5 | Medical Chemistry Lecture, Molecular Biology Lecture |
| 1 | Biochemistry I. Practical | AOBIK10T3 | | | 30 | AW5 | 2 | Medical Chemistry Lecture, Molecular Biology Lecture |
| 1 | Hungarian Language II/1. | AOHUN03T3 | | | 28 | AW5 | 2 | Hungarian language I/2. |
| 1 | Medical Physiology I. Lecture | AOELE09T3 | 56 | 28 | | ESE | 5 | Anatomy, Histology and Embryology I. Lecture, Biophysics Lecture |
| 1 | Medical Physiology I. Practical | AOELE10T3 | | | 42 | AW5 | 2 | Anatomy, Histology and Embryology I. Lecture, Biophysics Lecture |

## Compulsory courses for the 2. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Biochemistry II. Lecture | AOBIK13T4 | 48 | 24 | | FE | 5 | Biochemistry I. Lecture |
| 2 | Biochemistry II. Practical | AOBIK14T4 | | | 25 | AW5 | 2 | Biochemistry I. Lecture |
| 2 | Hungarian Language II/2. | AOHUN04T4 | | | 28 | AW5 | 2 | Hungarian language II/1. |
| 2 | Medical Physiology II. Lecture | AOELE11T4 | 37 | 20 | | FE | 7 | Anatomy, Histology and Embryology II. Lecture, Medical Physiology I. Lecture, Biostatistics |
| 2 | Medical Physiology II. Practical | AOELE12T4 | | | 24 | AW5 | 2 | Anatomy, Histology and Embryology II. Lecture, Medical Physiology I. Lecture, Biostatistics |
| 2 | Neurobiology Lecture (Neuroanatomy, Neurobiochemistry, Neurophysiology) | AONEB05T4 | 52 | 10 | | ESE* | 4 | Medical Physiology I. Lecture |
| 2 | Neurobiology Practical (Neuroanatomy, Neurobiochemistry, Neurophysiology) | AONEB06T4 | | | 56 | AW5 | 4 | Medical Physiology I. Lecture |
| 2 | Nursing practice | AO_NYGY_NURSING | | | 120 | SIGN | 0 | has to be completed before the 3rd year |

## Compulsory courses for the 3. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Basic Oncology | AOONK02T5 | 13 | | | AW5 | 1 | Medical Genetics Lecture, Biochemistry II. Lecture |
| 1 | Basic Surgical Techniques | AOMUT02T5 | 14 | 17 | 11 | ESE | 3 | Anatomy, Histology and Embryology II. Lecture, Medical Physiology I. Lecture |
| 1 | Clinical Biochemistry I. | AOKBK03T5 | 28 | | 16 | AW5 | 3 | Biochemistry II. Lecture, Medical Physiology II. Lecture |
| 1 | Hungarian Language III/1. | AOHUN05T5 | | | 28 | AW5 | 2 | Hungarian language II/2. |
| 1 | Immunology | AOIMM02T5 | 45 | 22 | 6 | ESE | 5 | Biochemistry II. Lecture, Cell Biology Lecture |
| 1 | Medical Anthropology | AOANT02T5 | | 15 | | ESE | 1 | Basics of Behavioural Siences |
| 1 | Medical Microbiology I. | AOMIK03T5 | 28 | | 28 | ESE | 5 | Cell Biology Lecture, Anatomy, Histology and Embryology II. Lecture |
| 1 | Pathology I. | AOPAT03T5 | 28 | | 45 | ESE | 5 | Anatomy, Histology and Embryology II. Lecture, Neurobiology Lecture |
| 1 | Propedeutics of Internal Medicine (Internal Medicine I.) | AOBEL22T5 | 28 | | 28 | ESE | 4 | Medical Physiology II. Lecture, Anatomy, Histology, Embryology II. Lecture |

## Compulsory courses for the 3. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Basic Surgical Techniques | AOMUT02T5 | 14 | 17 | 11 | ESE | 3 | Anatomy, Histology and Embryology II. Lecture, Medical Physiology I. Lecture |
| 2 | Clinical Biochemistry II. | AOKBK04T6 | 42 | | 28 | FE | 7 | Clinical biochemistry I. |
| 2 | Clinical Physiology | AOKFI04T6 | 14 | 28 | | ESE | 3 | Pathology I., Medical Physiology II. Lecture |
| 2 | Hungarian Language III/2. | AOHUN06T6 | | | 28 | FE | 2 | Hungarian Language III/1. |
| 2 | Internal Medicine II. (Immunology and Rheumatology) | AOBEL04T6 | 27 | | 18 | ESE | 3 | Immunology, Prop. of Internal Medicine (Internal Medicine I.) |
| 2 | Internal Medicine summer practice | AO_NYGY_INTMED | | | 90 | SIGN | 0 | has to be completed before the 4th year |
| 2 | Medical Microbiology II. | AOMIK04T6 | 19 | | 28 | FE | 5 | Medical Microbiology I. |
| 2 | Medical Psychology | AOPSZ08T6 | 20 | | 10 | ESE | 2 | Basics of Behavioural Sciences |
| 2 | Medical Sociology | AOSZO02T6 | 8 | 7 | | AW5 | 1 | Basics of Behavioural Siences |
| 2 | Pathology II. | AOPAT04T6 | 42 | | 45 | FE | 6 | Pathology I., Immunology |

## Compulsory courses for the 4. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Internal Medicine Block Practice I. - 4th year | AOBLOCKINTMED_1_IV | | | 60 | SIGN | 0 | Propedeutics of Internal Medicine (Int. Med. I.), Clinical Physiology, Pathology II. |
| 1 | Internal Medicine III. (Cardiology, Angiology) | AOBEL06T7 | 20 | | 10 | ESE | 3 | Propedeutics of Internal Medicine (Internal Medicine I.), Clinical Physiology, Pathology II. |
| 1 | Obstetrics and Gynecology Block Practice - 4th year | AOBLOCKOBGYN_IV | | | 30 | SIGN | 0 | Pathology II., Clinical Biochemistry II. |
| 1 | Obstetrics and Gynecology I. | AOSZU03T7 | 10 | | 20 | ESE | 2 | Pathology II., Clinical Biochemistry II. |
| 1 | Orthopaedic Surgery | AOORT03T7 | 10 | | 16 | ESE* | 3 | Pathology II. |
| 1 | Pharmacology I. | AOGYO03T7 | 30 | 20 | | ESE | 4 | Pathology I., Medical Physiology II. Lecture, Clinical Physiology |
| 1 | Preventive Medicine and Public Health I. | AOMEG03T7 | 30 | 40 | | AW5 | 5 | Medical Microbiology II., Clinical Biochemistry II. |
| 1 | Pulmonology | AOPUL03T7 | 15 | | 10 | ESE* | 3 | Clinical Physiology, Prop. of Internal medicine (Internal Medicine I.) |
| 1 | Radiology and Nuclear Medicine I. | AORAD03T7 | 20 | | 30 | ESE | 3 | Pathology II. |
| 1 | Stomatology | AOFOG03T7 | 10 | | 16 | ESE* | 2 | Pathology II. |
| 1 | Surgery/Small Surgery Block Practice - 4th year | AOBLOCKSURG_SMALLSURG_IV11-12 | | | 60 | SIGN | 0 | Pathology II., Basic Surgical Techniques |
| 1 | Surgery I. | AOSEB05T7 | 12 | | 10 | AW5 | 2 | Pathology II., Basic Surgical Techniques |
| 1 | Traumatology I. | AOTRA01A7 | 15 | | 10 | ESE* | 2 | Pathology II. |
| 1 | Urology | AOURO04T8 | 10 | | 16 | ESE* | 3 | Pathology II. |

## Compulsory courses for the 4. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | 4th year summer practice | AO_NYGY_4TH YEAR | | | 90 | SIGN | 0 | has to be completed before the 5th year |
| 2 | Behavioural Medicine | AOMAGO02T8 | | | 20 | AW5 | 1 | Basics of Behavioural Sciences |
| 2 | Bioethics | AOETI02T99 | 10 | 10 | | ESE | 2 | Medical Psychology |
| 2 | Clinical Genetics | AOKGE02T8 | 20 | | | ESE | 2 | Medical Genetics Lecture, Pathology II. |
| 2 | Internal Medicine Block Practice II. - 4th year | AOBLOCKINTMED_2_IV | | | 60 | SIGN | 0 | Propedeutics of Internal Medicine (Int. Med. I.), Clinical Biochemistry II., Pathology II. |
| 2 | Internal Medicine IV. (Endocrinology, Nephrology) | AOBEL08T8-K3 | 20 | | 10 | ESE | 3 | Prop. of Internal Medicine (Internal Medicine I.), Pathology II., Clinical Biochemistry II. |
| 2 | Obstetrics and Gynecology Block Practice - 4th year | AOBLOCKOBGYN_IV | | | 30 | SIGN | 0 | Pathology II., Clinical Biochemistry II. |
| 2 | Obstetrics and Gynecology II. | AOSZU04T8 | 5 | | 20 | ESE | 3 | Obstetrics and Gynecology I. |
| 2 | Orthopaedic Surgery | AOORT03T7 | 10 | | 16 | ESE* | 3 | Pathology II. |
| 2 | Pharmacology II. | AOGYO04T8 | 50 | 20 | | FE | 6 | Pharmacology I. |
| 2 | Preventive Medicine and Public Health II. | AOMEG04T8 | 30 | 20 | 15 | FE | 5 | Preventive Medicine and Public Health I. |
| 2 | Pulmonology | AOPUL03T7 | 15 | | 10 | ESE* | 3 | Clinical Physiology, Prop. of Internal medicine (Internal Medicine I.) |
| 2 | Radiology and Nuclear Medicine II. | AORAD04T8 | 10 | | 10 | ESE* | 1 | Radiology and Nuclear Medicine I. |
| 2 | Surgery/Small Surgery Block Practice - 4th year | AOBLOCKSURG_SMALLSURG_IV11-12 | | | 60 | SIGN | 0 | Pathology II, Basic Surgical Techniques |
| 2 | Stomatology | AOFOG03T7 | 10 | | 16 | ESE* | 2 | Pathology II. |
| 2 | Surgery II. | AOSEB06T8 | 10 | | | ESE | 3 | Surgery I. |
| 2 | Urology | AOURO04T8 | 10 | | 16 | ESE* | 3 | Pathology II. |

## Compulsory courses for the 5. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Behavioural Sciences Final Exam | AOMAG02T8 | | | | FE | 0 | Medical Anthropology, Behavioural Medicine, Bioethics |
| 1 | Dermatology | AOBOR03T9-KI | 15 | 10 | 20 | ESE* | 4 | Pathology II., Pharmacology II. |
| 1 | Emergency Medicine | AOOXY03T9 | 20 | | 20 | ESE | 3 | Pathology II., First Aid and Reanimation, Pharmacology II. |
| 1 | Family Medicine | AOCSA02T9 | | 10 | | AW5 | 1 | Pharmacology II., Prop. of Internal Medicine (Internal Medicine I.) |
| 1 | Forensic Medicine I. | AOIGA03T9 | 10 | | 10 | AW5 | 2 | Pathology II., Bioethics |
| 1 | Infectology | AOFER02T10 | 15 | | 20 | ESE | 2 | Pathology II., Medical Microbiology II., Pharmacology II. |
| 1 | Internal Medicine Block Practice I. - 5th year | AOBLOCKINTMED_1_V | | | 60 | SIGN | 0 | Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II. |
| 1 | Internal Medicine V. (Gastroenterology) | AOBEL13T9 | 20 | | 10 | ESE | 4 | Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II. |
| 1 | Neurology Block Practice - 5th year | AOBLOCKNEURO_V | | | 30 | SIGN | 0 | Internal Medicine III. (Cardiology, Angiology), Neurobiology Lecture |
| 1 | Neurology I. | AONEU03T9 | 15 | | 10 | AW5 | 4 | Internal Medicine III. (Cardiology, Angiology), Neurobiology Lecture |
| 1 | Ophthalmology | AOSZE04T10 | 10 | | 20 | ESE* | 3 | Pathology II., First Aid and Reanimation |
| 1 | Otolaryngology | AOFUL04T10 | 10 | | 20 | ESE* | 3 | Pathology II., Clinical Biochemistry II. |
| 1 | Pediatrics Block Practice - 5th year | AOBLOCKPEDIAT_V | | | 60 | SIGN | 0 | Pathology II., Pharmacology II. |
| 1 | Pediatrics I. | AOGYE03T9 | 20 | | 10 | AW5 | 4 | Pathology II., Pharmacology II. |
| 1 | Psychiatry I. | AOELM03T9 | 20 | | 20 | AW5 | 4 | Medical Psychology, Neurobiology Lecture |

## Compulsory courses for the 5. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Anesthesiology and Intensive care | AOINT02T10 | 10 | | 20 | ESE | 2 | Pharmacology II. |
| 2 | Clinical Oncology | AOKON02T10 | 20 | 7 | | ESE | 2 | Basic Oncology, Radiology and Nuclear Medicine II. |
| 2 | Dermatology | AOBOR03T9-KI | 15 | 10 | 20 | ESE* | 4 | Pathology II., Pharmacology II. |
| 2 | Emergency Medicine | AOOXY03T9 | 20 | | 20 | ESE | 3 | Pathology II., First Aid and Reanimation, Pharmacology II. |
| 2 | Forensic Medicine II. | AOIGA04T10 | 10 | | 10 | ESE* | 2 | Forensic Medicine I. |
| 2 | Internal Medicine Block Practice II. - 5th year | AOBLOCKINTMED_2_V | | | 60 | SIGN | 0 | Internal Medicine III. (Cardiology, Angiology), Clinical Biochemistry II. |
| 2 | Internal Medicine VI. (Haematology, Haemostaseology) | AOBEL16T10 | 15 | | 10 | ESE | 3 | Clinical Biochemistry II., Internal Medicine III. (Cardiology, Angiology) |
| 2 | Neurology Block Practice - 5th year | AOBLOCKNEURO_V | | | 30 | SIGN | 0 | Internal Medicine III. (Cardiology, Angiology), Neurobiology Lecture |
| 2 | Neurology II. | AONEU04T10 | 10 | | 10 | ESE | 2 | Neurology I. |
| 2 | Ophthalmology | AOSZE04T10 | 10 | | 20 | ESE* | 3 | Pathology II., First Aid and Reanimation |
| 2 | Otolaryngology | AOFUL04T10 | 10 | | 20 | ESE* | 3 | Pathology II., Clinical Biochemistry II. |
| 2 | Pediatrics Block Practice - 5th year | AOBLOCKPEDIAT_V | | | 60 | SIGN | 0 | Pathology II., Pharmacology II. |
| 2 | Pediatrics II. | AOGYE04T10 | 15 | | 10 | ESE | 3 | Pediatrics I. |
| 2 | Psychiatry II. | AOELM04T10 | 10 | | 20 | ESE | 2 | Psychiatry I. |

## Compulsory courses for the 6. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Internal Medicine VII. | AOBEL26T11 | | | 300 | FE | 10 | Successful completion of all compulsory subjects (I-V.) |
| 1 | Neurology III. | AONEU08T11 | | | 120 | FE | 4 | Successful completion of all compulsory subjects (I-V.) |
| 1 | Obstetrics and Gynecology III. | AOSZU08T11 | | | 150 | FE | 5 | Successful completion of all compulsory subjects (I-V.) |
| 1 | Pediatrics III. | AOGYE08T11 | | | 210 | FE | 7 | Successful completion of all compulsory subjects (I-V.) |
| 1 | Psychiatry III. | AOELM06T11 | | | 120 | FE | 4 | Successful completion of all compulsory subjects (I-V.) |
| 1 | Surgery III. | AOSEB09T11-K1 | | | 150 | FE | 5 | Successful completion of all compulsory subjects (I-V.) |

## Required elective courses for the 1. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Computer Science | AOINF43T1 | | | 28 | AW5 | 3 | None |
| 1 | Latin Language | AOLAT42T1 | | | 30 | AW5 | 2 | None |
| 1 | Library System | AOKON43T1 | | | 10 | AW5 | 1 | None |
| 2 | Computer Science | AOINF43T1 | | | 28 | AW5 | 3 | None |
| 2 | Medical Genomics | AOGEN43T2 | 16 | | 4 | AW5 | 2 | None |
| 2 | Understanding medical problems through experiments | AOOBP43T2 | | | 30 | AW5 | 3 | Medical Chemistry Lecture |

## Required elective courses for the 2. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Advanced students' scientific activity | AOTDK06 | | | | AW5 | 2 | Introduction to students' scientific activities |
| 2 | Modern biophysical methods in biology and medicine | AOMOD42T4 | 24 | | | AW5 | 2 | Biophysics Lecture, Cell Biology Lecture |
| 2 | Modern Techniques Allowing the Investigation of Physiological Phenomena | AOKOR42T4 | 24 | | | AW5 | 2 | Medical Physiology I. Lecture |
| 2 | Problem Based Learning in Physiology | AOPEL42T4 | | | 28 | AW5 | 3 | Medical Physiology I. Lecture |
| 2 | Selected Topics in Cell Biology | AOG157403-K1 | 24 | | | AW5 | 2 | Cell Biology Lecture |
| 2 | Students' scientific activity for beginners | AOTDK04 | | | | AW5 | 1 | none |
| 2 | The Regulatory Role of the Cell Membrane in Physiological and Pathological Conditions | AOSEM42T4 | 20 | | | AW5 | 2 | Medical Physiology I. Lecture |

## Required elective courses for the 3. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Dealing with irradiation induced side effects | AOG528305 | 5 | | 10 | AW5 | 1 | Propedeutics of Internal Medicine (Internal Medicine I.); Medical Physiology II. Lecture |
| 1 | Molecular Mechanism of Diseases Concerning Great Populations | AOG167605 | 25 | | | AW5 | 2 | Biochemistry II. Lecture |
| 1 | Molecular Oncology and Cancer Prevention | AOMOO41T5 | 13 | 2 | | AW5 | 1 | Biochemistry II. Lecture |
| 1 | Refraction, refractive errors, corrections, refractive surgery | AOREF42T9 | 5 | | | AW5 | 1 | Anatomy, Histology and Embryology II. Lecture, Medical Physiology II. Lecture |
| 1 | Social acceptance of people with disabilities | AOFOGY42T5 | 20 | | 2 | AW5 | 2 | None |

## Required elective courses for the 3. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Clinical Gerontology | AOKLG42T6 | 30 | | | AW5 | 3 | Immunology, Medical Physiology II. Lecture |
| 2 | Dealing with irradiation induced side effects | AOG528305 | 5 | | 10 | AW5 | 1 | Propedeutics of Internal Medicine (Internal Medicine I.); Medical Physiology II. Lecture |
| 2 | Fundamental Clinical Neuroscience | AOG458606 | 10 | 10 | 10 | AW5 | 2 | Pathology I. |
| 2 | Medical Imaging | AOOKE42T6 | 16 | | | AW5 | 1 | Pathology I. |
| 2 | PBL in haemostasis | AOPBL42T6 | | 20 | | AW5 | 2 | Clinical Biochemistry I. |
| 2 | Surgical operative techniques | AOG517407 | 4 | | 8 | AW5 | 1 | Basic Surgical Techniques |

## Required elective courses for the 4. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Antimicrobial chemotherapy | AOAKE42T7 | 20 | 10 | | AW5 | 2 | Medical Microbiology II. |
| 1 | Basic microsurgical training. Introduction to microsurgery | AOG517507 | 2 | | 10 | AW5 | 1 | Basic Surgical Techniques, Surgical Operative Techniques |
| 1 | Basic Principles and Introduction to Chest Radiology | AOG487707 | | 18 | | AW5 | 1 | Pathology II. |
| 1 | Clinical biochemistry and laboratory evaluation of thrombophilia | AOTHR42T7 | 12 | | | AW5 | 1 | Clinical biochemistry II. |
| 1 | Dietetics in the Everyday Practice and Beyond. Nutritional Therapy I. | AODIE42T7 | 24 | | | AW5 | 2 | Propedeutics of Internal Medicine (Internal Medicine I.) |
| 1 | Epidemiology, pathophysiology, diagnosis and treatment of osteoporosis. | AOEPI01T7 | 11 | 2 | 2 | AW5 | 1 | Internal Medicine II. (Immunology and Rheumatology) |
| 1 | Freely Chosen Block Practice | AOBLOCKFREELY_IV | | | 30 | AW3 | 2 | None |
| 1 | Geriatric Medicine | AOGER42A7 | 20 | | | AW5 | 3 | Internal Medicine II (Immunology and Rheumatology) |
| 1 | Surgical operative techniques | AOG517407 | 4 | | 8 | AW5 | 1 | Basic Surgical Techniques |
| 1 | Traumatology II. | AOTRA41A7 | 10 | | | AW5 | 2 | Pathology II. |

## Required elective courses for the 4. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Recent Advances of Infertility Management and Gynaecological Oncology | AOINF42T8 | 20 | | | AW5 | 2 | Obstetrics and Gynecology I. |
| 2 | Basic microsurgical training. Introduction to microsurgery | AOG517507 | 2 | | 10 | AW5 | 1 | Basic Surgical Techniques, Surgical Operative Techniques |
| 2 | Dietetics in the Everyday Practice and Beyond. Nutritional Therapy II. | AODIE44T8 | 20 | | 4 | AW5 | 2 | Dietetics in the Everyday Practice and Beyond. Nutritional Therapy I. |
| 2 | Magnetic resonance imaging: from basics to practice | AOMRE41T8 | | 24 | | AW5 | 1 | Biophysics Lecture |
| 2 | Ophthalmological aspects of wound healing processes | AOSSZ42T8 | 7 | 4 | 4 | AW5 | 1 | Pathology II., Basic Operative Techniques, Basic Microsurgical Training |
| 2 | Problem based learning - Skills' training | AOPSZ42T10 | | 20 | | AW5 | 2 | Internal Medicine II., Surgery I. |
| 2 | Problem based learning in Complex Pathology | AOEKP42T6 | 30 | | | AW5 | 3 | Clinical Biochemistry II. |
| 2 | Radiotherapy in the clinical practice | AOSUG42T7 | | 15 | | AW5 | 2 | Biophysics, Radiology and Nuclear Medicine I. |
| 2 | Rare diseases | AOG138107 | 10 | | | AW5 | 1 | Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine I. |
| 2 | Reproductive Endocrinology and Infertility | AOG558510 | 15 | | | AW5 | 2 | Obstetrics and Gynecology I. |
| 2 | Surgical operative techniques | AOG517407 | 4 | | 8 | AW5 | 1 | Basic Surgical Techniques |
| 2 | Thesis Writing Course | AOG197308 | | 14 | | AW5 | 1 | Propedeutics of Internal Medicine (Internal Medicine I.) |
| 2 | Travel and Tropical Medicine, Vaccinations | AOG307702 | 20 | | 5 | AW5 | 2 | Microbiology II. |
| 2 | Travel Medicine for medical scholars | AOUTA42T8 | 30 | | | AW5 | 2 | Pathology II, Medical Microbiology II., Pharmacology I. |

## Required elective courses for the 5. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Advanced Surgical Operative Techniques | AOHMGY42T10 | 4 | | 20 | AW5 | 2 | Basic microsurgical training. Introduction to microsurgery; Surgery II. |
| 1 | Basic laparoscopic surgical training | AOG517607-K10 | 5 | | 15 | AW5 | 2 | Basic Surgical Techniques; Surgical Operative Techniques; Surgery II. |
| 1 | Clinical Pharmacology | AOKFA42T9 | 20 | 8 | 2 | AW5 | 2 | Pharmacology II. |
| 1 | Facts and Recent Achievements of Andrology | AOAND41A8 | | 30 | | AW5 | 2 | Urology |
| 1 | Pharmacotherapy | AOG248110 | 30 | | | AW5 | 3 | Pharmacology II. |
| 1 | Surgical biomaterials | AOG518110 | 12 | | | AW5 | 1 | Surgical operative techniques; Basic microsurgical training. Introduction to microsurgery, Surgery II. |
| 1 | Thesis I. | AODIP47T9 | | | | AW3 | 5 | None |

## Required elective courses for the 5. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 2 | Advanced Surgical Operative Techniques | AOHMGY42T10 | 4 | | 20 | AW5 | 2 | Basic microsurgical training. Introduction to microsurgery; Surgery II. |
| 2 | Basic laparoscopic surgical training | AOG517607-K10 | 5 | | 15 | AW5 | 2 | Basic Surgical Techniques; Surgical Operative Techniques; Surgery II. |
| 2 | Facts and Recent Achievements of Andrology | AOAND41A8 | | 30 | | AW5 | 2 | Urology |
| 2 | Neurosurgery | AOISE02T10 | 6 | | 8 | AW5 | 2 | Neurology I. |
| 2 | Ophthalmological aspects of wound healing processes | AOSSZ42T8 | 7 | 4 | 4 | AW5 | 1 | Pathology II., Basic Operative Techniques, Basic Microsurgical Training |
| 2 | Principles of Physical Medicine and Rehabilitation | AOREH42T6 | 16 | | | AW5 | 2 | Internal Medicine III., Surgery II. |
| 2 | Reproductive Endocrinology and Infertility | AOG558510 | 15 | | | AW5 | 2 | Obstetrics and Gynecology I. |
| 2 | Surgical biomaterials | AOG518110 | 12 | | | AW5 | 1 | Surgical operative techniques; Basic microsurgical training. Introduction to microsurgery, Surgery II. |
| 2 | Thesis II. | AODIP48T10 | | | | AW3 | 5 | None |

## Required elective courses for the 6. year

| Sem | Subjects | Neptun code | L | S | P | Exam | Crd | Prerequisites of taking the subject |
|---|---|---|---|---|---|---|---|---|
| 1 | Thesis III. | AODIP49T11 | | | | AW3 | 5 | None |
| 2 | Ophthalmological aspects of wound healing processes | AOSSZ42T8 | 7 | 4 | 4 | AW5 | 1 | Pathology II., Basic Operative Techniques, Basic Microsurgical Training |
| 2 | Thesis IV. | AODIP50T12 | | | | AW5 | 5 | None |

## Freely Chosen Courses

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Anatomy, Histology and Embryology | Functional Anatomy of Brainstem | AOG107704-K1 | 1 | 2 | 16 | AW5 | Anatomy, Histology, Embriology 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, Histology, Embriology II. | Ervin Wolf M.Sc., Ph.D. |
| Department of Anatomy, Histology and Embryology | Functional Anatomy of the Visual System | AOG108204-K1 | 1 | 2 | 16 | AW5 | Anatomy, Histology, Embriology II. | Zoltán Kisvárday 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. | Ervin Wolf M.Sc., Ph.D. |
| Department of Anatomy, Histology and Embryology | Investigation of the embryonic cell-and tissue differentation | AOG1011003 | 2 | 1 | 26 | AW5 | Anatomy, Histology, Embryology I., Cell Biology, Molecular Biology, Biophysics | Róza Zákány M.D., Ph.D. |
| Department of Anatomy, Histology and Embryology | Dark side of the human mind with anatomical implications | AOG1010005 | 2 | 1 | 30 | AW5 | Anatomy, Histology, Embryology II. and Neurobiology | Tamás Juhász M.Sc., Ph.D. |
| Department of Anatomy, Histology and Embryology | 4D anatomy dissection | AOG1010105 | 2 | 1 | 30 | AW5 | None | Tamás Juhász M.Sc., Ph.D. |
| Department of Anatomy, Histology and Embryology | Modern methods in pain research | AOG1010104 | 1 | 2 | 24 | SIGN | Anatomy II finished and at least satisfactory mark from Biophysics | Péter Szücs M.D., Ph.D. |
| Department of Anatomy, Histology and Embryology | Computer Human Anatomy (CHA) and Clinical oriented anatomy of Head and Neck | AOG1010204 | 3 | 2 | 16 | ESE | None | András Stelescu M.D. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Anesthesiology and Intensive Care | US-guided techniques in anaesthesiology and ICU | AOG118109 | 1 | 1 | 16 | AW5 | Pharmacology II. | Ákos Fábián M.D., 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 Tőzsér M.Sc., Ph.D., D.Sc. |
| Department of Biochemistry and Molecular Biology | Adipose tissue biology and molecular mechanisms in the pathogenesis of obesity | AOG168006 | 1 | 2 | 20 | AW5 | Biochemistry II | Endre Károly Kristóf M.D. |
| Department of Biophysics and Cell Biology | Physical foundations of biophysics | AOG157303 | 1 | 1 | 24 | AW5 | None | György Vámosi M.Sc., Ph.D. |
| Department of Dermatology | Wound healing | AOG177205 | 1 | 1 | 12 | AW5 | None | István Juhász M.D., Ph.D., C.Sc. |
| Department of Dermatology | Aesthetic Dermatology | AOG177909 | 1 | 2 | 16 | AW5 | Anatomy, Histology and Embryology II., Medical Physiology II. | Éva Remenyik M.D., Ph.D., D.Sc. |
| Department of Dermatology | Plastic and reconstructive surgery | AOPLSURG02 | 1 | 2 | 15 | AW5 | None | István Juhász M.D., Ph.D., C.Sc. |
| Department of Dermatology | Myths and frequent questions in dermatological allergology - immunology | AOG179906 | 1 | 2 | 15 | AW5 | Physiology, Immunology | Andrea Szegedi M.D., Ph.D., D.Sc. |
| 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. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Foreign Languages | Latin Medical Terminology I. | AOG261100 2 | 1 | 2 | 30 | AW5 | Latin language | László Répás M.A. |
| Department of Foreign Languages | Hungarian Language Elective Medical III. | AOG102607 | 2 | 1 | 30 | AW5 | Hungarian Language Elective Medical II. | Judit Lampéné Zsíros M.A., Ph.D. |
| Department of Foreign Languages | Hungarian Language Elective Medical IV. | AOG102708 | 2 | 2 | 30 | AW5 | Hungarian Language Elective Medical III. | Judit Lampéné Zsíros M.A., Ph.D. |
| Department of Foreign Languages | Prescription Reading and Writing | AOG102805 | 2 | 1 | 30 | AW5 | Medical Latin, Medical Physiology II. | |
| Department of Foreign Languages | Tandem class for Hungarian and foreign students | AOG103002 | 2 | 1 | 30 | AW5 | Crash Course | Judit Lampéné Zsíros M.A., Ph.D. |
| Department of Foreign Languages | Latin Medical Terminology II. | AOG26111 | 2 | 2 | 30 | AW5 | Latin Medical Terminology I. | László Répás M.A. |
| Department of Immunology | Selected topics of Immunology | AOG297206 | 1 | 2 | 20 | AW3 | Immunology | Kitti Pázmándi M.Sc., Ph.D. |
| Department of Internal Medicine | Diagnosis and therapy of acute leukaemias | AOG138005 | 1 | 2 | 20 | AW5 | Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine | |
| Department of Internal Medicine | Immune intervention therapy in patients with autoimmune diseases | AOG149307 | 1 | 1 | 8 | AW5 | Pathology II., Immunology | Katalin Dankó M.D.,Ph.D.,D .Sc. |
| Department of Internal Medicine | Inflammatory bowel diseases: clinical, therapeutical and immunological aspects | AOG148709 | 1 | 1 | 8 | AW5 | Internal Medicine II. (Immunology and rheumatology) | Zoltán Csiki M.D., Ph.D. |
| Department of Internal Medicine | Modern functional diagnosis of microcirculation. | AOG149110 | 1 | 2 | 8 | AW5 | Pathology II., Internal Medicine V. (Gastroenterology ) | Zoltán Csiki M.D., Ph.D. |
| 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. habil. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| 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., D.Sc. |
| 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. |
| 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 Internal Medicine | Diagnosis and treatment of diseases most frequently found in the practice of our medical intensive care unit | AOG149009 | 1 | - | 15 | AW5 | None | Pál Soltész M.D., Ph.D., D.Sc. |
| Department of Internal Medicine | Idiopathic inflammatory myopathies, from bench to bedside | AOG149807 | 1 | 2 | 16 | AW5 | Internal Medicine II. (Immunology and Rheumatology) | Zoltán Griger M.D., Ph.D. |
| Department of Internal Medicine | Comprehensive Review of Obesity and Associated Disorders | AOG128307 | 2 | 1 | 30 | AW5 | Propedeutics of Internal Medicine | |
| Department of Laboratory Medicine | Biochemistry and clinical pathology in thrombin action | AOG328106 | 1 | 2 | 15 | AW5 | Clinical Biochemistry I. | János Kappelmayer M.D., Ph.D., D.Sc. |
| Department of Laboratory Medicine | Vitamin D and chronic diseases | AOG329908 | 1 | 2 | 15 | AW5 | Internal Medicine II. | Harjit Pal Bhattoa M.D., Ph.D. |
| Department of Laboratory Medicine | Clinical case studies | AOG328307 | 1 | 1 | 15 | ESE | Clinical Biochemistry II. | Zsuzsa Bagoly M.D., Ph.D. |
| Department of Medical Microbiology | Tumor viruses and oncogenes | AOG427804 | 1 | 2 | 12 | AW5 | Medical Microbiology II. | György Veress M.Sc., Ph.D. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Medical Microbiology | Interpretive Clinical Bacteriology and Virology | AOG428108 | 1 | 2 | 14 | AW5 | Medical Microbiology II. | József Kónya D.Sc. |
| 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 immunocompromise d | AOG429407 | 1 | 2 | 14 | AW5 | Medical Microbiology II. | László Majoros M.D., Ph.D. |
| 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 | 1 | 1 | 14 | AW5 | Medical Microbiology II. | Gábor Kardos M.D., Ph.D. |
| Department of Medical Microbiology | Travel and infectious diseases, imported infections | AOG429707 | 1 | 1 | 14 | AW5 | Medical Microbiology I. | Gábor Kardos M.D., Ph.D. |
| Department of Medical Microbiology | Infections spreading from animals to humans. | AOG429807 | 1 | 1 | 21 | AW5 | Medical Microbiology I. | Krisztina Szarka M.Sc., Ph.D. |
| Department of Medical Microbiology | Molecular diagnosis of multiresistant bacteria | AOG421000 8 | 1 | 2 | 12 | AW5 | Medical Microbiology II. | Judit Szabó M.D., Ph.D. |
| Department of Medical Microbiology | Microbiology of sepsis | AOG421000 7 | 1 | 1 | 12 | AW5 | Medical Microbiology I. | Judit Szabó M.D., Ph.D. |
| Department of Medical Microbiology | Laboratory diagnosis of anaerobic bacteria | AOG421000 6 | 1 | 2 | 12 | AW5 | Medical Microbiology I. | Judit Szabó M.D., Ph.D. |
| Department of Medical Microbiology | Introduction to Medical Mycology | AOG421020 7 | 1 | 1-2 | 14 | AW5 | Medical Microbiology II. | László Majoros M.D., Ph.D. |
| Department of Medical Microbiology | Clinical Mycology | AOG421010 7 | 1 | 1-2 | 12 | AW5 | Medical Microbiology II. | László Majoros M.D., Ph.D. |
| Department of Medical Microbiology | Malaria | AOG421040 7 | 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 | AOG421080 7 | 1 | 2 | 15 | AW5 | Medical Microbiology II. | György Veress M.Sc., Ph.D. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Medical Microbiology | Antimicrobial agents in clinical practice | AOG429007 | 2 | 1 | 30 | AW5 | Medical Microbiology II. | László Majoros M.D., Ph.D. |
| Department of Medical Microbiology | Management of clinical microbiology cases: a simulation practice | AOG4291107 | 1 | 1 | 15 | AW5 | Medical Microbiology II. | Gábor Kardos M.D., Ph.D. |
| Department of Medical Microbiology | Current concepts and practices in antiviral therapy | AOG4291007 | 1 | 1 | 14 | AW5 | Medical Microbiology II. | Anita Szalmás M.Sc., Ph.D. |
| Department of Neurology | Multimedia presentation of typical and unusual cases from neurology | AOG389109 | 1 | 1 | 15 | AW5 | Internal Medicine IV. (Endocrinology, Nephrology) | László Csiba M.D., Ph.D., D.Sc., M.H.A.Sc. |
| Department of Neurosurgery | Pediatric Neurosurgery | AOG277807 | 1 | 1 | 12 | AW5 | Pathology II. | Álmos Klekner M.D., Ph.D. habil. |
| 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. habil. |
| Department of Obstetrics and Gynecology | Practical healthcare in the English-speaking countries in the junior doctors' perspective | AOG558409 | 1 | 2 | 15 | AW5 | Obstetrics and gynecology II. | Tamás Szilveszter Kovács M.D., Ph.D. |
| Department of Obstetrics and Gynecology | Gynecological Cancer Detection and Prevention | AOG558009 | 1 | 2 | 16 | AW5 | Obstetrics and Gynecology I. | Zoltán Hernádi M.D., Ph.D., D.Sc. |
| Department of Otorhinolaryngology and Head and Neck Surgery | Reconstructive and voice rehabilitation methods in head and neck surgery | AOG217410 | 1 | 1 | 10 | AW5 | None | Balázs Bendegúz Lőrincz M.D., Ph.D. habil. |
| Department of Pathology | Neurodegenerativ diseases | AOG457207 | 1 | - | 20 | AW5 | Pathology II. | Péter Molnár M.D., D.Sc. |
| Department of Pharmacology | Dietary supplements, herbal medicines | AOG24_001 | 2 | 1 | 30 | AW5 | None | |
| Department of Pharmacology | Drug and drug-food interactions | AOG24_003 | 1 | 1 | 15 | AW5 | None | |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Department of Pharmacology and Pharmacotherapy | Introduction to Ayurveda and Integrative Practice of Clinical Medicine I. | AOG24950 | 2 | 1 | 26 | AW5 | Propedeutics of Internal Medicine and Pharmacology II. | |
| Department of Pharmacology and Pharmacotherapy | Introduction to Ayurveda and Integrative Practice of Clinical Medicine II. | AOG24951 | 2 | - | 26 | AW5 | Introduction to Ayurveda and Integrative Practice of Clinical Medicine I. | |
| Department of Physiology | Cellular mechanisms of regulation of cardiac function | AOG207605 | 1 | 1 | 14 | AW5 | Medical Physiology II. | Péter Nánási M.D., Ph.D., D.Sc. |
| Department of Preventive Medicine, Faculty of Public Health | Introduction to clinical decision making | AOG3671502 | 2 | 2 | 28 | AW5 | None | Szilvia Fiatal M.D., Ph.D. |
| Department of Preventive Medicine, Faculty of Public Health | Which country in Europe has the best health care system? | AOG3671402 | 1 | 2 | 16 | AW5 | None | Orsolya Varga M.D., Ph.D. |
| Department of Preventive Medicine, Faculty of Public Health | Meta-analysis | AOG3671002 | 1 | 2 | 14 | AW5 | None | Szilvia Fiatal M.D., Ph.D. |
| Department of Preventive Medicine, Faculty of Public Health | Evidence based diet | AOG3671602 | 1 | 2 | 14 | AW5 | None | Helga Bárdos M.D., M.Sc., Ph.D. |
| Department of Preventive Medicine, Faculty of Public Health | Workplace hazards in healthcare - Occupational risks for healthcare workers | AOG367801 | 1 | 1 | 20 | AW5 | None | Balázs Ádám M.D., M.Sc., Ph.D. |
| Department of Psychiatry | Person-centered psychotherapy | AOG478509 | 1 | 1 | 15 | AW5 | Neurobiology | Anikó Égerházi M.D., Ph.D. |
| Department of Pulmonology | Asthma bronchiale | AOG587707 | 1 | 1 | 8 | AW5 | Pathology II. | László Brugós M.D., Ph.D. |
| Department of Pulmonology | Lung cancer | AOG587607 | 1 | 1 | 10 | AW5 | Pathology II. | |
| Department of Surgery | Surgical Oncology | AOG497408 | 1 | 1 | 10 | AW5 | Pathology II. | Tamás Dinya M.D. |

| Department | Subject | Neptun code | Crd | Sem | 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 artritic injuries | AOG578608 | 1 | 2 | 12 | AW5 | Traumatology I., Traumatology II. | Ferenc Urbán M.D. |
| Department of Urology | Urological Laparoscopic Surgery | AOG599707 | 1 | 1-2 | 15 | AW5 | Basic Surgical Techiques | Mátyás Benyó M.D., Ph.D. |
| Department of Urology | Urolithiasis | AOG599807 | 1 | 1-2 | 15 | AW5 | Pathology II., Propedeutics of Internal Medicine | Csaba Berczi M.D., Ph.D. |
| Department of Urology | Urological Oncology | AOG599507 | 1 | 1-2 | 15 | AW5 | Pathology II., Propedeutics of Internal Medicine | Csaba Berczi M.D., Ph.D. |
| Department of Urology | Benign Prostatic Hyperplasia (BPH) | AOG591010 7 | 1 | 1-2 | 15 | AW5 | Pathology II. and Propedeutics of Internal Medicine | Mátyás Benyó M.D., Ph.D. |
| Department of Urology | Uro-radiology | AOG591020 7 | 1 | 1-2 | 15 | AW5 | Pathology II. and Propedeutics of Internal Medicine | Csaba Berczi M.D., Ph.D. |
| Division of Angiology | New methods in the detection of early atherosclerosis | AOG128208 | 1 | 2 | 16 | AW5 | Internal Medicine III. (Cardiology, Angiology) | Pál Soltész M.D., Ph.D., D.Sc. |
| Division of Cardiac Surgery | Cardiac Surgery | AOG607508 | 1 | 2 | 22 | AW5 | Surgery I. | Tamás Szerafin M.D., Ph.D. |
| Division of Cardiac Surgery | Valvular heart diseases: diagnosis, examination and patient management in the focus | AOG317808 | 1 | 2 | 16 | AW5 | Clinical Physiology, Internal Medicine III. (Cardiology, Angiology) | |
| Division of Cardiology | Echocardiography | AOG317307 | 1 | 1 | 18 | AW5 | Propedeutics of Internal Medicine, Clinical Physiology | Ida Hegedűs M.D., Ph.D. |
| Division of Cardiology | Cardiac interventions | AOG317408 -K1 | 1 | 2 | 16 | AW5 | None | Tibor Szűk M.D., Ph.D. |
| Division of Cardiology | Heart failure: an emerging epidemic in the 21st century | AOG607608 | 1 | 2 | 16 | AW5 | Clinical Physiology, Internal Medicine III.(Cardiology, Angiology) | Attila Borbély M.D., Ph.D. |
| Division of Cardiology | Cardiac arrhythmias | AOG317607 | 1 | 2 | 12 | AW5 | Propedeutics of Internal Medicine (Internal Medicine I.) | Zoltán Csanádi M.D., Ph.D., D.Sc. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Division of Clinical Immunology | Early phases of systemic autoimmune diseases | AOG149908 | 1 | 2 | 16 | AW5 | Internal Medicine II. (Immunology, Rheumatology) | Edit Bodolay M.D., Ph.D., D.Sc. |
| Division of Clinical Laboratory Science | Platelet Function and Platelet Function Disorders | AOG632006 | 1 | 2 | 12 | AW5 | Clinical Biochemistry II. | Krisztina Pénzes-Daku M.Sc., Ph.D. |
| Division of Clinical Laboratory Science | 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 Medical School of University of Debrecen, Student's Scientific Society | László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc. |
| Division of Nuclear Medicine and Translational Imaging | Nuclear medical differential diagnostics | AOG397310 | 2 | - | 22 | AW5 | Radiology and Nuclear Medicine II. | József Varga M.Sc., Ph.D. |
| Division of Nuclear Medicine and Translational Imaging | Medical imaging: current methods and new trends | AOG468905 | 1 | 1 | 12 | AW5 | Physiology | László Balkay M.Sc., Ph.D. |
| Division of Operative Techniques and Surgical Research | Basics of Hemorheology | AOG517908 -K1 | 1 | 1-2 | 10 | AW5 | Basic Surgical Techniques | Norbert Németh M.D., MBA, Ph.D., D.Sc. |
| Division of Radiology and Imaging Science | Selected Chapters from the Cross-Sectional Anatomy of the Human Body | AOCSA01L 3 | 2 | 1 | 28 | ESE | Anatomy, Histology, Embryology II. | |
| Division of Radiology and Imaging Science | Multimodal imaging and virtual reality in neurosciences | AOG487503 | 1 | 1 | 18 | AW5 | Biophysics | András Jakab M.D., Ph.D. |
| Division of Radiology and Imaging Science | History of Radiology | AOG487407 | 1 | 1 | 18 | AW5 | None | Ervin Berényi M.D., Ph.D. |
| Division of Radiology and Imaging Science | Clinico-radiological case reports | AOKLR41T 8 | 1 | 2 | 24 | AW5 | None | Ervin Berényi M.D., Ph.D. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Division of Radiology and Imaging Science | The basics of ultrasound imaging and it's practical application | AOG487906 | 1 | 2 | 15 | AW5 | Anatomy, Histology and Embryology II., Pathology I. | |
| Division of Radiotherapy | Operative techniques in radiotherapy (brachytherapy) | AOG527810 | 1 | 1-2 | 12 | AW5 | Radiology II. | Andrea Furka M.D., Ph.D. |
| Division of Rheumatology | Reumatology: Research and Clinical | AOG149108 | 1 | 2 | 10 | AW5 | Internal Medicine II. (Immunology and Rheumatology) | Zoltán Szekanecz M.D., Ph.D., D.Sc. |
| Division of Rheumatology | Vascular and microcirculation abnormalities in systemic sclerosis | AOG1450007 | 1 | 2 | 10 | AW5 | Immunology-Rheumatology | Gabriella Szűcs M.D., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Inborn Sociality - Socialized Individuality: A New Concept | AOG358902-K8 | 2 | - | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Becoming a Doctor: Thematic Self-Awarness Group | AOG359005-K10 | 2 | 2 | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Evolution and Medicine | AOG359101-K8 | 1 | 1 | 26 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | The Basic Problems of Medicine | AOG358601 | 1 | 1 | 20 | AW5 | None | Attila Bánfalvi M.A., Ph.D., C.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Madness and Psychiatry (Philosophical Approach) | AOG359602 | 1 | 2 | 20 | AW5 | None | Attila Bánfalvi M.A., Ph.D., C.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | 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., C.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Psychic Trauma | AOG3511102-K1 | 1 | 2 | 20 | AW5 | None | Attila Bánfalvi M.A., Ph.D., C.Sc. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Institute of Behavioural Sciences, Faculty of Public Health | Theoretical and Methodological Questions of Patient Satisfaction Studies | AOG359308 | 1 | 2 | 15 | AW5 | None | Csilla Kemény M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Yoga and Meditation I. | AOG3512001-K1 | 1 | 1 | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Bioethical Cases | AOG358706 | 2 | 2 | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Intercultural Health Care | AOG3511605-K1 | 2 | 2 | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Bioethics on Films | AOG3514405 | 1 | 1 | 26 | AW5 | None | Péter Kakuk M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Yoga and Meditation II. | AOG3510401-K1 | 2 | 2 | 30 | AW5 | None | Péter Molnár M.D., D.Sc. |
| Institute of Behavioural Sciences, Faculty of Public Health | Medicine in Art | AOG3515003 | 1 | 1-2 | 20 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Issues about the Start and End of Life | AOG3515103 | 1 | 1-2 | 22 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Psychosocial aspects in reproductive medicine | AOG351401 | 1 | 1 | 20 | AW5 | None | Antal Bugán M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Evolutionary medicine and psychopathology | AOG351801 | 1 | 1 | 20 | AW5 | Basics of Behavioural Sciences, Communication Skills | Roland Tisljár M.A., Ph.D. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Institute of Behavioural Sciences, Faculty of Public Health | Health and Healing in Wolrd Religions | AOG352101 | 1 | 1 | 20 | AW5 | None | Bence Döbrőssy M.A. |
| Institute of Behavioural Sciences, Faculty of Public Health | Introduction into Research Ethics | AOG3522607 | 1 | 1 | 20 | AW5 | None | János Kristóf Bodnár M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Medical sociology on film | AOG3522103 | 1 | 1-2 | 22 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | End-Of-Life Decisions on Film | AOG35_001 | 1 | 1 | 20 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | End-of-Life Decisions | AOG35_002 | 0 | 1 | 22 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Philosophy of Medicine in the Lights of Science-Fiction Movies | AOG359902 | 2 | 2 | 26 | AW5 | None | János Kristóf Bodnár M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | Classic Themes of Medical Sociology in Movies | AOG3511101 | 1 | 1 | 20 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Behavioural Sciences, Faculty of Public Health | End of Life Topics in Movies | AOG3511001 | 1 | 1 | 20 | AW5 | None | Sándor Kőműves M.A., Ph.D. |
| Institute of Sport Science of University of Debrecen | Fitness and health | AOFAH0105 | 2 | 1-2 | 30 | AW5 | None | Katalin Varga M.Sc. |
| Institute of Sport Science of University of Debrecen | Pulse Control | AOPULS0205 | 2 | - | 30 | AW5 | Medical Physiology II. | Katalin Varga M.Sc. |

| Department | Subject | Neptun code | Crd | Sem | Hours | Exam | Prerequisites of taking the subject | Coordinator |
|---|---|---|---|---|---|---|---|---|
| Institute of Sport Science of University of Debrecen | Pilates and Yoga | AOPYEN01 | 2 | 1-2 | 30 | AW5 | None | Katalin Varga M.Sc. |

# CHAPTER 13
# INTERIM PRACTICAL BLOCKS

INTERIM PRACTICAL BLOCKS - 4th and 5th year
The aim of the practical blocks is to improve the practical skills of medical students.
Students spend a 2-week (30 hours a week) practical session in the departments where they fulfil the specified requirements under the supervision of a tutor.
Students are allowed to spend maximum 2 practical blocks per semester.
Duration of the practical blocks: 6 hours per day, between 8:00-14:00.
Students are allowed to spend their practical blocks only in the give time period (8:00-14:00), except with the permission of the Head of the given Department.
There is a lecture book of practical blocks providing a guideline to the student on the requirements he/she should comply with in course of the practical blocks of the specific semesters and on the basic knowledge and skills he/she has to acquire on the given speciality during the gradual training.
The level of knowledge and skills to be learned is graded as follows:
**O**: student has observed the given intervention
**P**: student has performed the given intervention
Participation: Student attends the intervention and (if possible) actively contributes.
The lecture book may specify the expected number of interventions to be performed.
The practices can be completed
- at the clinics, departments of the University (in Debrecen);
- at teaching hospitals of the University in Hungary (Debrecen-Kenézy Hospital; in Nyíregyháza, Miskolc, Berettyóújfalu, etc.);
- outside of Hungary (at affiliated and non-affiliated university hospitals).

Fulfillment of the practice outside of Hungary is possible only with the permission of the Sub-Committee for Educational Matters and Credit Transfer.
You are allowed to start the practice in Hungary after the medical check-up with your Health Booklet.

Registration for practice: via Neptun System
Prerequisites: prerequisites of the same 4th and 5th year subject
Students have to register for practice and for the corresponding subject together (in the same semester).

**4th YEAR BLOCK PRACTICE**
Compulsory: 2*2 weeks Internal Medicine, 1 week Obstetrics and Gynecology, 1 week freely chosen (required elective), 2 weeks Surgery/Small Surgery
Freely chosen block practice (required elective): 1 week (Otolaryngology, Orthopedics, Radiology, Oral Surgery, Ophthalmology, Urology)
1st semester
2 weeks Internal Medicine (Cardiology and Angiology)
1 week Obstetrics and Gynecology and 1 week freely chosen or 2 weeks Surgery/Small Surgery

2nd semester
2 weeks Internal Medicine (Endocrinology, Nephrology)
1 week Obstetrics and Gynecology and 1 week freely chosen (required elective) or 2 weeks Surgery/Small Surgery
In case you choose Obstetrics and Gynecology in the 1st semester then you have to choose Surgery-Small Surgery in the 2nd semester and vice versa.

| 4th year block practice | possible clinic/hospital department |
|---|---|
| Internal Medicine (Cardiology and Angiology) | Internal Medicine, Cardiology, Pulmonology |
| Internal Medicine (Endocrinology, Nephrology) | Internal Medicine |
| Obstetrics and Gynecology | Obstetrics and Gynecology |
| Surgery/Small Surgery | Surgery, Traumatology, Orthopedics, Oral Surgery, Urology |
| Freely Chosen Block Practice (required elective) | Ophthalmology, Orthopedics, Oral Surgery, Otolaryngology, Radiology, Urology |

**5th YEAR BLOCK PRACTICE**
Compulsory: 2*2 weeks Internal Medicine, 2 weeks Pediatrics or 1 week Neurology
1st semester
2 weeks Internal Medicine (Gastroenterology)
2 weeks Pediatrics or 1 week Neurology

2nd semester
2 weeks Internal Medicine (Hematology)
2 weeks Pediatrics or 1 week Neurology
In case you choose Pediatrics in the 1st semester then you have to choose Neurology in the 2nd semester and vice versa.

| 5th year block practice | Possible clinic/hospital |
|---|---|
| Internal Medicine (Gastroenterology) | Internal Medicine, Infectology, Dermatology |
| Internal Medicine (Hematology) | Internal Medicine, Infectology, Dermatology |
| Pediatrics | Pediatrics |
| Neurology | Neurology |

Calendar for the 4th and 5th year block practice in the academic year 2018/2019:

| semester | weeks | dates |
|---|---|---|
| 1. | 11-12 | November 19, 2018 - November 30, 2018 |
| | 13-14 | December 3, 2018 - December 14, 2018 |
| 2. | 11-12 | April 29, 2019 - May 10, 2019 |
| | 13-14 | May 13, 2019 - May 24, 2019 |

# CHAPTER 14
# ACADEMIC PROGRAM FOR THE 1ST YEAR

## Department of Emergency Medicine

Subject: **FIRST AID AND REANIMATION**
Year, Semester: 1st year/1st semester**,** 1st year/2nd semester
Number of teaching hours:
Lecture: **6**
Practical: **20**

**1st week:**
**Lecture:** The concept of first aid, first aid levels. Time Factor. The role of the scene. The usage of paramedics, rules of calling ambulance. ABCDE approach.

**2nd week:**
**Lecture:** Concept and recognition of unconsciousness. Symptoms of airway obstruction. Airway management. Recovery position.

**3rd week:**
**Lecture:** Organizational tasks at the site of the resuscitation. Prevention and solution of the complications of resuscitation, BLS. Effect, result, success in CPR. AED.

**4th week:**
**Lecture:** Death as a process. Reversibility. Assessment of vital signs. First aid for burns. Shock.
**Practical:** Patient documentation. Patient monitoring. Measuring and documenting vital parameters. Communication.

**5th week:**
**Lecture:** Intoxications. Ways of poison can enter the body. First
aid of poisoning with corrosive and non-corrosive
substances. Typical symptoms and recognition of
**Practical:** Hygiene behavior. Rules of hand hygiene. Moving patients. Features of hospital beds. Forms and basics of bedding.

**6th week:**
**Lecture:** The concept and levels of nursing. The structure of the hospital, work schedule. Communication. Hygienic behavior and rules of hand hygiene. Rules and techniques for blood collection. Intramuscular and Subcutaneous Injections.
**Practical:** Medication. Blood collection techniques. Practicing the rules and techniques for intramuscular and subcutaneous injections, Types of artificial feeding, feeding tube placement.

**7th week:**
**Practical:** Checking breathing and circulation. Ventilation without equipment. ABCDE approach.

**8th week:**
**Practical:** Practicing ventilation without equipment.

**9th week:**
**Practical:** Practicing chest compression.

**10th week:**
**Practical:** Cardiac arrest care simulation (BLS+AED)

**11th week:**
**Practical:** Practical exam (BLS+AED)

**12th week:**
**Practical:** General rules of wound care. Presenting wound dressing and immobilization devices. Sterility. Bleeding control. Arterial pressure points. Arterial and venous pressure

bandage.

**13th week:**
**Practical:** First aid for soft tissue contusion, distortion, dislocation and bone fracture.

First aid for soft tissue contusion, distortion, dislocation and bone fracture.
Immobilization devices: Schanz cervical collar, Desault's bandage, hand and finger fracture fixation. Triangular bandage.
Kramer-, pneumatic air splint device.
Bone fracture care by body regions.
Complex trauma care.

**14th week:**
**Practical:** Written test.
**Self Control Test**

**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 practicals more than twice in a semester. Missed practicals should be made up after consultation with the tutor. Facilities for a maximum of 2 make-up practicals are available at the Simulation Center in Debrecen. The current knowledge of students will be tested twice in each semester driving a written test.

# Department of Foreign Languages

Subject: **HUNGARIAN CRASH COURSE**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **36**

**1st week:**
**Seminar:**
**Practical: 1st day:** 1. lecke, 2. lecke I. rész (Greetings, the alphabet, numbers 0-20, colours, everyday expressions, nationalities) - **2nd day:** 2. lecke II. rész, 3. lecke (languages, numbers 21-29, names of places, the days of the week, numbers 30-100, the time, *hány óra van?*) - **3rd day:** 4. lecke, 5. lecke I. rész (Test Your Knowledge 1, adjectives and adverbs, verbs expressing activities 1) - **4th day**: 5. lecke II. rész, 6. lecke (times of day, *hány órakor?*, numbers 1000-1000000000, verbs expressing activities 2, everyday expressions, ordinal numbers) - **5th day:** 7. lecke, 8. lecke (Revision 1, everyday objects, food and drink, adverbs of frequency)

**2nd week:**
**Practical: 1st day:** 9. lecke, 10. lecke I. rész (Food, drink, fruit, vegetables, the menu, ordering in a restaurant, shopping in the market, the uses of *tessék*, the weather) - **2nd day:** 10. lecke II. rész, 11. lecke (the seasons and months, clothes, Test Your Knowledge 2) - **3rd day:** 12. lecke, 13. lecke I. rész (body parts, adjectives and descriptions, accessories, jobs, places) - **4th day:** 13. lecke II. rész, 14. lecke (personal details and filling in a form, family relations, revision 2) - **5th day**: End course exam. Oral 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 from a list of situations covered in the coursebook. A further minimal requirement is the knowledge of 200 words.

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.

Subject: **HUNGARIAN LANGUAGE I/1.**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **24**

**1st week:**
**Practical:** 1. Ismétlés, Már beszélek egy kicsit magyarul

**2nd week:**
**Practical:** 2. Már beszélek egy kicsit magyarul

**3rd week:**
**Practical:** 2. Magyarórám lesz

**4th week:**
**Practical:** 3. Debrecenben lakom

**5th week:**
**Practical:** 3. Debrecenben lakom

**6th week:**
**Practical:** 4. Már ezt is tudom! + Midterm test

**7th week:**
**Practical:** 5. Magyarórán

**8th week:**
**Practical:** 6. Honnan jön, és hová megy?

**9th week:**
**Practical:** 6. Honnan jön, és hová megy?

**10th week:**
**Practical:** 7. Utazás

**11th week:**
**Practical:** 7. Utazás

**12th week:**
**Practical:** 8. Már ezt is tudom! Endterm test
Oral exam

## Requirements

**Requirements of the course:**
**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, (no matter why) the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Hungarian language course, students must sit for 2 written language tests, an oral and a listening exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their written test and have to take a vocabulary exam that includes all 100 words before the midterm and end term tests. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.

Based on the final score the grades are given as follows.

| **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 of the written tests is below 60, the student can take a written remedial exam once covering the whole semester's material.

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**

Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

# Department of Medical Chemistry

Subject: **MEDICAL CHEMISTRY LECTURE**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Lecture: **45**

Seminar: **56**

**1st 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:** Lectures of the week.

**2nd week:**

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

**Seminar:** Lectures of the week.

**3rd week:**

**Lecture:** Chemical equilibrium.

Ionic equilibria. Acids and bases: Acid base equilibria. Bronsted Lowry and Lewis theories

**Seminar:** Lectures of the week.

**4th week:**

**Lecture:** Thermochemistry and

thermodynamics.
Chemical kinetics.
**Seminar:** Lectures of the week.

**5th week:**
**Lecture:** Electrochemistry. Thermodynamics of redox reactions.
Introduction to organic chemistry.
Stereochemistry.
**Seminar:** Lectures of the week.

**6th week:**
**Lecture:** Saturated and unsaturated hydrocarbons.
Aromatic hydrocarbons.
**Seminar:** Lectures of the week.

**7th week:**
**Lecture:** Organic halogen compounds. Alcohols and phenols.
Aldehydes and ketones and quinones. Ethers.
Organic sulfur compounds
**Seminar:** Lectures of the week.

**8th week:**
**Lecture:** Nitrogen containing compounds.
Carboxylic acids and carboxylic acid derivatives.
**Seminar:** Lectures of the week.

**9th week:**
**Lecture:** Amino acids and peptides.
Proteins (Structure and classification)
**Seminar:** Lectures of the week.

**10th week:**
**Lecture:** Proteins (function and regulation).
Carbohydrates.
**Seminar:** Lectures of the week.
**Practical:**

**11th week:**
**Lecture:** Glycolysis and tricarboxylic acid cycle.
Regulation of basic metabolic pathways.
Lipids.
**Seminar:** Lectures of the week.

**12th week:**
**Lecture:** Nucleotides and nucleic acids. Nucleic acid – protein interactions.
**Seminar:** Lectures of the week.

**13th week:**
**Lecture:** Coordination chemistry. Function and transport of alkaline and alkaline earth metal cations. Transition metals: iron, copper, zinc.
**Seminar:** Lectures of the week.

**14th week:**
**Lecture:** Biological functions of the nonmetallic elements: oxygen, selenium, halogens.
Information on the final exam in Medical Chemistry. Research opportunities in the Department.
**Seminar:** Transition metals: iron, copper, zinc.
Biological functions of the nonmetallic elements: oxygen, selenium, halogens.

**Requirements**

The program consists of lectures, seminars. Attendance at the lectures is essential for successful completion of the course. Attendance at seminars is recorded, students should attend at least 80% of seminars.

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.

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 consists of a written exam and an oral examination. The written test is composed of multiple choice questions arranged into three modules: general chemistry; organic chemistry; bioorganic and bioinorganic chemistry. The student may get exemption from any module(s) of the final written exam in case (s)he successfully completed the control tests of the corresponding module. Results of control tests and exam modules can be carried to B or C chance exams. The student can only pass the written part of the exam if the result of all three modules is at least "pass (2)". The second part of the final exam is an oral exam covering all three modules. Only students who passed the written exam qualify to sit the oral exam.

Students who have successfully passed the exam but want to improve their mark are allowed to take one improvement exam.

In case the 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.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **MEDICAL CHEMISTRY PRACTICAL**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **42**

**1st week:**
**Practical:** Laboratory safety instructions. Fire-regulations. Chemical calculations.
Concentration of solutions. Laboratory techniques: laboratory equipments, volumetric apparatus. Filtration. Preparations of solutions.

**2nd week:**
**Practical:** Quantitative analysis. Acid-base titrations: strong acid-strong base, weak acid-strong base titrations. Introducing and using titrators.
Chemical analysis of drinking-water. Preparation of ion free water. Ion exchange chromatography.

**3rd week:**
**Practical:** Quantitative analysis. Acid-base titrations: strong acid-strong base, weak acid-strong base titrations. Introducing and using titrators.
Chemical analysis of drinking-water. Preparation of ion free water. Ion exchange chromatography.

**4th week:**
**Practical:** Paper chromatography: separation of food dyes and separation of metalions.
Gel filtration. Desalting of egg-white solution.
Spectrophotometry. Photometric determination of inorganic phosphate. Determination of acid labile phosphate in organic compounds.

**5th week:**
**Practical:** Paper chromatography: separation of

food dyes and separation of metalions.
Gel filtration. Desalting of egg-white solution.
Spectrophotometry. Photometric determination of inorganic phosphate. Determination of acid labile phosphate in organic compounds.

**6th week:**
**Practical:** Elektrometry. Electrometric pH measurement. Potentiometric titrations. Determination of buffering capacity.
Reactions kinetics.
Kinetic study of the saponification reaction of ethylacetate. Kinetic analysis of the oxidation of iodide ion using the Landolt-method.

**7th week:**
**Practical:** Elektrometry. Electrometric pH measurement. Potentiometric titrations. Determination of buffering capacity.
Reactions kinetics.
Kinetic study of the saponification reaction of ethylacetate. Kinetic analysis of the oxidation of iodide ion using theLandolt-method.

**8th week:**
**Practical:** Redox titrations. Iodometric titrations. Titrations with potassium bromate.
SDS-polyacrylamide gel electrophoresisof proteins.
Quantitative protein analysis: Biuret assay. Bradford assay. Assay of glucose.

**9th week:**
**Practical:** Redox titrations. Iodometric titrations. Titrations with potassium bromate.
SDS-polyacrylamide gel electrophoresisof proteins.
Quantitative protein analysis: Biuret assay. Bradford assay. Assay of glucose.

**10th week:**
**Practical:** Qualitative analysis of mono- and disaccharides. Polarimetry. Polarimetric analysis of carbohydrates.
Enzyme kinetics. Assay of glycogen phosphorylase activity.

**11th week:**
**Practical:** Qualitative analysis of mono- and disaccharides. Polarimetry. Polarimetric analysis of carbohydrates.
Enzyme kinetics. Assay of glycogen phosphorylase activity.

**12th week:**
**Practical:** Analysis of inorganic salts and complexes. Complexometric titrations. Photometric determination of iron.

**13th week:**
**Practical:** Analysis of inorganic salts and complexes. Complexometric titrations. Photometric determination of iron.

**14th week:**
**Practical:** Practical exam.

## Requirements

Attendance at laboratory practices is compulsory and recorded. Students should attend 100% of laboratory practices. 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 and the laboratory teacher permits).

Evaluation is based on the results of practical control tests written during the practical classes on the $5^{th}$, $9^{th}$ and $13^{th}$ week, besides the manual work. If the mark is fail (1), student should take the practical examination on the 14th week. If the practical examination is not successful, (s)he cannot get the signature from the subject and cannot register for the final examination for Medical Chemistry.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

## Division of Biomathematics

Subject: **BIOSTATISTICS**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Seminar: **28**

**1st week:**
**Lecture:** 1. Introduction, random variables, qualitative variables, quantitative variables, discrete and continuous random variables

**2nd week:**
**Lecture:** 2. Counting techniques (permutations and combination), Set theory, definition and properties of probability, conditional probability, Bayes's theorem
3. Descriptive statistics, ordered array, frequency distribution, cumulative frequency distribution, histogram mean, median, mode, range, variance
**Seminar:** Counting techniques (permutations and combination)

**3rd week:**
**Lecture:** 4. Probability distributions (discrete, continous), Binomial and Poisson distributions
**Seminar:** Set theory, definition and properties of probability, conditional probability, Bayes's theorem

**4th week:**
**Lecture:** 5. Normal distribution, standard normal distribution, problems for normal and standard normal distributions
**Seminar:** Descriptive statistics, ordered array, frequency distribution, cumulative frequency distribution, histogram mean, median, mode, range, variance

**5th week:**
**Lecture:** 6. Sampling, sampling distributions (special focus on SEM and the central limit theorem).
**Seminar:** Probability distributions (discrete, continous), Binomial and Poisson distributions

**6th week:**
**Lecture:** 7. Hypothesis testing, type I and type II errors
**Seminar:** Normal distribution, standard normal distribution, problems for normal and standard normal distributions

**7th week:**
**Lecture:** 8. Statistical tests (z, t and F tests)
**Seminar:** Sampling, sampling distributions (special focus on SEM and the central limit theorem).

**8th week:**
**Lecture:** 9. Clinical implications of conditional probability (sensitivity, specificity, positive and negative predictive values). Analysis of discrete random variables.
**Seminar:** Hypothesis testing, type I and type II errors

**9th week:**
**Lecture:** 10. Summary
**Seminar:** Statistical tests (z, t and F tests)

**10th week:**
**Seminar:** Clinical implications of conditional probability (sensitivity, specificity, positive and negative predictive values). Analysis of discrete random variables.

**Requirements**

| | |
|---|---|
| Aim of the course | The aim of the subject is to give an introduction to biostatistical methods, which can be used in different branches of medicine to solve biostatistical problems and to evaluate experimental results. In addition to providing a solid theoretical foundation the course will also introduce the students to the art and science of performing the simplest calculations. |
| Short description of the course | Brief introduction to the most basic concepts of calculus (slop, fitting, area under the curve); counting techniques; descriptive statistics; algebra of events; probability; random variables; statistical distributions and their properties; binomial, Poisson and normal distributions; sampling techniques and characterization of samples; statistical test (z, t, F and chi2 tests) |
| Attendance | |
| Conditions for signing the lecture book | Signing of the lecture book is denied if there are more than 2 absences from groupwise seminars. |
| Self control test | Students will write a grade-offering course test between weeks 12-14. The structure of this test will be identical to that of the final exam. |
| Exam | Students will write a grade-offering course test between weeks 12-14. The structure of this test will be identical to that of the final exam. |
| Final grade | Evaluation of the grade-offering test and the final exam is identical. - If the score of part A is less than 75% (30 out of 40 points), the student fails the grade-offering test or the final exam. Bonus points for lecture attendance are not added to the result of part A. If a student passes part A (i.e. the score is larger than or equal to 75%) on an exam or the grade-offering course test, the result is valid for his/her subsequent exam chances, i.e. it does not have to be retaken. - If the result of part A is less than 75%, part B is not evaluated (except for a C chance exam). If the student passes part A, bonus points (10p) for |

| | |
|---|---|
| | lecture attendance are added to the score of part B (max 100p) resulting in a final score (max 110p), which does not contain the score of part A. Based on this final score the following grades are offered: - FS<55 fail - 55≤FS<65 pass - 65≤FS<75 satisfactory. - 75≤FS<85 good - 85≤FS excellent A grade of 2 or better achieved on the grade-offering test is valid for the final exam. The bonus points for lecture attendance and the exemption from retaking part A of the exam are only valid for the course in which they have been achieved, i.e. they are not valid for repeated courses or exam courses. Rules for C-chance exams If the result of the written part of a C-chance exam is at least a pass (2) according to the rules pertaining to A- and B-chance exams, the grade of the C-chance exam will be what is to be offered based on the rules of the A- and B-chance exams. Part B of the written part of a C-chance exam will be scored even if the score of part A is less than 75%. If the result of a C-chance exam is a fail (the score of part A is less than 75% or the grade of part B with the bonus points is a fail), the written part will be followed by an oral exam. In this case the grade of the C-chance exam will be determined by the result of the written test and the performance on the oral exam. |
| Reading materials | Wayne W. Daniel: Biostatistics, A foundation for Analysis in the Health Sciences, John Wiley&Sons |
| Exemptions | Requests for exemptions from the Biostatistics course have to be turned in to the Credit Transfer Committee. Such requests cannot be directly turned in to the Biomathematics Division or the Department of Biophysics and Cell Biology. |
| Information for repeaters | Credits achieved in a semester cannot be transferred to other semesters. Therefore, students repeating the course are subject to the same rules and requirements as those taking the course for the first time. |
| Rules for calculator | 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.

# Division of Biophysics

Subject: **BIOPHYSICS LECTURE**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Lecture: **28**
Seminar: **28**

**1st week:**
**Lecture:** 1. Introduction. Electromagnetic waves , the properties of light (interference, photoelectric effect, photon theory). Matter waves. Thermal radiation.
2. Generation and absorption of X-ray, X-ray crystallography.
**Seminar:** Introduction.

**2nd week:**
**Lecture:** 3. Molecular spectra, Jablonski diagram, fluorescence, fluorescence applications.
4. Sedimentation and electrophoresis. Mass spectrometry.
**Seminar:** Material related to lectures 1 and 2.

**3rd week:**
**Lecture:** 5. Optics, optical microscopy, electron microscopy.
6. Lasers and their application in biology and medicine.
**Seminar:** Material related to lectures 3-6.

**4th week:**
**Lecture:** 7. Physical properties of sound, ultrasound, Doppler effect. Medical and biological applications of ultrasound.
8. Nuclear physics. Nuclear binding energy, radioactivity, law of radioactive decay, radioactive series.
**Seminar:** Material related to lectures 5 and 6.

**5th week:**
**Lecture:** 9. Features of nuclear radiation and its interaction with absorbing material. Detection of radiation.

10. Radiation biophysics: target theory, direct and indirect action of radiation. Dosimetry. Biological effects of radiation.
**Seminar:** Material related to lectures 7 and 8.

**6th week:**
**Lecture:** 11. Experimental and diagnostic application of isotopes. Accelerators.
12. Basic principles of nuclear magnetic resonance, NMR spectroscopy in biology and medicine.
**Seminar:** Material related to lectures 9 and 10.

**7th week:**
**Lecture:** 13. Principles of tomographic methods. X-ray absorption CT. PET.
14. Magnetic resonance imaging (MRI). Gamma camera, SPECT.
**Seminar:** Material related to lectures 11 and 12

**8th week:**
**Lecture:** 15. Chemical potential. Brownian motion. Diffusion at the molecular level, statistical interpretation. Fick's laws. Osmosis.
16. The structure of biological membranes. Membrane transport.
**Seminar:** Material related to lectures 13 and 14.

**9th week:**
**Lecture:** 17. Thermodynamic equilibrium potentials (Nernst, Donnan). Diffusion potential, Goldman-Hodgkin-Katz equation.
18. Resting potential, action potential, and electrical excitability. Measurement of membrane potential.
**Seminar:** Material related to lectures 15 and 16.

**10th week:**
**Lecture:** 19. Ion channels (gating, selectivity), the "patch clamp" technique.
20. The physical background of ECG and EEG.
**Seminar:** Material related to lectures 17 and 18

**11th week:**
**Lecture:** 21. The human ear. Mechanism of hearing. The Weber-Fechner law.
22. The human eye. Photoreceptors. The molecular mechanism of vision.
**Seminar:** Material related to lectures 19 and 20.

**12th week:**
**Lecture:** 23. Biomechanics.
24. Fluid mechanics, blood circulation.
**Seminar:** Material related to lectures 21 and 22.

**13th week:**
**Lecture:** 25. Biophysics of respiration.
26. Flow cytometry. Confocal laser scanning microscopy.
**Seminar:** Material related to lectures 23 and 24.

**14th week:**
**Lecture:** 27. Modern microscopic techniques (atomic force microscopy, super resolution microscopy).
28. Research in the Institute.
**Seminar:** Material related to lectures 25 and 26.

## Requirements

**Department:** Department of Biophysics and Cell Biology, Biophysics Division
**Semester recommended for taking the subject:** 1st year, 1st semester
**Semester for the regular course:** 1st
**Prerequisites of the course:** no prerequisites
**Teaching staff:** Prof. Dr. Péter Nagy and members of the Department
**Educational advisor:** Dr. Zsolt Fazekas (e-mail: biophysedu@med.unideb.hu)

**Aim of the course:** The course is aimed at providing the necessary theoretical background for the understanding the physical principles applied in biology and medicine, and for the description of the physical processes in living organisms. The course introduces students to biophysical techniques facilitating (1) the understanding of the pathomechanism of diseases; (2) development of novel therapeutic approaches; (3) development of novel diagnostic tools: e.g. ECG, MRI, PET; (4)

understanding the functioning of cells, tissues and organs at the molecular level in order to provide a solid background for Physiology, Clinical Physiology and Radiology

**Short description of the course:** Students will be introduced to the quantitative description of the physical basis of selected topics in biology and medicine.

**Structure of the course**
- Introduction to natural sciences (e.g. basic principles of atomic and nuclear physics)
- Medical physics (e.g. physical principles of diagnostic and therapeutic procedures)
- Molecular biophysics (e.g. diffusion, membrane biophysics)
- Organ biophysics (e.g. vision, hearing, circulation)

**Compulsory reading**
- Medical Biophysics (Editors: S. Damjanovich, J. Fidy, J. Szöllősi, Medicina, Budapest, 2009, ISBN: 978-963-226-127-0)
- Educational material published on the web page of the Department.

**Web page of the Department:** http://biophys.med.unideb.hu/en

**Exam:** Written exam during the exam period after the 1st semester.

**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**
Attendance to seminars is compulsory, however, a student may miss maximum 7 (seven) seminars. Students may attend the seminars according to their group assignment only. 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 (7-15 minutes) about the topic of the seminars (max. 2 students/seminar). The topic list for short presentations is posted to the web page of the Department. 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:
* keeping the allocated time (min. 7, max. 15 min);
* good quality of the figures (axis labels, color combinations, appropriate resolution);
* simply reading the text from the slides is not appropriate
* teaching merit of the presentation (too many slides without proper explanation is not accepted here).

The presenting student must show up at the beginning of the class to allow time for file uploading and technical arrangements; students arriving late may be denied of the chance to present their work.

**3. Exemptions**
Requests for exemptions must be turned in to the Educational Office. The Department of Biophysics and Cell Biology does not accept such applications.

**4. Conditions for signing the lecture book**
 * 7 or fewer absences from seminars;

**5. Self-control tests**
There will be 2 self-control tests (SCT) during the semester (week 7 and week 12).
Topics for the 1st SCT: lectures up to (including) week 5, and discussed on seminars on week 6.
Topics for the 2nd SCT: lectures up to (including) week 10, and discussed on seminars on week 11. Approximately 90% of the questions will focus on the topics not included in the 1st SCT.
None of the SCTs is obligatory. The type of the questions will be similar to those on the final exam (FE). The SCTs will include five minimum requirement questions as well proportional to the SCT topics plus the physics background questions. 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 is counted as 0% in the calculation of the average. Missed SCTs cannot be made up at a later time. 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 part II 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 – 0p
35-49.99 – 5p
50-54.99 – 6p
55-60.99 – 7p
61-65.99 – 8p
66-72.99 – 9p
73-78.99 – 10p
79 and above – 11p
85 and above – see point iii below

iii) if $X_{ave}$ is at least 85, the student is eligible for a grade-offering oral exam conducted at the end of the semester, where – based on his/her performance – grades 4 or 5 can be offered. Topics of the oral exam only include the lectures that were not included in the two SCTs (i.e. lectures from Week 11 on).
If the student does not show up in the oral exam or his/her performance is not sufficient on the grade-offering exam, no grades are offered and the student should take the regular written FE during the exam period.

**6. 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 2 parts:
Part I: Minimum requirement questions. It consists of a written quiz of 20 minimum requirement questions. One must pass this part to have the written test (part II.) evaluated. Minimum requirement questions and the answers thereto are provided on the website of the Department. 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 5. i). This part is evaluated as pass or fail, once passed it is valid for further exam chances (B- or C-chance) of the FE. The result of the minimum requirement questions are not counted into the result of the written test (part II. of the FE).

Part II: Written exam. It consists of essays, fill-in-the-missing-phrase type questions, relation analysis and various simple test and multiple-choice questions etc. Part II will only be evaluated if part I is passed. 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 II of the FE. Additional exemptions are in point 5. iii.

Evaluation of the FE:
Grade is calculated based on the sum of written exam score + bonus points (see conditions for the bonus points above)

| Grade | written exam score + bonus points |
|---|---|
| fail (1) | 0- 59.99 |
| pass (2) | 60 - 69.99 |
| satisfactory (3) | 70 - 79.99 |
| good (4) | 80 - 89.99 |
| excellent (5) | 90 - |

Rules for C-chance exams:
C-chance exams are conducted by a committee. Exemptions regarding Part I of the FE gained in the given semester apply to the C-chance as well. The evaluation process of the C-chance exam differs from the regular procedure (A- and B-chance) in the following aspects:
- Part II is evaluated even if Part I is failed.
- If either Part I or Part II is failed, an oral exam is conducted.
- If the student passes all two parts of the FE (either based on exemptions or the C-chance written results), the grade will be determined by the result of part II.

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.

**7. Rules for the usage of calculators 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.

**8. Information for repeaters**

- attendance to seminars is compulsory (see point 2)
- all exemptions and bonuses obtained during the failed semester (self-control tests, exemption from minimals) are lost
- according to the relevant rules (point 5) self-control tests may be written and exemptions may be obtained again
- in the case of schedule collisions with 2nd year classes we ask students to choose the 2nd year groups such that conflicts with the 1st year subjects can be avoided.

**9. Information for Exam Course students**

Points 1-5 and 8 are irrelevant.
Rules regarding the exams (point 6-7) apply to the exam course completely.
Point 7 applies.
SCT and seminar bonus points and the exemption from taking part I of the exam are not valid for exam courses. These are valid for the course in which they have been achieved, i.e. if one passes part I in a given exam course it will be valid for B and C chances of that exam course.

Further information: Zsolt Fazekas, Ph.D., manager of education, Dept. of Biophysics and Cell Biology
E-mail: biophysedu@med.unideb.hu
Office hours: The location and time of office hours are posted in the News section of the Department's web page.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **BIOPHYSICS PRACTICAL**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **22**

**1st week:**
**Practical:** Introduction to Biophysics - Practical.

**2nd week:**
**Practical:** Introduction to Biophysics - Practical.

**3rd week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**4th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**5th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**6th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**7th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**8th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**9th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**10th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**11th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**12th week:**
**Practical:** Labs to be performed: (1) Measurement of diffusion constant; (2) Optical measurements; (3) Microscopy; (4) Computer tomography and blood pressure measurement; (5) Measurement with a Geiger-Müller counter. Attenuation of nuclear radiation. For detailed information (timetable, protocols, requirements, etc.) see the web page of the Department.

**13th week:**
**Practical:** Spare lab.

**14th week:**
**Practical:** Practical exam

## Requirements

**Department:** Department of Biophysics and Cell Biology, Biophysics Division
**Semester recommended for taking the subject:** 1st year, 1st semester
**Semester for the regular course:** 1st
**Prerequisites of the course:** No prerequisites
**Teaching staff:** Prof. Dr. Péter Nagy and members of the Department
**Educational advisor:** Dr. Zsolt Fazekas (e-mail: biophysedu@med.unideb.hu)

**1. Aims of the course:** Demonstration of some of the methods discussed in the Biophysics theoretical course, performing some simple experiments relevant to these topics, and introduction to designing, performing and evaluating experiments.

**2. Structure of the course**
- Mathematical introduction
- Completion of labs

**3. Compulsory reading**
- material posted on the web site of the department

**4. Recommended reading**
- Medical Biophysics (Editors: S. Damjanovich, J. Fidy, J. Szöllősi, Medicina, Budapest, 2009, ISBN: 978-963-226-127-0)
- Biophysics laboratory manual

**5. Educational web site**
biophys.med.unideb.hu

**6. Evaluation**
Grades on a five-point scale.

**7. Requirements**
1. Attendance to labs and recording all results in a separate logbook are compulsory. Students may attend the practicals according to their group assignment only. The lab begins with a written quiz. At least 2.5 of 5 points must be earned in this test in order to be eligible for doing the lab. The written quiz is composed of true/false, multiple choice and simple calculation problems. Students earning less than 2.5 points need to repeat the lab.
2. Evaluation: At the end of each lab the teacher grades the performance of the student on a scale between 0-5 (lab grade, LG). Getting 0 means that the lab is not accepted and it has to be repeated. Details of how to write lab logbooks and of the evaluation system can be found on the web page of the department. At the end of the semester students will be graded on a five-point scale based on the score of the written quizzes and the lab grades.
3. Making up missed labs: Maximum two missed labs can be completed during the week assigned to spare practicals. Students must register for the make-up labs. Only one occasion will be available for making up a certain lab. A given lab can be repeated/made up only once.
4. Rules regarding repeaters will be posted on the web page of the department.

Further information is available on the web page of the Department of Biophysics and Cell Biology (biophys.med.unideb.hu). The above information is subject to change if unforeseen circumstances arise. These changes will be posted on the web site.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Institute of Behavioural Sciences, Faculty of Public Health

Subject: **BASICS OF BEHAVIOURAL SCIENCES**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Lecture: **20**

**1st week:**
**Lecture:** Introduction. Behavioural Sciences.

**2nd week:**
**Lecture:** Basics of Medical Bioethics.

**3rd week:**
**Lecture:** Basics of Medical Anthropology.

**4th week:**
**Lecture:** Basics of Medical Sociology.

**5th week:**
**Lecture:** Basics of Medical Psychology I. Human Development.

**6th week:**
**Lecture:** Basics of Medical Psychology II. Emotions and motivations.

**7th week:**
**Lecture:** Basics of Medical Psychology III. Learning and Memory.

**8th week:**
**Lecture:** Basics of Medical Psychology IV. Personality and Psychological Disorders.

**9th week:**
**Lecture:** Basics of Medical Psychology V. Social Influence and Social Cognition.

**10th week:**
**Lecture:** Medical Psychology VI. Psychological Methods and Research in Psychology.

**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.)

Subject: **COMMUNICATION SKILLS**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **20**

**1st week:**
**Lecture:** Introduction to the concept of communication. Channels of communication. Verbal and non-verbal communication. The main non-verbal channels.

**2nd week:**
**Lecture:** The helping relationship. Influencing factors, principles. The role of empathy in the communication.

**3rd week:**
**Lecture:** Aggressive, passive and assertive communication. Effective communication techniques.

**4th week:**
**Lecture:** The importance of communication with people in different situations. Difficulties in communication situations. Persuasive communication.

**5th week:**
**Practical:** Empathy, problems of empathy, active listening. Significance of the firs impression.

**6th week:**
**Practical:** Aggressive, passive, and assertive communication. Persuasive communication.

**7th week:**
**Practical:** Movie (2 hours long)

**8th week:**
**Practical:** Movie - analyzing its communicational aspects. The role of confidence.

**9th week:**
**Practical:** Presentation of the field practice. Closing the semester, semester-review. Feedbacks.

**10th week:**
**Practical:** Presentation of the field study. Feedback for the presenters. Feedback for the teacher. Deadline of giving the essay. Closing the semester.

**Requirements**

Aims:
Introducing and recognizing fundamental characteristics of human communication and developing basic knowledge, skills and attitudes which are most important in doctor patient relationship. This course serves as a basis for the continuation of third year studies of more specific communicational knowledge needs for healing and curing in the field of medical practice.
Framework and process of learning:
In form of small-group learning discussions, role-plays, observational tasks will be introduced by which students can be active participants in learning by acquiring not only theoretical issues. Because teachers guide semi-structured seminars, student will be facilitated to give feedback, express opinions and propose available topics, which could build into to learning process.
During first seminars individual learning objectives can be elaborated together with teacher and classmates and can be achieved alongside the main objectives of the whole group.
Standpoints of the observational task of communication class:
For the purpose of developing so called observational skills, a special task will be introduced. Students will be requested to watch systematically human behaviours at different places where one can perceive various forms of formal and informal communication (two weeks will be given for completing observations instead of attending seminars during this period. Seminars will be

continued after two weeks break).
Sensitivity toward relating phenomena can be enhanced by these observational tasks. Several places of health case system, like wards, surgeries for outpatients, waiting rooms or other places like libraries, the campus where many human interactions can be observed are available.
Students will be asked to prepare a presentation and deliver it in front of the group. (Presentations will be held on the following week after finishing observations) and write an essay on the basis of their experience (volume: 3-4 pages, relevant theoretical background can be embedded. Deadline of giving in is the second week following the presentations).
The presentation will be given for the whole group and classmates will give feedback using structured criteria-system (see formative Assessment table on the back of the sheet. Presentation skills, proper use of nonverbal communicational channels can be assessed by which improvement of personal communicational skills can be facilitated.
After completed observational task the basic verbal communicational skills will be practiced using role-plays (or simulated patients- at given groups). Main forms of possible doctor-patient conversations can be discussed, as history taking, problem-, supportive-, and bad-new-conversations.
Oral Presentation: Formative Assessment
Skills and Qualities
Content/Text
Answers the question/deals effectively with the task. Demonstrates appropriate skills in analysis/synthesis/evaluation/application etc. Use of evidence/examples etc.
Structure/Logic
Forecasting e.g. introduction.
Sign positing e.g. beginning and end of subtopics, key points/foci (highlighting important points) linking, sequencing, summarising, closure i.e. concluding.
Delivery/Presentation
Voice (intonation, emphasis, pace, pauses, and silences).
Eye contact; posture, mannerisms, appearance, rapport with audience, timing etc. Audio Visual Aids.
Handling Questions
Responding engaging others in discussion, managing the audience (e.g. encouragement, constructive feedback).
Knowledge, depth or answer

# Department of Anatomy, Histology and Embryology

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY I. LECTURE**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **28**
Seminar: **28**

**1st week:**
**Lecture:** General introduction. Epithelial tissue: covering and lining epithelia.
**Seminar:** Histology: Introduction to histological methods. The microscope and the resolution. Using the virtual microscope: Case Center and Panoramic Viewer. 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)

**2nd week:**
**Lecture:** Osteology and arthrology - introduction. The muscular system - general introduction. Innervation of the muscles.
**Seminar:** 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.

**3rd week:**
**Lecture:** Glandular epithelium. Connective tissue - part one.
**Seminar:** 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).

**4th week:**
**Lecture:** Connective tissue - part two. Clinical anatomy of the upper limb.
**Seminar:** Histology: Glandular epithelium, pigment epithelium 1. 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.)

**5th week:**
**Lecture:** Connective tissue-part three. Adipose tissue. Cartilage.
**Seminar:** Histology: Cells of the connective tissue 1. Mesenchyme (umbilical cord, HE stain) 2. Fibroblasts (granular tissue, HE stain) 3. Mast cells (healing wound from rat skin, Toluidin blue stain) 4. Macrophages (Skin, Trypan blue - nuclear fast red stain) 5. Demonstration: l. Plasma cells (lymph node, HE stain) 2. Fibroblasts (tissue culture, H stain).
**Self Control Test**

**6th week:**
**Lecture:** Histology of bone. Development and growth of the bone.
**Seminar:** 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.

**7th week:**
**Lecture:** Muscular tissue - part one. Muscular tissue - part two.
**Seminar:** Histology: CONSULTATION (Basic histological methods. Epithelial and connective tissues.)

**8th week:**
**Lecture:** Spermiogenesis. Oogenesis. The structure of the foot.
**Seminar:** Histology: SELF CONTROL: Basic histological methods. Epithelial and connective tissues.
**Self Control Test**

**9th week:**
**Lecture:** Fertilization, beginning of the pregnancy. Clinical anatomy of the lower limb.
**Seminar:** 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) 8. White and brown adipose tissues (adrenal gland, HE).

**10th week:**
**Lecture:** Gastrulation. The early differentiation of the mesoderm. Histology of the blood vessels.
**Seminar:** Histology: Histology and development of the bone. l. 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. (rat knee joint, toluidin-blue stain).
**Self Control Test**

**11th week:**
**Lecture:** The differentiation of the ectoderm and mesoderm. Blood.
**Seminar:** Histology: Muscle tissue l. 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.

**12th week:**
**Lecture:** The differentiation of the entoderm, the folding of the embryo. Bone marrow.
**Seminar:** Histology: The microscopic structure of blood vessels. l. Elastic artery (HE stain). 2. Elastic artery (orcein stain). 3. Muscular artery and vein (HE stain) 4. Large intestine (HE stain) 5. Demonstration: Spermatic cord (Van-Gieson resorcin fuchsin stain).

**13th week:**
**Lecture:** Fetal membranes. Stages of development: embryonic and fetal periods. Twins. Developmental mechanisms The formation of blood cells.
**Seminar:** Histology: Blood. Bone marrow. 1.Peripheral blood smear (May-Grünwald-Giemsa stain) 2. Bone m.arrow (HE stain) 3. Sinusoids (Hypophysis, HE stain) 4. Demonstration: Bone marrow smear (May-Grünwald-Giemsa stain) video

**14th week:**
**Lecture:** Development of the skull and vertebrae. Overview of general embryology.
**Seminar:** Histology: SELF CONTROL - Adipose tissue, cartilage, bone, development and growth of the bone, muscular tissue. The histology of blood vessels, blood and bone marrow. Production of blood cells.
Embryology: SELF CONTROL - Embryonic development.
**Self Control Test**

## Requirements

Requirements
Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the University are valid. The attendance on the seminars is compulsory and presence will be recorded. The head of the department may refuse to sign the Lecture Book if a student is absent more than twice from histology seminars in one semester even if he/she has an acceptable reason. Compensation of seminars is possible only on the same week at another student's group. The compensation of three histology seminars is allowed in one semester.
Rules of examinations:
Evaluation of the midterm examinations:
The performance of the students on the midterm examinations will be evaluated on two histology (h1-h2) and one embryology (e1) self controls. The results of the midterm examinations will be

converted into marks in the following ways:

0 – 59%= 1 (fail)
60 – 69% = 2 (pass)
70 – 79% = 3 (satisfactory)
80 – 89% = 4 (good)
90 – 100%= 5 (excellent)

In case of a 2 (pass) or better performance in a self control the student can chose the obtained mark to be accepted as the grade for the particular part in the End Semester Exam. Students with a fail (1) mark for a given self control have to sit for that part in the end-semester exam. Students will be examined only from those parts from which they do not have an accepted mark by the end of the semester.

End semester examination:

The final examination consists of oral (anatomy - in the dissecting room) and written (histology, embryology - MOODLE) parts. The exams cover the topics of the lectures, seminars and practicals of both “Anatomy, Histology and Embryology I" course of the semester – and include the relevant material from official textbooks. The first exam is an “A” chance exam.

Oral part

Anatomy (three topics – three marks):
a1. upper limb
a2. lower limb
a3. skull and trunk

If the student has a 4 (good) or 5 (excellent) mark from the “Anatomy, Histology and Embryology – I. Practical” course (earned a “Practical Bonus”) the examiner will only ask two of the topics. The examiner decides which topic to leave out from the exam.

Written part

Embryology (one mark): e1

Histology (two marks):
h1: microtechnic, epithelial tissue, connective tissue
h2: adipose tissue, cartilage, bone, bone formation muscle tissue, blood vessels, red bone marrow, blood and development of its formed elements.

The obtained points of the written parts will be converted into marks similarly to the evaluation of the mid semester examinations (see above). The average marks from the oral and two written parts will be calculated as follows:

anatomy = (a1+a2+a3)/3OR anatomy = (a1+a2+5)/3 in case of a “Practical Bonus”
histology = (h1+h2)/2
embryology = e1.

The final ESE mark is calculated as the average of the anatomy, histology and embryology parts (rounded up from x.5 to the nearest integer)

ESE mark = (anatomy + histology + embryology)/3

Improvement

Improvement of the mark is possible during the regular examination period by repeating all of the oral and written parts of the exam and the ESE mark in this case will be calculated from the new marks. The previous ESE mark will be discarded.

Registration and postponement: Through the NEPTUN system.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY I. PRACTICAL**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **56**

**1st week:**
**Practical:** Anatomy: Anatomical terminology. Bones and joints of the upper limb. **a**. Anatomical terminology. Terms of positions and directions. Bones of the upper limb. 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 disci 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.

**2nd week:**
**Practical:** Anatomy: Dissection of the upper limb I-II. **a**. Dissection of the upper limb I. Surface anatomy of the upper limb. Show 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. 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.

**3rd week:**
**Practical:** Anatomy: Dissection of the upper limb III-IV. **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.

**4th week:**
**Practical:** Anatomy: Dissection of the upper limb V-VI. **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.

**5th week:**
**Practical:** Anatomy: **a**. CONSULTATION: The upper limb. (Bones, joints, muscles, blood vessels and nerves) **b**. Bones of the pelvic girdle: hip bone, sacrum. Joints, ligaments and walls of the pelvis. Statics of the pelvis. Bones of the lower limb.

**6th week:**
**Practical:** Anatomy: Bones of the lower limb. The structure of the pelvis. Joints of the lower limb. Dissection of the lower limb I. **a.** Joints of

the lower limb. Follow the instruction that was given at the upper limb. **b**. Surface anatomy of the lower limb. Show 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. 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.

**7th week:**
**Practical:** Anatomy: Dissection of the lower limb II-III. **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.

**8th week:**
**Practical:** Anatomy: Dissection of the lower limb IV-V. **a**. Dissection of the gluteal region, popliteal fossa and the sole. Clear all fasciae from the gluteus maximus muscle before transsection. 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 adductor hiatus, popliteal fossa, supra -et infrapiriform hiatuses.

**9th week:**
**Practical:** Anatomy: Dissection of the lower limb VI - CONSULTATION. **a**. 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. **b**. CONSULTATION

**10th week:**
**Practical:** Anatomy: Bones and joints of the thorax and vertebral column. **a.** Bones and joints of the thoracic cage and vertebral column. **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.

**11th week:**
**Practical:** Anatomy: Skull I-II. **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.

**12th week:**
**Practical:** Anatomy: Skull III-IV. **a**. Inferior aspect of the skull. Vault of the skull (calvaria), sutures, fonticuli. **b**. Bones of the facial skeleton including the mandible - overview Individual bones: shape, main parts. The structure of the facial skeleton.

**13th week:**
**Practical:** Anatomy: Skull V-VI. **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.

**14th week:**
**Practical:** Anatomy: CONSULTATION+End Semester Exam (ESE): **a**. CONSULTATION - Lower limb, bones of the thorax and vertebrae, skull.

**Requirements**

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 will be recorded. The head of the department may refuse to sign the subject if a student is absent more than three times from practices in the 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. All together, compensation of three practices is allowed.

The exam is an oral examination conducted with the aid of anatomical preparations in the dissecting room, in the time of the last practical on the 14th week. The exam will focus on IDENTIFICATION of gross anatomical structures selected from a list of structures that will be made available for the students in the first week of the semester. The examination is successful in case of 60% or better performance. The successful ESE is converted to grades on the basis of the following scheme of conversion:
0 - 59 % = 1 (fail)
60 - 69 % = 2 (pass)
70 - 79 % = 3 (satisfactory)
80 - 89 % = 4 (good)
90 - 100 % = 5 (excellent)
In case the result of the AW5 is 4 (good) or 5 (excellent) the student will earn a “Practical Bonus” for the Final Examination of the “Anatomy, Histology and Embryology – I. Lectures” course.

Registration for the examination:
Students are supposed to register for the ESE through the NEPTUN system.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

## Department of Biochemistry and Molecular Biology

Subject: **MOLECULAR BIOLOGY LECTURE**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **42**
Seminar: **14**

**1st 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.

**2nd 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 Michealis-Menten and Briggs-Haldane kinetics. Definition and determination of KM and vmax. 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.

**3rd 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.

**4th 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.

**5th 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.

**6th 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).

**7th 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.

**8th week:**
**Lecture:** Transcription in eukaryotes. Transcription of mRNAs. Stages of eukaryotic

transcription. Formation of caps (capping). Excision of introns (splicing), snRNAs and the splicosome. The polyadenylation. Alternative splicing. Export of mRNA. Quality control of mRNA. Transcription and posttranscriptional modifications and transport of rRNA and tRNA.
**Self Control Test**

**9th 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.

**10th 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.

**11th 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.

**12th 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: ubiqutination and the proteasome system. Proteases.

**13th 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 immunoprecipitiation.
**Self Control Test**

**14th 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.

## Requirements

**Requirements for signing the semester**: attendance in seminars.

Required knowledge from Molecular Biology: topics of molecular biology presented at the lectures (slides are available at the https://elearning.med.unideb.hu web site, login with your university network ID and password) and topics discussed in the seminars.
Attendance on the **lectures** is recommended, but not compulsory. Note that getting the bonus points on the seminars will be very difficult without proper understanding of the material, for which the attendance on the lectures is essential.

On the **seminars,** lectures of the previous week can be discussed. On the seminars 10 bonus points can be collected by the seminar tests. Based on the test results, from 60 % 4 bonus points, from 70 % 6 bonus points, from 80 % 8 bonus points, from 90% 10 bonus points can be collected (please ask for more details the seminar teachers). The seminar bonus points will be added to the total points collected during the semester, but can't be added to the points of the written exam. In case of the seminars maximum three absences are accepted. Students can't make up a seminar with another group. Seminars are not obligatory for repeaters (if they have got signature previously). Only those students can collect seminar bonus points, who don't miss more than three seminars (regarding repeaters, too).

**Control tests:** During the semester students can write two control tests from the material of the lectures and seminars. Both tests are composed of 40 single choice test questions (one correct answer must be marked among five possible answers, each good answer is 1,25 points. By the two control test max. 2 x 50 points can be collected. Control tests are not obligatory.

**Offered grades**: at the end of the semester, on the basis of the collected points, grade will be offered. During the semester 100 (+10) points can be collected by the two control tests of the material of the lectures (50+50 points) and by the seminar tests (10 points). Grades: 2 (pass): 60-69.5 points, 3 (satisfactory): 70-79.5 points, 4 (good): 80-89.5 points and 5 (excellent): 90-110 points.

Students have to decide to accept the offered grade until beginning of the exam period. If someone accept the grade, it will be registered in the Neptun and the grade can be improved once during the exam period. If one declines the offered grade one must take exam in the exam period.

Semester points will be automatically erased of those students, who break the rules of test writing.

**Semester exam**: Those students who did not collect 60 points during the semester (or didn't accept the offered grade) have to take a written exam in the exam period. The written exam composed of 40 single choice test questions (one correct answer must be marked among five possible answers, each good answer is 2.5 points). By the test maximum 100 points can be collected. 60% (60 points) is needed to get a passing mark, and the grade increases with every 10 points (60-69.5 pass, 70-79.5 satisfactory, 80-89,5 good, 90-100 excellent).

If a student fails the "C" written exam, the department provides him/her a chance to prove his/her knowledge in an oral exam in front of an examination committee. If the student passes the oral exam he/she will be given a grade 2 (pass). The department will provide one examination date per week during the exam period.

Improvement exam: It is allowed to take one improvement exam for a fee in the form of a semester exam. Both the offered grade and the exam grade can be improved. The policy of the institute is that one may not worsen the already achieved grade.

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 having to write a written part of the biochemistry and molecular biology final exam. Minimum questions of the Biochemistry final exam will also contain basic questions of Molecular Biology.

Please follow the announcements of the department on the announcement table (LSB downstairs 1st corridor), and on the website (http://bmbi.med.unideb.hu), you can login with your university network ID and password.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **MOLECULAR BIOLOGY PRACTICAL**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **15**

**5th week:**
**Practical:** Introduction practice

**6th week:**
**Practical:** Introduction practice

**7th week:**
**Practical:** Introduction practice

**8th week:**
**Practical:** Protein blotting and immunological identification by specific antibodies.

**9th week:**
**Practical:** Protein blotting and immunological identification by specific antibodies.

**10th week:**
**Practical:** Protein blotting and immunological identification by specific antibodies.

**11th week:**
**Practical:** Studies on phosphatases

**12th week:**
**Practical:** Studies on phosphatases

**13th week:**
**Practical:** Studies on phosphatases

**Requirements**

**Requirements for signing the semester:**

Every laboratory **practices** must be performed, if someone is absent due to any serious reason, the missing experiment have to be performed within the three weeks practical period joining to another group (after obtaining permission from the practical teacher of the other group). Period of the practices: “Introduction” on week 5-7, “Western-blot” on week 8-10, “Study of phosphatases” on week 11-13. Students have to be prepared for the practices. Please check our homepage to get more information and the schedule of the practices (http://bmbi.med.unideb.hu/Education/Molecular Biology/GM, Dent/Information about practices)! For obtaining the signature students need to attend the three practices, submit the laboratory books in the required format. Grades will be given on the basis of the quality of notebooks and laboratory work.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE I/2.**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** 1. Emlékszel?

**2nd week:**
**Practical:** 2. Napirend

**3rd week:**
**Practical:** 3. Melyik a jobb?

**4th week:**
**Practical:** 3. Melyik a jobb?

**5th week:**
**Practical:** 4. A testem

**6th week:**
**Practical:** 5. Beteg vagyok

**7th week:**
**Practical:** 6. Ismétlés a tudás anyja Midterm test

**8th week:**
**Practical:** 7. A család

**9th week:**
**Practical:** 7. A család

**10th week:**
**Practical:** 8. Csak azért is zumbázni akarok

**11th week:**
**Practical:** 9. Mit csináltál tegnap?

**12th week:**
**Practical:** 9. Mit csináltál tegnap? 10. Hol nyaraltatok?

**13th week:**
**Practical:** 10. Vizsga lesz! End term test

**14th week:**
**Practical:** Oral exam

**Requirements**

**Requirements of the course:**
**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, (no matter why) the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Hungarian language course, students must sit for 2 written language tests, an oral and a listening exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their written test and have to take a vocabulary exam that includes all 100 words before the midterm and end term tests. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.

Based on the final score the grades are given as follows.

| **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 of the written tests is below 60, the student can take a written remedial exam once covering the whole semester's material.

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**
Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

# Department of Human Genetics

Subject: **MEDICAL GENETICS LECTURE**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **30**

**1st week:**
**Lecture:** (1) Introduction to genetics, molecular genetics and genomics. DNA is the genetic material. (2) Molecular organization of chromosomes in prokaryotes and eukaryotes. The human genome. Cell division: mitosis. (3) Cell division: meiosis.

**2nd week:**
**Lecture:** (4) Cytogenetics I. Karyogram, ideogram, banding techniques. Human autosomal trisomies. (5) Cytogenetics II. Abnormalities of the X and Y chromosomes. Sex determination in humans. (6) Cytogenetics III. Structural aberrations of human chromosomes. Genomic imprinting. Uniparental disomy. Molecular cytogenetics.

**3rd week:**
**Lecture:** (7) The function of genes. Gene expression. (8) Gene regulation in prokaryotes. (9) Gene regulation in eukaryotes.

**4th week:**
**Lecture:** (10) Epigenetics, the genetic role of RNA. (11) Transmission genetics. Genes and alleles. Genotype and phenotype. Monohybrid cross. Mendel's 1st law. Reciprocal cross and test cross. Autosomal and X-linked genes. (12) Dihybrid cross. Mendel's 2nd law. Different

types of inheritance. Dominant and recessive genes: a molecular view. Genotype and phenotype. Extranuclear inheritance.
**Self Control Test (1st test in extra time on Monday morning.)**

**5th week:**
**Lecture:** (13) Gene interactions, epistasis, lethal genes. Multiple alleles. (14) The genetic basis of complex inheritance. (15) Mutation and repair.

**6th week:**
**Lecture:** (16) Human genetic diversity. DNA polymorphism. (17) Human genetic diversity. Genetics of blood types and MHC. (18) Population genetics.
**Practical:**

**7th week:**
**Lecture:** (19) The molecular, biochemical and cellular basis of genetic diseases I. (20) The molecular, biochemical and cellular basis of genetic diseases II. (21) The treatment of genetic diseases.

**8th week:**
**Lecture:** (22) Cancer genetics and genomics. (23) Pharmacogenetics, pharmacogenomics Ecogenetics and ecogenomics. (24) Human gene mapping and disease gene identification.

**9th week:**
**Lecture:** (25) Human gene mapping and disease gene identification. (26) Bacterial genetics. (27) Developmental genetics and birth defects.
**Self Control Test (2nd test in extra time on Monday morning.)**

**10th week:**
**Lecture:** (28) Genomics, proteomics, the human genome project.. (29) Prenatal diagnosis. Personalized medicine. (30) Genetic counseling and ethical issues.

**11th week:**
**Lecture:** Medical genomics lectures

**12th week:**
**Lecture:** Medical genomics lectures

**13th week:**
**Lecture:** Medical genomics lectures

**14th week:**
**Lecture:** Medical genomics lectures
**Self Control Test (3rd test in extra time on Monday morning.)**

## Requirements

**Conditions of signing the lecture book:**

During the semester there will be three self-control tests offered in the 4th, 9th and 14th 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:

| Percentage (%) | 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 have to register also for the practical part, but with the group constructed for repeaters with signature from a previous year. DO NOT register to more than one groups.
They can take the three midterm tests in order to qualify for an offered grade based on these tests, or for test bonuses and they take the regular exam at the end of the semester. They cannot have home-work bonuses.
Students, who did not earn a signature in the previous year have to register and attend the labs and seminars and they are considered as the other students registering the course at the first time.

**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%. Bonuses are calculated only in the year of acquisition.
Further bonus points (1 points each) are given for the timely and correct completion of the following midterm home-works:
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.
As a first task of the examination medical student receives 10 basic questions. You have to answer correctly at least 7 of them to qualify for the exam. If you cannot answer correctly the required minimum number of questions your exam is considered unsuccessful. You have to pass this basic question exam only once in a semester. If you have to repeat the semester, you have to repeat the basic question exam, too. Students, who received offered grade do not have to answer the basic

questions.

The slides of the lectures and up-to-date information can be found at https://elearning.med.unideb.hu, username and password is your network-id (same as Neptun-id) and password. You will be able to check the content after the Neptun has registered you to the subject.

Departmental homepage: https://humangenetics.unideb.hu

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **MEDICAL GENETICS PRACTICAL**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **26**

**1st week:**
**Practical:** Seminar. How to study. Required and advised readings. Laboratory safety rules in student's laboratories. The nucleus and the chromatin. Cell division, mitosis and meiosis.

**2nd week:**
**Practical:** Seminar on cytogenetics.

**3rd week:**
**Practical:** Seminar on gene structure, function, regulation.

**4th week:**
**Practical:** Seminar on mendelian genetics I. Theoretical background, problem solving.

**5th week:**
**Practical:** Study of X chromatin: the Barr body. Demonstration of mammalian chromosomes. Preparation of metaphase spreads.

**6th week:**
**Practical:** Complementation test. The gene concept.

**7th week:**
**Practical:** Induction of beta-galactosidase in E. coli cells.

**8th week:**
**Practical:** Seminar on mendelian genetics II. Problem solving. Pedigree analysis. Polymorphisms.

**9th week:**
**Practical:** Seminar on molecular genetics of inherited human diseases. Mutation, repair.

**10th week:**
**Practical:** Seminar on population genetics.

**11th week:**
**Practical:** Detection of human polymorphism by polymerase chain reaction.

**12th week:**
**Practical:** PCR evaluation of the human polymorphism experiment. Transformation of E. coli by plasmid DNA.

**13th week:**
**Practical:** Seminar. General consultation.

**14th week:**
**Practical:** Medical genomics seminar

## Requirements

Concerning attendance, the rules are set out in the Rules and Regulations of the University.

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 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. 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 14th weeks in Medical Genetics. The questions include multiple choice and short essay questions, figures, pedigrees, definitions, etc. Selected ones will be considered as practical questions and based on the % average of the three test practical question results a final grade will be offered according to the next table:

| Percentage (%) | 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.

**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) is dispensable. Students should register for the subject electronically during the first weeks of the semester. They have to register for the practical part with the group constructed for repeaters with signature from a previous year. DO NOT register to more than one groups.

They can take the three midterm tests in order to qualify for an offered grade based on these tests, or for test bonuses and they take the regular exam at the end of the semester. They have to answer the practical questions in order to have a grade for the Medical Genetics Practical course. They cannot have home-work bonuses.

Students, who did not earn a signature in the previous year have to register and attend the labs and seminars and they are considered as the other students registering the course at the first time.

The slides of the lectures and up-to-date information can be found at

https://elearning.med.unideb.hu, username and password is your network-id (same as Neptun-id) and password. You will be able to check the content after the Neptun has registered you to the subject.

Departmental homepage: https://humangenetics.unideb.hu

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Division of Cell Biology

Subject: **CELL BIOLOGY LECTURE**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **28**
Seminar: **28**

**1st week:**
**Lecture:** 1. Introduction. Origin of life. Prokaryotes and eukaryotes. Basic cell constituents and functions.
2. Cell membrane. Membrane transport
**Seminar:** Introduction, course requirements, safety, FAQ.

**2nd week:**
**Lecture:** 3. ABC transporters and related diseases
4. Ion channels, membrane potential.
**Seminar:** Material related to lectures 1-2.

**3rd week:**
**Lecture:** 5. Cell organelles. Overview of intrcellular transport processes
6. Intracellular membrane systems I: lysosome, peroxisome, endoplasmic reticulum
**Seminar:** Material related to lectures 3-4.

**4th week:**
**Lecture:**
7. Intracellular membrane systems II: The Golgi complex, endo- and exocytosis, protein sorting
8. Nuclear envelope. Transport through nuclear pores
**Seminar:** Material related to lectures 5-6.

**5th week:**
**Lecture:** 9. Cytoskeleton I: microtubules
10. Cytoskeleton II: intermedier filaments, actin cytoskeleton
**Seminar:** Material related to lectures 7-8.

**6th week:**
**Lecture:** 11. Calcium homeostasis
12. Osmo-, volume and pH regulation
**Seminar:** Material related to lectures 9-10.

**7th week:**
**Lecture:** 13. Cell-cell and cell-matrix contacts
14. Cellular energetics, mitochondrion
**Seminar:** Material related to lectures 11-12.

**8th week:**
**Lecture:** 15. Nucleus, Chromtatin
16. Mitosis, meiosis

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

**9th week:**
**Lecture:** 17. Mechanics of the cell cycle
18. Regulation of the cell cycle
**Seminar:** Material related to lectures 15-16.

**10th week:**
**Lecture:** 19. Cell signaling I. General concepts. Nuclear receptors. G-protein coupled receptors
20. Cell signaling II. Receptor tyrosine kinases. The Ras/MAPK, PI3K/Akt and PLC/CaMK pathways

**Seminar:** Material related to lectures 17-18.

**11th week:**
**Lecture:**

21. Cell signaling III. Pathways to the nucleus
22. Cell-cell communication in the nervous and the immune system
**Seminar:** Material related to lectures 19-20.

**12th week:**
**Lecture:**
23. The changing cell
24. Oncogenes, tumor cells
**Seminar:** Material related to lectures 21-22.

**13th week:**
**Lecture:** 25. Cell senescence, apoptosis
26. Stem cells
**Seminar:** Material related to lectures 23-24.

**14th week:**
**Lecture:** 27. Interaction of cells with viruses and bacteria.
28. Cell motility
**Seminar:** Material related to lectures 25-26.

## Requirements

**Department:** Department of Biophysics and Cell Biology, Cell Biology Division

**Recommended semester:** 1st year 2nd semester.
**Semester for the regular course:** 1st.
**Prerequisites of the course:** No prerequisites.
**Teaching staff:** Prof. Dr. György Vereb and the members of the Department
**Education coordinator:** Dr. Zsolt Fazekas (e-mail: cellbioedu@med.unideb.hu)

**Aims of the course:** The course gives an overview of the functional anatomy of higher eukaryotic animal cells with examples of the paradigmatic molecular mechanisms. Students successfully completing the course will have acquired an active professional vocabulary minimally required for studying biochemistry, molecular biology, genetics, histology and physiology. In addition, the course aims to provide a thorough knowledge base which serves to understand the functions and dysfunctions of the human body in their broader context.

**Course synopsis:** Structure and constituents of eukaryotic cells, the most important cellular functions: membrane transport, vesicular transport, cell signaling, cell division (mitosis, meiosis), differentiation, cell death

**Material to be studied:**
Compulsory sources: 4th ed. of Essential Cell Biology (Alberts et al.,Garland Publ Inc. 2014. ISBN:

978-0-8153-4454-4). Chapters 1 and 11 through 20 are studied in depth during the course. Chapters 2 through 10 contain explanations for basic molecular concepts. There is additional core material that is available only in the lectures.

Cell biology Lab Notes: the currently required, up-to-date version is available at the course home page.

**Recommended:** The in depth full-text version of the course material can be found in:
Alberts et al.: Essential Cell Biology, 4th edition, Garland Publ. Inc., 2014, ISBN 978-0-8153-4455-1; Lodish et al.: MOLECULAR CELL BIOLOGY, 7th edition, W. H. Freeman, 2013, ISBN-13: 978-1-4292-3413-9; Alberts et al.: MOLECULAR BIOLOGY OF THE CELL; 6th edition, Garland Publ. Inc., 2015, ISBN 978-0-8153-4453-7;
The 4th editions of these are also available online:
http://www.ncbi.nlm.nih.gov/books/NBK21475/
http://www.ncbi.nlm.nih.gov/books/NBK21054/

**Knowledge that will be examined in this course** is comprised in the slides presented in the lectures. It is recommended to download these slides before the lectures ant take notes on them during the lecture. Slides of central importance will be marked accordingly.

**Course home page:** http:// biophys.med.unideb.hu/

**Signature:** Signing for the course can be denied if the student has missed more than 2 seminars.

**Type of exam:** Final exam

**Exemptions:** In order to get exemption from the complete Cell Biology course, the student has to apply to the Education Office. Applications for exemption from part of the courses are handled by the Department. The deadline for such applications is Monday on the second week of education. No application will be considered after this date. The following documents have to be submitted to the Educational 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. Applicants may be interviewed before the decision is made.

**Requirements:**

**1. Lectures:** Attendance of lectures is indispensable for acquiring the knowledge required to pass, understanding which parts of the material have the highest importance, and finding the proper sources for preparing for the exam.

**2. Seminars:** Seminars serve to discuss the lecture material. Use them well, study the material before the seminar and arrive with your questions. Maximum two absences are permitted. Students must attend the seminars with their assigned study group. Students may sign up for one short interactive presentation during the semester. The teacher will choose the topic/questions on the spot and the presenter is required to pick the appropriate lecture slides and use them explain the topic. This requires the in depth knowledge of all the topics presented at the lectures and studying the relevant textbook chapters. The presentations are graded on a scale of 0-5. This grade counts toward the bonus points earned during the semester.

**3. Labs:** Labs are done under a separate subject code.

**4. Self-control Tests (SCT-s):**
There will be at least two SCT-s. The dates and topics (covering roughly the whole material) for SCT-s are announced in the beginning of the semester. Test and essay questions are scored on a 0-100% scale, averaged for the SCTs (=$SCT_{ave}$) and this average is used to offer exemptions and bonus points towards the final grade (see 5.2 and 5.4.1.). Similarly to the final exam, basic questions (on minimally required knowledge, part A) and in depth questions (part B) constitute the SCT. As opposed to the final exam, both A and B parts are evaluated in SCTs and contribute to the SCT score regardless of their value.
Writing the SCTs is not compulsory; SCTs cannot be made up for, even in the case of a justified absence. Missed SCTs contribute a score of 0 towards $SCT_{ave}$.

**5. Final Exam (written):**

**5.1. Parts of the Final Exam.** The exam is a written test of two parts (A and B).
**Part A** of the written test is a so-called minimum level test. It consists of a set of 10 true-or-false questions about basic cell biology knowledge (1 point each) and 5 questions asking for a brief description of basic terms (molecules, concepts). These terms are listed among the key-words published on the subject's website. The answers are scored on a 0-2 scale in increments of 0.5 points. The student has to score 16 or above out of the total 20 points in part A to pass. Below 16 points the grade of the exam is a fail (1) and part B is not marked (except C and last chance exams, see 5.5.). For writing Part A, 20 minutes are allocated. A successful passing of Part A (or exemption from writing Part A, see 5.4.2) is valid for B and C exams throughout the exam period, but not beyond.
**Part B** is a 90 minute complex written exam, including short essays (~20-25% of the total score), fill-in, short answer, multiple choice, relation analysis, sketch-recognition as well as simple choice and yes-or-no questions.

**5.2. Calculating the exam score.** As per 5.1., exam score is only calculated if Part A is passed.

| | |
|---|---|
| 1. % result of Part B expressed as points | 100 points maximum |

**If score on Part B is greater or equal to 50%, the following bonus points are added to the score of Part B:**

| | |
|---|---|
| 2. Presentation grade | 5 points maximum |
| 3. Average % results of SCTs ($SCT_{ave}$) | |
| 3 points for reaching 30% | |
| and +1 point for each additional 10% reached | 10points maximum |
| **Total:** | 115 points maximum |

**N.B.** Bonuses are only valid in the semester they were obtained.

**5.3. Assigning grades to exam scores**

Part A below 16 points: fail (1)

Exam score (see 5.2.):
below 60 points: fail (1)
60-69 points: pass (2)
70-79 points: satisfactory (3)
80-89 points: good (4)
reaching, and above 90 points: excellent (5)

**5.4. Exemptions**

5.4.1. For those who achieve $SCT_{ave}$ >=50% at the self-control tests, a final grade offering score is calculated as follows:

1. $SCT_{ave}$ % expressed as points 100 points maximum
2. Presentation grade5 points maximum
Total:105 points maximum

Grades are offered as listed under ”**5.3. Assigning grades to exam scores**”. (Part ‘A’ is considered to be passed in this case.)

5.4.2. Those who achieve $SCT_{ave}$ >=66% at the self-control tests and do not accept the offered grade calculated as under 5.4.1. and therefore take the final exam, are exempted from Part A of the written final exam during the given semester.

**5.5. “C” chance and last chance exams**

At ”C” and last chance exams if the score on Part A is 16 or above, and the exam score is 60 or above, grades are assigned as usual (see 5.3.). However, if Part A is failed, Part B will nevertheless be marked. A failed written exam is followed by an oral exam and the final grade is determined from comprehensive evaluation of the written and oral parts.

**6. Rules for repeating the course**

**6.1. Repeaters taking again a regular Cell Biology course** need to attend seminars and can do presentations as regulated normally (see 2.). We encourage repeaters to write the SCTs since this is the only way to receive bonuses and exemptions based on $SCT_{ave}$ scores.

**6.2. Repeaters can apply for a Cell Biology exam course** in the third semester if they have received a signature in the previous semester. The above items 1.-4. and 6.1. are irrelevant to the exam course and consequently no bonuses can be earned during the exam course. Otherwise the final exam proceeds as detailed under 5.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **CELL BIOLOGY PRACTICAL**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **20**

**2nd week:**
**Practical:** Preparation for labs

**3rd week:**
**Practical:** Cell types and basic constituents: separation and staining of blood cells

**4th week:**
**Practical:** Cell types and basic constituents: separation and staining of blood cells

**5th week:**
**Practical:** Membrane transport: multidrog resistance

**6th week:**
**Practical:** Membrane transport: multidrog resistance

**7th week:**
**Practical:** Homeostasis: cell viability and death

**8th week:**
**Practical:** Homeostasis: cell viability and death

**9th week:**
**Practical:** Cell morphology, subcellular structures: fluorescent visualization

**10th week:**
**Practical:** Cell morphology, subcellular structures: fluorescent visualization

**11th week:**
**Practical:** Cell signaling: in situ observation

**12th week:**
**Practical:** Cell signaling: in situ observation

**13th week:**
**Practical:** Remedial lab

**14th week:**
**Practical:** Remedial lab

**Requirements**

**Department:** Department of Biophysics and Cell Biology, Cell Biology Division
**Recommended semester:** 1st year 2nd semester.
**Semester for the regular course**: 1st.
**Prerequisites of the course:** No prerequisites.
**Teaching staff:** Prof. Dr. György Vereb and the members of the Department
**Education coordinator:** Dr. Zsolt Fazekas (e-mail: cellbioedu@med.unideb.hu)

**Aims of the course:** The course gives an overview of the functional anatomy of higher eukaryotic animal cells with examples of the paradigmatic molecular mechanisms.

**Material to be studied:**
Cell biology Lab Notes: the currently required, up-to-date version is available at the course home page.
Relevant parts of the Cell Biology Lecture course (see there).

**Course home page:** http:// biophys.med.unideb.hu/

**Signature:** Signing for the course can be denied if the student has not performed all the lab practices or any of the lab logs has not been accepted.

**Type of exam:** Practical grade

**Requirements:**
Completing all labs, and writing up the results and their interpretation in a lab log book on the spot is required. Only handwritten, bound lab log books are acceptable. The compulsory preparation for the lab includes writing the aims of the lab and the methods of implementation into the lab logbook before the lab. During the lab the log written must document what the student has actually done, the results obtained (including graphs and color drawings), and their interpretation. The lab tutor will sign the log upon completion of the lab and acceptance of the lab performance and log (=lab signature, LS). All labs must be accepted by a valid LS in order to receive the end of term signature.
Labs can only be performed by students who arrive well prepared. This is checked by a ~10 min written quiz at the beginning of the lab, graded by the lab teachers on a scale of 0-5 (=Quiz Grade, QG). A grade of 0 results automatically in dismissal from the lab, and the student must do the lab, after adequate preparation, in the spare week. There is no possibility to make up for more than one missed lab. Grades >=1 are averaged ($QG_{ave}$) and contribute to the final grade.
Maximum one practice can be missed, and it must be made up for in the spare week. Besides a QG=0, only medical or official excuses are accepted, after presenting the appropriate documents to the Educational Advisor.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# CHAPTER 15
# ACADEMIC PROGRAM FOR THE 2ND YEAR

## Department of Anatomy, Histology and Embryology

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY II. LECTURE**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Lecture: **56**
Seminar: **48**

**1st week:**
**Lecture:** Topographical anatomy of the head and neck I. Topographical anatomy of the head and neck II. Topographical anatomy of the oral and nasal cavities. Anatomy, histology and development of the teeth.
**Seminar:** Histology: **a. - b.-**

**2nd week:**
**Lecture:** Pharynx. Larynx. Development of the face, and the oral and nasal cavities. Development of the pharyngeal gut.
**Seminar:** Histology: **a**. 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) **b**.-

**3rd week:**
**Lecture:** Clinical anatomy of the head and neck I. Clinical anatomy of the head and neck II. Lymphatic tissue I. Lymphatic tissue II.
**Seminar:** Histology: **a.** 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). **b**. Lymphatic tissues I. 1. Thymus (HE stain) 2. Lymphatic follicle (large intestine, HE stain) 3. Lymph node (HE stain) 4. Demonstration: Cells of the lymph node (video).

**4th week:**
**Lecture:** Lymphatic tissue III. The skin. The hypothalamo-hypophyseal system. Hypopysis and epiphysis.
**Seminar:** Histology: **a**. Lymphatic tissues II. 1. Spleen (HE stain) 2. Palatine tonsil (HE stain) 3. Lingual tonsil (HE stain) **b.** The skin 1. Fingertip (HE stain) 2. Skin (HE stain) 3. Mammary gland (HE stain)

**5th week:**
**Lecture:** Thyroid gland, parathyroid gland, suprarenal gland. The APUD system. Heart I. Heart II.
**Seminar:** Histology: **a.** Endocrine organs I. 1. Hypophysis (HE stain) 2. Hypophysis (Azan stain) 3. Epiphysis (HE stain) **b**. Endocrine organs II. 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)

**6th week:**
**Lecture:** Heart III. Development of the heart I. Development of the heart II. Trachea and lungs.
**Seminar:** Histology: **a**. CONSULTATION - Histology of the lip, tongue, salivary glands, teeth (with its development), lymphatic tissue, skin, endocrine organs. **b. -**

**7th week:**
**Lecture:** Pleural sac. Development of the respiratory system. Mediastinum. Esophagus. Clinical anatomy of the organs of the thorax. Structure of the abdominal wall.
**Seminar:** Histology: **a**. SELF CONTROL - Histology of the lip, tongue, salivary glands, teeth (with its development), lymphatic tissue, skin, endocrine organs. **b**. Respiratory system I. 1. Larynx (HE stain) 2. Trachea (HE stain) 3. Lung (HE stain) 4. Lung (The vascular system

filled with drawing ink+HE)
**Self Control Test**

**8th week:**
**Lecture:** Digestive system - introduction. Development of the primitive gut. Stomach. Small intestines. Large intestine.
**Seminar:** Histology: Digestive system I. **a**. 1. Esophagus (HE stain) 2. Stomach (HE stain) 3. Stomach (PAS+H stain) 4. Demonstration: Stomach (GEP cells: silver impregnation and immunohistochemical reaction) **b**. Digestive system II 1. Gastro-duodenal junction (HE stain) 2. Gastro-duodenal junction (PAS+H stain) 3. Jejunum (HE stain) 4. Jejunum (Goldner's stain)
**Self Control Test**

**9th week:**
**Lecture:** Histology of the stomach and the intestines. Pancreas. Liver I. Liver II. Portal system. Peritoneum. Lesser sac of the peritoneum.
**Seminar:** Histology: **a**. Digestive system III. 1. Colon (HE stain) 2. Demonstration: Colon (GEP cells, immunohistochemical reaction) 3. Appendix (HE stain) 4. Rectum (HE stain) **b**. Digestive system IV. 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) 7. Gall bladder (HE)

**10th week:**
**Lecture:** Development of the peritoneum and intestines. Separation of the body cavities. Retroperitoneum. Gross anatomy of the kidneys.
**Seminar:** Histology: **a**. SELF CONTROL - Respiratory system. Digestive system. **b**. Urogenital system I. 1. Kidney - coronal section (HE stain)
**Self Control Test**

**11th 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 epidydimis.
**Seminar:** Histology: **a.** Urogenital system II. 1. Kidney - tangential section (HE stain) 2. Kidney (Vascular infiltration with drawing ink + HE stain) **b**. Uogenital system III. 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)

**12th 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.
**Seminar:** Histology: **a**. Urogenital system IV. 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 V 1. Vagina (HE stain) 2. Ovary (HE stain) 3. Ovary with corpus luteum (HE stain).

**13th 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 I.
**Seminar:** Histology: **a**. Urogenital system VI. 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 VII. 1. Pregnant uterus (HE stain) 2. Placenta (HE stain)

**14th week:**
**Lecture:** Placenta II. 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.
**Seminar:** Histology: **a**. Consultation - Urogenital system **b.** SELF CONTROL - Urogenital system
**Self Control Test**

## Requirements

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 the lectures will be recorded in half of the lectures. Students who are present on all the recorded lectures will receive a “Lecture Bonus”. The “Lecture Bonus” entitles the student to change EITHER the “Anatomy” OR “Embryology” complex topic of the Theory part in the Final Examination. Such change is only allowed once and only on an “A” chance exam.
The attendance on the histology seminars is compulsory and presence will be recorded. The head of the department may refuse to sign the Lecture Book if a student is absent more than twice from histology seminars in one semester even if he/she has an acceptable reason. Compensation of seminars is possible only on the same week at another student's group. The compensation of three histology seminars is allowed in one semester.
Midterm examinations:
Midterm examinations (Self Control Tests) are conducted with the MOODLE system in the time of the Histology Seminars. Attendance in the midterm examinations is compulsory. The self controls cover the topics of lectures and seminars of the semester, and include relevant material from official textbooks. If a student fails to show up on two or more midterm examinations the head of department may refuse to sign the subject.
Two Midterm examinations will cover the following topics:
Histology 1: Histology of the lip, tongue, salivary glands, palate, lymphatic tissue, skin, endocrine system. Structure and development of teeth and their supporting tissues.
Histology 2: Histology of the respiratory, digestive and the urogenital systems.
Evaluation of the midterm examinations:
Midterm examinations will be evaluated with points. The points earned in midterm examinations are converted to grades on the basis of the following scheme of conversion:
0 – 59 %= 1 (fail)
60 - 69 %= 2 (pass)
70 - 79 % = 3 (satisfactory)
80 - 89 %= 4 (good)
90 - 100 % = 5 (excellent)
The midterm examination is successful in case of 2 (pass) or better performance. In case of successful midterm examinations the student will be exempted from the corresponding parts (h1-h2) of Part 2 (Histology) of the final examination.
Final examination (at the end of the 1st semester):
Students can only sign up for the Final examination in the NEPTUN system after passing the “Oral Anatomy, Histology and Embryology II. Practical” course. The Final exam is an oral examination that consists of three parts:
Part 1 – Anatomy (2 topics from different regions of the human body with the continuous aid of anatomical preparations – Dissecting room)
a1. Head and neck: (gross and topographic anatomy including visceral relations)
a2. Visceral organs: (gross and topographic anatomy including visceral and skeletal relations of the organs of the thorax, abdomen, pelvis and perineum)

If the student has a 4 (good) or 5 (excellent) mark from the “Oral Anatomy, Histology and

Embryology – II. Practical" course (earned a "Practical Bonus") the examiner will only ask one of the topics. The examiner decides which topic to leave out from the exam.
On the "B" and "C" examinations the student will be exempted from the parts that have been successfully passed previously.
Part 2 - Histology (2 slides – Histology seminar room)
h1. Histology 1: Histology of the lip, tongue, salivary glands, palate, lymphatic tissue, skin, endocrine organs. Structure and development of teeth and their supporting tissues
h2. Histology 2: Histology of respiratory, digestive and urogenital system
On the "B" and "C" examinations the student will be exempted from the parts that have been successfully passed previously.
Part 3 – Theory (Dissecting room)
The student picks one complex topic from each part (Anatomy, Histology and Embryology). The mark for Theory (t1) will be calculated as the average of marks (1-5) for the anatomy, histology and embryology parts (recorded separately on the examination sheet). The Theory mark is a fail (1) if the student gets a fail (1) from any part (Anatomy, Histology and Embryology).
On the "B" and "C" examinations the entire Theory part has to be repeated.
Calculation of the mark for the final examination
The mark of the final examination will be calculated on the base of the following rules:
Part 1 – Anatomy = (a1+a2)/2 OR Anatomy = (a1+5)/2*
* in case of a "Practical Bonus"
Part 2 - Histology = (h1+h2)/2
Part 3 – Theory = t1
The final mark is calculated as the average of Part1, Part2 and Part 3 (rounded up from x.5 to the nearest integer)
Final mark = (Part 1 + Part 2 + Part 3) / 3
Registration for the examination:
Students are supposed to register for the exam through the NEPTUN system.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY II. PRACTICAL**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Practical: **84**

**1st week:**
**Practical:** Anatomy: Topographical anatomy of the head and neck I.-II.
**a**. Topographical anatomy of the head and neck I. Surface anatomy: Show 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$^{th}$ and VII$^{th}$ 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.

**2nd week:**
**Practical:** Anatomy: Topographical anatomy of the head and 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 middel 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.

**3rd week:**
**Practical:** Anatomy: Topographical anatomy of the head and the neck: V.-VI.
**a**. Head: Retromandibular fossa. At the side of the removed parotid gland dissect the alveolar nerve and artery from the mandibular canal in situ without removing the 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 nucheal region from the external occipital protuberance to the 7th 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.

**4th week:**
**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. **b**. Demonstration of the median section of the head and neck. Conclusion of the dissection of the pharynx and larynx. Demonstration of the pharynx, larynx, tongue, palatine and lingual tonsil.

**5th week:**
**Practical:** Anatomy: Repetition of the topographic anatomy of the head and the neck. Dissection of the thoracic cavity I.
**a**. Repetition of the topographic anatomy of the head and neck. **b.** Surface projections of the thoracic organs. On the anterior thoracic wall show 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. Presentation of radiographs.

**6th week:**
**Practical:** Anatomy: Dissection of the thoracic cavity II-III. **a**. 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 youratlaseswith the in situ positions of the thoracic organs. Mediastinum and its divisions. **b**. 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.

**7th week:**
**Practical:** Anatomy: Dissection of the thoracic cavity IV-V.
**a.** 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. **b**.Study the pleura and its recesses. Remove the lungs and inspect the surfaces. Discuss schematic drawings of atlases 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.

**8th week:**
**Practical:** Anatomy: Dissection of the thoracic cavity VI. Dissection of the abdominal cavity I. **a**.Structures of the posterior mediastinum. Dissection of the intercostal vessels and nerves. Topography of the intercostal space and the cupula pleurae. Presentation of radiographs. **b**. Demarcate the regions of the abdominal wall and cavity and discuss the surface projections of abdominal organs on the cadaver. Presentation of radiographs.

**9th week:**
**Practical:** Anatomy: Dissection of the abdominal cavity II-III.
**a**. Dissection of the median abdominal and the inguinal regions. Structure of the abdominal wall, layers of the abdominal wall. Muscles of the abdominal wall, rectus sheath, thoracolumbar fascia. Structure of the posterior abdominal wall. Opening of the abdominal cavity. Inspection and identification of the abdominal organs..**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.

**10th week:**
**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). 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. Topography and sheaths of the kidney. Layers of the retroperitoneal space.

**11th week:**
**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. **b**. Dissection of the retroperitoneal space. Diaphragm. Openings of the diaphragm and its piercing structures. Lumbar plexus. Parietal branches of the abdominal aorta.

**12th week:**
**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).

**13th week:**
**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.

**14th week:**
**Practical:**
Anatomy: True pelvis and perineal region V.
**a**. Male and female genital organs - demonstration of excised preparations. Placenta. Sacral plexus.

## Requirements

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 will be recorded. The head of the department may refuse to sign the subject if a student is absent more than three times from practices in the 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. All together, compensation of three practices is allowed.

The exam is an oral examination conducted with the aid of anatomical preparations in the dissecting room, in the time of the last practical on the 14th week. The exam will focus on identification of gross anatomical structures selected from a list of structures that will be made available for the students in the first week of the semester. The examination is successful in case of 60% or better performance. The successful AW5 is converted to grades on the basis of the following scheme of conversion:
0 – 59 %= 1 (fail)
60 - 69 % = 2 (pass)
70 - 79 % = 3 (satisfactory)
80 - 89 % = 4 (good)
90 - 100 % = 5 (excellent)
In case the result of the AW5 is 4 (good) or 5 (excellent) the student will earn a “Practical Bonus”

for the Final Examination of the “Anatomy, Histology and Embryology – II. Lectures” course.
In case the student fails the AW5, the exam can be repeated once in the regular examination period.
Registration for the examination:
Students are supposed to register for the ESE through the NEPTUN system.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

## Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY I. LECTURE**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Lecture: **42**
Seminar: **14**

**1st week:**
**Lecture:** Energy in biology. Oxidative phosphorylation. The citric acid cycle and its regulation. The mithocondrial genom.

**2nd week:**
**Lecture:** 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.

**3rd 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:**

**4th 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.

**5th 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.

**6th week:**
**Lecture:** Synthesis of triacyl-glycerol. Lipid metabolism during starvation. Ketone bodies.

**7th week:**
**Lecture:** Steroid hormones. Bile acids. Vitamin D. Eicozanoids. Lipid peroxidation. Synthesis of sphyngolipids and phospholipids

**8th 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.
**Self Control Test**

**9th 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.

**10th 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. Monooxygenation 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.

**11th week:**
**Lecture:** Degradation and synthesis of proline. Degradation and synthesis ofarginine 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 vitamine 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 cathecolamines.

**12th 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.

**13th 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.
**Self Control Test**

**14th week:**
**Lecture:** 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). Integrated metabolism.

**Requirements**

Requirements for signing the semester: attendance in seminars.

**Required knowledge from Biochemistry I.:** topics of metabolism presented at the lectures (slides are available at the https://elearning.med.unideb.hu website, login with your university network ID and password) and topics discussed in the seminars.

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.

On the **seminars** the lectures of the previous week can be discussed. On the seminars 10 bonus points can be collected by the seminar tests. Based on the test results, from 60% 4 bonus points; from 70% 6 bonus points; from 80 % 8 bonus points; from 90% 10 bonus points can be collected (please ask for more details the seminar teachers). The seminar bonus points will be added to the total points collected during the semester, but can't be added to the points of the written exam. In case of the seminars maximum three absences are accepted. Students can't make up seminars with another group. Seminars are not obligatory for repeaters, if they previously attended them. Only those students can collect seminar bonus points, who don't miss more than three seminars.

Achievements during the semester will be evaluated in terms of points. During the semester 100 (+ 10) points can be collected. 100 points could come from control tests of the material of the lectures. Control tests consist of test questions. Bonus points earned by the seminar tests (10 points) will be added to the total collected points. Semester points will be automatically erased for those students, who break the rules of test writings.

Grade will be offered on the basis of the collected points for all those students, who collected at least 60 points: pass for 60-69.5 points; satisfactory for 70-79.5 points; good for 80-89.5 points; excellent for over 90 points. Those students, who would like 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.

At the written end-semester exam 50 points can be collected, the test consists of single- and multiple choice test questions from the lecture material. 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, and 45-50 excellent).

Those students who collect at least 220 points during the three semesters from the three main courses (Molecular Biology, Biochemistry I., Biochemistry II.) of the Department of Biochemistry and Molecular Biology and have more than 60 points from each subjects will be exempted from the written part of the final exam.

Please follow the announcements of the department about the control tests, exams and other current information on the announcement table (LSB downstairs, 1st corridor), and on the website (http://bmbi.med.unideb.hu, login with your university network ID and password).

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **BIOCHEMISTRY I. PRACTICAL**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Practical: **30**

**1st week:**
**Practical:** Safety instructions and fire regulations. Introduction to the practices.

**2nd week:**
**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH. Studies on the coupling of mitochondrial electron transport by proton motive force to ATP synthesis.

**3rd week:**
**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH. Studies on the coupling of mitochondrial electron transport by proton motive force to ATP synthesis.

**4th week:**
**Practical:** Determination of the activity of glycolytic enzymes (aldolase, LDH), electrophoresis of LDH. Studies on the coupling of mitochondrial electron transport by proton motive force to ATP synthesis.

**5th week:**
**Practical:** Usage of medical devices in biochemistry. Bioinformatics I.

**6th week:**
**Practical:** Usage of medical devices in biochemistry. Bioinformatics I.

**7th week:**
**Practical:** Usage of medical devices in biochemistry. Bioinformatics I.

**8th week:**
**Practical:** Studies on transaminases.

**9th week:**
**Practical:** Studies on transaminases.

**10th week:**
**Practical:** Studies on transaminases.

**11th week:**
**Practical:** Evaluation and discussion of the practices. Control test.

**Requirements**

**Requirements for signing the semester:**
Every laboratory **practices** must be performed, if someone is absent due to any serious reason, the missing experiments have to be performed within the three weeks practice period joining another group (after obtaining permissions from the practice teacher of the other group). Grades will be given on the basis of the quality of the laboratory work, notebooks and the result of the practical tests.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE II/1.**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** 1. fejezet : Emlékszik?

**2nd week:**
**Practical:** 1. fejezet: Emlékszik? / Tegezés - Önözés

**3rd week:**
**Practical:** 2. fejezet: Tegezés - Önözés

**4th week:**
**Practical:** 3. fejezet: Élelmiszerek 1.

**5th week:**
**Practical:** 4. fejezet: Élelmiszerek 2.

**6th week:**
**Practical:** 5. fejezet: Étkezések, étteremben 1.

**7th week:**
**Practical:** 6. fejezet: Étkezések, étteremben 2.

**8th week:**
**Practical:** 7. fejezet: Összefoglalás, midterm test

**9th week:**
**Practical:** 8. fejezet: A városban 1.

**10th week:**
**Practical:** 9. fejezet: A városban 2.

**11th week:**
**Practical:** 10. fejezet: Édes otthon 1.

**12th week:**
**Practical:** 11. fejezet: Édes otthon 2.

**13th week:**
**Practical:** 12. fejezet: Összefoglalás End term test

**14th week:**
**Practical:** Oral exam

**Requirements**

**Requirements of the course:**
**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, (no matter why) the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week. with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Hungarian language course, students must sit for 2 written language tests, an oral and a listening exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their written test and have to take a vocabulary exam that includes all 100 words before the midterm and end term tests. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.

Based on the final score the grades are given as follows.

| **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 of the written tests is below 60, the student can take a written remedial exam once covering the whole semester's material.

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**

Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

# Department of Physiology

Subject: **MEDICAL PHYSIOLOGY I. LECTURE**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Lecture: **56**
Seminar: **28**

**1st week:**
**Lecture:**
Introductory remarks
Preparation for laboratory practices
Humoral regulation of cell function
Membrane transport mechanisms
Physiology of the body fluids. Liquor. Blood plasma.

**Practical:** Introduction

**2nd week:**
**Lecture:**
Red blood cells. Iron circulation.
Jaundice. Blood types.
Hemostasis 1
Hemostasis 2. White blood cells.
Electrical properties of the cell membrane

**Practical:** 1. Investigation of the cardiovascular functions

**3rd week:**
**Lecture:**
Mechanisms underlying the action potential.
Neuromuscular junction. Synapse The autonomic nerves
Basic receptor function.
Regulation of striated muscle contraction
Smooth muscle physiology

**Practical:** Evaluation of ecg recordings – recognition of ecg alterations

**4th week:**
**Lecture:**
Electrophysiology of cardiac myocyte
Mechanics and contractility of cardiac myocyte
Cardiac electrophysiology, ECG
The cardiac cycle
Cardiac mechanics

**Practical:** Determination of parameters characterising the respiratory functions
**Self Control Test**

**5th week:**
**Lecture:**
Autoregulation of cardiac output
Neuroendocrine control of cardiac functions
Cardiac work and energetics; cardiac failure
Principles of hemodynamics
Features of arterial circulation

**Practical:** Examination of the blood I.

**6th week:**
**Lecture:**
Microcirculation
Lymphatic circulation, venous circulation
Components of vascular tone
Cardiovascular reflexes I.
Cardiovascular reflexes II.

**Practical:** COMPUTER AIDED ACQUISITION AND PROCESSING OF BIOLOGICAL SIGNALS

**7th week:**
**Lecture:**
Renal, Humoral and Local Regulation of Circulation
Functions of endothelium
Coronary and cerebral circulation
Pulmonary circulation
Splanchnic, cutaneous and skeletal muscle circulation

**Practical:** Remedial lab

**8th week:**
**Lecture:**
Measurement of intracellular Ca2+ concentration
Mechanics of respiration
Compliance, work of breathing
Gas transport in the blood
Control of breathing

**Practical:** Effects of electrolytes on the uterinal smooth muscle function

**9th week:**
**Lecture:**
Neural regulation of gastrointestinal functions
Endocrine and paracrine regulation of gastrointestinal functions
Motor functions of the gastrointestinal tract I
Motor functions of the gastrointestinal tract II
Secretion of saliva and gastric juice

**Practical:** Computer simulation of the frank-straling-mechanism
**Self Control Test**

**10th week:**
**Lecture:**
Exocrine functions of pancreas, liver and intestines
Absorption of nutrients
The liver
Food intake and its regulation
Energy balance

**Practical:** Computer simulation of the humoral regulation of intestinal smooth muscle

**11th week:**
**Lecture:**
Regulation of body temperature
Energetics of muscle contraction
Exercise physiology

Circulatory shock I.
Circulatory shock II.

**Practical:** Investigation of the endothelial function on isolated arterial ring

**12th week:**
**Lecture:** Cardiovascular regulations under physiological and pathological conditions
**Practical:** Computer simulation of the skeletal muscle function

**13th week:**
**Practical:** Remedial lab
**Self Control Test**

**14th week:**
**Lecture:** Date of the remedial test
**Practical:** Remedial lab

**Requirements**

1. Signature of the semester
Attendance of lectures, laboratory practices and seminars is compulsory. The signature of the semester may be refused for the semester in case of more than three absences from the seminars and/or more than two absences from the practices.
Completion of a missed seminar with a different group is not possible. All missed practices must be must be made up, however this does not reduce the number of absences! 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 semester.
If one has five or more lecture absences, the end-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.med.unideb.hu).

The lectures of Medical Physiology I. are listed at the web site of the Department of Physiology (http://phys.med.unideb.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! Calculation of bonus points is detailed at the description of Medical Physiology II.

3. Examination
The first semester is closed by an oral end-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.med.unideb.hu/).

The ESE 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 has fewer than 5 lecture absences, and
- the Dept. of Physiology verifies the semester (signature of 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.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **MEDICAL PHYSIOLOGY I. PRACTICAL**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Practical: **42**

**1st week:**
**Practical:** Introduction

**2nd week:**
**Practical:** 1. Investigation of the cardiovascular functions

**3rd week:**
**Practical:** Evaluation of ecg recordings – recognition of ecg alterations

**4th week:**
**Practical:** Determination of parameters characterising the respiratory functions

**5th week:**
**Practical:** Examination of the blood I.

**6th week:**
**Practical:** Computer aided acquisition and processing of biological signals

**7th week:**
**Practical:** Remedial lab

**8th week:**
**Practical:** Effects of electrolytes on the uterinal smooth muscle function

**9th week:**
**Practical:** Computer simulation of the frank-straling-mechanism

**10th week:**
**Practical:** Computer simulation of the humoral regulation of intestinal smooth muscle

**11th week:**
**Practical:** Investigation of the endothelial function on isolated arterial ring

**12th week:**
**Practical:** Computer simulation of the skeletal muscle function

**13th week:**
**Practical:** Remedial lab

**14th week:**
**Practical:** Closing lab

**Requirements**

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Department of Anatomy, Histology and Embryology

Subject: **NEUROBIOLOGY LECTURE (NEUROANATOMY, NEUROBIOCHEMISTRY, NEUROPHYSIOLOGY)**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **52**
Seminar: **10**

**1st week:**
**Lecture:** Macroscopic anatomy of the central nervous system – Introduction I.
Macroscopic anatomy of the central nervous system – Introduction II.
Macroscopic anatomy of the central nervous system – Introduction III.
Macroscopic anatomy of the central nervous system – Introduction IV.

**2nd week:**
**Lecture:** Histology of the nervous system – I.
Histology of the nervous system – I.
Structure of the cerebral cortex.
General features of neurons and glial cells.

**3rd week:**
**Lecture:** Neuronal excitatory processes, role of ion channels.
Axonal transport: degeneration and regeneration in the central nervous system.
Ultrastructure and molecular architectures of synapses I.
Ultrastructure and molecular architectures of synapses II.
**Practical: Histology:** I. Peripheral nerve, neuroglia, ganglia, enteral plexus.

**4th week:**
**Lecture:** Synaptic function: vesicular release.
Synaptic regulation, pre-, and postsynaptic mechanisms, synaptic plasticity
Basic forms of neuronal interaction in the central nervous system.
Neuronal integration, EEG.
**Practical: Histology: II.** Cerebellum, thalamus, basal ganglia

**5th week:**
**Lecture:** Consultation lecture
Metabolism of the central nervous system – I.
Metabolism of the central nervous system – II.
Development of the central nervous system – neurohistogenesis. Parts of the nervous system
**Practical: Histology:** III. Cerebral cortex (neocortex, archicortex)

**6th week:**
**Lecture:** Development of the brainstem and spinal cord.
Development of the diencephalon and telencephalon.
Neurogenesis. Neuronal migration
Programmed cell-death, genesis and elimination of synapses

**7th week:**
**Lecture:** Sensory functions of the spinal cord; receptors, primary afferents.
The somatosensory system.
The viscerosensory system.
Physiology of sensory functions and skin sensation

**8th week:**
**Lecture:** Pain sensation and itch

Structure of the acoustic and vestibular system I.
Structure of the acoustic and vestibular system II.
Physical background of sensory functions I. (Wave-motions)
**Practical: Histology:** IV. Spinal cord, brainstem.

**9th week:**
**Lecture:** Mechanisms of hearing and vestibular sensation
Structures of the eye and the retina

Physical background of sensory functions – II. (optics)
Retinal mechanisms of vision

**Practical: Histology:** Inner ear

**10th week:**
**Lecture:** Eye movements, optical reflexes, basic mechanisms of color vision
Central processing of visual information
Taste and the olfaction I.
Taste and the olfaction II.
**Practical: Histology:** Eye, palpebra, lacrimal gland

**11th week:**
**Lecture:** Somatomotor functions of the spinal cord, neuromuscular endplate, spinal motor apparatus

Spinal cord reflexes, proprioceptive and nociceptive reflexes
Role of brainstem in motor coordination
Roles of the basal ganglia and cerebral cortex in motor coordination.
**Seminar:** Discussion of lecture material.
**Practical: Anatomy:** Sensory organs – II. Structures of the eye and orbita

**12th week:**
**Lecture:** Vegetative system: peripheral and brainstem vegetaive mechanisms.
Hypothalamic functions.
The limbic system.
Monoaminergic system; motivation, reward, addiction. Regulation of behaviour.
**Seminar:** Discussion of lecture material.

**13th week:**
**Lecture:** Sleep, wakefulness, attention, mechanisms of circadian rhythm.
Learning, memory, speech
Latest results in neurobiology I.
Latest results in neurobiology II.
**Seminar:** Discussion of lecture material.

**14th week:**
**Lecture:** -
**Seminar:** Discussion of lecture material.

## Requirements

1. Signature of the semester

Neurobiology is delivered by teachers of the Department of Physiology and the Department of

Anatomy, Histology and Embryology. The administrative duties of the course are managed by the Department of Physiology.

Attendance of the lectures, seminars are compulsory. The course director may refuse to sign the semester, if a student misses more than two seminars. Making up of missed seminars is not possible. Making up the histology part is possible with the same rules that applied for the courses: Anatomy-I and II.

In order to pass the course successfully students are advised to use textbooks (below), lectures and notes taken during the practical classes. Course thematic and lecture slides (including figures) can be downloaded from the e-Learning website of the faculty of Medicine or from the web site of dept. of Physiology.

2. Evaluation during the semester
The knowledge of students will be tested once during the semester in the form of a written test (multiple choice questions). The goal of this test is to provide feedback about the student's knowledge.

3. Examination
The semester is closed by an end-semester exam (ESE) covering the topics of all lectures, seminars, histology and laboratory practices of the semester. The ESE is a written test that is conducted with the help of Moodle system. The evaluation of the written ESE is based on the scale below:

0 – 59 %: fail
60 – 69 % pass
70 – 79 % satisfactory
80 – 89 % good
90 – 100 % excellent

For more details see the website of the Department of Physiology.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **NEUROBIOLOGY PRACTICAL (NEUROANATOMY, NEUROBIOCHEMISTRY, NEUROPHYSIOLOGY)**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Practical: **56**

**1st week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – Part I. Demonstration of surface structures of cerebral hemispheres, meninges, cisterns, structure of the calvaria, blood supply of the brain

**2nd week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – Part II. The structures and the position of the lateral ventricles.

**3rd week:**
**Practical:** Dissecting Room: Anatomy:

Dissection of the brain – Part III. Flechsig'scut, basal ganglia, diencephalon, third ventricle

**4th week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – IV. Structures of the brainstem, cerebellar peduncles. Coronal sections of the brain – I.

**5th week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – Part V. Fourth ventricle, rhomboid fossa,circulationof cerebrospinal fluid. Cerebellum.

**6th week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – VI. Coronal sections of the brain – II. Spinal cord.

**7th week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – In situ I.
Demonstration: trigeminal nerve, trigeminal ganglion; facial nerve

**8th week:**
**Practical:** Dissecting Room: Anatomy: Dissection of the brain – In situ II.
Demonstration of the oculomotor, trochlear, abducent, glossopharyngeal, vagus, accessory and hypoglossal nerves.

**9th week:**
**Practical:** Dissecting Room: Anatomy: Consultation – I.
Practice Hall of Dept. of Physiology: Computer simulation – action potential of nerve fibers

**10th week:**
**Practical:** Dissecting Room: Anatomy: Sensory organs – I. Structures of the ear, n. VIII.
Practice Hall of Dept. of Physiology: Computer simulation - ionic currents of nerve fibers

**11th week:**
**Practical:** Dissecting Room: Anatomy: Sensory organs – II. Structures of the eye and orbita
Practice Hall of Dept. of Physiology: Examination of the cranial nerves..

**12th week:**
**Practical:** Dissecting Room: Anatomy: Consultation – II.
Practice Hall of Dept. of Physiology: Examination of somatosensor and motor system.

**13th week:**
**Practical:** Dissecting Room: -
Practice Hall of Dept. of Physiology: Examination of peripheral nerves and muscles innervated by peripheral nerves.

**14th week:**
**Practical:** Dissecting Room: Anatomy: Consultation - III. (open lab)
Practice Hall of Dept. of Physiology: Remedial

## Requirements

1. Signature of the semester

Neurobiology is conducted by teachers of the Department of Physiology and the Department of Anatomy, Histology and Embryology. The administrative duties of the course is managed by the Department of Physiology.

Attendance of the practicals are compulsory.
The course director may refuse to sign the semester if a student misses more more than five practicals. Making up of practicals conducted in the histology room or in the dissecting room are

possible with the same rules that applied for the courses: Anatomy-I and II. Completion of the practicals conducted in the practical room of the Department of Physiology are proven by filling out the appropriate chapters of the laboratory practice book and getting it signed by the lab-teacher. Without these signing the lecture book may be refused.

In order to pass the course successfully students are advised to use textbooks (below), lectures and notes taken during the practical classes. The actual information concerning this course can be find on the e-Learning website of the faculty of Medicine or on the web site of dept. of Physiology.

2. Evaluation during the semester
None

3. Examination
Laboratory practical knowledge of the students will be tested at the end of the semester as part of the Practical Exam. As a precondition of attending the Practical Exam, the fully completed Exercise Book (with all the verified topics) must be presented during the exam. The Practical Exam is evaluated by grade between 1 (fail) and 5 (excellent).
There will be only one date for the improvement of the Practical Exam during the exam period.

For more details of the Practical Exam see the website of the Department of Physiology.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

## Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY II. LECTURE**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **48**
Seminar: **24**

**1st week:**
**Lecture:** Lecture: Gene expression I: Levels of eucariotic gene expression. The active chromatin. Regulation of transcription. Regulation at the mRNA level.

**2nd week:**
**Lecture:** Gene expression II: Translational regulation. Posttransational events. Gene therapy. Biochemistry of cell proliferation I: Mitotic cascade. M-phase kinase. Products and biochemical function of protooncogenes. Mechanism of oncogene formation.

**3rd week:**
**Lecture:** Biochemistry of cell proliferation II: Tumor suppressor genes and their biochemical function. Biochemical features of terminal differentiation. Biochemistry of programmed cell death.

**4th week:**
**Lecture:** Signal transduction I: Signal 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. 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.

**5th week:**
**Lecture:** Signal transduction II: Cell death receptors. 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.
Iron and hem metabolism I: 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.

**6th week:**
**Lecture:** Iron and hem metabilism II: 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.
Hemolobine and inflammation: 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.
**Self Control Test**

**7th week:**
**Lecture:** Biochemistry of blood clotting I: 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. Contact phase of blood coagulation. Blood clotting in the test tube and in the body.

**8th week:**
**Lecture:** Biochemistry of blood clotting II: Classification of blood coagulation. Role of thrombocytes and the vascular endothel. Limiting factors inhibitors and activators of blood coagulation. Fibrinolysis.
Biochemistry of the liver I: Biotransformation.

**9th week:**
**Lecture:** Biochemistry of the liver II: Biochemical consequences of ethanol consumption. 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 muscle.

**10th 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).
Neurobiochemistry I: Blood-brain barier and the transport processes in the CNS

**11th week:**
**Lecture:** Neurobiochemistry II: Metabolical processes in the CNS, synthesis of neurotransmitters. Enzymathic processes in the production and degradation of neurotransmitters.

Metabolism of the central nervous system, energy prodocing pathways of neurons

**12th week:**
**Lecture:** Neurobiochemistry III: Biochemical background of Alzheimer disease and biochemical bases of its therapy.
Biochemistry of stress: 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.
**Self Control Test**

**Requirements**

**Requirements for signing the semester:** attendance in seminars.

**Required knowledge from Biochemistry II.**: topics of cell-and organ biochemistry presented at the lectures (slides are available at the https://elearning.med.unideb.hu website, login with your university network ID and password) and topics discussed on the seminars.

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.

On the **seminars** the lectures of the previous week can be discussed. On the seminars 10 bonus points can be collected by the seminar tests. Based on the test results, from 60 % 4 bonus points, from 70 % 6 bonus points, from 80 % 8 bonus points, from 90% 10 bonus points can be collected (please ask for more details the seminar teachers). The seminar bonus points will be added to the total points collected during the semester, but can't be added to the points of the written exam. In case of the seminars maximum three absences are accepted. Students can't make up seminar with another group. Seminars are not obligatory for repeaters (if they have got signature previously). Only those students can collect seminar bonus points, who don't miss more than three seminars (in case of repeaters, too).

Achievement during the semester will be evaluated in term of points.
During the semester 100 (+ 10) points can be collected. 100 points could come from the control tests from the material of the lectures. Control tests consist of single- and multiple choice test questions. Bonus points earned by seminar activity will be added to the total points collected during the semester. Semester points will be automatically erased of those students, who break the rules of test writings.

Those students who finally reach 70 points in this semester, will get 5 exam bonus points, those who reach 80 points will get 8 exam bonus points that will be added to the results of the written part of the exam.

Those students, who reaches 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.. On the written exam 50 points can be collected, it consists of 50 single- and multiple choice test questions from "Molecular Biology" (5 points), "Metabolism" (20 points), "Cell- and organ biochemistry" (25 points).

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, and molecular biology, that should be answered immediately. The list of these questions will be posted on the website at the end of the semester, together with the exam titles of the final exam. After properly answering the „molecular biology” and „medical” questions, 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 on the announcement table (LSB downstairs 1st corridor), and on the website (http://bmbi.med.unideb.hu, login with your university network ID and password)

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **BIOCHEMISTRY II. PRACTICAL**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Practical: **25**

**1st week:**
**Practical:** Introduction to the practices.

**2nd week:**
**Practical:** Studies on enzymes participating in neurotransmission

**3rd week:**
**Practical:** Studies on enzymes participating in neurotransmission

**4th week:**
**Practical:** Studies on enzymes participating in neurotransmission

**5th week:**
**Practical:** Fractionation and quantitative determination of plasma proteins.

**6th week:**
**Practical:** Fractionation and quantitative determination of plasma proteins.

**7th week:**
**Practical:** Fractionation and quantitative determination of plasma proteins.

**8th week:**
**Practical:** Studies on blood clotting.
Bioinformatics II.

**9th week:**
**Practical:** Studies on blood clotting.
Bioinformatics II.

**10th week:**
**Practical:** Studies on blood clotting.
Bioinformatics II.

**11th week:**
**Practical:** Evaluation of the results of practicals. Control test. Visit of the department.

**Requirements**

**Requirements for signing the semester:**

Every laboratory **practices** must be performed, if someone is absent due to any serious reason, the missing experiments have to be performed within the three weeks practice period joining another group (after obtaining permissions from the practice teacher of the other group). Grades will be given on the basis of the quality of the laboratory work, notebooks and the result of the practical tests.

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE II/2.**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** Emlékszel?

**2nd week:**
**Practical:** Testrészek

**3rd week:**
**Practical:** Tünetek

**4th week:**
**Practical:** Gyógyszerek

**5th week:**
**Practical:** Klinikák és szakorvosok

**6th week:**
**Practical:** Lassítsunk egy kicsit!

**7th week:**
**Practical:** Összefoglalás, Midterm test

**8th week:**
**Practical:** Szoktál kanapészörfölni?

**9th week:**
**Practical:** Jó és rossz szokások

**10th week:**
**Practical:** Instrukció

**11th week:**
**Practical:** Tessék mondani!

**12th week:**
**Practical:** Anamnézis

**13th week:**
**Practical:** Összefoglalás End term test

**14th week:**
**Practical:** Oral exam

## Requirements

**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Hungarian language course, students must sit for 2 written language tests, an oral and a listening exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their written test and have to take a vocabulary exam that includes all 100 words before the midterm and end term tests. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.
Based on the final score the grades are given as follows.

| **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 of the written tests is below 60, the student can take a written remedial exam once covering the whole semester’s material.
**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**
Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

# Department of Physiology

Subject: **MEDICAL PHYSIOLOGY II. LECTURE**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **37**
Seminar: **20**

**1st week:**
**Lecture:** Preparation for laboratory pract.
Homeostasis, principles of renal morphology and renal function
Quantitative description of renal function
Mechanism of glomerular filtration

**2nd week:**
**Lecture:**
Regulation of glomerular filtration
Tubular transport: proximal tubule
Tubular transport: loop of Henle and distal nephron
Urinary concentration and dilution, clinical correlates

**3rd week:**
**Lecture:**
Osmoregulation, water balance
Defense of body fluid volume, sodium balance
Acid-base balance
Acid-base disturbances, Calcium homeostasis I.

**4th week:**
**Lecture:** Calcium homeostasis II.; physiology of bone
Potassium balance, mycturition
Haemodialysis
General principles of endocrinology

**5th week:**
**Lecture:** Mechanisms of hormone action
Pituitary gland
Growth hormone
The thyroid gland I.

**Self Control Test**

**6th week:**
**Lecture:** The thyroid gland II.
Glucocorticoids I.
Glucocorticoids II.
The hormones of adrenal medulla

**7th week:**
**Lecture:**
The actions of catecholamine
The hormones of pancreatic islets I
The hormones of pancreatic islets II
Regulation of the function of pancreatic islets

**8th week:**
**Lecture:** Endocrine regulation of metabolism
Dianetes Mellitus
General principles in the regulation of gonadal functions
Male gonadal functions

**9th week:**
**Lecture:**
Female gonadal functions
Pregnancy, lactation
Stem cell
Sport physiology I.

**10th week:**
**Lecture:** Sport physiology II.

**11th week:**
**Self Control Test**

## Requirements

### 1. Signature of the semester

Attendance of lectures, laboratory practices and seminars is compulsory. The signature of the semester may be refused for the semester in case of more than three absences from the seminars and/or more than two absences from the laboratory practices. In cases of more than four lecture absences these special advantages are withdrawn (see below). Completion of a missed seminar with a different group is not possible. All missed practices must be must be made up, however this does not reduce the number of absences! 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 semester.
Each student must attend seminars and practices with the group specified by the Education Office. For continuous updates on all education-related maters, please check the departmental web-site (http://phys.med.unideb.hu)
The lectures of Medical Physiology II. are listed at the web site of the Department of Physiology (http://phys.med.unideb.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 any possibilities to improve or make-up for missed tests.

### 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.med.unideb.hu)

Depending on the average result of the five self-controls of 2018/2019 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 Department of Physiology refuses to sign the lecture book or in cases 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 2018/2019 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 examination was attempted because no mark could be offered (i.e. one had to take the exam): 2: 65%; 3: 75%; 4: 85%; 5: 95%.
- If one had an offered grade and it was improved, then the conversion is: 2: 69%; 3: 79%; 4: 89%, and 5: 100%.

The successful completion of the Practical part is prerequisite for obtaining signature for the Theoretical (Lecture) part.

Subject: **MEDICAL PHYSIOLOGY II. PRACTICAL**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Practical: **24**

**1st week:**
**Practical:** Introduction

**2nd week:**
**Practical:** effects of physical exercise on the cardiorespiratoric parameters. a study of restitution

**3rd week:**
**Practical:** examination of the blood ii.

**4th week:**
**Practical:** effects of neurotransmitters and hormones on the uterinal smooth muscle function

**5th week:**
**Practical:** simulation of the renal transport mechanisms

**6th week:**
**Practical:** computer simulation of the glucose tolerance test

**7th week:**
**Practical:** Remedial lab

**8th week:**
**Practical:** Closing lab

In case student could not obtain AW5 grade, the Department will provide one exam chance for practical part in the active semester. The practical grade cannot be improved during the exam period.

# CHAPTER 16
# ACADEMIC PROGRAM FOR THE 3RD YEAR

## Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE III/1.**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** 1. fejezet: Személyi adatok, családi anamnézis - ismétlés

**2nd week:**
**Practical:** 1. fejezet: Szociális anamnézis

**3rd week:**
**Practical:** 1. fejezet: Korábbi betegségek, műtétek.

**4th week:**
**Practical:** 2. fejezet: Jelen panaszok

**5th week:**
**Practical:** 2. fejezet: A fájdalom

**6th week:**
**Practical:** 3. fejezet: Fizikális vizsgálat, utasítások.

**7th week:**
**Practical:** 4. fejezet: Összefoglalás

**8th week:**
**Practical:** Midterm Oral Exam

**9th week:**
**Practical:** 5. fejezet: Gyakori tünetek, kérdések, panaszok.

**10th week:**
**Practical:** 5. fejezet: Gyakori tünetek, kérdések, panaszok

**11th week:**
**Practical:** 6. fejezet: Gyógyszerelés

**12th week:**
**Practical:** 6. fejezet: Gyógyszerelés

**13th week:**
**Practical:** 7. fejezet: Összefoglalás

**14th week:**
**Practical:** Oral exam

### Requirements

**Requirements of the course:**
**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Testing, evaluation**

In each Medical Hungarian language course, students must sit for a listening and two oral exams.

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their midterm and final exams. They also have to take a vocabulary exam that includes all 100 words before the midterm and end term exams. A word quiz can be postponed by a week and students can take it only with their own teacher.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course.

The grades are given as follows.

fail (1)
pass (2)
satisfactory (3)
good (4)
excellent (5)

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**
Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

## Department of Immunology

Subject: **IMMUNOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **45**
Seminar: **22**
Practical: **6**

**1st week:**
**Lecture:** Elements of the immune system and their role in defense against pathogens. Components and cells of the innate response. Characteristics and function of the innate immune response. The structure of lymphoid tissues and organs.
**Seminar:** Elements of the immune system and their role in defense against pathogens. The structure of lymphoid tissues and organs.

**2nd week:**
**Lecture:** Structure and function of proteins encoded by the major histocompatiblity (MHC) gene complex. Processing and presentation of antigens. T-lymphocytes. Requirements and consequences of T-cell activation.
**Seminar:** Components and cells of the innate response. Characteristics and function of the innate immune response.

**3rd week:**
**Lecture:** B-lymphocytes. Characteristics of the acquired immune response. An introduction to antibody structure and function. Lymphatic circulation, immune surveillance by re-circulation of immunocytes within the immune system. Inflammation and the acute phase response.
**Seminar:** The major histocompatiblity gene complex (MHC). Processing and presentation of antigens. T-lymphocytes.

**4th week:**
**Lecture:** Recognition of pathogens by the innate arm of the immune system. Elimination of pathogens by the innate arm of the immune system. The complement system. Generation of B-cell receptor diversity.
**Seminar:** B-lymphocytes. An introduction to antibody structure and function. Inflammation and the acute phase response.

**5th week:**
**Lecture:** Antigen-independent differentiation of B-lymphocytes. Antigen-dependent differentiation of B-lymphocytes. B-cell activation. Production of various antibody isotypes and their functions.
**Seminar:** The innate arm of the immune system.
**Self Control Test**

**6th week:**
**Lecture:** T-cell development. Central tolerance. Effector function of helper T-cell. Activation and function of cytotoxic T-lymphocytes.
**Seminar:** Generation of B-cell receptor diversity. Antigen-independent differentiation of B-lymphocytes. B-cell development.

**7th week:**
**Lecture:** Mechanism of peripheral tolerance. The function of regulatory T-cells.
**Seminar:** T-cell development. Activation and function of cytotoxic T- lymphocytes. Effector function of helper T-cells.

**8th week:**
**Lecture:** The primary and secondary immune response. The development of immunological memory.
**Seminar:** Central tolerance. Mechanisms of peripheral tolerance. The function of regulatory T-cells.

**9th week:**
**Lecture:** Monoclonal antibodies. Vaccination. Tumor immunology. Tumor antigens and immune response to tumors. Escape mechanisms of tumors, suppression of anti-tumor responses. Approaches to overcome tumor-induced tolerance mechanisms. A hope for cancer immunotherapy.
**Seminar:** The primary and secondary immune response. The development of immunological memory.
**Self Control Test**

**10th week:**
**Lecture:** Hypersensitivity reactions, Typa I. hypersensitivity (Allergy). Hypersensitivity reactions, Type II-IV hypersensitivity. Mechanisms of the development of autoimmune diseases.
**Seminar:** Tumor immunology. Monoclonal antibodies. Vaccination.

**11th week:**
**Lecture:** Characteristics of the organ-specific autoimmune diseases. Characteristics of the systemic autoimmune diseases. The immune response to intracellular pathogens.
**Practical:** Hypersensitivity reactions. The utility of flow cytometry in diagnosis, in clinical- and basic medical research.

**12th week:**
**Lecture:** The immune response to extracellular pathogens. Congenital immunodeficiencies I (B-cell deficiencies). Congenital immunodeficiencies II (T-cell deficiencies).
**Practical:** Autoimmune diseases. Agglutination, qualitative determination of rheumatoid factor.

**13th week:**
**Lecture:** The immune response associated with tissue and organ transplantation. Hematopoietic stem-cell transplantation.
**Practical:** Congenital immunodeficiencies. The methodology of the Enzyme Linked Immunosorbent Assay (ELISA) and its use in clinical diagnosis, clinical and basic research.
**Self Control Test**

**14th week:**
**Lecture:** Immunotherapy methods in the clinical practice. Contemporary (hot) topics in Immunology. Trends/Perspective in immunology R&D technology.
**Seminar:** Tissue and organ transplantation. Hematopoietic stem-cell transplantation.

**Requirements**

**Signing of the Lecture Book:**
Participation in the Seminars and the Practical Courses is compulsory. The Department shall refuse to sign the students' Lecture book if he/she is absent from more than two seminars or practices (altogether) during semester. However, students can make up for a missed seminar or practice with another group; yet, only on the same week. Making up for a seminar should be communicated to both seminar teachers prior to the seminar.
**Self control tests (SCTs), offered grades, end-term exam:**
During the semester three self control test (SCT) will be organised (weeks 5., 9. and 13.).
The first SCT contains the material of the lectures of weeks 1-3 as well as the material of seminars on weeks 1-4. To ensure a solid basic knowledge of immunology, students must score higher than 70% to qualify for the 2nd and 3rd SCT, hence for an offered grade.
The 2nd and 3rd SCT contains the material of lectures 4-8 and 9-13, respectively including the materials of the corresponding seminars and practices.
If a student's score for the first SCT is higher than 70% and the score of the second and third SCT one by one is higher than 50%, she/he will be offered a grade. Should student accept this offered grade, she/he will be exempted from the end-term exam.
The offered grades are calculated by the following algorithm, based on the cumulative percentage points of the three SCTs (i.e. 300 points maximum).
170 - 204: pass (2)
205 - 239: satisfactory (3)
240 - 269: good (4)
270 - 300: excellent (5)
Those students who have not qualified for an offered grade must take the end-term exam during the exam period. The end-term exam consists of a written and an oral part.
"A" exam: To qualify for the oral part of an "A" exam, students must score higher than 70% on the written (entry) exam. Students who score less than 70% on the written part will fail (thus, the oral exam will not take place).
"B" exam: "B" exams are identical to "A" exams except when the student failed the oral, but not the written, part of the "A" exam. With a score of higher than 70% on the written part of the "A" exam, the student is exempt from the written exam on the "B" exam.
"C" exam: "C" exams are oral exams only, without a written entry test.
Those students who would like to improve the grade of a successful ("A" or "B" exam) or do not accept the offered grade, are also exempted from the entry test.
The list of exam topics is available on the departmental website (www.elearning.med.unideb.hu).
Lecture materials and other information concerning education can be found on our website at www.elearning.med.unideb.hu.

## Department of Internal Medicine

Subject: **PROPEDEUTICS OF INTERNAL MEDICINE (INTERNAL MEDICINE I.)**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **28**
Practical: **28**

**1st week:**
**Lecture:** 1. Introduction. The subject of Internal Medicine. The medical ethic. Relationship between doctor and patients. Medical secret, information, attitude of doctors. Diagnosis: definition, importance, types.
2.Principles of history taking: Family history, habits, provoking factors, previous illnesses. Medical documentation. Present complains
**Practical:** *Introduction of the department. Location, functions, profile and system. Presentation of history taking*

**2nd week:**
**Lecture:** 1. Physical examination. Inspection, palpation, percussion, auscultation. General symptoms. Different types of fever. Blood pressure and body weight measurement.
2. Examination of the respiratory system: percussion, puncture of the chest. Pectoral fremitus, bronchophony
**Practical:** *Presentation of history taking. Measures of heat, and weight. Types of fevers.*

**3rd week:**
**Lecture:** 1.Examination of the respiratory system: History, cough, dyspnea, hemoptoe, breathing types.
2.Principles of physical examination of the chest. Differential diagnosis of chest pain.
**Practical:** *Taking case history. Inspection. Physical examination of the chest*

**4th week:**
**Lecture:** 1.Auscultation of the chest
2. X-ray examination of the chest.
**Practical:** *Physical examination of the lung.*

**5th week:**
**Lecture:** 1. Pneumonia, pleuritis, PTX. Mediastinal tumour.
2. Bronchitis, asthma, emphysema.

**Practical:** *Physical examination of the lung. Lung syndromes.*

**6th week:**
**Lecture:** 1.Examination of the heart I: History, inspection, palpation, apex impulse, percussion.
2.Examination of the heart II: Auscultation. Sounds and murmurs.
**Practical:** *Physical examination of the hearth. Percussion, auscultation*

**7th week:**
**Lecture:** 1.Valvular heart diseases. Symptoms and diagnostics
2.Electrocardiography (ECG). Holter ECG, ABMP, echocardiography. Classification of arrhythmias, syncope.
**Practical:** *Physical examination of the hearth. Percussion, auscultation - normal and abnormal heart sounds.*

**8th week:**
**Lecture:** 1.Angina pectoris, myocardial infarction. Coronarography
2.Heart failure and different types of shock.
**Practical:** *ECG analysis.*

**9th week:**
**Lecture:** 1. Examination of the arterial vascular system.
2. Examination of the venous vascular system. Acute deep vein thrombosis, pulmonary embolism.
**Practical:** *Physical examination of the blood vessels.*

**10th week:**
**Lecture:** 1. Anamnesis and physical examination of the abdomen Rectal digital examination.
2. Abdominal pain, vomiting, constipation and diarrhoea.
**Practical:** *Physical examination of the abdomen*

**11th week:**
**Lecture:** 1.Differential diagnosis of spleen and liver enlargement. Gastrointestinal bleeding
2.The characteristics of ascites and jaundice.
**Practical:** *Physical examination of the abdomen.*

**12th week:**
**Lecture:** 1.Hematologic anamnesis, diagnostics.
2.The examination of endocrine system.
**Practical:** *Physical examination of the lymph nodes and the endocrine system.*

**13th week:**
**Lecture:** 1.The locomotor system. Examination of the bones, joints and muscles.
2.Renal function, urinary system.
**Practical:** *Examination of the locomotor system.*

**14th week:**
**Lecture:** 1.Diagnosis of metabolic diseases.
2.Examination of the nervous system.

**Practical:** *Examination of the nervous system.*

**Requirements**

**Conditions of signing the Semester**
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 the end of semester examination (ESE). The ESE covers all the topics of the lectures and those in the recommended books.

# Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY I.**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **28**
Practical: **16**

**1st week:**
**Lecture:** 1. Introduction: pathobiochemistry, clinical biochemistry, laboratory diagnostics.
2. Different levels of laboratory diagnostics (reference values, requesting test, interpretation of result).

**2nd week:**
**Lecture:** 3. Laboratory aspects of investigating human disorders
4. Pathochemistry and laboratory signs of cell damage

**3rd week:**
**Lecture:** 5. Pathobiochemistry of inflammation
6. Pathobiochemistry of plasma proteins

**4th week:**
**Lecture:** 7. Clinical biochemistry of tumor metastasis
8. Pathobiochemical alterations in association with tumor growth and metastasis formation and their laboratory detection

**5th week:**
**Lecture:**
9. Tumormarkers in the diagnosis of malignant diseases
10. Inherited metabolic diseases and their laboratory diagnostics I.

**6th week:**
**Lecture:**
11. Inherited metabolic diseases and their laboratory diagnostics II.
12. Inherited metabolic diseases and their laboratory diagnostics III.

**7th week:**
**Lecture:**
13. Disorders of iron metabolism. Laboratory diagnostics of microcytic anemias.
14. Laboratory diagnostics of hemoglobinopathies

**Practical:** Molecular genetic methods in clinical biochemistry. Laboratory safety.

**8th week:**
**Lecture:** 15. Laboratory diagnostics of macrocytic and hemolytic anemias
**Practical:** Hematology I. Blood collection, anticoagulants. Preparation of a blood smear, staining.

**9th week:**
**Lecture:**
16.Laboratory diagnostics of quantitative platelet disorders
17.Laboratory diagnostics of acut and chronic leukemias and lymphomas I.

**Practical:** Hematology II. Evaluation of a normal smear.Red blood cell morphology. Determination of reticulocyte count.
**Self Control Test**

**10th week:**
**Lecture:**
18. Laboratory diagnostics of acut and chronic leukemias and lymphomas II.
19. Laboratory diagnostics of acut and chronic leukemias and lymphomas III.

**Practical:** Hematology III. Determination of hemoglobin and hematocrit. Hematology analyzers.

**11th week:**
**Lecture:**
20. Blood group serology, biochemistry, inheritance, antigens and antibodies of ABO blood group system
21.Biochemistry, inheritance, antigens and antibodies of rh blood group system and its clinical significance. Compatibility testing.

**Practical:** Hematology IV. Evaluation of peripheral smears in malignant hematological disases. Protein electrophoresis, myeloma multiplex.

**12th week:**
**Lecture:**
22. Other blood group system (Kell, Kidd, Duffy, MN, Ss, Ii). Regulation of transfusion
23. Blood products

**Practical:** Determination of AB0 and Rh blood groups

**13th week:**
**Lecture:** 24.Laboratory diagnostics of central nervous system diseases. Laboratory investigation of the cerebrospinal fluid.
25. Clinical biochemistry at the extremes of ages.
**Practical:** Detection of irregular antibodies, antibody screening, compatibility testing.

**14th week:**
**Lecture:**
26. Clinical biochemistry at the extremes of ages
27. Therapeutic drug monitoring I-II.

**Practical:** Immuno assay
**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 (1 theoretical, 1 practical topic and 1 practical picture). The practical pictures will be demonstrated on the last lectures of the 2nd semester. 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 2016.) as well as the textbook of William J. Marshall: Clinical Chemistry (8th edition, 2017.). Suggested reading: Hoffbrand A.V., Pettit J.E.: Essential Haematology, 3rd edition, 1999.

# Department of Medical Microbiology

Subject: **MEDICAL MICROBIOLOGY I.**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **28**
Practical: **28**

**1st week:**
**Lecture:** 1. Prokaryotic cell structure
2. The physiology of bacteria
**Practical:** Rules of collecting clinical specimens

**2nd week:**
**Lecture:** 3. Bacterial genetics
4. Sterilization and disinfection
**Practical:** Visualizing bacteria. Examination of unstained and stained specimens

**3rd week:**
**Lecture:** 5. Principles of antimicrobial chemotherapy
6. Antimicrobial drugs for systemic administration
**Practical:** Culture techniques. Anaerobic culture

**4th week:**
**Lecture:** 1. Bacterial pathogenesis I
2. Bacterial pathogenesis II
**Practical:** Biochemical activities of bacteria. Sterilization and disinfection

**5th week:**
**Lecture:** 9. Antibacterial immunity. Hypersensitivity
10. Active and passive immunization
**Practical:** Determining the sensitivity of bacteria to antibiotics

**6th week:**
**Lecture:** 11. Staphylococci
12. Streptococci

**Practical:** Serological reactions

**7th week:**
**Lecture:** 13. Mycobacterium genus
14. Causative agents of respiratory tract infections
**Practical:** 1st WRITTEN EXAMINATION (General Bacteriology)
**Self Control Test**

**8th week:**
**Lecture:** 15. Enterobacteriaceae I
16. Enterobacteriaceae II
**Practical:** Wound, skin and soft tissue infections caused by bacteria

**9th week:**
**Lecture:** 17. Vibrio, Campylobacter, Helicobacter
18. Pseudomonas and other non-fermentative Gram negative bacilli
**Practical:** Bacterial respiratory tract diseases

**10th week:**
**Lecture:** 19. Neisseria, Legionella, Brucella
20. Clostridia
**Practical:** Agents of bacterial intestinal infections and food poisoning

**11th week:**
**Lecture:** 21. Non-Clostridial anaerobic infections
22. Treponema
**Practical:** Urinary tract infections caused by bacteria

**12th week:**
**Lecture:** 23. Borrelia, Leptospira
24. Chlamydia and Mycoplasma
**Practical: 2nd WRITTEN EXAMINATION** (Bacteriology with the exception of Spirochaetaceae, Chlamydiae, Rickettsiae and Mycoplasms)
**Self Control Test**

**13th week:**
**Lecture:** 25. Rickettsia
26. Mycology I
**Practical:** Bacterial sexually transmitted diseases (STD)

**14th week:**
**Lecture:** 27. Mycology II
28. Normal microbial flora of the human body. Nosocomial infections
**Practical:** Central nervous system diseases caused by bacteria

**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. The ESE consists of a written entry test and an oral examination (there is no practical part). 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 questions. 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 I.**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **28**
Practical: **45**

**1st week:**
**Lecture:** -Introduction to anatomical pathology. Macropsy, autopsy-Surgical pathology: Methods and reporting
**Practical:** Introduction

**2nd week:**
**Lecture:** -Adaptation on cellular level-Morphology of the reversible cell injury and cell death (swelling, fatty change and necrosis)
**Practical:** 1. Acute myocardial infarction (coagulation necrosis) 2. Gangrene in the lower leg 3. Fat necrosis in the pancreas 4. Caseous necrosis (lymphadenitis tuberculosa)

**3rd week:**
**Lecture:** - Abnormal glycogen and protein accumulation. Storage diseases. Amyloidosis. Pigments.- Oedema. Hyperemia. Congestio. Shock.
**Practical:** 5. Fatty change in the liver 6. Fatty change in the liver (lipid staining) 7. Atheromatous plaque 8. Cholesterolosis in the gallbladder 9. Atrophia brunea cordis

**4th week:**
**Lecture:** - Haemorrhage. Thrombosis. Embolism. DIC. - Morphologic patterns of the acute inflammatory response.
**Practical:** 10. Simple endometrial hyperplasia 11. Atrophia endometrii et myometrii 12. Nodular hyperplasia in the prostate 13. Bile stasis in the liver due to extrahepatic bile duct obstruction

**5th week:**
**Lecture:** -Tissue regeneration. Reparation and wound healing. Calcification.
- The role of macrophages in inflammation. Granulomatous inflammation.
**Practical:** 14. Amyloidosis (Kongó staining) 15. Arterias thrombus 16. Necrosis of the small bowel due to incarceration 17. Hemorrhagic infarct in the lung

**6th week:**
**Lecture:** - Dysplasia, preneoplastic conditions.-Tumor dignity. Proliferation. Grading and staging.
**Practical:** 18. Pulmonary edema 19. Nutmeg liver 20. Appendicitis acuta suppurativa 21. Meningitis purulenta

**7th week:**
**Lecture:** - Characteristics of tumor cell populations (clonality, heterogenity and progression).- Characteristics of benign and malignant tumors. Differentiation and anaplasia.
**Practical:** 22. Bronchopneumonia with lung abscess 23. Septic abscesses in the myocrdiumban due to systemic fungal infection (PAS staining) 24. Chronic non-specific salpingitis 25. Foreign body granuloma

**8th week:**
**Lecture:** - Diagnostic immunohistochemistry. markers of differentiation.- Prognostic and predictive tumor markers.
**Practical:** 26. Keratoachantoma 27. Condyloma 28. Bowen’s disease 29. Invasive cervical cancer

**9th week:**
**Lecture:** - Mechanisms of local and distant tumor spread. Angiogenesis.- The biology of tumor growth. Heredity in cancer.
**Practical:** 30. Signet ring cell carcinoma in the stomach (PAS) 31. Krukenberg type ovarian metastasis (PAS) 32. Liver metastasis 33. Teratoma adultum (cysticum) ovarii 34. Leiomyoma

**10th week:**
**Lecture:** - Opportunistic infections. Systemic effects of neoplasia (cachexia, immunosupression, paraneoplastic syndromes).- Humoral and cellular immunopathological mechanisms.
**Practical:** 35. Allergic vasculitis 36. Polyarteritis nodosa 37. End stage lesion in Burger's disease 38. Gouty tophus

**11th week:**
**Lecture:** - Immunodeficiencies. Tuberculosis.- The pathology of transplantation. Autoimmunity.
**Practical:** 39. Polymiositis 40. SLE lymphadenopathy 41. Chronic synovitis (Rheumatoid arthritis) 42. Rheumatoid nodule (Rheumatoid arthritis)

**12th week:**
**Lecture:** - Systemic autoimmune diseases (SLE, Sjögren, RA, SS).- Vasculitis.
**Practical:** 43. Gaucher's disease 44. Toxoplasma lymphadenitis 45. Chronic lyphocytic leukemia (CLL) 46. Follicular lymphoma (FL)

**13th week:**
**Lecture:** - Mono-, and polygenic disorders.- Pathology of the lymphatic system.
**Practical:** 47. Diffuse large B-cell lymphoma (DLBCL) 48. Gastric lymphoma (MALT type) 49. Hodgkin's disease (HL) 50. Myelofibrosis

**14th week:**
**Lecture:** - Malignant lymphomas.- Leukemias.
**Practical:** Repeating practice

**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 13th week (computerized) written exam,
14th week histopathology exam (computerized)
14th week practical exam
(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 and theoretical parts.
The written exam: the students get questions (can be found on the Department's website) and has to reach 85% to pass this part of the exam. In the 2nd semester the questions comes from the 1st and the 2nd semester.
During the computerized histopathology exam the students get 6 slides, and has to reach 85% 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 2 titles are to be worked out and presented 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 the take **Final Exam** (FE). **The Exam consists of:** written, practical and theoretical parts. The written and practical exams are the 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). 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
https://elearning.med.unideb.hu/

## Department of Preventive Medicine, Faculty of Public Health

Subject: **BASIC ONCOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **13**

**1st week:**
**Lecture:** Tumor initiation and progression

**2nd week:**
**Lecture:** The effect of lifestyle and social factors on tumorigenesis and tumor progression

**3rd week:**
**Lecture:** Role of the radioactive and UV radiations in the malignant transformation

**4th week:**
**Lecture:** The effect of nutrition on tumorigenesis

**5th week:**
**Lecture:** Role of viruses in the malignant transformation. I. Carcinogenic DNA viruses.

**6th week:**
**Lecture:** Role of viruses in the malignant transformation. II. Carcinogenic RNA viruses.

**7th week:**
**Lecture:** Chemical carcinogenesis. Carcinogenic chemicals in the environment

**8th week:**
**Lecture:** Tumor immunology in clinical practice

**9th week:**
**Lecture:** Molecular biological techniques in cancer diagnosis and to search for alterations in the cancer genome

**10th week:**
**Lecture:** Cancer stem cells

**11th week:**
**Lecture:** Epidemiology of malignant diseases

**12th week:**
**Lecture:** Cancer screening. Cancer registries

**13th week:**
**Lecture:** Prevention strategies in cancer

**Requirements**

Conditions of signing the Lecture book at the end of the semester.

Although attendance at lectures is not compulsory, it is highly recommended, since the material covered in the lectures will be examined. The department will refuse to sign the Lecture book if the student fails the test. If the student fails the written test, they can retake it on the date prearranged with the department.

One of the main objective is to provide sufficient theoretical background to the basic principles of carcinogenesis, cellular and molecular biology of cancer, the effect of lifestyle, social factors and nutrition on tumorigenesis. In order to highlight the importance of the various environmental factors in the development and progression of cancer, detailed information is given in the following areas: the health effect of various chemicals and occupational exposures, health hazard of ionizing and nonionizing radiation and the role of viruses in malignant transformation. The genetic background of various cancers will be discussed based on molecular epidemiological data. The course provides sufficient background to pathobiochemical alterations associated with tumor growth and tumor metastasis, characteristics of benign and malignant tumors and malignant cell populations. The course also aims to give up-to-date information on cancer epidemiology, the major issues in screening programs and the benefit and role of screening tests and prevention strategies.

## Division of Operative Techniques and Surgical Research

Subject: **BASIC SURGICAL TECHNIQUES**
Year, Semester: 3rd year/1st semester**,** 3rd year/2nd semester
Number of teaching hours:
Lecture: **14**
Seminar: **17**
Practical: **11**

**1st week:**
**Lecture:**
Surgical deontology. Terminology for surgery. Surgical armamentarium.

**Seminar:**
Administration. Cutting, hemostatic, grasping-retracting, special and suturing instruments. Clips and staplers. Order of the instrumental trays and tables.

**2nd week:**
**Lecture:** Surgical sutures. Surgical suture materials.
**Seminar:** Knotting techniques on different knotting pads. Conventional hand suturing techniques (interrupted, continuous sutures on gauze model). Special knotting and suturing techniques on surgical training model.

**3rd week:**
**Lecture:** Surgical hemostasis. Venous cutdown technique. Basics of electrosurgery.

**Seminar:** Demonstration of steps of the venous cutdown technique.
**Practical:** Ligation of vessels on gauze model. Vein preparation, cannulation on phantom model, preparation of infusion set. Wound closure with different suture techniques on surgical training model.

**4th 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 instrumental table and on the Sonnenburg table. Isolation of the operative field.
**Practical:** Scrubbing, gowning and gloving. Wound closure with different suturing techniques on biopreparate model.

**5th 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 on phantom model, preparation of infusion set.

**6th week:**
**Lecture:** Injection techniques. Blood sampling methods.
**Seminar:** Infusions. Blood sampling, intramuscular and intravenous injection, infusion set - video-demonstration on models.
**Practical:** Blood sampling, intramuscular and intravenous injection on phantom models. Repeat: Vein preparation, cannulation on phantom model, preparation of infusion set.
**Self Control Test**

**7th week:**
**Lecture:** Laparotomy.
**Seminar:** Paramedian laparotomy - video-demonstration
**Practical:** Laparotomy on surgical training models. Repeat: Blood sampling, injection techniques on phantom models. Vein preparation, cannulation on phantom model, preparation of infusion set.

**8th week:**
**Lecture:** Basic principles of intestinal surgery.
**Seminar:** End-to-end one-layer small bowel anastomosis - video-demonstration.
**Practical:** Scrubbing. End-to-end one-layer intestinal anastomosis on small bowel biopreparate model.

**9th week:**
**Lecture:** Basic principles of vascular surgery.
**Seminar:** Vascular suture lines (arteriotomy and suturing) - video-demonstration.
**Practical:** Scrubbing. Vascular suturing techniques on aorta biopreparate model.

**10th week:**
**Lecture:** Surgery of the parenchymal organs.
**Seminar:** Video-demonstration of spleen resection and spleen autotransplantation.
**Practical:** Scrubbing.Wound closure with different suturing techniques on biopreparate model. Parenchymal stitches on spleen biopreparate model.

**11th week:**
**Lecture:** Bioplasts and tissue adhesives. Drains, punctures (thoracal, abdominal).
**Seminar:** Application of surgical tissue adhesives and bioplasts.
**Practical:** Scrubbing. Vein preparation, cannulation on phantom model. Wound closure with different suture techniques on surgical training model.

**12th week:**
**Lecture:** Types of wounds. Principles of wound care. Catheters. Basic principles of catheterization.
**Seminar:** Different types of wound dressings and catheters. Catheterization of the urinary bladder on phantom model - video-demonstration.
**Practical:** Catheterization of the urinary bladder on phantom model. Repeat: Blood sampling, injection techniques on phantom models. Vein

preparation, cannulation on phantom models, preparation of infusion set.
**Self Control Test**

**13th week:**
**Lecture:** Insights ino the new surgical techniques, procedures.
**Seminar:** Repeating of all practices by video-demonstration.
**Practical:** Scrubbing. Wound closure with different suture techniques on biomodels.

**14th week:**
**Lecture:** Repeat all practices. Preparation for the practical exam.
**Seminar:** Repeating of all practices.
**Practical:** Practical exam

**Requirements**

**Prerequisite:** Anatomy, histology and embryology II., Medical Physiology I.

The lectures and seminars/practices are built on each other. Consequently, it is difficult to make-up missed classes. The make-up of the 1st-2nd-3rd-4th seminars/practices is obligatory. Compensation for missed seminars should be paid according to the Rules and Regulation of the Faculty of Medicine, University of Debrecen. If the student is absent from more than 2 seminars/practices in a semester (without any acceptable reason), the Department may refuse the signature. Attending the 1st, 2nd, 3rd, 4th and 5th lectures is obligatory.
There will be two written tests during the semester (6th and 12th weeks).
A list of topics is announced on our webpage: www.surg.res.dote.hu

All the supplementary materials (handouts) required fot the exam are available online:
https://elearning.med.unideb.hu/course/index.php?categoryid=145
https://elearning.med.unideb.hu/course/index.php?categoryid=130
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.

# Institute of Behavioural Sciences, Faculty of Public Health

Subject: **MEDICAL ANTHROPOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Seminar: **15**

**1st week:**
**Seminar:** "Roots" and "shoots" of medical anthropology: the web of basic concepts.

**2nd week:**
**Seminar:** Historical - cultural determination of medical concept of man.

**3rd week:**
**Seminar:** Medical knowledge: cultural and epistemological background of its legitimity.

**4th week:**
**Seminar:** Post-modern knowledge and concept of man in medicine: a critical-interpretive approach to medical anthropology.

**5th week:**
**Seminar:** Doctor-patient interaction: a cultural anthropological aspect.

**6th week:**
**Seminar:** Explanatory models and illness narratives explaining doctor-patient bonds.

**7th week:**
**Seminar:** Cultural definition of anatomical and physiological concepts.

**8th week:**
**Seminar:** Medical treatments vs. alternative treatments: the concepts of alternative medicine.

**9th week:**
**Seminar:** Death and dying: anthropology of loss and bereavement.

**10th week:**
**Seminar:** Biological and social death in Western societies.

**11th week:**
**Seminar:** Rituals and their relation to health.

**12th week:**
**Seminar:** Ethnomedicine and its European school.

**13th week:**
**Seminar:** The concept of man in medicine: a text analysis.

**14th week:**
**Seminar:** The nature of the scientific basis in medical knowledge: a test analysis. Concluding discussion.

**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.

Subject: **MEDICAL SOCIOLOGY**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **8**
Seminar: **7**

**1st week:**
**Lecture:** Introduction to Medical Sociology

**2nd week:**
**Seminar:** Social Aspects of Health and Illness.

**3rd week:**
**Seminar:** Social Aspects of Health and Illness.

**4th week:**
**Lecture:** Social Inequalities and Health

**5th week:**
**Seminar:** Social Aspects of Doctor-Patient Relationship

**6th week:**
**Seminar:** Social Aspects of Doctor-Patient Relationship

**7th week:**
**Lecture:** Sociology of Medical Knowledge

**8th week:**
**Seminar:** Medicalization

**9th week:**
**Seminar:** Medicalization

**10th week:**
**Lecture:** Quality of Life. Sociology of Dying.

**11th week:**
**Seminar:** End of Course Test

**12th week:**
**Seminar:** End of Course Test
**Self Control Test**

**Requirements**

Requirements. Making a presentation is prerequisite for the end of course test.

# Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE III/2.**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** 1. fejezet: Ismétlés: Tünetek, kérdések, panaszok, betegségek

**2nd week:**
**Practical:** 1. fejezet: Légzőszervi betegségek

**3rd week:**
**Practical:** 1. fejezet: Légzőszervi betegségek

**4th week:**
**Practical:** 2. fejezet: Szív-és érrendszeri betegségek

**5th week:**
**Practical:** 3. fejezet: Emésztőszervi betegségek

**6th week:**
**Practical:** 3. fejezet: Emésztőszervi betegségek

**7th week:**
**Practical:** 4. fejezet: Összefoglalás

**8th week:**
**Practical:** Midterm oral exam

**9th week:**
**Practical:** 5. fejezet: A vizeletkiválasztó szervek betegségei

**10th week:**
**Practical:** 6. fejezet: Anyagcsere és endokrin betegségek

**11th week:**
**Practical:** 6. fejezet: Anyagcsere és endokrin betegségek

**12th week:**
**Practical:** 7. fejezet: Mozgásszervi betegségek

**13th week:**
**Practical:** 8. fejezet: Autoimmun betegségek

**14th week:**
**Practical:** 9. fejezet: Összefoglalás

## Requirements

**Requirements of the course:**

**Attendance**

Attending language classes is compulsory. If a student late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

**Students may not take Medical Hungarian course before entering the 3rd year.**
**Testing, evaluation**

In each Medical Hungarian language course, students must sit for a listening and two oral exams. A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If students fail or miss any word quizzes they cannot start their midterm and end term exams. They also have to take a vocabulary exam that includes all 100 words before the midterm and end term exams. A word quiz can be postponed by a week and students can take it only with their own teacher.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course.

The grades are given as follows.

fail (1)
pass (2)
satisfactory (3)
good (4)
excellent (5)

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.** Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

# Department of Internal Medicine

Subject: **INTERNAL MEDICINE II. (IMMUNOLOGY AND RHEUMATOLOGY)**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **27**
Practical: **18**

**1st week:**
**Lecture:** 1. Immunopathogenic mechanisms of systemic of autoimmune diseases. UCTD. 2. Systemic lupus erythematosus. (SLE) 3. Antiphospholipid syndrome. Immunity and pregnancy.
**Practical:** UCTD.

**2nd week:**
**Lecture:** 4. Systemic sclerosis. 5. Raynaud's syndrome. 6. Mixed Connecitve tissue disease (MCTD).
**Practical:** SLE, APS.

**3rd week:**
**Lecture:** 7. Sjögren's disease. 8. Organspecific autoimmune diseases. 9. Adult immunodeficiencies.
**Practical:** PSS and Raynaud's syndrome. MCTD.

**4th week:**
**Lecture:** 10. Demato/polymyositis. 11. Systemic vasculitides I. 12. Systemic vasculitides II.
**Practical:** Sjögren's syndrome and vasculitis.

**5th week:**
**Lecture:** 13. Laboratory diagnostics of autoimmune, allergic diseases and immunodeficiencies. 14. Respiratory allergic diseases. 15. Tumor immunology.
**Practical:** Polymyositis and dermatomyositis.

**6th 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.

**7th week:**
**Lecture:** 19. Early arthritis and special forms of RA. 20. Spondyloarthritides. 21. Differential diagnosis of arthritides and autoimmune diseases.
**Practical:** Presentation of a case with RA and spondyloarthritides.

**8th week:**
**Lecture:** 22. Soft tissue rheumatism, compression syndromes. 23. Reactive and septic arthritides. 24. Oseoarthritis, spondylosis. Low back pain.
**Practical:** Presentation of a case with gout, osteoporosis and other arthritides.

**9th week:**
**Lecture:** 25. Crystal deposition diseases. 26. Osteoarthritis, spondylosis. Low back pain. 27. Physiotherapy, balneotherapy.
**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). 1st part is written (minimum test, ≥85%), 2nd part is practical exam; 3rd part is oral exam (two topics).

# Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY II.**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **42**
Practical: **28**

**1st week:**
**Lecture:** 1. Coagulopathies, (general introduction), haemophilias.
2. von Willebrand disease
3. Platelet function disorders.
**Practical:** Laboratory informatics

**2nd week:**
**Lecture:** 4. Inherited thrombophilias.
5. Acquired thrombophilias
6. Prethrombotic state, thromboembolias, consumption coagulopathies
**Practical:** Laboratory diagnostics of coagulopathias

**3rd week:**
**Lecture:** 7. Laboratory diagnosis of autoimmune diseases
8. Disorders of sodium and water metabolism I.
9. Disorders of sodium and water metabolism II.
**Practical:** Laboratory diagnostics of Thrombophilia. Laboratory monitoring of anticoagulant therapy

**4th week:**
**Lecture:**
10. Disorders of potassium metabolism
11. Disturbances of the acid-base balance
12. Laboratory diagnostics of renal disorders

**Practical:** Laboratory diagnostics of platelet function disorders. Laboratory monitoring of antiplatelet therapy.

**5th week:**
**Lecture:**
13. Pathobiochemistry of the renal function I.
14. Pathobiochemistry of the renal function II.
15. Hypoglycaemias

**Practical:** Laboratory diagnostics of renal disorders.

**6th week:**
**Lecture:**
16. Pathogenesis and pathomechanism of diabetes mellitus
17. Pathobiochemistry and clinical biochemistry of the acute complications of diabetes mellitus
18. Laboratory diagnostics of diabetes mellitus

**Practical:** Examination of urine sediment
**Self Control Test**

**7th week:**
**Lecture:**
19. Disorders of lipid metabolism
20. Laboratory diagnostics of hyperlipidemia
21. Risk factors of atherosclerosis

**Practical:** Basic laboratory methods in metabolic diseases

**8th week:**
**Lecture:**
22. Laboratory diagnostics of acute coronary syndrome I.
23. Laboratory diagnostics of acute coronary syndrome II.
24. Laboratory diagnostics of hyperuricaemia and gout

**Practical:** Case presentation

**9th week:**
**Lecture:**
25. Pathobiochemistry of liver disorders
26. Laboratory diagnostics of liver disorders. Pathobiochemsitry of acute hepatic disorders
27. Pathobiochemistry and laboratory diagnostics of cholestasis and cirrhosis

**Practical:** Laboratory investigation of cerebrospinal fluid and other body fluids.

**10th week:**
**Lecture:**
28. Pathobiochemistry and laboratory diagnosis of autoimmune liver diseases
29. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract I.
30.Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract II.

**Practical:** Separation techniques.
**Self Control Test**

**11th 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, POCT

**12th week:**
**Lecture:**
34. Laboratory diagnostics of thyroid functions.
35. Clinical chemistry of parathyroid disorders. Disorders of calcium, phosphate and magnesium metabolism
36. Pathobiochemistry and laboratory diagnostics of adrenal cortex disorders

**Practical:** Laboratory evaluation of autoimmune diseases.

**13th week:**
**Lecture:**
37. Pathobiochemistry and laboratory diagnostics of adrenal medulla disorders
38. Clinical biochemistry of gonadal functions
39. Laboratory diagnostics of bone disorders

**Practical:** Laboratory evaluation of liver and pancreas function
**Self Control Test**

**14th week:**
**Lecture:**
40. Laboratory diagnostics of muscle disorders

41. Demonstration of practical pictures

42. Summary of laboratory methods

**Practical:** Laboratory evaluation of liver and pancreas function - case presentation.

**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 (1 theoretical, 1 practical topic and 1 practical picture). The practical pictures will be demonstrated on the last lectures of the 2nd semester. 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 2016.) as well as the textbook of William J. Marshall: Clinical Chemistry (8th edition, 2017.). Suggested reading : Hoffbrand A.V., Pettit J.E.: Essential Haematology, 3rd edition, 1999.

## Department of Medical Microbiology

Subject: **MEDICAL MICROBIOLOGY II.**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **19**
Practical: **28**

**1st week:**
**Lecture:** 1. Protozoa
2. Cestodes
**Practical:** Bacterial zoonotic infections

**2nd week:**
**Lecture:** 3. Nematodes I
4. Nematodes II
**Practical:** Anaerobic infections

**3rd week:**
**Lecture:** 5. The structure and classification of viruses
6. The replication of viruses
**Practical:** Infections of sterile body sites (sepsis, bacteriemia, endocarditis, osteomyelitis)

**4th 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

**5th week:**
**Lecture:** 9. Orthomyxoviruses
10. Paramyxoviruses, Coronaviruses, Rubellavirus
**Practical:** 3rd WRITTEN EXAMINATION (Clinical Bacteriology and Mycology)
**Self Control Test**

**6th week:**
**Lecture:** 11. Hepatitis viruses I
12. Hepatitis viruses II
**Practical:** The protozoal diseases

**7th week:**
**Lecture:** 13. Herpesviruses I
**Practical:** Cestodes, Nematodes

**8th week:**
**Lecture:** 14. Herpesviruses II
**Practical:** Laboratory diagnosis of viral infections

**9th week:**
**Lecture:** 15. Adenoviridae, Parvoviridae
**Practical:** Respiratory tract infections caused by viruses

**10th week:**
**Lecture:** 16. Picornaviridae, Reoviridae
**Practical:** Agents of viral skin rash. Congenital virus infections

**11th week:**
**Lecture:** 17. Rabies, slow virus infections
**Practical:** Agents of viral gastroenteritis. Hepatitis viruses

**12th week:**
**Lecture:** 18. Arbo- and Roboviruses
**Practical:** 4th WRITTEN EXAMINATION (Parasitology, Virology)
**Self Control Test**

**13th week:**
**Lecture:** 19. AIDS viruses
**Practical:** Epidemics in human history

**14th week:**
**Lecture:** 20. Human tumor viruses
**Practical:** Review of procedures of microbiological sample collection

**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. The ESE consists of a written entry test and an oral examination (there is no practical part). 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: 3rd year/2nd semester
Number of teaching hours:
Lecture: **42**
Practical: **45**

**1st week:**
**Lecture:** - Ophthalmic pathology. Cerebrovascular diseases. - Infective diseases of the CNS. - Tumors of the CNS.
**Practical:** Introduction

**2nd week:**
**Lecture:** - Neurodegenerative diseases I.- Dementias.- Neurodegenerative diseases II.- Movement disorders.- Diseases of the peripherial nerves and skeletal muscles.
**Practical:** 51. Meningeoma 52. Schwannoma 53. Glioblastoma 54. Retinoblastoma

**3rd week:**
**Lecture:** - Soft tissue tumors.- Melanocytic and epithelial skin tumors.- Diseases affecting tubuli and interstitium. Kidney stones. Hydronephrosis.
**Practical:** 55 a és b Alzheimer’s disease (a; HE + b; tau) 56 a és b Parkinson’s disease (a; HE + b; alpha-synuclein) 57. Lipoma 58. Embryonal rhabdomyosarcoma

**4th week:**
**Lecture:** - Glomerular diseases.- Cystic diseases and tumors of the kidney.- Pathology of the urinary tract.
**Practical:** 59. Carcinoma basocellulare 60. Compound naevus61. Superficial spreading malignant melanoma62. Malignant melanoma in the eye

**5th week:**
**Lecture:** - Hyperplasia and carcinoma of the prostate.- Diabetes mellitus.- Arteriosclerosis. Hypertension and hypertensive vascular disease.
**Practical:** 63. Nephropathia diabetica 64. Crescentic glomerulonephritis 65. Acute pyelonephritis 66. Clear cell kidney carcinoma

**6th week:**
**Lecture:** - Cardiomyopathies. Myocarditis.- Ischemic heart disease. Coronary heart disease.- Disease of the endocardium and the cardiac valves.
**Practical:** 67. Carcinoma transitiocellulare vesicae urinariae 68. Prostatic adenocarcinoma 69. IRDS 70. Bronchial asthma

**7th week:**
**Lecture:** - Congenital heart diseases. venous and lymphatic vessel disorders.- Interstitial lung disease.- Chronic obstructive pulmonary diseases.
**Practical:** 71. Boeck’s sarcoidosis 72. Bronchial squamous carcinoma 73. Intrabronchial carcinoid tumor 74. Small cell carcinoma

**8th week:**
**Lecture:** - Tumors of the lung and pleura.- ARDS. Pneumonia. Pulmonary embolisms.- Benign, preneoplastic and neoplastic lesions in the oral cavity. Diseases of salivary glands.
**Practical:** 75 a és b Barrett’s esophagus (a; HE + b; PAS-AB) 76. Ulcus pepticum ventriculi77. Crohn’s disease 78. Ulcerative colitis

**9th week:**
**Lecture:** - Esophageal diseases. Gastritis. Gastroduodenal ulcers.- Gastric tumors.- Maldevelopment of the intestine. Megacolon. Circulatory intestinal lesions.
**Practical:** 79. High grade adenoma in the colon 80. Malignant transformation of adenoma 81. Mucinous adenocarcinoma 82. Liver cirrhosis with HCC

**10th week:**
**Lecture:** - Enteritis. Enterocolitis. malabsorption. Inflammatory bowel diseases.- Colorectal cancer.- Intra-, and extrahepatic biliary tract diseases.
**Practical:** 83. Hashimoto’s thyreoiditis 84. Graves disease 85. Papillary carcinoma of the thyroid 86. Follicular carcinoma of the thyroid

**11th week:**
**Lecture:** - Viral hepatitis. Drug induced liver diseases. Acute and chronic hepatic failure.- Liver cirrhosis.- Tumors and circulatory disorders of the liver. Inheredited metabolic liver diseases.
**Practical:** 87. Pure seminoma 88. Embryonal carcinoma with choriocarcinoma 89. Tubal abortion 90. Fibroadenoma

**12th week:**
**Lecture:** - Cholestatic liver diseases. Disorders of the gallbladder and the extrahepatic biliary tract.- Pathology of the thyroid and parathyroid.- Pathology of the adrenals.
**Practical:** 91. Invasive ductal carcinoma with DCIS 92. Invasive lobular carcinoma 93. Adenocarcinoma of the endometrium 94.

Perineal endometriosis

**13th week:**
**Lecture:** - The pathology of the pancreas and the appendix.- Testicular tumors.- Non-neoplastic and preneoplastic conditions of the breast.
**Practical:** 95. Cystadenocarcinoma papillare serosum ovarii 96. Acute osteomyelitis 97. Chondroma98. Osteosarcoma

**14th week:**
**Lecture:** - Breast cancer.- Uterine tumors.- Tumors of the ovarium.
**Practical:** Repeating practice

**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 13th week (computerized) written exam,
14th week histopathology exam (computerized)
14th week practical exam
(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 and theoretical parts.

The written exam: the students get questions (can be found on the Department's website) and has to reach 85% to pass this part of the exam. In the 2nd semester the questions comes from the 1st and the 2nd semester.
During the computerized histopathology exam the students get 6 slides, and has to reach 85% 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 2 titles are to be worked out and presented 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 the take **Final Exam** (FE).

**The Exam consists of:** written, practical and theoretical parts. The written and practical exams are the 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). 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
https://elearning.med.unideb.hu/

# Division of Clinical Physiology

Subject: **CLINICAL PHYSIOLOGY**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **14**
Seminar: **28**

**1st week:**
**Lecture:** Introduction, cellular and molecular factors of pathologic cardiac excitability.
**Seminar:** The basics of ECG.

**2nd week:**
**Lecture:** Pathologic contractile function of the heart (contractile proteins, intracellular Ca2+-homeostasis and cardiac pumping).
**Seminar:** ECG diagnosis of arrhythmias I.

**3rd week:**
**Lecture:** Myocardial ischemia, myocardial infarction and new ischemic syndromes (hibernation, preconditioning, stunning).
**Seminar:** ECG diagnosis of arrhythmias II.

**4th week:**
**Lecture:** Cardiac hypertrophy and failure.
**Seminar:** Differential diagnostics or arrhytmias, evaluation of ECG recordings.

**5th week:**
**Lecture:** Heart failure (molecular pathophysiology).
**Seminar:** Conduction disorders, ECG sings of volume and pressure overload.

**6th week:**
**Lecture:** Endothelium, smooth muscle, vessels.
**Seminar:** Angina pectoris, myocardial infarction.

**7th week:**
**Lecture:** Hypertension.
**Seminar:** Exercise stress test ECG, Holter ECG.

**8th week:**
**Lecture:** New translational perspectives in cardiovascular medicine.
**Seminar:** Electronic pacemakers, mechanisms of arrhythmias.

**9th 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.)**

**10th week:**
**Lecture:** Cellular and molecular elements of the respiratory system with clinical significance.
**Seminar:** Evaluation of ECG recordings (oral ECG exam).

**11th week:**
**Lecture:** Clinical physiology of the respiratory system.
**Seminar:** Echocardiography I., standard views, normal values.

**12th week:**
**Lecture:** Clinical physiology of nutrition and metabolism.
**Seminar:** Echocardiography II., consequences of myocardial infarction, stress echocardiography, TEE.

**13th week:**
**Lecture:** Clinical physiology of the nervous system I.
**Seminar:** Respiratory function tests.

**14th week:**
**Lecture:** Clinical physiology of the nervous

system II.
**Seminar:** Cardiac catheterisation.
**Self Control Test (Result of the 9th and 14th 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 the acknowledgment of the semester from this subject if a student is absent for more than two seminars. Seminar attendance is recorded electronically during the first 5 minutes of the seminars, thereby late arrivals by 6 or more minutes result in seminar absences. A successful oral ECG test (during the 10thweek of the second semester) is also a prerequisite for Clinical Physiology.

Third year students are invited to participate in two written tests ("Assessment of the work" (AW)) during the 9th and 14th weeks organized by the Division of Clinical Physiology. Single choice test questions (single right or single false answers should be chosen from five possibilities) will be asked to assess students' proficiency. Bonus points can be collected for the 9th week written exam to be included into the result of the pre-final (14th week exam) and final tests (during examination period). 20 questions covering the materials of lectures and seminars between 1-9 weeks will be asked on the 9th week written self control.

Students reaching higher than passing limits will be offered by a recommended grade following the 14th week self control. This pre-final exam will contain 50 questions where the entire curriculum of Clinical Physiology will be included. The Division cannot ensure opportunities for the inspection of the corrections of the above self controls on a personal basis, nevertheless test questions can be discussed after the tests during independent events organized for all students at the same time. Students are expected to arrange this event where a minimum of 40 students should participate and to contact the academic advisor for technical support.

If a final grade cannot be recommended, written exams will be performed during the examination period. First exams and first repeated exams are in written, while the second repeated exam is in an oral. In addition students can register for an oral improvement provided they exceeded the passing limit of any written tests. There is not a special topic list for oral improvement exam, oral ECG analysis and all the materials of seminars and lectures are asked.

For more information, please visit: klinfiz.unideb.hu. Login requires NEPTUN code and its password.

## Institute of Behavioural Sciences, Faculty of Public Health

Subject: **MEDICAL PSYCHOLOGY**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

**1st week:**
**Lecture:** Health and medical psychology: definition, models, the bio-psycho-social model.

**Seminar:** The role of psychology in medical practice.

**2nd week:**
**Lecture:** Seeking professional help (first encounter, medical history, diagnostic procedure). Doctor-patient interaction, compliance, the "difficult patient".

**Seminar:** Special problems of medical students and doctors.

**3rd week:**
**Lecture:** Health beliefs, models of health, health behaviours, illness cognitions. Models of illness. Health risk behaviours.
**Seminar:** Phases of doctor-patient consultation.

**4th week:**
**Lecture:** Adverse childhood experiences and adult health (ACE).
**Seminar:** Breaking bad news.

**5th week:**
**Lecture:** Pain - psychological and sociolcultural factors.
**Seminar:** Stress management, time management, relaxation.

**6th week:**
**Lecture:** Chronic diseases, psychological preparation for surgery, intensive care unit, hospitalization.

**7th week:**
**Lecture:** Stress and coping (vulnerabiliy, protective factors). Basics of psychology.

**8th week:**
**Lecture:** Crisis, presuicidal syndrome, burnout.

**9th week:**
**Lecture:** Somatoform and psychosomatic disorders.

**10th week:**
**Lecture:** Placebos and the interrelationship among beliefs, behaviour and health.

**Requirements**

**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.)
The final mark is the average of the seminar and the lecture results. Both how to be to better than fail (1) to pass the ESE.

# CHAPTER 17
# ACADEMIC PROGRAM FOR THE 4TH YEAR

## Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY BLOCK PRACTICE - 4TH YEAR**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Practical: **30**

### Requirements

Block practice is an integral part of the curriculum in obstetrics and gynecology, details are shown there.

Subject: **OBSTETRICS AND GYNECOLOGY I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

**1st week:**
**Lecture:** Obstetric history and examination
**Practical:** Introduction of the Department. Case presentations

**2nd week:**
**Lecture:** Physiological pregnancy
**Practical:** Case presentations

**3rd week:**
**Lecture:** Antenatal care
**Practical:** Case presentations

**4th week:**
**Lecture:** Labour
**Practical:** Case presentations

**5th week:**
**Lecture:** Fetal assessment
**Practical:** Case presentations

**6th week:**
**Lecture:** Preterm labour
**Practical:** Case presentations

**7th week:**
**Lecture:** Preeclampsia
**Practical:** Case presentations

**8th week:**
**Lecture:** Haemorrhagic complications
**Practical:** Case presentations

**9th week:**
**Lecture:** Interventional obstetrics
**Practical:** Case presentations

**10th week:**
**Lecture:** Miscarriage, abortion, ectopic pregnancy
**Practical:** Case presentations
**Self Control Test (Oral exam exemption test)**

**11th week:**
**Practical:** Block practice

**12th week:**
**Practical:** Block practice

**13th week:**
**Practical:** Block practice

**14th week:**
**Practical:** Block practice

**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. These occasions must be arranged with the responsible tutors in advance, as it is possible only with them and only at the missed location within their ordinary rotation schedule.
Signature in the lecture book will be declined if arrears exist at the end of semester.
Block practicals (5x6 hours) are organized according to the curriculum. Similarly to the weekly practicals, each student is allocated to a specified team of tutors, following their rotation schedule between wards and outpatient clinics.
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 1st and 2nd 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. Information on the practical part of the exam will be spread out during the semester.

# Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOLOGY I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **30**
Seminar: **20**

**1st week:**
**Lecture:** Introduction to general pharmacology
Basics of pharmacodynamics
Basics of pharmacokinetics
**Seminar:** Basic principles 1.

**2nd week:**
**Lecture:** Drug interactions
Introduction to autonomic pharmacology
Cholinoceptor-activating and blocking drugs
**Seminar:** Basic principles 2. Autonomic nervous system 1.

**3rd week:**
**Lecture:** Adrenoceptor-activating and other sympathomimetic drugs

Adrenoceptor-blocking drugs
Uterotonics, tocolytics and smooth muscle relaxant drugs
**Seminar:** Basic principles 3. Autonomic nervous system 2.

**4th week:**
**Lecture:** Agents used in hyperlipidemia treatment
Diuretics and antidiuretics I.
Diuretics and antidiuretics II.
**Seminar:** Basic principles 4. Cardiovascular system 1.

**5th week:**
**Lecture:** Antianginal drugs, myocardial ischemia, calcium antagonists
NO donors and inhibitors, vasodilators, pharmacology of vasoactive peptides
Treatment of congestive heart failure, positive inotropic drugs
**Seminar:** Basic principles 5. Cardiovascular system 2.

**6th week:**
**Lecture:** Antihypertensive agents I.
Antihypertensive agents II.
Agents used in cardiac arrhythmias I.
**Seminar:** Basic principles 6. Cardiovascular system 3.

**7th week:**
**Lecture:** Agents used in cardiac arrhythmias II.
Respiratory pharmacology I. Treatment of bronchial asthma and COPD
Respiratory pharmacology II. Antitussives and expectorants
**Seminar:** Basic principles 7. Cardiovascular system 4.

**8th week:**
**Lecture:** Agents used in anemias, hemopoietic growth factors
Drugs used in disorders of coagulation
Pharmacology of the liver and gall bladder.
Pancreatic enzyme replacement products. Drugs promoting gastrointestinal motility.
**Seminar:** Basic principles 8. Drug formulae and prescription writing 1.

**9th week:**
**Lecture:** Antiemetics, laxatives and antidiarrheal drugs
Drugs used in the treatment of inflammatory bowel diseases
Pharmacotherapy of peptic ulcer disease
**Seminar:** Basic principles 9. Drug formulae and prescription writing 2.
**Self Control Test**

**10th week:**
**Lecture:** Regulation of the appetite.
Pharmacotherapy of the obesity.
Botanical (herbal) remedies
Biological products and gene therapy
**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 will refuse to sign the semester if he/she is absent from more than 2 seminars/semester. Two control tests during the semester will be performed, which is obligatory.
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. Three questions should be answered in detail. To know the groups of drugs with examples in all of the chapters in pharmacology is compulsory. If one question is remained properly unanswered from the three titles the student is not allowed to pass. If lethal dose, not proper or ineffective treatment is discussed the student have to be failed.

Dress code for exams: Informal (www.dresscodeguide.com; www.dresscode.hu). Display religious affiliation is allowed (cross, abaya, burqa (niqab), chador, hijab, sartorial hijab, turban, yarmulke etc.), but it cannot generate fear. Wedding ring, sindoor, snoods are allowed as well. For more details visit our website: pharmacology.med.unideb.hu

## Department of Preventive Medicine, Faculty of Public Health

Subject: **PREVENTIVE MEDICINE AND PUBLIC HEALTH I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **30**
Seminar: **40**

**1st week:**
**Lecture:** 1. The history, scope and methods of public health and preventive medicine 2. Introduction to human ecology 3- 4. Global environmental pollution
**Seminar:** 1. Effects of environmental pollution – POPs (case study) 2. Health effects of foodborne exposures (case study)

**2nd week:**
**Lecture:** 5. Air pollution and health 6. Water pollution and health 7.-8.**Toxicology of pesticides and organic solvents**
**Seminar:** 3. Health effects of exposures of drinking water sources (case study) 4. Effects of workplace-related exposures (case study)

**3rd week:**
**Lecture:** 9. Heavy metals in the human environment 10**. Scope of occupational health 11. Introduction to occupational toxicology**12. Health effects of noise
**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)

**4th week:**
**Lecture:** 13-14. Occupational diseases 15. Nutritional deficiency diseases 16. Food borne diseases
**Seminar:** 7. Diet and risk of chronic diseases 8. Water quality control

**5th week:**
**Lecture:** 17.-18. Diet related diseases. The role of diet in the pathogenesis of cardiovascular diseases and malignant neoplasm 19. Bioterrorism 20. Genetic susceptibility to chronic diseases at individual and population levels
**Seminar:** 9. Diagnosing occupational diseases 10. Enviroenmental radiation control

**6th week:**
**Lecture:** 21. The history, definition and scope of epidemiology 22. Epidemiological investigations,
**Seminar:** 11. Basic biostatistics 12.Using research results in clinical practice I

**7th week:**
**Lecture:** 23. Frequency measures in epidemiology 24. Study design
**Seminar:** 13. Types of epidemiological studies14. Validity of epidemiological studies

**8th week:**
**Lecture:** 25. Analyses based on aggregate statistics 26. Conclusions of the epidemiological studies
**Seminar:** 15. Using research results in clinical practice II 16. Using epidemiological measures in practice (DEALE method)

**9th week:**
**Lecture:** 27. Preventive strategies 28. Randomized controlled trials
**Seminar:** 17. Preventive strategies 18. Critical evaluation of the epidemiological literature

programs

**10th week:**
**Lecture:** 29. Interventional studies 30. Screening
**Seminar:** 19. Clinical trials 20.Screening

**Requirements**

**Requirements for signing the lecture book:**
Attendance of lectures and class seminars is highly recommended. 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 during the same week.

**Requirements for the exam:**
During the last week of the first semester (on week 10, *the exact date will be announced later*) 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.

The slides of lectures and seminars can be downloaded from our website: www.publichealth.hu/pdf

# Department of Surgery

Subject: **SURGERY BLOCK PRACTICE - 4TH YEAR**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Practical: **60**

**Requirements**

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 organized.
Practice hours are between 7.30 AM and 1.30 PM (weekdays only).
The students are required to deposit their yellow practice book with the secretary at the beginning of the practice which they are given back signed upon completion of the requirements. Moreover, to monitor the attendance every student has to leave his/her university card with the secretary every morning and pick it up at the end of the day.

Subject: **SURGERY I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **12**
Practical: **10**

**1st week:**
**Lecture:** The history of surgery
**Practical:** Vascular surgery practice week

**2nd week:**
**Lecture:** Patient counseling, informed consent. Ethical and legal aspects.
**Practical:** Breast-endocrine surgery practice week

**3rd week:**
**Lecture:** Wound healing, surgical infections. Tetanus, gas gangrene
**Practical:** General surgery, TRP practice week

**4th week:**
**Lecture:** Lecture1: Diseases of the esophagus
Lecture 2: Plastic surgery operations of the trunk and extremities (Zoltán Péter, M.D.)
**Practical:** Thoracic surgery practice week

**5th week:**
**Lecture:** Lecture 1: Benign gastric lesions. Gastric cancer
Lecture 2: Plastic surgery operations in the head and neck region. (Attila Szűcs M.D., PhD)
**Practical:** Gastroenterologic surgery practice week

**6th week:**
**Lecture:** Hernia surgery

**7th week:**
**Lecture:** Diseases of the biliary tract and gall bladder

**8th week:**
**Lecture:** Hepatic surgery

**9th week:**
**Lecture:** Pancreatitis, pancreas malignancies

**10th week:**
**Lecture:** Diseases of the spleen. Laparoscopy in surgery

**Requirements**

There are 10 surgery lectures during the semester and 2 extra lectures on plastic surgery (organized by the Department of Dermatology)
During the first semester the first half of the year has to complete 5x2 hours of practice.
If missing a practice, you have to make it up with another group during the same week. The Head of the Department may refuse to sign the electronic Lecture Book if a student was absent from more than one practice during the semester without an acceptable reason.
Examination: written test covering the topics of the first semester.

## Department of Traumatology and Hand Surgery

Subject: **TRAUMATOLOGY I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

**1st week:**
**Lecture:** 1. The role of traumatology in medicine. Process of fracture healing (biology, biomechanics). The diagnosis and treatment of fractures. Classifications of closed fractures. The basic principles of fractures treatment. 2. Classification and treatment of open fractures. Prevention and treatment of post-traumatic and post operative infections. 3. Process of wound healing. Closed and open soft tissue injuries, wound treatment. Types of bleeding. Diagnosis and treatment of closed and open vessel injuries.

**2nd week:**
**Lecture:** 1.Diagnosis and treatment tactics of dislocations. Recognition and treatment of posttraumatic pathological states. Compartment syndrome. Sudeck dystrophy. Disturbances of bone healing: delyed union and non-union. Posttraumatic arthritis. 2. Injuries in childhood. Injuries specific to growing bone and their treatment principles. Characteristic childhood injuries. 3. Injuries of thoracic cage. Pneumathorax, hemothorax. Cardiac injuries. Closed and open injuries of the abdomen. Diagnosis and operative treatment of abdominal organ injuries. Diaphragmatic rupture. Injuries to retroperitoneal organs.

**3rd week:**
**Lecture:** 1. Treatment protocol of severely injured patients, ATLS. Intensive care. Traumatic hemorrhagic shock. Fluid and electrolyte replacement. 2. Craniocerebral injuries. Fractures of the skull and calvaria. Brain edema. Recognition and treatment of intracranial hemorrhage. 3. Diagnosis and treatment of vertebral fractures with and without nervous system injuries. Physiology of nerve regeneration. Diagnosis and basic treatment principles of peripheral nerve injuries.

**4th week:**
**Lecture:** 1. Injuries of the pelvic ring and acetabulum. 2. Occurrence of femur neck fractures, characteristics of fractures in elderly patients. Garden classification. Minimal invasive therapy: osteosynthesis using cannulated screws. Indication for the use of hip replacement. 3. Diagnosis, classification and treatment of per- and subtrochanteric femur fractures. Treatment of femur diaphysis fractures.

**5th week:**
**Lecture:** 1-2. Common fractures of the upper limb - treatment of fractures of the proximal humerus and wrist. 3. Diagnosis, classification and basic principles of treatment of crural and ankle fractures. Pilon fractures.

**6th week:**
**Practical:** Physical examination of the trauma patient. Anemnesis. General physical examination. Functional examination of the extremities (neutral 0 method). Examination of circulation and inveration. Imaging 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.

**7th week:**
**Practical:** The basic principle of wound treatment. Sutures, knot tying, suture removal. Bandage. Tetanus and Lyssa profilaxis.

**8th week:**
**Practical:** Types of conservative fracture treatment. Roles of application of plasters. Soft bandages, braces, orthesises. Traction treatment.

**9th week:**
**Practical:** Operative fracture treatment. Implantations. Metallosis, corrosion, metal allergy. Types of osteosynthesises. Diagnostic and operative arthroscopy. Basic principles of osteosynthesises.

**10th week:**
**Practical:** Treatment of seriosly injured patients. ATLS (Advanved Trauma Life Support). Resuscitation.

**Requirements**

The lectures will take place in the Auguszta big lecture hall. We strongly advise to participate on the lectures, because the official textbook include not all the diagnostic and therapeutic knowledge. The practices will take place two hours a week at the Department of Trauma and Hand Surgery (4031 Debrecen, Bartók B. u. 2-26). Participation on the practices 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.

After finishing Traumatology I. course and practices, during the educational period there will be written test with 30 questions. The students, who have good results of the test, will receive discount on the oral exam.

Type of the exam:

Emphasised mode oral exam (Kollokvium). Registration to the exam should be done the day before the exam till 12.00 hour on the internet Neptun program.

The oral exam consists of three questions.

# Division of Cardiology

Subject: **INTERNAL MEDICINE III. (CARDIOLOGY, ANGIOLOGY)**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

**1st week:**
**Lecture:** 1. Epidemiology of cardiovascular diseases. Milestones in cardiology.
2. Pathomechanism of atherosclerotic diseases. Risk factors and prevention.
**Practical:** Coronary Heart Disease: stable coronary artery disease, unstable angina, STEMI, NSTEMI management.

**2nd week:**
**Lecture:** 3. Acute coronary syndrome management.
4. Stable coronary artery disease. Non-invasive and invasive imaging modalities for evaluating coronary artery stenos and their complications.
**Practical:** Congenital and acquired heart disease. Heart murmurs, diagnosis and therapy, surgical indications.

**3rd week:**
**Lecture:** 5. Coronary artery bypass graft surgery. Surgical management of the complications of acute myocardial infarction.
6. Peripheral arterial disease: symptoms, diagnosis and therapy.
**Practical:** Examination of heart failure patients. Arrhythmias.

**4th week:**
**Lecture:** 7. Aortic aneurysm: diagnosis, therapy. Vasculitis, disorders of microcirculation.
8. Symptoms, types, diagnosis and therapy of

hypertension.
**Practical:** Hypertension and peripheral artery disease.

**5th week:**
**Lecture:** 9. Pathomechanism, symptoms and diagnosis of heart failure. Classification of cardiomyopathies.
10. Pharmacological therapy of acute and chronic heart failure.
**Practical:** Cardiovascular prevention and rehabilitation.

**6th week:**
**Lecture:** 11. Mechanical circulatory support. Heart transplant.
12. Myocarditis, pericarditis, infective endocarditis.

**7th week:**
**Lecture:** 13. Clinical appearance of bradycardias. Syncope, pacemaker therapy.
14. Supraventricular tachycardias. Catheter ablation. Differential diagnostics of narrow and wide QRS complex tachycardia.

**8th week:**
**Lecture:** 15. Atrial fibrillation and flutter: ECG-signs, antiarrhythmic therapy and prevention of thromboembolic complications.
16. Ventricular arrhythmias: diagnosis and management. ICD therapy.

**9th week:**
**Lecture:** 17. Rheumatic, degenerative and ischemic valvular heart disease.
18. Grown-up congenital heart disease (ASD, VSD, PDA, coarctation of the aorta, Ebstein anomaly, bicuspidal aortic valve).

**10th week:**
**Lecture:** 19. Surgical and interventional management of valvular heart disease (valvular surgery, TAVI). Postoperative pharmacological therapy.
20. Cardiac rehabilitation after myocardial infarction, percutaneous and surgical interventions.

**11th week:**
**Practical:** Block practice

**12th week:**
**Practical:** Block practice

**13th week:**
**Practical:** Block practice

**14th week:**
**Practical:** Block practice

**Requirements**

Participation in practices is obligatory.
Type of exam: minimum test, practical exam, oral exam.
Signature of lecture book: take part in all practices. Application for subject.

# Division of Radiology and Imaging Science

Subject: **RADIOLOGY AND NUCLEAR MEDICINE I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **30**

**1st week:**
**Lecture:** Principles of Radiological Techniques. Contrast media in Radiology.
**Practical:** Contrast media in Radiology. Chest Radiology.

**2nd week:**
**Lecture:** Chest Radiology. Cardiovascular Radiology.
**Practical:** Cardiovascular Radiology.

**3rd week:**
**Lecture:** Gastrointestinal and abdominal radiology.
**Practical:** Gastrointestinal radiology I. (esophagus, stomach)

**4th week:**
**Lecture:** Urogenital Radiology. Gynecological and Obstetric Radiology.
**Practical:** Gastrointestinal Radiology II. (liver, spleen, gall, pancreas)

**5th week:**
**Lecture:** Breast imaging. Interventional radiology.
**Practical:** Urogenital Radiology. Breast imaging. Gynecological and Obstetric Radiology.

**6th week:**
**Lecture:** Neuroradiology - brain, spine.
**Practical:** Neuroradiology - brain.

**7th week:**
**Lecture:** Head and neck imaging.
**Practical:** Neuroradiology - spine.

**8th week:**
**Lecture:** Musculosceletal radiology.
**Practical:** Musculosceletal radiology.

**9th week:**
**Lecture:** Paediatric imaging.
**Practical:** Paediatric imaging.

**10th week:**
**Lecture:** Emergency radiology.
**Practical:** Emergency radiology.

**Requirements**

The aim of the course is to teach students the basis of how the different medical imaging modalities work with respect to clinical application.
Two absences are allowed.
Final test: written.
At least 30 % of the end of semester test questions will be given to the students prior to the test to help them prepare.
Petitions, e.g: to change groups, will be accepted until the second week.
Must to reach 60 % to pass the exam.
70%-satisfactory
80%- good
90%- excellent

# Faculty of Dentistry

Subject: **STOMATOLOGY**
Year, Semester: 4th year/1st semester**,** 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **16**

**6th 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.

**7th week:**
**Lecture:** Disorders of the TMJ. Facial pain. Oral Medicine.
**Practical:** Recognizing and treatment of orthodontic disorders. Anomalies of the occlusion and dental arches.

**8th 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.

**9th week:**
**Lecture:** Stomato-oncology. Pediatric Dentistry. Preventive Dentistry.
**Practical:** Dental and maxillo-facial traumatology. Treatment and prevention of stomato-oncological diseases.

**10th 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 cannot exceed one (2 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.
The exam is ESE, an electronical test via exam.unideb.hu (moodle).
Max. 30 students can be examined on an exam date.

## Institute of Behavioural Sciences, Faculty of Public Health

Subject: **BIOETHICS**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Seminar: **10**

**1st week:**
**Lecture:** Introduction to bioethics. The role of ethics in medicine; Patients' Rights as a moral framework: Medical confidentiality.
**Seminar:** Confidentiality and data-management in clinical practice.

**2nd week:**
**Lecture:** Patients' Rights II.: Informed consent and communication.
**Seminar:** Informed consent in practice.

**3rd week:**
**Lecture:** Ethics of end-of-life decisions: Euthanasia and the right to refuse treatment.
**Seminar:** Ethics of end-of-life decisions.

**4th week:**
**Lecture:** Fundamental ethical requirements for medical research on humans.
**Seminar:** Clinical trials and non-interventional research.

**5th week:**
**Lecture:** Justice in health care: Allocation for carce resources.
**Seminar:** Distributive justice in the clinic.

**6th week:**
**Seminar:** Confidentiality and data-management in clinical practice.

**7th week:**
**Seminar:** Informed consent in practice.

**8th week:**
**Seminar:** Ethics of en-of-life decisions.

**9th week:**
**Seminar:** Clinical trials and non-interventional research.

**10th week:**
**Seminar:** Distributive justice in the clinic.

**Requirements**

Requirements for signing the lecture book: regular attendance at the seminars.

Evaluation: ESE Marks will be given to the ethical workup. The students will prepare ethical analysis, and written answers to questions.

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 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 IV. (ENDOCRINOLOGY, NEPHROLOGY)**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

**1st 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.

**2nd week:**
**Lecture:** 1. The thyroid nodule. Thyroid cancer. Multiple endocrine neoplasia, carcionoid syndrome. Hypoglycemic disorders.2. Hypothyroidism. Thyroiditis.

**3rd week:**
**Lecture:** 1. Adrenal insufficiency, adrenal crisis. Cushing's disease and Cushing's syndrome. 2. Hyper- and hypoparathyroidism. Hypercalcemic states.

**4th week:**
**Lecture:** 1. Mineralocorticoid excess. Congentianl adrenal hyperplasia. Pheochromocytoma. 2. Diseases of the anterior pituitary. Hypo- and hyperfunction. Posterior pituitary, diabetes insipidus, SIADH

**5th week:**
**Lecture:** 1. Hyper and hypoparathyroidism. Hypercalcemic states. 2. Case presentation

**6th week:**
**Lecture:** 1. Chronic kidney disease - definition, significance, classification, causes and screening. Referral to a nephrology clinic, emergency states. 2. Accelerated vascular calcification, anaemia and disorders of the Ca-P metabolism in kidney disease.
**Practical:** Endocrinology I. History taking, physical examination and diagnostic procedures in patients with endocrine diseases.

**7th week:**
**Lecture:** 1. Primary glomerulonephritis. 2. Acute and chronic tubulointerstitial nephritis. Pregnancy and the kidney. Urinary tract infection, renal stones.
**Practical:** Endocrinology II. Case presentation of patients with the most common endocrine diseases (Graves' diseases, acromegaly, Cushing's disease)

**8th week:**
**Lecture:** 1. Systemic diseases (diabetes, lupus, vasculitis, myeloma) associated with glomerulopathy. 2. Vascular and hypertensive kidney damage.
**Practical:** Nephrology I. History taking, physical examination and diagnostic procedures in patients with kidney diseases.

**9th week:**
**Lecture:** 1. Acute renal failure - presentation, diagnosis, differential diagnosis, prevention. 2. Renal replacement therapy (hemodialysis, peritoneal dialysis.
**Practical:** Nephrology II. Case presentation of patients with the most common acute chronic kidney diseases (diabetes, hypertension, vascular kidney disease), differential diagnosis.

**10th week:**
**Lecture:** 1. Kidney transplantation, recipient and donor compatibility, immunosuppression. 2. Case presentation.
**Practical:** Renal replacement therapy. Presentation of the Division of Nephrology and

the Extracorporeal Life Support Center

**11th week:**
**Practical:** Block practice

**12th week:**
**Practical:** Block practice

**13th week:**
**Practical:** Block practice

**14th week:**
**Practical:** Block practice

**Requirements**

Requirements for accepting the semester: Practices are compulsory, therefore nobody should be absent from any practice unless due to well-documented reasons. Missed practices should be repeated preferably the same week, confirmation of attendance should be presented to the tutor. Everyone must be able to communicate with the patients using basic Hungarian during history taking and physical examination. The official material of examinations includes the lecture and practice materials and the suggested readings.
Examination procedure:

1. Written test (minimum questions), pass limit 90%

2. Practical (bedside) examination

3. Theoretical examination

https://elearning.med.unideb.hu

## Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **5**
Practical: **20**

**1st week:**
**Lecture:** Gynaecological history and examination
**Practical:** Case presentations

**2nd week:**
**Lecture:** Infertility and contraception
**Practical:** Case presentations

**3rd week:**
**Lecture:** Benign gynaecological conditions
**Practical:** Case presentations

**4th week:**
**Lecture:** Gynaecological malignancies
**Practical:** Case presentations

**5th week:**
**Lecture:** Operative gynaecology
**Practical:** Case presentations

**6th week:**
**Practical:** Case presentations

**7th week:**
**Practical:** Case presentations

**8th week:**
**Practical:** Case presentations

**9th week:**
**Practical:** Case presentations

**10th week:**
**Practical:** Case presentations
**Self Control Test (Oral exam exemption test)**

**11th week:**
**Practical:** Block practice

**12th week:**
**Practical:** Block practice

**13th week:**
**Practical:** Block practice

**14th week:**
**Practical:** Block practice

**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. These occasions must be arranged with the responsible tutors in advance, as it is possible only with them and only at the missed location within their ordinary rotation schedule.
Signature in the lecture book will be declined if arrears exist at the end of semester.
Block practicals (5x6 hours) are organized according to the curriculum. Similarly to the weekly practicals, each student is allocated to a specified team of tutors, following their rotation schedule between wards and outpatient clinics.
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 1st and 2nd 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. Information on the practical part of the exam will be spread out during the semester.

# Department of Orthopedic Surgery

Subject: **ORTHOPAEDIC SURGERY**
Year, Semester: 4th year/2nd semester**,** 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **16**

**1st 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).

**2nd 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).

**3rd 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.

**4th 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.

**5th 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.

**6th 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.

**7th week:**
**Lecture:** Diseases of the neck and upper extremities.

**8th 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.

**9th week:**
**Lecture:** Bone tumours and tumour - like lesions

**10th 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 Department. 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: 4th year/2nd semester
Number of teaching hours:
Lecture: **50**
Seminar: **20**

**1st week:**
**Lecture:** Antiepileptics
Sedatohypnotics
Alcohols
Antipsychotics and lithium
Antidepressants
**Seminar:** Repetition of the pharmacology of the autonomic drugs and the prescription writing.

**2nd week:**
**Lecture:** Antiparkinsonian agents
Pharmacotherapy of other neurodegenerative diseases
Opioid analgesics and antagonists-I
Opioid analgesics and antagonists-II
Drug of abuse
**Seminar:** Pharmacology of the cardiovascular drugs. CNS pharmacology I: Antiepileptics and sedatohypnotics.

**3rd week:**
**Lecture:** General anaesthetics
Local anaesthetics
Peripheral and central muscle relaxants
Serotonin, agonits and antagonists, the ergot alkaloids and the therapy of migraine
Histamine and antihistaminic drugs
**Seminar:** Pharmacology of the gastrointestinal drugs. CNS pharmacology II: Antidepressants. Antiparkinsonian agents.

**4th week:**
**Lecture:** Non-steroidal antiinflammatory drugs I
Non-steroidal antiinflammatory drugs II
Pharmacotherapy of rheumatoid arthritis and gout
Hypothalamic and hypophyseal pharmacology
Thyroid and antithyroid drugs. Parathyroid hormon
**Seminar:** CNS pharmacology III: Antipsychotics, Other neurodegenerative disorders, opioids. Muscle relaxants and the pharmacology of anesthesia.

**5th week:**
**Lecture:** Adrenocorticosteroids and adrenocortical antagonists
Pancreatic hormones and antidiabetic drugs-I
Pancreatic hormones and antidiabetic drugs-II
The gonadal hormones and inhibitors-I
The gonadal hormones and inhibitors-II
**Seminar:** Serotonin, histamine, NSAIDs
Pharmacological treatment of RA and gout.

**6th week:**
**Lecture:** Drugs and pregnancy

Pharmacology of doping
Agents that affect bone mineral homeostasis
Basic principles of antimicrobial chemotherapy
β-lactam antibiotics and other cell wall synthesis
**Seminar:** Endocrine pharmacology especially treatment of diabetes.

**7th week:**
**Lecture:** Protein synthesis inhibitors
Sulfonamides, trimethoprim and (fluoro)quinolones, metronidazole and urinary antiseptics
Antimycobacterial drugs
Other and novel antibacterial drugs
Antiseptics and disinfectants
**Seminar:** Antibacterial chemotherapy

**8th week:**
**Lecture:** Antiviral chemotherapy and prophylaxis I
Antiviral chemotherapy and prophylaxis II
Antiparasitic chemotherapy: basic principles. Antiprotozoal drugs
Antiparasitic chemotherapy: Antihelminthic drugs. Disinfectants, antiseptics and sterilants
Antifungal agents
**Seminar:** Antihelmintic and antiprotozoal agents. Disinfectants, antiseptics and sterilants

**9th week:**
**Lecture:** Cancer chemotherapy-I
Cancer chemotherapy-II
Cancer chemotherapy-III
Immunopharmacology-I
Immunopharmacology-II
**Seminar:** Antifungal and antiviral agents. Pharmacological management of neoplastic diseases.
**Self Control Test (Test from the topics of the first 8 weeks.)**

**10th week:**
**Lecture:** Toxicology-I Introduction to toxicology
Toxicology-II Treatment of intoxicated patient
Ocular and dermatological pharmacology
Pharmacology of radiological contrast media
Preclinical and clinical drug development
**Seminar:** Immunopharmacology. Toxicology. Drug development

**Requirements**

Prerequisites: Pharmacology I.

Attendance at lectures is highly recommended, since the topics in examination cover the lecture topics. Attendance register will be performed regularly. Attendance at seminars is compulsory. The Department will refuse to sign the semester if he/she is absent from more than 2 seminars/semester. Two control tests during the semester will be performed, which is obligatory.
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 the two semesters. Three questions should be answered in detail. To know the groups of drugs with examples in all of the chapters in pharmacology is compulsory. If one question is remained properly unanswered from the three titles the student is not allowed to pass. If lethal dose, not proper or ineffective treatment is discussed the student has to be failed. For further details visit our website: pharmacology.med.unideb.hu

# Department of Preventive Medicine, Faculty of Public Health

Subject: **PREVENTIVE MEDICINE AND PUBLIC HEALTH II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **30**
Seminar: **20**
Practical: **15**

**1st week:**
**Lecture:** 1. Introduction to the epidemiology and surveillance of communicable diseases2. Characteristics of infectious diseases, steps of outbreak investigation 3. Epidemiology of sexually transmitted diseases
**Seminar:** 1. Dynamics of infection 2. Using Epiinfo in outbreak investigation

**2nd week:**
**Lecture:** 4. Epidemiology and control of zoonoses 5. Epidemiology of gastrointestinal infections 6. Epidemiology of hepatitis
**Seminar:** 3. Outbreak investigation of hepatitis B virus infection in clinical setting 4. Community emergency care

**3rd week:**
**Lecture:** 7. Epidemiology of nosocomial infections 8. Vaccines and immunization9. Re-emerging infections
**Seminar:** 5. Concept and methods of health monitoring 6. Control of nosocomial infections (visit)

**4th week:**
**Lecture:** 10. Epidemiology of HIV/AIDS 11. Prion diseases: facts and theories in preventive medicine 12. Epidemiology and control of airborne infections.
**Seminar:** 7. Vaccine preventable diseases 8. Public health databases

**5th week:**
**Lecture:** 13. Epidemiology of chronic respiratory diseases 14. Introduction to the epidemiology of non-communicable diseases 15. Epidemiology and control of metabolic, gastrointestinal and liver diseases Dr. János Sándor
**Seminar:** 9. Priority setting in health care10. Public health databases 2

**6th week:**
**Lecture:** 16. Epidemiology of mental disorders and behavioral problems 17. Epidemiology and control of cardiovascular diseases 18. Epidemiology of cancers
**Seminar:** 11. Health education in primary care12. Health education techniques

**7th week:**
**Lecture:** 19. Health status in developing and developed countries 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:** 13. Concept and practice of health promotion14. Prioritizing using public health database

**8th 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:** 15. Introduction to health policy16. Health systems financing

**9th week:**
**Lecture:** 25. Needs, demand and use of health service, Methods of financing health services 26. Methods of financing health services 27. Organization of public health services
**Seminar:** 17. Assessing and improving quality of health services 18. Interpretation of public health databases (exam) all seminar teachers are preparing the exam sheets

**10th 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 *Lecture*s is highly recommended. The slides of lectures can be downloaded from our website () 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, at another time.

**Requirements for the final exam:**
The final exam (at the end of the second semester) consists of a written part and an oral exam (practical exam). The oral exam will cover the topics of all laboratory practices and seminars of the full academic year. The final mark of the practical exam is the average of the mark given for the interpretation of public health databases (week 9) and the mark obtained for the oral exam.
The written exam will be accomplished by computer based test that covers the topics of all *Lecture*s 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: 4th year/2nd semester**,** 4th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

**1st 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.

**2nd week:**
**Lecture:** Lung function tests, blood gas analysis. Laboratory examinations in pulmonary disease.
**Practical:** Bronchoscopy.

**3rd week:**
**Lecture:** Chest X-ray, CT scan, tomography, CT.
**Practical:** Lung function test, blood gas analysis.

**4th week:**
**Lecture:** COPD I.
**Practical:** Allergology, skin test. Asthma bronchiale.

**5th week:**
**Lecture:** COPD II.
**Practical:** Chronic obstructive lung disease, emphyseama, chronic bronchitis.

**6th week:**
**Lecture:** Pleural disorders
**Practical:** Pneumonia.

**7th week:**
**Lecture:** Lung cancer, symptoms, signs, diagnosis
**Practical:** Demonstration of patients with lung cancer. Differential diagnosis, treatment, prevention.

**8th week:**
**Lecture:** Tuberculosis
**Practical:** Tuberculosis/Control test.

**9th week:**
**Lecture:** Pleural disorders
**Practical:** Respiratory failure.

**10th week:**
**Lecture:** Lung cancer therapy
**Practical:** Collection of chest X-ray for the exam.

**11th week:**
**Lecture:** Occupational lung disease and immunpathogenetic based pulmonary disease. Interstitional lung disease, sarcoidosis
**Practical:** Collection of chest X-ray for the exam.

**12th week:**
**Lecture:** Pulmonary embolism, cor pulmonale, pulmonary hypertension

**13th week:**
**Lecture:** Asthma bronchiale.

**14th week:**
**Lecture:** Chronic respiratory failure. Collection of chest X-ray for the exam.

**Requirements**

The rules written in the statue of the Organization and Operation of Medical University of Debrecen will be applied. The student is obliged to attend the practices.

In case of absence the student must compensate on the same week with another student's group or should ask the tutor.

If a student is absent more than twice from practices in a semester.

The final examination will consist of a practical (X-ray examination) and az oral part, two questions from the topics. The topics will be given in the first lecture of the semester.

Lectures are the guidelines for the examination.

# Department of Surgery

Subject: **SURGERY II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**

**1st week:**
**Lecture:** Inflammatory Bowel Diseases
**Practical:** Vascular surgery practice week

**2nd week:**
**Lecture:** Acute abdomen, surgical emergencies
**Practical:** Breast-endocrine surgery practice week

**3rd week:**
**Lecture:** Surgery for morbid obesity
**Practical:** General surgery, TRP practice week

**4th week:**
**Lecture:** Bowel obstruction. Proctology
**Practical:** Thoracic surgery practice week

**5th week:**
**Lecture:** Surgical treatment of colorectal cancer
**Practical:** Gastroenterologic surgery practice week

**6th week:**
**Lecture:** Endocrine surgery

**7th week:**
**Lecture:** Benign breast lesions. Breast cancer

**8th week:**
**Lecture:** Vascular surgery (arterial and venous diseases)

**9th week:**
**Lecture:** Thoracic surgery

**10th week:**
**Lecture:** Transplantation surgery

**Requirements**

There are 10 surgery lectures during the semester.
During the second semester the second half of the year has to complete 5x2 hours of practice. If missing a practice, you have to make it up with another group during the same week. The Head of the Department may refuse to sign the electronic Lecture Book if a student was absent from more than one practice during the semester without an acceptable reason.
Examination: written test covering the topics of both semesters.

## Department of Urology

Subject: **UROLOGY**
Year, Semester: 4th year/2nd semester**,** 4th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **16**

**1st 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.

**2nd 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.

**3rd week:**
**Lecture:** Tumors of the prostate.
**Practical:** Differential diagnosis and treatment of the obstruction of the urine collecting system: transurethral and suprepubic bladder catheter, uretercatheter, DJ stent, nephrostomy tube. Video demonstration of catheter insertion.

**4th week:**
**Lecture:** Female urology. Urodynamic study.
**Practical:** Endoscopy and laparoscopy in urology: indications, methods, benefits, disadvantages, complications. Demonstration of the special instruments.

**5th 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.

**6th week:**
**Lecture:** Tumors of the kidney.
**Practical:** Differential diagnosis of scrotal disorders: varicocele, hydrocele, retention of the testicle, tescticular atrophy, epididymitis, orchitis, trauma, torsion, testicular cancer, inguinal hernia, oedema. Case presentations at the ward.

**7th week:**
**Lecture:** Tumors of the testis.
**Practical:** Urological infections, prevention. When to treat bacteruria. Nosocomical infections. Urine analysis at our laboratory.

**8th week:**
**Lecture:** BPH. Retention urine. Clinical assessment and treatment.
**Practical:** Urinary stone disease: etiology, diagnosis, treatment. Discussing the problematic titles of urology.

**9th week:**
**Lecture:** Nonspecific infections. Specific infection. Pediatric urology. Congential anomalies.

**10th week:**
**Lecture:** Urinary tract stones. Surgical and non surgical treatment. Radiomorphologic investigation in urology.

**Requirements**

Exam: oral type, the student has to pull 2 topics (1 cancer and 1 general).
Students have to attend all (8) 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.
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.
According to the statement of the University no pre-final is allowed in urology.

# Division of Clinical Genetics

Subject: **CLINICAL GENETICS**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **20**

**1st week:**
**Lecture:** Fundamentals of classical genetics. History and concepts of genetics, classification of congenital disorders. Genetic tests in clinical laboratory practice.

**2nd week:**
**Lecture:** Molecular genetics of severe inherited disorders I.-II.

**3rd week:**
**Lecture:** Fundamentals of genomic medicine. Personalized medicine.

**4th week:**
**Lecture:** Biochemical genetics. Quality management in genetic testing, risk assessment in monogenic diseases.

**5th week:**
**Lecture:** Clinical cytogenetics I-II.

**6th week:**
**Lecture:** Genetics of multifactorial disorders. Syndromology.

**7th week:**
**Lecture:** Genetic counselling I-II.

**8th week:**
**Lecture:** Prenatal diagnostics. Genetics of infertility.

**9th week:**
**Lecture:** Cancer genetics I-II.

**10th week:**
**Lecture:** Mental retardation in clinical genetics. Practice in clinical genetics: case reports, interpretation of medical/laboratory reports.

**Requirements**

Participation on 30% of the lectures is compulsory.
Evaluation: Students take the oral examination (two titles) during the examination period.

## Division of Radiology and Imaging Science

Subject: **RADIOLOGY AND NUCLEAR MEDICINE II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

**1st week:**
**Lecture:** Principles of radionuclide imaging. Radiobiology and radioprotection.
**Practical:** Nuclear Medical investigations procedures, demonstrated on bone scintigraphy.Visit to Nuclear Medicine Department. Tools for radiation protection.

**2nd week:**
**Lecture:** Isotope diagnostics inendocrinology. Radioiodine therapy of hypertherosis. Radionuclide imaging of the heart and lung.
**Practical:** Thyroid and other endocrine studies. Radioisotope imaging of the heart.

**3rd week:**
**Lecture:** Radionuclide imaging of the kidney function and the gastrointestinal tract.
**Practical:** Dynamic studies: kidney, hepatobiliary, esophageal, gastric.

**4th week:**
**Lecture:** Nuclear medicine in oncology; cell labeling. Radioisotope therapy.
**Practical:** Nuclear oncology. Inflammation & infection.

**5th week:**
**Lecture:** Basics of radiation therapy.
**Practical:** Brain SPECT and PET. Lung

function.

**9th week:**
**Lecture:** The spine and the spinal cord

**Practical:** The diseases of the spine and the spinal cord

**Requirements**

Chance "A" is a written exam with offered term mark. if not accepted, the term mark will be the average of the written and oral parts. Chance "B" and "C" are oral.
One absence is allowed. Electronic materials:
http://elearning.med.unideb.hu/ ingroup "Izotópdiagnosztika/Nuclear Medicine" see " Nuclear Medicine

## Institute of Behavioural Sciences, Faculty of Public Health

Subject: **BEHAVIOURAL MEDICINE**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Practical: **20**

6th **week:**
**Lecture:** Introduction. Psychological aspects of somatic diseases: cardiovascular and respiratory diseases.

**Practical:** Introduction. Assessing prior knowledge, expectations. Students' career paths to date and actual stress sources. The role of psychology in the medical care. Requirements.

**7th week:**
**Lecture:** Psychological aspects of somatic diseases: gastrointestinal diseases, eating disorders, obesity.

**Practical:** Behaviour Change: the Prochaska-DiClemente (or Stagers of Change) model and the motivation interviewing.

**8th week:**
**Lecture:** Changes in elderly, communication with older patients.

**Practical:** Communication with somatising patient.

**9th week:**
**Lecture:** Death, dying, bereavement.

**Practical:** Communication with angry or aggressive patients.

**10th week:**
**Lecture:** Exam.

**Practical:** Discussion of experiences of the patient/motivational interviews. Closing the course.

**Requirements**

**Description**
The purpose of the course is to acquaint students with application possibilities of the bio-psycho-social perspective in different somatic areas, to gain an understanding of psychological factors in prevention, etiology, diagnosis and treatment of somatic diseases. Students will gain an insight into some methods of behaviour change, and they learn medical communication techniques for specific cases.

# CHAPTER 18
# ACADEMIC PROGRAM FOR THE 5TH YEAR

## Affiliated Department of Infectology

Subject: **INFECTOLOGY**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **20**

**1st week:**
**Lecture:**
Challenges in Infectious Diseases

**Practical:** Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**2nd week:**
**Lecture:** Antibiotics - Practical antimicrobial therapy
**Practical:** Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**3rd week:**
**Lecture:** Infection control in hospital settings. Multiresistant pathogens, noscomial infections
**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major classes of infectious diseases

Kenezy Gyula University Hospital, Infectology

**4th week:**
**Lecture:** Bloodstream infections and sepsis
**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases

Kenezy Gyula University Hospital, Infectology

**5th week:**
**Lecture:**
Neuroinfections

**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases

Kenezy Gyula University Hospital, Infectology/Departments of Surgery and Neurosurgery , University of Debrecen Clinical Centre

**6th week:**
**Lecture:** Respiratory infections
**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital,

Infectology /Department of Pediatric Infectious Diseases, Pediatric Clinic, University of Debrecen, Clinical Centre

**7th week:**
**Lecture:**
Staphylococcal and streptococcal infections

**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology / University of Debrecen Clinical Centre

**8th week:**
**Lecture:**
Gastrointestinal infections

**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases

Kenezy Gyula University Hospital, Infectology

**9th week:**
**Lecture:**
Viral hepatitis

**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases

Kenezy Gyula University Hospital, Infectology

**10th week:**
**Lecture:**
Zoonoses

**Practical:**
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**11th week:**
**Lecture:** Exanthematous infectious diseases

**Practical:** Case studies (both in in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**12th week:**
**Lecture:** HIV/AIDS. Tropical infections

**Practical:** Case studies (both in in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**13th week:**
**Lecture:** Traveller's diseases
**Practical:** Case studies (both in in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

**14th week:**
**Lecture:** Vaccination
**Practical:** Case studies (both in in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases. Infectious disease's News.

Summary
Kenezy Gyula University Hospital, Infectology

**Requirements**

**Course objectives:** to install the right mindset for approaching infectious diseases, introduce pathogen-based thinking, convey basic knowledge of modern diagnosis and antimicrobial treatment. Practical teaching involving case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major classes of infectious diseases. How to use infection control in practice at inpatient departments and outpatient service settings. To help acquire a multidisciplinary philosophy in relation to treating infectious cases.
**Brief course summary:** pyogenic infections, infective gastroenteritis, upper and lower respiratory tract infections, neuroinfections, viral hepatitises, zoonoses, infections of immunocompromised patients, exanthematous infectious diseases, bloodstream infections, HIV/AIDS, tropical diseases, antimicrobial treatment in practice, adult and childhood vaccination, infection control principles and practical implementation, multiresistant pathogens, nosocomial infections
Participation in the classroom lectures is compulsory (we expect to be there), because the final exam based on them. For the regularly attendance of these lectures we give bonus points for final exam.
Attendance of seminars and practices are mandatory for our students. In case of more than two absence the Lecture Book will not be signed (except in case of officially documented disease or other reasonable cause). Absences may be compensated on the basis of agreement with the tutor. Students must take the final examination at the end of the semester. The type of examination is basically written.
The slides of the lectures (after the presentation) and other up-to-date information can be found at https://elearning.med.unideb.hu (Faculty of Medicine: Affiliated Department of Infectology), username and password is your network-ID (same as Neptun-ID) and password. You will be able to check the content after a registration for the subject in Neptun.
**Departmental homepage:** http://infektologia.med.unideb.hu
**Textbook:** Dennis L. Kasper, Anthony S. Fauci: Harrison's Infectious Diseases 3rd Edition. McGraw-Hill Education-Europe, 2017
**Type of assessment:** end-of-semester examination

# Department of Dermatology

Subject: **DERMATOLOGY**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **15**
Seminar: **10**
Practical: **20**

**1st week:**
**Lecture:** Anatomy, physiology and pathology of the skin. Introduction to dermatology
**Seminar:** Cutaneous autoimmune disorders

**Practical:** Introduction to dermatology: dermatological anamnesis. Primary and secondary lesions, dermatological status, moulages

**2nd week:**
**Lecture:** Primary and secondary lesions
**Seminar:** Urticaria, cutaneous vasculitis
**Practical:** Practicing primary and secondary lesions, dermatological status, patient examination

**3rd week:**
**Lecture:** Hair and nail diseases
**Seminar:** Thermal injuries (Burn and frostbite)
**Practical:** Oral test: primary and secondary lesions, patient examination

**4th week:**
**Lecture:** Papulosquamous disorders
**Seminar:** Dermatosurgery, histology
**Practical:** Patient examination, allergological skin tests, phototherapy

**5th week:**
**Lecture:** Drug allergy
**Seminar:** Bacterial infections
**Practical:** Patient examination. Local treatments I, dermatological prescriptions

**6th week:**
**Lecture:** Mycotic infectionsSystemic therapy in dermatology
**Seminar:** Seborrhoea, acne, rosacea, perioral dermatitis
**Practical:** Patient examination, burn

**7th week:**
**Lecture:** Syphilis, gonorrhoea, other sexually transmitted diseases Topical therapy in dermatology
**Seminar:** Chronic vein insufficiency Leg ulcer
**Practical:** Patient examination (oral test), cosmetology, dermatoscopy

**8th week:**
**Lecture:** Common benign tumors, Kaposi-sarcoma, cutaneous lymphomas Skin tumors originating from non-pigment cells
**Seminar:** Ekzema
**Practical:** Patient examination. Local treatments II (written test)

**9th week:**
**Lecture:** Photo(chemo) therapy Viral and parasitic dermatoses
**Seminar:** The skin and internal diseases
**Practical:** Patient examination (written test). Mycological examination. STD laboratory testing

**10th week:**
**Lecture:** Photodermatoses AIDS
**Seminar:** Naevuses. Malignant melanoma.
**Practical:** Consultation. Test - compensations

**11th week:**
**Practical:** Block of practice 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

**12th week:**
**Practical:** Block of Practice 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

**13th 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

**14th 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

**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 Emergency Medicine

Subject: **EMERGENCY MEDICINE**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **20**
Practical: **20**

**1st week:**
**Lecture:** General approach for emergency care, urgency levels, transportation trauma, etc. Rescue techniques in catastrophe situations.
**Practical:** Initial assessment and treatment with the airway, breathing, circulation, disability, exposure, approach in emergency medicine. Practical approach for emergency medicine. Prehospital Management. Airway management. Symptoms of airway obstruction.

**2nd week:**
**Lecture:** Cardiac arrest, levels of cardiopulmonary resuscitation, basic life support, professional basic life support, advanced life support, post resuscitation care.
**Practical:** BLS.

**3rd week:**
**Lecture:** Cardiac rhythm disturbances. Hypertensive emergencies. Syncope, endocrine, metabolic and acid-base emergencies.
**Practical:** Safe defibrillation. AEDs, manual defibrillators.

**4th week:**
**Lecture:** Chest pain, acute coronary syndromes, pulmonary embolism, aortic dissection.
**Practical:** Indications and limitations of maintaining peripheral veins. Vein puncture. Intraosseous access. Central vein catheterization. Gastric lavage, delivery in the field.

**5th week:**
**Lecture:** Shock. Acute severe allergic reactions, anaphylaxis. Respiratory failure.
**Practical:** CPR practice/ ALS.

**6th week:**
**Lecture:** Pediatric emergencies cardiac arrest in childhood, acute circulatory and respiratory failure, seizures, etc.
**Practical:** Pediatric CPR.

**7th week:**
**Lecture:** Poisoning psychiatric emergencies.
**Practical:** Complex rapid trauma survey.

**8th week:**
**Lecture:** Abdominal pain. Gastrointestinal bleeding. Vomiting and diarrhea. Obstetric and gynecologic emergencies.
**Practical:** Complex treatment of critical patients.

**9th week:**
**Lecture:** Stroke, headache, subarachnoid hemorrhage, convulsions, altered mental status, coma.
**Practical:** Complex case situation.

**10th 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:** Consultation.

**Requirements**

Requirements for signing the lecture book:

For obtaining the signature at the end of the semester you are required to attend all practicals. In case of absence you have to do the practical at a chosen time, written excuse is not accepted. Concerning the supplementary practical you have to contact your physician responsible for the practical. Facilities for maximum 2 (two) complementary practicals are available at the Simulation Center in Debrecen. If somebody will have more than 2 missed practices will get no signature. Evaluation: students write a test every week reading previous week lectures topic. The final examination consists of an oral and a practical part. Students can go for the oral exam only if 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 one. "A" and "B" exam chances are assured.

The subject Emergency medicine (AOOXY03T9) includes course material equivalent to 0.5 credits according to the electronic, Moodle-based teaching program entitled “Basic Life Support module (BLS)” and course

material equivalent to 2.0 credits according to the electronic, Moodle-based teaching program entitled “Advanced Life Support module (ALS)”

# Department of Family and Occupational Medicine, Faculty of Public Health

Subject: **FAMILY MEDICINE**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Seminar: **10**

**1st week:**
**Seminar:** 1. Primary health care. General practice/family medicine.

**2nd week:**
**Seminar:** 2. Doctor-patient consultation in general practice/family medicine. Diagnosis and treatment in primary care.

**3rd week:**
**Seminar:** 3. Working with families in primary health care.

**4th week:**
**Seminar:** 4. Prevention in primary care.

**5th 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: 5th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

**1st week:**
**Lecture:** Introduction to Forensic Medicine.
**Practical:** Getting to know the Department of Forensic Medicine.
Practices between 1st - 11th week: Usual and special autopsy techniques, external examination of dead person autopsy cases and case studies on the above mentioned topics.

**2nd week:**
**Lecture:** Forensic autopsies.

**3rd week:**
**Lecture:** Time of death. Postmortem changes after death I.

**4th week:**
**Lecture:** Postmortem changes after death II.

**5th week:**
**Lecture:** Types of injuries and wounds I.

**6th week:**
**Lecture:** Types of injuries and wounds II. Vital injuries.

**7th week:**
**Lecture:** Traffic accident victims.

**8th week:**
**Lecture:** Craniocerebral trauma. Electrical injuries.

**9th week:**
**Lecture:** Firearm injuries. Effects of heat and cold. Fire deaths.

**10th week:**
**Lecture:** Death due to asphyxia I-II.

**11th week:**
**Lecture:** Physical and biological trace evidences.

## Department of Internal Medicine

Subject: **INTERNAL MEDICINE V. (GASTROENTEROLOGY)**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

**1st week:**
**Lecture:** 1. Gastrooesophageal reflux disease 2. Gastritis, H. pylori infection, Peptic ulcer disease.

**2nd week:**
**Lecture:** 1. Neoplasms of the esophagus, stomach and small intestine. 2. Malabsorption, celiac disease, lactose intolerance.

**3rd week:**
**Lecture:** 1. Inflammatory bowel disease (Crohn's disease. Ulcerative colitis) 2. Case presentation.

**4th week:**
**Lecture:** 1. Colorectal cancer. (etiology, premalignant lesions, diagnosis, screening, treatment) 2. Alcoholic liver disease. Non-alcoholic fatty liver disease

**5th week:**
**Lecture:** 1. Autoimmune liver diseases. 2. Viral hepatitis

**6th week:**
**Lecture:** 1. Diseases of the biliary tract. Liver neoplasms. 2 Hepatic cirrhosis, liver transplantation.
**Practical:** Differential diagnosis of abdominal pain and palpable lumps. The acut abdomen. GI bleeding, IBD, CRC and precancerous lesions.

**7th week:**
**Lecture:** 1. Acute pancreatitis. 2. Chronic pancreatitis, pancreatic tumors.
**Practical:** Liver failure, cirrhosis. Diseases of the pancreas and the biliary system. Differential diagnosis of jaundice, abdominal paracentesis.

**8th week:**
**Lecture:** 1. Diabetes mellitus: patomechanism, types, clinical symptoms and complications. 2. Management of type 2 diabetes mellitus
**Practical:** TIDM, insulin regimes. Complications of diabetes mellitus.

**9th week:**
**Lecture:** 1.Type 1 diabetes mellitus, insulin therapy 2. Case presentation. Obesity: etiology, diagnosis and treatment. Gout.
**Practical:** GI endoscopic procedures. (Practice will be held in Inst. of Internal Medicine, Building B)

**10th week:**
**Lecture:** 1. Primary and secondary hyperlipoproteinemias: types, symptoms and

treatment. Porphyrias 2. Electrolite disorders, metabolic bone disorders
**Practical:** Obesity, metabolic syndrome, T2DM, gout

**11th week:**
**Practical:** Block practice

**12th week:**
**Practical:** Block practice

**13th week:**
**Practical:** Block practice

**14th week:**
**Practical:** Block practice

**Requirements**

Requirements for accepting the semester: Practices are compulsory, therefore nobody should be absent from any practice unless due to well-documented reasons. Missed practices should be repeated preferably the same week, confirmation of attendance should be presented to the tutor. Everyone must be able to communicate with the patients using basic Hungarian during history taking and physical examination. The official material of examinations includes the lecture and practice materials and the suggested readings.
Examination procedure:

1. Written test (minimum questions), pass limit 90%

2. Practical (bedside) examination

3. Theoretical examination

https://elearning.med.unideb.hu

# Department of Neurology

Subject: **NEUROLOGY BLOCK PRACTICE - 5TH YEAR**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Practical: **30**

**Requirements**

The block practice lasts for 1 week. Attendance at all lectures, seminars and practices during the block practice is mandatory.
Practice books for signatures can be brought to the Secretary of Department of Neurology only during office hours. Signed practice books can be taken at the Secretary from the following Thursday during office hours.
Absence from the block practice is not allowed. In case of one day absence, written medical or other official certificate is necessary, but even in this case the practice should be made up by

participation in a duty or on a round visit with the Head of the Department. In case of more than one day absence, the block practice must be repeated.
Consulting hours for Educational Advisor: Monday 13:00- 14:00, Thursday 13:00-14:00.
Educational Advisor: Dr Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday 13:00- 14:00, Thursday 13:00-14:00.

Subject: **NEUROLOGY I.**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

**1st week:**
**Lecture:** Neurological diseases
Neurological examination, neurodiagnostic procedures

**2nd week:**
**Lecture:** Neurological examination/Cranial nerves
Examination of motor/sensory systems and coordination

**3rd week:**
**Lecture:** Stroke I.
Stroke II.

**4th week:**
**Lecture:** Epilepsy I
Epilepsy II

**5th week:**
**Lecture:** Headache I
Headache II

**6th week:**
**Lecture:** Multiple sclerosis

**7th week:**
**Lecture:** Other neurological diseases with autoimmune origin

**8th week:**
**Lecture:** Dizziness/ Vertigo

**9th week:**
**Lecture:** Low back pain

**10th week:**
**Lecture:** Movement disorders

**Requirements**

Consulting hours for Educational Advisor: Monday, Thursday 13:00 - 14:00.
Educational Advisor: Dr Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday 13:00- 14:00, Thursday 13:00-14:00
Material for students: neurology.dote.hu until the new website is ready

1. Neurology I. may only be admitted if Internal Medicine III. and Neurobiology exams were passed.
2. There are 15 lectures in the 1st semester (90-minute lectures/week for 5 weeks, 45-minute lectures/week also for 5 weeks). Attending lectures is highly recommended.

3. There are 90-minute-long practices in the first semester (1 practice/week/group). The purpose of these practices is to learn the neurological examination. Please arrive at the practices on time and bring lab coat. Participation at the practices is obligatory. Only one excused absence out of the 5 occasions is accepted. The students must provide a written medical (in case of any illness) or official certificate (in case of an unexpected serious event) about the reason of the absence, but even in this case the student must make up the practice at other class in the same week. At the same time maximum 3 students are allowed to join to one group in order to make up the practice. Making up the practice should be certified by a signed and stamped document from the tutor of the group. All students must attend the practice in their own group, making up at a different group is allowed only once, in case of a certified absence. If a student misses more than one practice in a semester, his/her lecture book will not be signed, he/she must repeat the semester regardless of the reason of the absence. Participation at the practice is verified by the tutor of the group. If a student wants to change a group he/she has to submit a written application to the Head of the Department not later than the first week of the semester. The student can change the group only with written permission of the Head. If somebody changes group without permission, his/her lecture book will not be signed even if he/she participated in all practices.
4. A competition is organised at the last week of the semester. Good(4) and excellent(5) grades will be offered for the best performing students. Participation at the competition is not considered as an 'A' chance exam. If the grade offered is accepted, it should be indicated in the Neptun system within one week. If the grade offered is not accepted in the Neptun system, the student has to take the exam. Places for exams are opened in the Neptun system before the exam period. Students have to register in Neptun for the exam. Without registration the exam cannot be taken. The first exam is the 'A' chance, the second exam is the 'B' chance, both of them are written (test) exams. If somebody failed both 'A' and 'B' chances, the third possibility is the 'C' chance, which is an oral exam in front of an examination committee. In case of C exam the student has to visit our Secretary in office hours in order to make an appointment with the examiners. Teaching materials presented at the lectures and practices are asked at the exams.
If the student wishes to improve the grade, it is possible once in the exam period after registration in the Neptun for a free exam place. Grade improvement will not be considered as 'B' chance.
Apart from some exceptions (see point 6.) students are not allowed to take exams during their block practice period.
6. Students who are allowed to complete the block practice abroad after the end of the semester can start their exams earlier, including even the block practice period (depending on the decision of Registrars Department).
7. The 6th academic year may not be started without signatures for both the first and second semesters of the 5th year.
8. Please consider the dignity of the patients when visiting the wards, laboratories and outpatient units. Inappropriate behavior (laughing, phoning etc.) during patient demonstration is not allowed. All patient data must be treated confidentially. The patient's chart is a legal document which may be used only on the ward. The patient's chart may not be photographed, copied or removed. If you make notes for yourself, please use only the patients' initials.

# Department of Pediatrics

Subject: **PEDIATRICS I.**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

**1st week:**
**Lecture:** The field of pediatrics. Pediatric epidemiology. The healthy newborn infant. Anatomical and physiological features. Lecturer: György Balla M.D., Ph.D., D.Sc.
The Hemorrhagic Disease of the Newborn. Lecturer: Csongor Kiss M.D., PhD.

**2nd week:**
**Lecture:** Cardiopulmonary adaptation. Pediatric emergencies in the delivery room. Lecturer: György Balla M.D., Ph.D., D.Sc.
Principles and practice of mechanical ventilation. Lecturer: Tamás Kovács M.D.

**3rd week:**
**Lecture:** Special problems of prenaturity (ROP, NEC, DAP). Lecturer: György Balla M.D., Ph.D., D.Sc.
Techniques of natural and artificial feeding. Special formulas. Vomiting in Neonates and infants. Lecturer: Judit Kovács M.A.

**4th week:**
**Lecture:** Respiratory distress syndrome (IRDS, BPD). Lecturer: Andrea Nagy M.D.
Hemolytic disease of the newborn. Jaundice in the neonatal and infant period. Lecturer: Éva Oláh M.D., Ph.D., D.Sc.

**5th week:**
**Lecture:** Congenital and aquired diseases of the gastrointestinal tract requiring surgical intervention in neonates and young infants. Lecturer: László Sasi Szabó M.D.
Seizures in infants and newborns. Hypoxic damage, Periventricular leukomalatia. Habilitation. Lecturer: Ilona György M.D., Ph.D.

**6th week:**
**Lecture:** Birth injuries. Lecturer: Éva Oláh M.D., Ph.D., D.Sc.
Neonatal characteristics of renal function, urinary tract disorders. Lecturer: Tamás Szabó M.D., Ph.D.

**7th week:**
**Lecture:** Fluid and electrolyte balance. Acid-base balance disorders: acidosis, alkalosis. Lecturer: Tamás Kovács M.D.
Hypo- and hyperglycemia, metabolic diseases, screening. Lecturer: Enikő Felszeghy M.D.

**8th week:**
**Lecture:** Intrauterine and neonatal infections. Lecturer: György Balla M.D., Ph.D., D.Sc.
Failure to thrive in children. Lecturer: Éva Nemes M.D.

**9th week:**
**Lecture:** Cardiac emergencies in newborns and infants. Lecturer: Gábor Mogyorósy M.D., Ph.D.
Central nervous system in newborns. Peri-intraventricularis bleeding. Lecturer: Andrea Nagy M.D.

**Requirements**

Place: Lecture Hall of Institute of Pediatrics

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: course evaluation through a 5 scale practical grade according to the last week test which is based on the practices and lectures.
The subject Pediatrics I. (AOGYE03T9) includes course material equivalent to 2 credits according to the electronic, Moodle-based teaching program entitled “ Neonatology-Pediatrics module

## Department of Psychiatry

Subject: **PSYCHIATRY I.**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **20**

**1st 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.

**2nd week:**
**Lecture:** Liaison psyichiatry. Overlap between psychiaty and other medical fields. Psychological tests. Clinical rating scales in psychiatry.
**Practical:** Anamnesis. Mental state examination I.

**3rd 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.

**4th 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.

**5th week:**
**Lecture:** Mood disorders I. Major Depressive Disorders. Dysthymic Disorders. Mood disorders II. Bipolar and Cyclothymic Disorders.
**Practical:** Mood disorders.

**6th week:**
**Lecture:** Schizophrenia I. Schizophrenia II. Etiology. Treatment.
**Practical:** Examination of the schizophrenic patient.

**7th week:**
**Lecture:** Anxiety disorders. Generalised anxiety disorder. Posttraumatic stress disorder. Panic disorder and agoraphobia.
**Practical:** Examination of the anxious patient.

**8th 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.

**9th week:**
**Lecture:** Normal and pathological sexual behavior. Sleep and disorders of sleeping. Eating

disorders.
**Practical:** Examination of the neurotic patient.

**10th week:**
**Lecture:** Obsessive-compulsive disorder and phobias. Dissociative disorder. Somatoform disorders.
**Practical:** Psychiatric symptoms related to general medical conditions.

**Requirements**

Practical exam

## Institute of Behavioural Sciences, Faculty of Public Health

Subject: **BEHAVIOURAL SCIENCES FINAL EXAM**
Year, Semester: 5th year/1st semester
Number of teaching hours:

**Requirements**

Prerequisite of the final exam of Behavioural Sciences:
Completion of the following courses:
- Communication
- Basics of Behavioural Sciences
- Medical Psychology
- Bioethics
- Medical Sociology
- Medical Anthropology
- Behavioural Medicine

The final examination of Behavioural Sciences is the total examination which covers all the materials of psychology, bioethics, medical anthropology, medical sociology and behavioural medicine.
In the written „A" exam 117 items in test form should be solved.
Evaluation:

| Percent (%) | Grade |
|---|---|
| 0 - 59.99: | fail (1) |
| 60.00 - 69.99: | pass (2) |
| 70.00 - 79.99: | satisfactory (3) |
| 80.00 - 89.99: | good (4) |
| 90.00 - 100: | excellent (5) |

In the case of improvement of the result of the "A" exam, and in the case of „B" and „C" oral exams the students have to answer an item of questions' list in presence of a teachers' board.
Topic list of the oral exam can be found:
http://nk.unideb.hu/node/160

Compulsory readings for the final exam:

MEDICAL PSYCHOLOGY, AND BEHAVIOURAL MEDICINE

Csabai, M. and Molnar, P.: Health, Illness and Care. A textbook of medical psychology. Springer, Budapest, 2000.
Material of the lectures

BIOETHICS
Handouts and background readings: in e-formats that were given during the seminars.
Jay E. Kantor: Medical Ethics for Physicians-in-Training. Plenum, NY & London, 1989.

MEDICAL SOCIOLOGY
Anne-Marie Barry and Chris Yuill. Understanding Health. A Sociological Introduction. SAGE Publications. London-Thousand Oaks-New Delphi. 2002.

MEDICAL ANTHROPOLOGY
Chapters from the following textbook: Cecil G. Helman: Culture, Health and Illness, Fifth Edition, Hodder Arnold, London, 2007. (different editions are available)
- The body: cultural definitions of anatomy and physiology
- Doctor-patient interaction
- Gender and reproduction
- Pain and culture
- Culture and pharmacology: drugs, alcohol and tobacco
- Cross-cultural psychiatry

(Titles of chapters can slightly differ in different editions.) + Handouts

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## Department of Anesthesiology and Intensive Care

Subject: **ANESTHESIOLOGY AND INTENSIVE CARE**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

**1st week:**
**Lecture:** General guidelines of anesthesiology and intensive care. Severity scoring systems.
**Practical:** Securing airways.

**2nd week:**
**Lecture:** Respiratory insufficiencies: definition, causes, types and basic guidelines of treatment
**Practical:** Monitoring ventilation, O2 therapy and mechanical ventilation

**3rd week:**
**Lecture:** Oxygen therapy and artificial ventilation
**Practical:** Hemodynamic monitoring and support

**4th week:**
**Lecture:** Intensive treatment of the hemodynamically unstable critically ill
**Practical:** Advanced Life Support

**5th week:**
**Lecture:** General (intravenous and inhalational) anesthesia
**Practical:** General anesthesia

**6th week:**
**Lecture:** The treatment of the acid-base disturbances
**Practical:** The diagnostic steps and treatment of acid-base disturbances

**7th week:**
**Lecture:** Sepsis and multiple organ failure
**Practical:** Nutrition therapy

**8th week:**
**Lecture:** Brain death and donor conditioning
**Practical:** Anesthesiological risk, premedication, OR and PACU

**9th week:**
**Lecture:** Life-threatening disturbances of fluid-electrolite balance. Guidelines of volume therapy
**Practical:** Workload at the ICU. Transport of the critically ill

**10th week:**
**Lecture:** Regional anesthesia
**Practical:** Regional anesthesia and pain therapy

**Requirements**

On weeks 1-5 practicals are held at he Simulation Center of the Medical Faculty (Ophthalmology Clinic Building), whereas between 6th-10th week at the working place of the tutor. Conditions of signing the Lecture book: The student is required to attend the practicals, absences are to be compensated during the duties of the tutor. Exam: The prerequisite of entering the exam is to show the signed attendance sheet of the practicals. The exam is oral only. 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.

# Department of Forensic Medicine

Subject: **FORENSIC MEDICINE II.**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

**1st week:**
**Lecture:** Sudden death I.
**Practical:** Practices between 1st - 11th week: Autopsy cases, case studies and consultation on the above mentioned topics.

**2nd week:**
**Lecture:** Sudden death II.

**3rd week:**
**Lecture:** Sudden infant death syndrome. Non-accidental injuries to children. Child abuse.

**4th week:**
**Lecture:** Abortion. Infanticide.

**5th week:**
**Lecture:** Sex crimes and problems.

**6th week:**
**Lecture:** Unidentified and missing persons. Forensic anthropology.

**7th week:**
**Lecture:** Legal aspects of medical practice.
**Practical:** Visiting the Toxicology lab.

**8th week:**
**Lecture:** Deaths due to medical treatment. Forensic toxicology.

**9th week:**
**Lecture:** Alcohol intoxication. Legal aspects. Forensic toxicology.

**10th week:**
**Lecture:** Drug related death. Forensic toxicology

**11th week:**
**Lecture:** Forensic psychiatry.

# Department of Internal Medicine

Subject: **INTERNAL MEDICINE VI. (HAEMATOLOGY, HAEMOSTASEOLOGY)**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

**1st week:**
**Lecture:** 1. Haemopoiesis. Basic principles, normal values, aplastic anaemia, agranulocytosis. 2. Non-Hodgkin lymphomas I - classification, diagnostics
**Practical:** Bone marrow failure: aplasia, agranulocytosis, neutropenia, deficiency anaemias

**2nd week:**
**Lecture:** 1. Non-Hodgkin lymphomas II - treatment. 2. Hodgkin's lymphoma
**Practical:** Leukocytosis. Benignant and malignant haematologic disorders with special focus on AML, ALL, CLL and CML.

**3rd week:**
**Lecture:** 1. Acute leukaemias. 2. Chronic myeloproliferative disorders: PV, ET, MF
**Practical:** Lymphoma patients. Hodgkin-, and Non-Hodgkin Lymphomas.

**4th week:**
**Lecture:** 1. Hemolytic anaemias 2. Differential diagnosis of anaemia. Iron deficiency. Megaloblastic anaemia. Myelodysplastic syndrome
**Practical:** Thrombophilia, thromboembolism. Clinical signs, diagnosis, therapy.

**5th week:**
**Lecture:** 1. Chronic myelogenous leukaemia. 2. Chronic lymphocytic leukaemia. Multiple myeloma. Waldenström macroglobulinaemia.
**Practical:** Bleeding tendency (ITP, TTP, DIC, HIT, haemophilia, Willebrand-disease). A practical approach.Diagnosis, therapy

**6th week:**
**Lecture:** Hemopoietic stem cell transplantation

**7th week:**
**Lecture:** Inherited and acquired thrombophilias. Antithrombotic therapy induced bleeding

**8th week:**
**Lecture:** Inherited and acquired thrombophilias. Antithrombotic therapy induced bleeding.

**9th week:**
**Lecture:** Thrombocytopenias (ITP, DIC, TTP, HIT).

**10th week:**
**Lecture:** Coagulopathies (haemophilia, von Willebrand disease). Platelet disorders.

**Requirements**

Attending the lectures is not compulsory; however, it is highly recommended.
Participation at the practical lessons is compulsory. Since topics of the practices are very strict and only five haematological practices are available, no supplementary or „replacement" practices (e.g. weekends, other days, etc.) can be accepted! N.B. The importance of practical skill (physical and laboratory examination) will be in focus. The guide given above might be a matter of change according to the actually available patients.
Students are strongly recommended to prepare for the seminars since those will be interactive!
Examination:
A. Written test, the minimum questions can be downloaded from the following website: , under the tag "Education".
B. Oral examination: practical questions and 2 titles.
Exam entrance only with signed Lecture Book.

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: 5th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

**1st week:**
**Lecture:** CNS complications of internal medicine diseases

**2nd week:**
**Lecture:** Infectious diseases of CNS

**3rd week:**
**Lecture:** Bedside diagnosis of disturbances of consciousness

**4th week:**
**Lecture:** Emergency in neurology

**5th week:**
**Lecture:** Dementias

**6th week:**
**Lecture:** Sleep disturbances

**7th week:**
**Lecture:** Neuromuscular diseases

**8th week:**
**Lecture:** Mono- and polyneuropathies

**9th week:**
**Lecture:** Lobar syndromes

**10th week:**
**Lecture:** Questions and answers

**Requirements**

Consulting hours for Educational Advisor: Monday, Thursday 13:00 - 14:00.
Educational Advisor: Dr. Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday 13:00-14:00, Thursday 13:00-14:00
Material for student: neurology.dote.hu until the new website is ready

1. Neurology II. may only be admitted if Neurology I exam was passed.
2. There are five 90-minute long practices in the second semester (1 practice/week/group). The purpose of these practices is to study the signs/symptoms, the diagnostic procedures and treatment strategies of the main neurological disorders. Please arrive at the practices on time and bring lab coat. Participation at the practices is obligatory. Only one excused absence out of the 5 occasions is accepted. The students must provide a written medical (in case of any illness) or official certificate (in case of an unexpected serious event) about the reason of the absence, but even in this case the student must make up the practice at other class in the same week. At the same time maximum 3 students are allowed to make up the practice in one group. Making up the practice should be certified by a signed and stamped document from the tutor of the group. All students must attend the practice in their own group, making up at a different group is allowed only once, in case of a certified absence. If a student misses more than one practice in a semester, his/her lecture book will not be signed, he/she must repeat the semester regardless of the reason of the absence. Participation at the practice is verified by the tutor of the group. If somebody wants to change a group he/she has to submit a written application to the Head of the Department not later than the first week of the semester. The student can change the group only with written permission of the Head. If somebody changes group without permission, his/her lecture book will not be signed even if he/she participated in all practices.
3. A competition is organised at the 10th week of the semester. Good(4) and excellent(5) grades will be offered for the best performing students. Participation at the competition is not considered as 'A' chance exam. If the grade offered is accepted, it should be indicated in the Neptun system within one week. If the grade offered is not accepted in the Neptun system, the student has to take the exam. Places for exams are opened in the Neptun system before the exam period. Students have to register in Neptun for the exam. Without registration the exam cannot be taken. The first exam is the 'A' chance, the second exam is the 'B' chance, both of them are written exams. If somebody failed both 'A' and 'B' chances, the third possibility is the 'C' chance, which is an oral exam in front of an examination committee. In case of ’C’ chance, the student has to visit our Secretary in office hours in order to make an appointment with the examiners. Teaching materials presented at the lectures and practices are asked at the exams.

If the student wishes to improve the grade, it is possible once in the exam period after registration in the Neptun for a free exam place.

Apart from some exceptions (see point 4), students are not allowed to take exam(s) during the block practice period.

Students, who are allowed to complete the block practice abroad after the end of the semester, can start their exams earlier, including even the block practice period (depending on the decision of Registrars Department).

5. The 6th academic year may not be started without signatures for both the first and second semesters of the 5th year.
6. Please consider the dignity of the patients when visiting the wards, laboratories and outpatient units. Inappropriate behavior (laughing, phoning, etc.) during patient demonstration or examination is not allowed. All patient data must be treated confidentially. The patient's chart is a legal document, which may be used only on the ward. The patient's chart may not be photographed, copied or removed. If you make notes for yourself, please use only the patients' initials!

# Department of Ophthalmology

Subject: **OPHTHALMOLOGY**
Year, Semester: 5th year/2nd semester**,** 5th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

**1st week:**
**Lecture:** 1. Diseases of the conjunctiva and the cornea. 2. Diseases of the lacrimal apparatus.
**Practical:** Admission. Anamnesis. External examination. Eyelid eversion.

**2nd week:**
**Lecture:** 3. Lens, Cataract.4. Diseases of the retina
**Practical:** Visual acuity (definition, how to check). Refractive errors, trial lenses. Eyeglass prescription.

**3rd week:**
**Lecture:** 5. Tumors6. Strabismus
**Practical:** Keratometry, topography, contact lenses. Low vision aids.

**4th week:**
**Lecture:** 7. Glaucoma8. Diseases of the uvea and the vitreous
**Practical:** Visual field, perimetry. Color vision.

**5th week:**
**Lecture:** 9. Orbit and the Lids10. Trauma
**Practical:** Examination of the anterior segment of the eye.

**6th week:**
**Practical:** Fundoscopy

**7th week:**
**Practical:** FLAG, LASER, OCT, UH

**8th week:**
**Practical:** Tonometry. Lacrimal system probing and irrigation. Wound care, Bandages. Irrigation of the conjunctival sac.

**9th week:**
**Practical:** Drugs in ophthalmology, surgical videos

**10th week:**
**Practical:** Pictures of the practical exam.

## Requirements

### Conditions of signing the Lecture book

Participation at the practicals is compulsory. Missed practicals can be replaced by attending practical with another group in the same week. If this is not possible, replacement is also possible by spending two hours at the Clinic, when the student's practical teacher is on duty. The head of the Department may refuse signing of the Lecture book in cases of one or more missed practicals until replacement is done. Three out of the ten lectures are seminars (compulsory lectures). These are Retina, Glaucoma and Trauma. The list of lectures (subject, date, lecturer) is given in written form to the students at the first lecture. Those who miss one or more of the three seminars will get extra questions at the exam from the most important parts of the missed seminar(s). Attendance of lectures is recommended as pictures of the most important eye diseases are shown during lectures. To see these pictures not only helps to prepare for the exam, but have to be learned even if the student missed one or more of the lectures.

At the end of the semester the student is required to take the oral final examination (FE), 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. To help this there is a set of pictures shown on the Department's website www.szemklinika.deoec.hu. Five out of these pictures have to be recognized at the exam (practical exam) before the student gets theoretical titles. Both the pictures and the extra questions taken from seminars aim parts of Ophthalmology that are considered to be important for the medical practice of a non-ophthalmologist general practitioner. List of titles are also accessible on the website. The student has to register for the FE before the exam, choosing the requested date shown to be available on the Neptun system.

## Department of Otorhinolaryngology and Head and Neck Surgery

Subject: **OTOLARYNGOLOGY**
Year, Semester: 5th year/2nd semester**,** 5th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

**1st week:**
**Lecture:** 1. Anatomy and Physiology of the ear. Disorders of the Pinna, ExternaL Auditory Canal and Acut Otitis2. Tests of the Auditory Apparatus
**Practical:** Exposition of general methods in otorhinolaryngology. Demonstration of instrumentes required at basic examinations: practising 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 (whispering speech, conversational speech, examination s with tuning-fork, treshold audiometry, objective audiometry and special tests). Audiometrical methods in practice.

**2nd week:**
**Lecture:** 1. Chronic Otitis Media 2. Complications of Otitis Media
**Practical:** Symptomatology of ear diseases, Investigation of functioning of auditory tube (Valsalva's experiment, Polizter's test, tympanometry). Vestibular examinations. Evaluation of spontaneus vestibular symptoms. Incuded examinations. (Rotatorical examination of electrical rotatory chair, electrony stagmography, analysis of optokinetic and positional nystagmus). Demonstration ofexamination methods.

**3rd week:**
**Lecture:** 1. Disorders of the Cochlea Rehabilitation of the sensorineural hearing loss.2. Anatomy, Physiology and Disorders of the nose.
**Practical:** Exposition and demonstration of ear operations, Tympanoplastical operations. Antrotomy, mastoidectomy, the essence of radic, ear operation. (Operating theatre, videoprogram). Nose and paranasal sinus operations, nasal endoscopy videoprogram). Demonstration of maxillary sinus punctionIndications of tonsillectomy and adenotomy. Sight of the operation. Control method of epistaxis. Anterior nasal packing and Belloque-tamponade.

**4th week:**
**Lecture:** 1. Malignant tumor of the nose &

paranasal sinuses.2. The Pharynx (Anatomy, Physiology, Inflammatory Disorders, Neoplasm)
**Practical:** Diff. diagnosis of cervical masses. Cervical nodes, cervical trigones. Importance of cryosurgery in otorhinolaryngological practise. Examination of patientes. Malignant diseases of larynx. Presentation of larynx operations/video or Operating teather/. Examination of patients. Examinations with the endoscope in otorhynolaryngological practice.

**5th week:**
**Lecture:** 1. The Larynx (Anatomy, Physiology, Inflammatory diseases)2. Beningn and malignant tumor of hypopharynx and larynx.
**Practical:** Demonstration of microlaryngoscopy and oesophagoscopy. Laryngological connections of Laser surgery/video or operating theater. Use of laryngoscope. Examinations of patients. Practice otorhinolaryngological examination methods. Demonstration of microlaryngoscopy and oesophagoscopy. Laryngological connections of Laser surgery/video or operating theater. Use of laryngoscope. Examinations of patients. Practice otorhinolaryngological examination methods.

**Requirements**

Attendance at seminars is compulsory. Missed seminars should be made up for by the student at the later date to be discussed their tutor. Lecture book will be signed if every missed seminars substituted.

## Department of Pediatrics

Subject: **PEDIATRICS II.**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

**1st week:**
**Lecture:** Allergic respiratory diseases in childhood.
Congenital heart diseases. Cyanotic and acyanotic heart lesions.
**Practical:** Practices, related to the topics of lectures, are being held in the Lecture Room of the Department and at the Wards.

**2nd week:**
**Lecture:** Haemorrhagic diathesis (coagulopathy, platelet disorder). Differential diagnosis of anemia, deficiency and hemolytic anemia. Childhood leukemia in modern diagnosis and therapy. Bone marrow transplantation. Malignant solid tumors in childhood.

**3rd week:**
**Lecture:** Fainting states and epilepsy.
Pediatric gastroenterology diseases. Inflammatory bowel disease, gastrooesophageal reflux.

**4th week:**
**Lecture:** Endocrine problems in children.
Childhood acute and chronic renal failure.

**5th week:**
**Lecture:** Pediatric emergency childcare-poisoning.
Differential diagnosis in respiratory diseases in childhood.

**6th week:**
**Lecture:** Exanthema in pediatric diseases.

**7th week:**
**Lecture:** Treatment for children with type 1 (insulin-dependent) diabetes mellitus.
Obesitas, type 2 diabetes.

**8th week:**
**Lecture:** Primary and secondary immune deficiencies in children.
Autoimmune syndromes.

**9th week:**
**Lecture:** Congenital and acquired malformations of the urinary tract.

**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: 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 II.**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

**1st week:**
**Lecture:** Psychosomatic disorders
**Practical:** Psychosomatic diseases

**2nd week:**
**Lecture:** Theories of Personality and Psychopathology. Psychoanalysis.
**Practical:** Examination of personality, personality tests

**3rd week:**
**Lecture:** Normal and pathological development of personality
**Practical:** Examination of personality, personality tests

**4th week:**
**Lecture:** Personality disorders
**Practical:** Examination of personality disorders

**5th week:**
**Lecture:** Psychoteherapies I.
**Practical:** Indication of psychotherapy

**6th week:**
**Lecture:** Psychoteherapies II.
**Practical:** Types of psychotherapies

**7th week:**
**Lecture:** Child psychiatry
**Practical:** Child psychiatry

**8th week:**
**Lecture:** Emergency cases in psychiatry(Crisis, suicide)
**Practical:** Crisis intervention

**9th week:**
**Lecture:** Emergency cases in psychiatry(Aggressivity and restraining

measure)Legal regulations in psychiatry
**Practical:** Management and treatment of the aggressive patient

**10th week:**
**Lecture:** Rehabilitation of psychiatric patients
**Practical:** Rehabilitation in psychiatry

**Requirements**

Practical exam

# Division of Clinical Oncology

Subject: **CLINICAL ONCOLOGY**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **20**
Seminar: **7**

**1st week:**
**Lecture:** The role of prevention and screening in oncology
**Seminar:** Systemic therapeutic options in oncology

**2nd week:**
**Lecture:** Diagnosis and current treatment of breast cancer
**Seminar:** Complex treatment of brain tumors

**3rd week:**
**Lecture:** Supportive and palliative treatment in cancer patients

**4th week:**
**Lecture:** Emergency conditions in oncology

**5th week:**
**Lecture:** Psychooncology

**6th week:**
**Lecture:** Basics of radiotherapy
Surgical aspects in oncology
Rare tumors
**Seminar:** Complex treatment of skin tumors

**7th week:**
**Lecture:** Complex treatment of soft tissue tumors and osseal sarcoma
Treatment of oesophageal and gastric cancer
Complex treatment of colorectal tumors
**Seminar:** Case presentations - gastrointestinal tumors

**8th week:**
**Lecture:** Urooncology 1 - Treatment of renal and vesical tumors
Case presentations - urooncology
Treatment of biliary tract tumors, hepatocallular carcinoma and pancreatic cancer
**Seminar:** Urooncology 2 - Treatment of testicular, prostate tumors

**9th week:**
**Lecture:** Treatment of head and neck cancer
Case presentations - head and neck tumors
Complex treatment of lung cancer
**Seminar:** Case presentations - lung cancer

**10th week:**
**Lecture:** Imaging techniques in oncology
The role of translational research in oncology, biomarkers
Molecular classification of cancers
**Seminar:** Case presentations - breast cancer

**Requirements**

Attendance at lectures and seminars is compulsory for the students.
4 absences from the lectures and 2 absences from the seminars are allowed.
The slides of the lectures can be downloaded from the e-learning website of the university. The final exam will be a written test containing 30 multiple-choice questions, covering the topics of oncology. The test questions will be collected from the presented lectures. Therefore the students can prepare for the exam only in case they attend the lectures and seminars. In case of passing the written test the student will receive an offered grade. The student has to reach 60 % to pass the exam. In case of failure of the test or in case the student does not accept the offered grade, an oral exam has to be taken in the exam period.

# CHAPTER 19
# ACADEMIC PROGRAM FOR THE 6TH YEAR

| | |
|---|---|
| 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**.
Consulting hours for Educational Advisor: Monday, Thursday, 13:00 - 14:00.
Educational Advisor: Dr. Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday 13:00 - 14:00, Thursday 13:00-14:00.
During the practice participation on consultations are obligatory. Participation on consultations will be registered on specific 'practice' sheets. Minimum number of consultation and every other detail of the practice is marked on the sheet. Every student has to write a case report even if he/she spends the practice abroad. Case report should be written in English at the target institute, and it should be accepted by the tutor of the student (the tutor should sign the completed case report).
The final exam in the 6th year consists of three parts: minimal questions, practIcal exam and

theoretical exam.
The minimal questions part is a test on computer with one correct answer. To pass it, at least 80% of the answers must be correct. In addition one exceptionally important question should also be answered! The practical exam consists of the examination of a patient, question from 'Questions and Answers' (note-book published by Dept. of Neurology). In addition, evaluation of skull CT/MR images can be asked as well. Teaching materials presented at the 5th year lectures and practices ('both 1st and 2nd semesters) could be asked at both the practical and theoretical exams.
In case of failing the final exam, an additional 2 weeks long practice must be completed at the Department of Neurology in the UD before attempting the B or C exam.
The practice is allowed to start ONLY on Monday.

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&GYN**

Requirements for signing the lecture book: Participation in the internship program (Duration 5 weeks, to be accomplished in the Dept. of OB&GYN or in one of the accredited Hungarian teaching hospitals, or - based on the permission of the Educational Subcommittee - in the OB&GYN department of an acknowledged hospital.) Students should work under the supervision of the assigned tutors, from 8 am to 2 pm on every working day, following their rotation schedule. 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 academic advisor in charge for the 6th 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. Seminars on special topics are available on demand.
Requirements of final examination: Obtaining signature of sections of individual practical skills in the practice book by the tutors, confirmed by the academic advisor of 6th year. Based on this,

signature of the lecture book.
Registration for the final exam is exclusively through the Neptun system.
Final exam consists of practical and oral part. Students spending at least a part of their practice at our department may be exempted from the practical part, based on the signature from their tutors.
Oral part consists of (4 exam titles, in accordance with the current official textbooks, listed in separate chapter).
Repeating an unsuccessful final exam is possible after 3 additional weeks of practice, completed exclusively in the Department of OB&GYN of University of Debrecen.

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 6th 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 5th 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.

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.

# CHAPTER 20
# REQUIRED ELECTIVE COURSES

## Department of Biochemistry and Molecular Biology

Subject: **MOLECULAR MECHANISM OF DISEASES CONCERNING GREAT POPULATIONS**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **25**

**1st week:**
**Lecture:** Introduction to molecular medicine

**2nd week:**
**Lecture:** Genomic medicine

**3rd week:**
**Lecture:** Diabetes

**4th week:**
**Lecture:** Obesity

**5th week:**
**Lecture:** Vitamin D and immundefects

**6th week:**
**Lecture:** Cancer I.

**7th week:**
**Lecture:** Cancer II.

**8th week:**
**Lecture:** Cancer II.

**9th week:**
**Lecture:** Osteoporosis

**10th week:**
**Lecture:** Immunedeficiencies

**Requirements**

**Course content:** topics presented at the lectures (available at the website of the Department of Biochemistry and Molecular Biology,**)** Follow the link: Educational materials- Elective courses

**Attendance:** Students are expected and required to attend all lectures of this course. No more than one unexcused absence is permitted. Students will fail the course on their second unexcused absence. Legitimate excuses should be presented in writing to the course administrator by the specified date.

**Grading policy:** The final grade will be based on the final oral exam at the end of the semester. Students have to select one topic from the full list of course topics for their oral exam, and can sign up for the topic at the link below. The final sign-up sheet will be posted on the department web-site at the beginning of the exam period. **It will be your responsibility to contact the lecturer for the assignment, and for the date of the oral examination.** The course lecturers will assign scientific publications to the students based on the sign-up sheet. For the oral exam students are expected to prepare a short Powerpoint presentation (4-5 slides) based on the publication, and discuss the publication with the lecturer.

Please follow the **announcements** of the course administrator about exam dates or changes in the schedule on the bulletin board (LSB downstairs, 1corridor), and on the department

## Department of Biophysics and Cell Biology

Subject: **COMPUTER SCIENCE**
Year, Semester: 1st year/1st semester**,** 1st year/2nd semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** Exemption Tests.

**2nd week:**
**Practical:** Exemption Tests.

**3rd week:**
**Practical:** Word processor programs, MS Word I.

**4th week:**
**Practical:** Word processor programs, MS Word II.

**5th week:**
**Practical:** Fundamentals and basic concepts informatics.

**6th week:**
**Practical:** Logical and physical realization of networks.

**7th week:**
**Practical:** Internet.

**8th week:**
**Practical:** Spreadsheets programs, MS Excel I.

**9th week:**
**Practical:** Spreadsheets programs, MS Excel II.

**10th week:**
**Practical:** Spreadsheets programs, MS Excel III.

**11th week:**
**Practical:** Spreadsheets programs, MS Excel IV.

**12th week:**
**Practical:** Computerised presentation, MS PowerPoint.

**13th week:**
**Practical:** Summary.

**14th 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.
Without registration, there is no way to do the course! First year students who missed/skipped the exemption test, but signed up for the course in the Neptun must attend the course and do the final test at the end. For students attending the informatics course a maximum of 4 absences are allowed during the semester to receive a signature (we recommend to use as few as possible, in case an emergency comes up). This is taken very seriously! Missing more than 4 classes automatically means losing the chance to pass the course. There will be a final test at the end of the semester.

Students are allowed to make up the missed practices with another group but only on the given week, if there are enough free seats in the room.
The course start with an exemption test. Only first year students are allowed to write the exemption test at the first week of the given semester with their group (appointment should be checked in the given timetable). In any other cases (students older than first year/repeaters/students who are not exempted) students have a final test at week 14 of the given semester. There is no other self control test during the semester. At the end of the course students will write a final test. The exemption and the final tests covers topics and skills in connection with Microsoft office Word, Excel, and PowerPoint (versions:2007/2010) programs, as written in the curriculum. Both of the tests (exemption and the final test) are written tests. The tests are practical tests, conducted in the computer room. Students passing the exemption test will automatically receive 5 (excellent) grade at the end of the semester. Final grades based on the final test score will be given according to the followings: 0-60% = grade 1 (fail); 61%-70% = grade 2 (pass); 71% - 80% = grade 3 (satisfactory); 81% - 90% = grade 4; (good) 91% = grade 5 (excellent). Students should download free Office guide books from the internet offered at the webpage of the course (Email registration is required for downloading files). Students who did not get exemption/did not show up at the exemption test/repeaters/students older than first year MUST ATTEND on the course. They should join to one of the groups mentioned in the timetable. The number of the seats is limited in the classroom. Students who has informatics course in the given appointment (according to the timetable) have priority to attend the lesson. Others are allowed to join to the given group if there are free seats. Older students have to do the whole course as well. Students passing the exemption test will automatically receive 5 (excellent) grade at the end of the semester. Students who failed the exemption test must attend the course and do the final test at the end. Students having ECDL (European Computer Driving License) or are not required to write the exemption test, instead, they can submit exemption request to the Education Office. Until You are waiting for the decisions, You should also come to the course!!!

Subject: **MODERN BIOPHYSICAL METHODS IN BIOLOGY AND MEDICINE**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **24**

**3rd week:**
**Lecture:** Luminescence spectroscopy. Theoretical and technical background and principles of application of fluorescence spectroscopy. Fluorescence conjugation of biomolecules, techniques based on fluorescence resonance energy transfer.

**4th week:**
**Lecture:** Selected applications of Magnetic Resonance Imaging: exploitation of molecular motions.

**5th week:**
**Lecture:** Modern microscopy 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.

**6th 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).

**7th 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.

**8th 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.

**9th week:**
**Lecture:** LSC - Laser-Scanning Cytometry (imaging cytometry, slide-based imaging cytometry). Limitations of 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.

**10th week:**
**Lecture:** Closing 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.
**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, Szöllősi Eds.), Medicina, 2009;

**Web address for the course material:**
**Type of examination:** practical grade, 5 levels

**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 date is shown in the.

below 50%: fail

50%-59%: pass

60-69 %: satisfactory

70-79 %: good

>= 80% excellent

*Repeated/improved exam*: during the examination period, one occasion, written test.

Subject: **SELECTED TOPICS IN CELL BIOLOGY**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **24**

**2nd week:**
**Lecture:** Receptor tyrosine kinases: regulation by interactions and compartmentation of signaling components (2 lectures)

**3rd week:**
**Lecture:** Interaction of Integrins and receptor tyrosine kinases: a pointer to therapy resistance of cancer

**4th week:**
**Lecture:** From cell biology to preclinical models: CDKs as drug targets.

**5th week:**
**Lecture:** GFP and friends - the molecule that drew the Nobel Prize in Chemistry

**6th week:**
**Lecture:** Something only your mother can give you: the mitochondrium

**7th week:**
**Lecture:** Molecular targets for cancer therapy in the signal transduction pathway of receptor tyrosine kinases

**8th week:**
**Lecture:** A strict rule in multicellular development: cells must behave, otherwise their fate is apoptosis or …

**9th week:**
**Lecture:** Newly discovered mechanisms in the regulation of cell division.

**10th week:**
**Lecture:** Cancer immunotherapy

**11th week:**
**Lecture:** Ion channels: cellular physiology and disease.

**12th week:**
**Lecture:** What goes up, must come down: Degrading proteins and lipids - and the consequences of aberrant pathways

**13th week:**
**Lecture:** Test

**Requirements**

PLEASE SIGN UP FOR THE COURSE IN NEPTUN!!!

Those who don't sign up, cannot get a signature.
Most classes are 100 min, but there will be lectures with two topics, consequently longer, so that the course could finish in time.
**Do check regularly the website http://biophys.med.unideb.hu/en/node/1885 to see if there are any changes, news, etc!**
**DETAILS UNDER THE MENU ITEM:**
**Compulsory reading:**

Lecture material posted on the website
Requirement for signature:
- maximum 3 recorded absences total (no make-up possible)
- signing up for the electronic course by the end of week 5

Exam dates: week 13 written exam for receiving the practical grade.

The exam can also be taken during the exam period, but this counts as a first exam after a practical grade of "fail". Check NEPTUN for dates.

Exam type: Electronic test (see below)

**Grading**:
>50% pass

>60% satisfactory

>70% good

>80% excellent

**In order to take an exam of the course "Selected Topics in Cell Biology" you need to be registered for the electronic version of the course. Here is the procedure to follow:**

Start your internet browser and type this address: https://exam.unideb.hu
NOTE: It only works from IP addresses of the university, so you need to be logged on to EDUROAM, use a PC from the library, or use a VPN connection from outside.

Select the English (en) language (top left)

At the Login, type your Username, which is: your network-id (the same as in the Neptun)

Type your Password: (the same as in the Neptun)

Click on the [Login] button

Attention: The authentication may take some time, it runs on a server related to the Neptun system.

If your data are not complete in Neptun, you will be asked to complete them.

You cannot continue to the course until you have complemented your data in Neptun. You might be asked to verify your personality by logging into your email account and clicking on a link sent to you by the system.

Even if your are not forced by the system to complement your data, you can edit your user profile by clicking the "You are logged in as [name] (Logout)" link. There you should fill in the required fields: give the country, city name and e-mail address.

Once finished, you can continue in the e-learning system:

Find your course category: Biofizika/Biophysics

Pick your course: Elective Courses - Selected topics in cell biology (Click on the course name)

Type the Enrolment key that will be provided in the first lecture

Click on the [Enrol me] button

## Department of Foreign Languages

Subject: **LATIN LANGUAGE**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **30**

**1st week:**
**Practical:** Class introduction and Chapter 1 Introduction to medical terminology

**2nd week:**
**Practical:** Chapter 2: Anatomical positions, planes and directions

**3rd week:**
**Practical:** Chapter 3: Parts of the human body - Word Quiz 1

**4th week:**
**Practical:** :Grammar 1: Basic elements of Latin grammar - Word quiz 2

**5th week:**
**Practical:** Chapter 5: Regions

**6th week:**
**Practical:** Concord of genders - Word quiz 4

**7th week:**
**Practical:** Formation of adjectives - Word quiz 5

**8th week:**
**Practical:** Revision. Midterm test.

**9th week:**
**Practical:** Chapter 6: Skeletal system I

**10th week:**
**Practical:** Skeletal system II, Plural forms - Word quiz 6

**11th week:**
**Practical:** Chapter 7: Joints - Word quiz 7

**12th week:**
**Practical:** Complex adjectives - Word quiz 8

| 13th week: | 14th week: |
| --- | --- |
| **Practical:** Chapter 8: Muscles Latin prefixes, Latin and Greek prefixes related to numerals and quantities; Latin numerals - Word quiz 9 | **Practical:** Chapter 9: Greek roots - Word quiz 10, Revision 2, End term test |

**Requirements**

**Requirements of the course:**

**Attendance**

Attending language classes is compulsory. If a student is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum 2 occasions. If they miss 6 occasions, (no matter why) the final signature will be refused and the student must repeat the course.

Absentees can make up the missed classes in the same week with their own teacher in case they bring a certificate from the doctor to the class. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time attendance is refused.

**Testing, evaluation**

In each Latin language course, students must sit for 2 written language tests. Students must appear at the lecture hall at least 15 minutes before the exam. If students are late, they are not allowed to write the test.

A further minimum requirement is the knowledge of 300 words per semester. There is a written word quiz in the first 5-10 minutes of the class, every week. If students fail 4-4 successful word quizzes till the mid-term and the end-term tests they are not allowed to sit in for the test. If students do not have minimum 8 successful word quizzes have to take a vocabulary exam that includes all 300 words. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can obtain bonus points (5-5%) by taking all the word quizzes successfully.

Based on the final score the grades are given as follows.

| 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 can take a remedial exam once covering the whole semester's material.

**Coursebook:** See the website of the Department of Foreign Languages: **ilekt.med.unideb.hu.** Minimum vocabulary lists and further details are also available on the website.

# Department of Human Genetics

Subject: **MEDICAL GENOMICS**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **16**
Practical: **4**

**11th 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.

**12th 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.
7. Technologies for testing human genome sequence and proteome variability.

**13th week:**
**Lecture:** 8. Systems biology and medical diagnostics. Biotechnology.
9. Bioinformatics II. Protein sequence comparison, motifs, prediction of 3D structure, multiple sequence alignments.
10. Modern genetic maps.
11. Genome databases, gene ontology. Genome analysis, practical examples.

**14th week:**
**Lecture:** 12. Evolutionary genome biology.
13-14. Genomescan technology, global genetic association and its relevance to multigenic diseases.
15. Nanotechnology and medicine.
**Practical:** 1. Sequence alignment practical.
2. Browsing databases for human diseases genes.
3. Association of DNA polymorphisms with complex diseases.
4. Using the public gene expression databases.

**Requirements**

Minimum requirements of the signature:

Electronic registration through Neptun.
Active participation on 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 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, 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. They have to register to both seminar and practical courses, but they should register to the practical course generated for students having signature from a previous year.
Students not having a signature in the lecture book and/or in the Neptun, have to attend classes to earn a signature.

DO NOT register to more groups. If the time of the chosen group is not appropriate we will allow the changing of the group (but of course a permission have to be asked, because the number of computers is limited).

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 11-15.

Practical: week 14-15, 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.)

The slides of the lectures and up-to-date information can be found at https://elearning.med.unideb.hu, username and password is your network-id (same as Neptun-id) and password. You will be able to check the content after the Neptun has registered you to the subject.
Departmental homepage: https://humangenetics.unideb.hu

## Department of Internal Medicine

Subject: **BASIC HOSPITALISATION TECHNIQUES FOR MEDICAL STUDENTS**
Year, Semester:
Number of teaching hours:
Lecture: **5**
Practical: **5**

**1st week:**
**Lecture:** History - needs - health and diseases. Marslow hierarchy of needs. Assistance, duties of nurses: recreation, mobilisation, bedding.

**2nd week:**
**Lecture:** Assistance, duties of nurses: hygienic needs, defecation, catheters. Documentation. Inspection, observation, test results, public health laws concerning to nursing.

**3rd week:**
**Lecture:** Sterilisation, disinfection. Wound healing, decubitus, decubitus prevention. Medication.

**4th week:**
**Lecture:** Infusion techniques, transfusion. Diagnostic examinations, getting up the patient. Drainage, bleeding, punctions.

**5th 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.

Subject: **GERIATRIC MEDICINE**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**

**1st week:**
**Lecture:** Gerontology and Geriatrics. Aging in general. Communication with the elderly patient History-taking in the Elderly.
**Self Control Test**

**2nd week:**
**Lecture:** Physiological and patho-physiological changes in the elderly. Pain medication in the elderly.
**Self Control Test**

**3rd week:**
**Lecture:** Age-related physiological changes in the heart. Circulatory disorders in the elderly.
**Self Control Test**

**4th week:**
**Lecture:** The most common respiratory diseases in the Elderly.
**Self Control Test**

**5th week:**
**Lecture:** Sarcopenia and immobilization in the Elderly.
**Self Control Test**

**6th week:**
**Lecture:** Changes of renal functions in the elderly.
**Self Control Test**

**7th week:**
**Lecture:** Endocrine changes with aging, endocrine diseases in the elderly. Metabolic changes and diseases in the elderly.
**Self Control Test**

**8th week:**
**Lecture:** Acute and chronic gastrointestinal disorders in the elderly.
**Self Control Test**

**9th week:**
**Lecture:** Depression, dementia in the elderly. Neuropatologic alterations.
**Self Control Test**

**10th week:**
**Lecture:** Diseases of the locomotor system in the elderly.

**Self Control Test**

**Requirements**

Subject: **RARE DISEASES**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**

**1st week:**
**Lecture:** Rare disorders: introduction. (G. Pfliegler)Rare diseases: organizations Hungarian and international approach (J. Sándor)

**2nd week:**
**Lecture:** Molecular genetics in rare diseases (I. Balogh)Rare bleeding disorders - genotype, phenotype, laboratory and molecular genetics (Zs. Bereczki)

**3rd week:**
**Lecture:** Genetic disorders (É. Oláh) Manifestations of rare diseases in the eye (V. Nagy)

**4th week:**
**Lecture:** The role of biochemical laboratory in the diagnosis of rare disorders. (J. Kappelmayer ) Lysosomal diseases and immunodeficiency (L. Maródi)

**5th week:**
**Lecture:** Orphan drugs. (G. Blaskó)Case presentations (E. Kovács, K. Urbán)Closing remarks (G.Pfliegler)Conditions for acceptance: test

Subject: **TRAVEL MEDICINE FOR MEDICAL SCHOLARS**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **30**

**Requirements**

1. Positioning travel medicine among the medical disciplines. Travel medicine in Hungary - first in Europe
2. Health status of the traveler. Risk factors of the traveler. Definition and analysis of the travel types. Prevention possibilities.
3. Classification of the travel related medical problems. Travel induced diseases: deep vein thrombosis,jet-lag, motion sickness, travel psychosis
4. Travel related medical problems: environmental hazards, traffic accidents, safety measurements, crime prevention
5. Vaccination-preventable and non-preventable infectious diseases. Traveler's diarrhoea. Safe food

and drink.
6. Technique of the vaccination, contraindications, side effects
7. Pretravel advices for the immunocompromised traveler. Treatment abroad
8. Sexually transmitted diseases, morbidity, prevention. Post exposure prorhylaxis of AIDS
9. Dermataological problems during the trip and after returning
10. Modalities and timing of the repatriation. Indication and contraindications of the repatriation. MEDIF. Fit-to-fly formula
11. Malariaprevention, different types of malaria, high risk areas, malaria as an emergency
12. Travelers with special needs: VFR. Migration problems
13. Diabetic traveler, patient with heart disease, preparing COPD patient for travel
14. Cabin environment, preparing patient for the air travel. Fear of flying.

# Department of Laboratory Medicine

Subject: **EPIDEMIOLOGY, PATHOPHYSIOLOGY, DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **11**
Seminar: **2**
Practical: **2**

**1st week:**
**Lecture:** Definition and epidemiology of osteoporosis

**2nd week:**
**Lecture:** Pathophysiology of osteoporosis I

**3rd week:**
**Lecture:** Pathophysiology of osteoporosis II

**4th week:**
**Lecture:** Diagnosis of osteoporosis

**5th week:**
**Lecture:** Treatment of osteoporosis

**6th week:**
**Lecture:** Case-study and literature reviews

**7th week:**
**Lecture:** BMD measurement and Bone turnover marker measurement
**Practical:** BMD measurement and Bone turnover marker measurement

**8th week:**
**Lecture:** Summary and MCQ test
**Self Control Test**

**Requirements**

To get the latest and updated information on the complex condition of osteoporosis

Subject: **PROBLEM BASED LEARNING IN COMPLEX PATHOLOGY**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **30**

**1st week:**
**Lecture:** Introduction

**2nd week:**
**Lecture:** Problem based evaluation of myeloproliferative disorders.

**3rd week:**
**Lecture:** Problem based evaluation of anemias.

**4th week:**
**Lecture:** Clinical case

**5th week:**
**Lecture:** Problem based evaluation of malignancy and tumor immunology.

**6th week:**
**Lecture:** Problem based evaluation of kidney diseases.

**7th week:**
**Lecture:** Problem based evaluation of diabetes mellitus.

**8th week:**
**Lecture:** Problem based evaluation of acute coronary syndrome.

**9th week:**
**Lecture:** Problem based evaluation in gastrointestinal disorders

**10th week:**
**Lecture:** Problem based evaluation in autoimmunity and hypersensitivity reactions.

### Requirements

Entrance conditions: at least 10 students.
Only in 2nd semester.

## Department of Medical Chemistry

Subject: **ADVANCED STUDENTS' SCIENTIFIC ACTIVITY**
Year, Semester: 2nd year/2nd 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.

Subject: **UNDERSTANDING MEDICAL PROBLEMS THROUGH EXPERIMENTS**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **30**

**1st week:**
**Practical:** How to make fat and how to get rid of it? (Adipocyte differentiation. Lipid and energy metabolism.)

**2nd 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.)

**3rd week:**
**Practical:** Let's make bones!(Phosphate-induced mineralization in osteoblast cultures. Role of Vitamin C.)

**4th week:**
**Practical:** How to kill tumor cells?(Cellular effects of different classes of anticancer drugs on cancer cell lines.)

**5th week:**
**Practical:** A smoking gun.(How cigarette smoking causes lung injury?)

**6th week:**
**Practical:** Beware of the Sun!(Effects of UV radiation on skin cells.)

**7th week:**
**Practical:** A radical idea.(Generating and eliminating free radicals by the cells.)

**8th week:**
**Practical:** About fruits and vegetables.(Testing the antioxidant effects of various fruits and vegetables.)

**9th week:**
**Practical:** Can the exhaust fumes of your car lower your blood pressure?(Cell biology of nitric oxide and peroxynitrite.)

**10th week:**
**Practical:** Show me your breath, I tell you who you are!(Measurements from exhaled breath concentrate.)

**11th week:**
**Practical:** Will your pain killer kill your liver? (Liver toxicity of acetaminophen.)

**12th week:**
**Practical:** Immunosuppression in action.(How does cyclosporine work?)

**13th week:**
**Practical:** You are what you eat!(Evaluation of the effects of lipid-rich diet by histology and biochemical essays.)

**14th week:**
**Practical:** Filling and emptying glycogen stores. (Determination of the glycogen stores in various alimentary conditions.)

**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 whom will supervise their activities and labwork. First, students make a thorough literature search to understand the medical problems in question, it's 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 Medical Microbiology

Subject: **ANTIMICROBIAL CHEMOTHERAPY**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**
Seminar: **10**

**1st week:**
**Lecture:** History of antimicrobial chemotherapy. Principles.

**2nd week:**
**Lecture:** Pharmacokinetics and pharmacodynamics.

**3rd week:**
**Lecture:** Antibacterial agents: β-lactam antibiotics.

**4th week:**
**Lecture:** Non-β-lactam antibiotics.

**5th week:**
**Seminar:** Measurement of antimicrobial activity.

**6th week:**
**Lecture:** History, mechanisms and spread of antibiotic resistance.

**7th week:**
**Lecture:** Antibiotic usage, antibiotic stewardship.

**8th week:**
**Lecture:** Risks caused by antibiotic use.

**9th week:**
**Lecture:** Antiviral agents.

**10th week:**
**Lecture:** Antifungal agents, antifungal resistance.

**11th week:**
**Lecture:** Chemotherapy against protozoal pathogens and helminths.

**12th week:**
**Seminar:** Presentation of project works

**13th week:**
**Seminar:** Presentation of project works.

**14th week:**
**Seminar:** Interactive case studies.

**Requirements**

To enhance the competence of students in chemotherapy of infectious diseases.

# Department of Neurosurgery

Subject: **NEUROSURGERY**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **6**
Practical: **8**

**1st 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.

**2nd week:**
**Lecture:** 2. Intracranial tumours I. General review. Neuroepithelial tumors, meningioma, schwannoma, neurofibroma, haemangio-blastoma.

**3rd 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).

**4th week:**
**Lecture:** 4. Spinal space-occupying lesions (tumors, disc prolapse and spondylosis). Tumours of peripheral nervous system.

**5th week:**
**Lecture:** 5. Neurotraumatology. Head, spinal and peripheral nerve injuries.

**6th week:**
**Lecture:** 6. Cerebrovascular diseases requiring neurosurgical treatment. Inflammatory processes, brain abscess.

**7th week:**
**Practical:** 1. Diagnosis and treatment of intracranial space occupying lesions (except hematomas). Neurosurgical aspects of hydrocephalus and intracranial developmental anomalies. Shunt operations.

**8th week:**
**Practical:** 2. Neurosurgical aspects of vascular diseases. Causes and outcome of subarachnoid haemorrhage. Cerebral aneurysm, angioma and fistula, their surgical management.

**9th week:**
**Practical:** 3. Craniocerebral and spinal trauma, diagnosis and neurosurgical treatment. Management of unconscious neurosurgical patients. Brain herniations.

**10th 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. No more than two misses of lectures and one miss of seminars and accepted written test exam are needed to get the credit.

## Department of Obstetrics and Gynecology

Subject: **RECENT ADVANCES OF INFERTILITY MANAGEMENT AND GYNAECOLOGICAL ONCOLOGY**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **20**

**Requirements**

**Aim**: To provide supplemental knowledge of modern human reproductive technology in five lectures. Lectures 6-16 are devoted to transmitting structured knowledge of gynaecological cancer management in sequence of their localisation and public health importance. The course is primarily aimed at providing graduate level audiovisual information that could not be fitted into the restricted schedule of regular lectures of semester II. in year IV. curriculum.

**Topics:**

Pathophysiology of reproductive failure
Infertility work-up, practical approach
Assisted reproduction. Homologous and heterologous insemination
In vitro fertilisation. Embryo transfer Legal and ethical issues of in vitro fertilisation
Ovarian cancer epidemiology and diagnostics
Ovarian cancer chemotherapy
Ovarian cancer surgical treatment
Endometrial cancer epidemiology and diagnostics
Endometrial cancer therapy
Cervical cancer prevention and screening
Cervical cancer diagnostics and therapy
Vaginal and vulval cancer epidemiology and diagnostics
Vaginal and vulval cancer treatment
Trophoblast tumours
Lecturer: Prof. Póka, Róbert, M.D., Dr. habil., Ph.D.

Subject: **REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY**
Year, Semester: 4th year/2nd semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **15**

**1st week:**
**Lecture:** 1. Introduction (Jakab, Attila M.D., Ph.D.) Reproductive Physiology (Lecturer: Deli, Tamás M.D., Ph.D.): Molecular Biology and Biochemistry for Reproductive Endocrinology. Ovarian and Uterine Embryology, Development and Reproductive Function. Neuroendocrinology. Regulation of the Menstrual Cycle. Sperm and Egg Transport, Fertilization, and Implantation.

**2nd week:**
**Lecture:** 2. Clinical Reproductive Endocrinology (Lecturer: Gődény, Sándor M.D., Ph.D.): Normal and abnormal sexual development, abnormal puberty. Normal and abnormal sexual developement, normal and abnormal growth and pubertal developement. Intersexuality. Pubertal obesity and hyperandrogenism.

**3rd week:**
**Lecture:** 3. Clinical Reproductive Endocrinology (Lecurer: Deli, Tamás M.D., Ph.D): Amenorrhoea, Galactorrhoea. Hyperprolactinemia. Premature Ovarian Failure (POF).

**4th week:**
**Lecture:** 4. Clinical Reproductive Endocrinology (Lecturer: Jakab, Attila M.D., Ph.D.): Chronic anovulation. Polycystic Ovarian Syndrome (PCOS). Menstrual disorders in reprodutive age. Hirsutism.

**5th week:**
**Lecture:** 5. Clinical Reproductive Endocrinology (Lecturer: Deli, Tamás M.D.,

Ph.D): Endocrinology of the pregnancy. Ectopic pregnancy. Repeated pregnancy loss (RPL). Pregnancy and endocrine disorders. Human parturition, onset of labor. Hormonal therapy in obstetrics.

**6th week:**
**Lecture:** 6. Contraception (Lecturer: Jakab, Attila M.D., Ph.D.): Family planning. Oral contraception. Transdermal and vaginal contraception. Long acting methods. Intrauterine contraception (medicated and non-medicated intrauterine systems, IUD, IUS).

**7th week:**
**Lecture:** 7. Infertility: (Lecturer: Jakab, Attila M.D., Ph.D.) The infertile couple. Diagnostics test of female and male infertility. Anovulatory infertility. Infertility genetics. Reproduction and thyroid. Fertility preservation in cancer patients.

**8th week:**
**Lecture:** 8. Infertility: (Lecturer: Sápy, Tamás M.D., Ph.D.) Uterine and tubal infertility. Endometriosis. Minimally invasive procedures. Ovulation induction. Assisted reproductive tecthniques (ART).

**9th week:**
**Lecture:** 9. Menopause (Lecturer: Jakab, Attila M.D., Ph.D): Epidemiological issues of the menopuase. Physiology of the menopausal transition. Postmenopausal Hormone Replacement Therapy (HRT). Postmenpausal abnormal bleeding. Cardiovascular changes and osteoporosis in the menopause. HRT in reproductive cancer patients.

**10th week:**
**Lecture:** 10. Reproductive Andrology (Lecturer: Benyó, Mátyás M.D.): Regulation of testicular function. Aging male. Male infertility. Semen analysis. Sperm function tests. Sperm preparation methods for assisted reproduction. Surgical treatment for male infertility. Sperm cryopereservation. Closing test (Jakab, Attila M.D., Ph.D.)

**Requirements**

Reproductive Endocrinology covers the physiology and pathophysiology of the female reproductive system, from puberty through the reproductive ages, until and beyond the menopause. Over the decades, advances of genetics, molecular biology and clinical epidemiology resulted in rapidly growing information and threapeutical possibilities in the fields of gynecologic endocrinology, infertility and menopause. Along with the increasing expectation of the patients, these led to the recognition, that professional prevention and restoration of the female reproductive health requires wide knowledge, which goes beyond the basics of Obstetrics and Gynecology. Reproductive Sciences are among the most intensively developing field of Ob/Gyn. The aim of the course is to gain detailed knowledge on the physiological basics and clinical practice of wide spectrum of disorders in the field of gynecologic endocrinology, infertility and menopause. Throughout ten weeks, on each occasion, lectures are followed with interactive seminars, case presentations.

## Department of Ophthalmology

Subject: **OPHTHALMOLOGICAL ASPECTS OF WOUND HEALING PROCESSES**
Year, Semester: 4th year/2nd semester**,** 5th year/2nd semester**,** 6th year/2nd semester
Number of teaching hours:
Lecture: **7**
Seminar: **4**
Practical: **4**

**1st week:**
**Lecture:** Basic ophthalmological anatomy. Basics of wound healing processes. (Dr. Csutak)
**Seminar:** Overview and application of instruments used for practical training, learning appropriate techniques.
**Practical:** Learning appropriate techniques of instruments used for practical training.

**2nd week:**
**Lecture:** Corneal lesions and refractive surgeries. What does the tear film affect in wound healing processes? (Dr. Csutak)
**Seminar:** Types and treatments of corneal lesions.
**Practical:** Creating corneal lesions and practicing their treatment on biomodels.

**3rd week:**
**Lecture:** Significance of mediators in tears in the wound healing processes following keratoplasty. (Dr. Fodor)
**Seminar:** Types and treatments of scleral lesions.
**Practical:** Creating Scleral lesions and practicing their treatment on biomodels.

**4th week:**
**Lecture:** Scleral surgeons. Significance of scleral wound healing processes in respect of glaucoma surgery treatments. (Dr. Csutak)
**Seminar:** Treatment of lesions on face/eyelids, how to gain "extra skin".
**Practical:** Treating lesions made on face/eyelids; how to gain "extra skin" on biomodels.

**5th week:**
**Lecture:** Fundamentals in Ophthalmological Operations (Dr. Ujhelyi)

**6th week:**
**Lecture:** Practices in Ophthalmological Operations (Dr. Ujhelyi)

**7th week:**
**Lecture:** Wound healing processes on eyelids and in the eye area. How developed is ophthalmological plastic surgeon?

**Requirements**

In-depth knowledge of the mechanisms of wound healing processes on different tissues. Acquisition of basic operative techniques. Ensuring practice opportunities for the basics of operative professions.
Our long-term goal is to facilitate the specialization of students interested in operative professions.

Subject: **REFRACTION, REFRACTIVE ERRORS, CORRECTIONS, REFRACTIVE SURGERY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **5**

**1st week:**
**Seminar:** Refraction, refractive errors, corrections, refractive surgery. - Dr. Berta András

**2nd week:**
**Seminar:** Refraction errors, keratometry, aberrometry, corneal topography - Dr. Berta András

**3rd week:**
**Seminar:** Prescription of Eyeglasses. - Dr. Balla Szabolcs

**4th week:**
**Seminar:** Contact lenses. - Dr. Kettesy Andrea Beáta

**5th week:**
**Seminar:** Refractive Surgery - Dr. Berta András

**Requirements**

The attendance on all the 5 seminars is compulsory. Missed seminars should be repeated by attending seminars on the next semester. The knowledge of students is assessed on a five-grade scale (test). Registration to the course should be done on the Neptun system.

# Department of Pathology

Subject: **FUNDAMENTAL CLINICAL NEUROSCIENCE**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **10**
Seminar: **10**
Practical: **10**

**Requirements**

Requirements: Attendance of lectures, seminars, practical sessions is compulsory - absences and their 'make-up' are regulated by the Educational office of the Medical Faculty. The exam questions are primarily based on the material presented at the Lectures. The Seminars and Practical sessions are supporting the learning and understanding of the topics.

Aims of the course: To teach the molecular and morphological aspects of clinical neurosciences and to provide a solid basis for the clinical studies and medical practice. To refresh the relevant knowledge acquired at the pre-clinical studies (Anatomy, Physiology, Biochemistry) in a clinico-pathological context.

Curriculum: During the 6 weeks the topics will be covered in altogether 30 hours. Lectures will be supported by seminars & practicals with clinico-pathological discussions and demonstrations of neuropathological methods & techniques (including brain cut, microscopy).

week 1: Basic reactions in the nervous system; week 2: cerebrovascular diseases; Trauma; Infectious and inflammatory diseases; week 3: Dementias and movement disorders; week 4: Brain tumours; week 5: Metabolic and toxic disorders; Developmental disorders; week 6: Demyelinating diseases; Neuromuscular diseases; Other neuro-psychiatric diseases.

Textbook: Robbins: Basic pathology (9th edition); selected research papers (to be specified) Suggested reading: selected research papers (to be specified)

Exam: Written (Multiple Choice Questions test paper)

# Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOTHERAPY**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **30**

**1st week:**
**Lecture:** Metabolic diseases I: Diabetes mellitus

**2nd week:**
**Lecture:** Metabolic diseases II: Hyperlipidaemias

**3rd week:**
**Lecture:** Diseases of the biliary truct and the pancreas

**4th week:**
**Lecture:** Pharmacotherapy of cardiac arrhythmias

**5th week:**
**Lecture:** Pharmacotherapy of hypertension

**6th week:**
**Lecture:** Myocardial infarction and unstable angina

**7th week:**
**Lecture:** Pharmacotherapy of ischaemic heart disease Angina pectoris, AMI

**8th week:**
**Lecture:** Pharmacotherapy of rheumatic diseases

**9th week:**
**Lecture:** Chronic obstructive airway disease

**10th week:**
**Lecture:** Cancer therapy

**11th week:**
**Lecture:** Test writing

**Requirements**

Pharmacology final exam.

# Department of Physical Medicine and Rehabilitation

Subject: **PRINCIPLES OF PHYSICAL MEDICINE AND REHABILITATION**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **16**

**1st week:**
**Lecture:** Theory of medical rehabilitation. Functional assessments of people with disabilities. - Zoltán Jenei M.D., Ph.D
Basic principles of therapy approaches in medical rehabilitation, measuring the effects of rehabilitation. - Zoltán Jenei M.D., Ph.D

**2nd week:**
**Lecture:** Intervention, treatments and service delivery in rehabilitation (inpatient, outpatient and community-based services). - Zsuzsanna Vekerdy-Nagy M.D, Ph.D
Special features of pediatric rehabilitation - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

**3rd week:**
**Lecture:** Autonomy and compliance. Quality of Life - Adél Nagy M.D.
Living with disability: personal experiences - Betti Dézsi coordinator of comp.rehab. Msc, informatician, special translator

**4th week:**
**Lecture:** Cardiac rehabilitation - Zoltán Jenei M.D., Ph.D
Pulmonary rehabilitation - Anna Sárközi M.D.

**5th week:**
**Lecture:** Characteristics of neuro-rehabilitation.
I. Neuro-rehabilitation. - Rita Szepesi M.D.
II. Musculosceletal rehabilitation. - Rita Szepesi M.D.

**6th week:**
**Lecture:** The role of physical therapy in medical rehabilitation - Ilona Balajti Mrs. Veres, PT
Orthetics and prothetics in rehabilitation - Andrea Jánossy Győrfiné PT

**7th week:**
**Lecture:** Objective measurement in medical rehabilitation - Zsófia Hőgye PT, Rehabilitation Expert, Ergotherapist
Medical assistive devices - Zsófia Hőgye PT, Rehabilitation Expert, Ergotherapist

**8th week:**
**Lecture:** Occupational therapy in medical rehabilitation - Boglárka Boldogfalvi PT
Importance of nutrition and dietetics in rehabilitation - Krisztina Sáfrány dietitian

**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

Subject: **SOCIAL ACCEPTANCE OF PEOPLE WITH DISABILITIES**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **2**

**1st week:**
**Lecture:** Problems of people with disabilities during their life Subtopics: a) Definitions (normality, abnormality, handicap, deficiency, disability, participation – the health concept in different cultures and societies). b) Different types of impairments, their characteristic features, possible treatments and rehabilitation (visual, auditive, movement, learning impairments, mental deficiencies, behavioural and communicational disturbances).- Zsuzsanna Vekerdy-Nagy M.D., Ph.D

**2nd week:**
**Lecture:** Social inclusion and its legal environment Subtopics: a) Politics of equal rights, equal treatment and antidiscrimination. b) Legal problems of limitations the rights of people with disabilities. - Angéla Molnár jurist
The world of people with disabilities from the point of view of parents and relatives Subtopics: a) Experiences and personal messages, advices to the experts. b) Short and long term life goals. c) Changes in life quality. - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc.

**3rd week:**
**Lecture:** How to approach to people with disabilities? Psychological considerations. Bernadett Bodor psychologist
Dietary problem of people with disabilities - Krisztina Sáfrány nutrician

**4th week:**
**Lecture:** The world of people with disabilities from “inside” – own experiences (lecturers: persons with disabilities) - Subtopics: a) Expectations towards ourselves and towards the environment b) Successes and/or failures of adaptation c) Attitudes d) Short and long term life goals e) Expectations in communication - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc.

**5th week:**
**Lecture:** Care nursing being with disabilities from the point of view of volunteers, therapist, caregivers and nurses Subtopics:
a) The most frequent problems arising during care and nursing, the “art of being there”, avoiding burnout. - Zsófia Hőgye PT, ergotherapist, rehabilitation expert and Gabriella Nagy PT, rehabilitation expert
b) Communicational problems. - Edina Szabó Ph.D. speech therapist
c) Characteristics of rehabilitation care. - Julianna Illyés Kavaleczné social worker

**6th week:**
**Lecture:** Parent of children with disabilities - perspective of the PRM doctor. - Éva Szabó M.D.
Pedagogical aspects of disabilities, concepts of special needs, special educational requirements, deficiencies of partial abilities, questions of integration - inclusion. - Erzsébet Gortka-Rákó Ph.D.

**7th week:**
**Lecture:** Social aspects of disabilities, characteristic features of groups of people with disabilities, homes of people with disabilities, segregated institutes, stigmatization, discrimination, employment, psychology. - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc

**8th week:**
**Lecture:** Ferryman's Service. - Judit Miholecz psychologist
UN, WHO perspectives - on overview the role international organizations in disability issue. - Zsuzsanna Vekerdy-Nagy M.D., Ph.D.

**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
Announced for students in year: 1st semester
no. of lessons: 20 x 45 min no. of practices: 2 x 45 min Credit points: 2
Practice: in small groups (min. 3, max. 6 students) during the academic year (summer included)

# Department of Physiology

Subject: **MODERN TECHNIQUES ALLOWING THE INVESTIGATION OF PHYSIOLOGICAL PHENOMENA**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **24**

**1st week:**
**Lecture:** Application of electrophysiological techniques in the investigation of the electric activities of living cells.

**2nd week:**
**Lecture:** Methods allowing the monitoring of the intracellular Ca2+ concentration in living cells.

**3rd week:**
**Lecture:** Analysis, evaluation and interpretation of current recordings. Biostatistics.

**4th week:**
**Lecture:** Preparation of neurones for functional investigation. Possible advantages and disadvantages of the applicable methods.

**5th week:**
**Lecture:** Investigation of the signal transducing proteins at the levels of proteins, RNA or DNA (immunocytochemistry, immunohistochemistry, confocal microscopy, Western blot, quantitative [real-time] PCR).

**6th week:**
**Lecture:** Cell and tissue culture (primary cultures, cell lines, organ cultures).

**7th week:**
**Lecture:** Isolation and identification of contractile proteins by biochemical methods.

**8th week:**
**Lecture:** Measurements conducted on isolated ion channels: the bilayer technique.

**9th week:**
**Lecture:** tutorial

**10th week:**
**Lecture:** Final Assessment.

**Requirements**

1. Signature of the semester

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 maters, please check the departmental web-site (http://phys.med.unideb.hu)

2. Evaluation during the semester

None.

3. Examination

At the end of the course a written final assessment will be organized in the form of multiple choice questions. The result of this assessment will determine the signature mark of the credit course using the following conversion table:

0-39.9% - Failed
40-54.9 - Pass
55-69.9% - Satisfactory
70-84.9% - Good
85-100% - Excellent

Subject: **PROBLEM BASED LEARNING IN PHYSIOLOGY**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Practical: **28**

**1st week:**
**Practical:** The practices are listed at the web site of the Department of Physiology (http://PHYS.MED.UNIDEB.HU)

**Requirements**

1.Signature of the semester
This is an individual project oriented program. The signature of the semester may be refused if the project report is not submitted before to the deadline.

2.Evaluation during the semester
No mid-semester evaluation.

3.Examination
The evaluation is based on the project report submitted before the deadline. For specifics, see the rules below and consult with the departmental website (http://phys.med.unideb.hu).

Aims of the course: The program offers carefully selected and designed problems from the field of Physiology. Students can learn how to apply problem solving approach, self-conducted strategy and analytic thinking in resolving selected problems. Skill in team-work is helpful in the program.

RULES FOR THE PROBLEM BASED LEARNING (PBL) CREDIT COURSE

1.The program is conducted between 3rd and 11th academic weeks of the second semester.
2.Students must have a tutor, this is the prerequisite for the program. Tutor can be any professor of the Department, not only her/his seminar/practical instructor. The applicant should contact the chosen professor and request him/her to undertake the tutorship. Professors of the Department maintain the right to accept or refuse to be the tutor of the applicant.
3.Special Rule: the applicant has to organize the chosen project and register at the tutor (NOT via NEPTUN) until the end of second academic week. Applications after the second week are not accepted.
4.Preconditions for the program: mark three (3) or better in Physiology I, successful closing lab and permission of the Department (arranged by the tutor).
5.The maximum number of participants in the program cannot exceed 100 students. In case, the number of applicants is higher than 100, the seminar/practical instructor or the course coordinator can refuse applicants with mark three or better. The name of the students registered to the program

is published on the website of Department of Physiology on the 3rd academic week.
6.Two students works in team on one project, and prepare one mutual report, thus they get the same score at the end of the program regardless their contribution. The Journal Club and Lab Visit programs are carried out individually.
7.Evaluation of the students is based on the written report or the oral presentation using five grade score system (1-5). Grades are final, no make-up is allowed.
8.The list of offered programs are available at the practical lab of the Department or on the Department’s homepage (http://phys.med.unideb.hu/files/oktatas/kredit/PMO/PBL_topics.pdf).
9.The deadline for the program is the end of the 11th academic week. Reports should be submitted to the tutor. Missing the deadline automatically results grade 1 (fail).
10.Detailed information for the program can be accessed on the website of the Department (http://phys.med.unideb.hu).

Subject: **THE REGULATORY ROLE OF THE CELL MEMBRANE IN PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **20**

**1st week:**
**Lecture:** Introduction, a general characterisation of the cell membrane. The electrical and biochemical characteristics of the surface membrane.

**2nd week:**
**Lecture:** General description of cardiac ionic currents. The connection between excitatory processes and the regulation of [Ca2+]i

**3rd week:**
**Lecture:** [Ca2+]i dependent excitatory processes in the surface membrane of cardiac cells.

**4th week:**
**Lecture:** The structure of the skeletal muscle. Ionic channels underlying the excitability of the skeletal muscle. Molecular structure of ionic channels.

**5th week:**
**Lecture:** Changes in surface membrane function in inherited skeletal muscle disorders: degenerative forms (muscle dystrophies). Changes in surface membrane function in inherited skeletal muscle disorders: alterations in the muscle tone (myotonies).

**6th week:**
**Lecture:** The role of the surface membrane in the regulation of calcium homeostasis in neurons. Pathological conditions arising from abnormal calcium handling in neurons.

**7th week:**
**Lecture:** Changes in the membrane properties of the neurons under pathological conditions. Pathological conditions arising from the hyperexcitability of neurons.

**8th week:**
**Lecture:** The role of TRP channels in the regulation of biological processes of human skin cells. TRP-pathies.

**9th week:**
**Lecture:** The role of the endocannabinoid system in the transmembrane signaling of skin-derived cells. Is the human skin always "high"?

**Requirements**

1. Signature of the semester
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 maters, please check the departmental web-site (http://phys.med.unideb.hu)

2. Evaluation during the semester
None.

3. Examination
At the end of the course a written final assessment will be organized in the form of multiple choice questions. The result of this assessment will determine the signature mark of the credit course using the following conversion table:
0-39.9% - Failed
40-54.9 - Pass
55-69.9% - Satisfactory
70-84.9% - Good
85-100% - Excellent

# Department of Traumatology and Hand Surgery

Subject: **TRAUMATOLOGY II.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **10**

**6th week:**
**Lecture:** 1. Periprotetic fractures of the femur. Treatment of fractures of the distal femur. 2.Patella and proximal tibial fractures.

**7th week:**
**Lecture:** 1.Injuries of the shoulder, humerus fractures. 2. Indication of limb replantation, techniques and expected results. Revascularization syndrome. Skin defects, skin replacement procedures.

**8th week:**
**Lecture:** 1. Classification and treatment of wrist fractures. Basic treatment principles of closed and open fractures of the hand. 2. Fractures of the talus and calcaneous. Subtalar dislocation. Fractures of tarsal bones and toes.

**9th week:**
**Lecture:** 1. Role of arthroscopy in the diagnosis and surgical treatment of joint injuries. Meniscus injuries, diagnosis and treatment injuries to knee ligaments. Haemarthrosis. Osteochrondritis dissecans. 2.Methods of ligament, bone and joint replacement. Use of metals and plastics in traumatology. Biological osteosynthesis.

**10th week:**
**Lecture:** 1.Fractures of the neck and head of radius. Olecranon fractures. Fractures of the forearm diaphysis. Monteggia and Galeazzi

| | |
|---|---|
| fractures. 2.Carpal instability, treatment of fractures of carpal bones. Tendon and nerve injuries of the hand. Treatment of severely | injured hand. |

**Requirements**

The lectures will take place in the Auguszta 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.

# Department of Urology

Subject: **FACTS AND RECENT ACHIEVEMENTS OF ANDROLOGY**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Seminar: **30**

**Requirements**

Course title: Facts and Recent Achievements of Andrology
Course type: required elective
ECTS credit: 2
Conditions: successful Urology exam
Type of exam: AW5
Lecturers:
Molnár, Zsuzsanna MD, PhD assistant lecturer
Drabik, Gyula MD, assistant lecturer
Murányi, Mihály MD, clinical specialist
Benyó, Mátyás MD, PhD assistant professor
(Coordinator: Benyó, Mátyás MD, benyomatyas@gmail.com)
Aims of the Course
The incidence of infertility is has increased in the last decade in the developed countries. About 15% of couples do not achieve pregnancy within one year and seek for medical treatment because of infertility. In 50% of involuntarily childless couples a male-infertility-associated factor is found together with abnormal semen parameters. The improving standard of living resulted in a focused attention on male fertility and sexual dysfunctions. Since the assessment of these patients requires special knowledge, andrologists are needed in these cases. Andrology covers the physiology and pathophysiology of the male reproductive system. Unfortunately andrology can't get the required attention due to time limit during the education of urology.
The aim of the course is to gain detailed knowledge on the physiological basics and clinical practice of wide spectrum of andrological disorders. Throughout ten weeks experts of andrology will demonstrate the different fields of andrology.
During the course 4 certified absences are allowed. In case of 5 absences maximum grade can be 4

(good), in cases of 6 and 7 absences grade 3 (satisfactory) and grade 2 (pass) can be gives, respectively. If the student has at least 8 absences, the course will not be signed.

Program (location: seminary room of the Department of Urology):
1st week: Introduction, anatomy of the male reproductive tract, setting up an andrological diagnosis (Mátyás Benyó)
2nd week: Sexual dysfunctions (background, diagnosis) (Mátyás Benyó)
3rd week: Sexual dysfunctions (treatment), male contraception (Mátyás Benyó
4th week: Role of the hormones in the male reproductive tract (Gyula Drabik)
5h week: Causes of male infertility, environmental exposure (Mátyás Benyó)
6th week: Ageing male, late onset hypogonadism (Gyula Drabik)
7th week: Sperm analysis, assisted reproduction (Zsuzsanna Molnár)
8th week: Development of the testicles, the relationship of testicular cancer with male infertility (Mátyás Benyó)
9th week: Surgery of the penis and urethra, effects of radical procedures on sexual function (Mihály Murányi)
10th week: Microsurgical andrological procedures, closing test (Mátyás Benyó)

Suggested reading: European Association of Urology: Guidelines on Male Infertility, Guidelines on Males Sexual Dysfunction (www.uroweb.org).
Closing test: multiple choice questions, MCQ

## Division of Clinical Laboratory Science

Subject: **CLINICAL BIOCHEMISTRY AND LABORATORY EVALUATION OF THROMBOPHILIA**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **12**

**1st week:**
**Lecture:** Control mechanisms of blood coagulation. Biochemistry of antithrombin III. Laboratory diagnosis of antithrombin III deficiencies.

**2nd week:**
**Lecture:** Biochemistry of protein C and protein S. Laboratory diagnostics of protein C and protein S deficiencies

**3rd week:**
**Lecture:** Thrombophilias caused by APC resistance and prothrombin 20210 polimorphism and their laboratory diagnostics. Rare thrombophilias.

**4th week:**
**Lecture:** Hereditary thrombophilias in the clinical practice. Obstetric and gynecologic aspects of hereditary thrombophilias.

**5th week:**
**Lecture:** Laboratory diagnostics of antiphospholipid syndrom. Anti-phospholipid syndrome in the clinical practice

**6th 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.

Subject: **PBL IN HAEMOSTASIS**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Seminar: **20**

**1st week:**
**Seminar:** Studying of actual hemostasis cases by problem based learning methods.

**2nd week:**
**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**3rd week:**
**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**4th week:**
**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**5th week:**
**Seminar:** Studying of actual haemostasis cases by problem based learning methods

**6th 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.

## Division of Clinical Oncology

Subject: **MOLECULAR ONCOLOGY AND CANCER PREVENTION**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **13**
Seminar: **2**

**1st week:**
**Lecture:** Transformation; Carcinogenesis
Tumorigenesis; The modeling of tumorigenesis
Molecular classification of cancers; Targeted therapy, personalized medicine

**2nd week:**
**Lecture:** The genetics of cancer / hereditary and

acquired genetic changes / High vs. low penetrance genes / TCGA
Tumor heterogeneity and cancer stem cells
Tumor microenvironment / The role of inflammation in cancer formation and maintenance

**3rd week:**
**Lecture:** The rationale and strategies of cancer prevention
**Seminar:** Summary and discussion of the curriculum

**4th week:**
**Lecture:** Oncogenes as therapeutic target; NRs / RTKs as therapeutic and preventive targets
Tumor suppressors / DNA repair / synthetic lethality; Morphogenic tumor suppressor pathways
Metabolic alterations in cancer / The Warburg effect; Energy substrate sensors / AMPK, S6K, mTOR / IDH

**5th week:**
**Lecture:** Cancer risk factors and risk assessment; Biomarkers as surrogate endpoints
Proof of Concept - Clinical trials; Quantitation of treatment effect size
Cancer drug development / Design; Molecular screening / Drug repurposing

**6th week:**
**Lecture:** The theory and practice of immune therapy and cell therapy in oncology
**Seminar:** Summary and discussion of the curriculum

**Requirements**

Students are required to attend at least two thirds of the lectures. Expected for the successful completion of the course is the ability to apply cellular and molecular level knowledge of malignant disregulation to current treatment options in oncology and targeted therapy. Understanding the rationale and current status of cancer prevention is also emphasized. Course performance is evaluated in oral exams based on the topics listed, and includes the interpretation of a graph from a research paper.

## Division of Operative Techniques and Surgical Research

Subject: **ADVANCED SURGICAL OPERATIVE TECHNIQUES**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **4**
Practical: **20**

**1st week:**
**Lecture:** Scrubbing and behaviourial rules in the Operating Theatre. Main principles of surgical hemostasis. Basic surgical techniques of laparotomies, intestinal anastomoses, management of splenic injury, resection of the spleen and cholecystectomy. Operative techniques of preparation and cannulation of the external jugular vein, arteriotomy and closure of arteries, conicotomy and tracheostomy.

**2nd week:**
**Practical:** Overviewing basic surgical techniques on models prior to the living operations.

**3rd week:**
**Practical:** Paramedian laparotomy, one layer end-to-end jejuno-jejunostomy. Preparation and cannulation of the external jugular vein.

**4th week:**
**Practical:** Paramedian laparotomy, spleen

stitches, resection of the spleen, cholecystectomy. Preparation and cannulation of the external jugular vein. Preparation, arteriotomy and suturing of the common carotid artery and femoral artery. Conicotomy and tracheostomy.

**5th week:**
**Practical:** Paramedian laparotomy, spleen stitches, resection of the spleen. Preparation and cannulation of the external jugular vein. Preparation, arteriotomy and suturing of the common carotid artery and femoral artery. Conicotomy and tracheostomy.

**Requirements**

Prerequisite: Basic Microsurgical Training -Introduction to Microsurgery, Surgery II
Aim of the course:
To provide an opportunity for those students, who are interested in specialties which require manual skills before they finish their university studies and start their clinical practice. The course is based on the knowledge obtained during the "Basic Surgical Technique", "Surgical Operative Technique", "Basic Microsurgical Training. Introduction to Microsurgery" compulsory and compulsory elective courses.
Course description: During the course, student will have the opportunity to practice surgical hemostasis, to secure a venous access, to make a venous cutdown, conicotomy, tracheostomy, to perform a laparotomy and to implement the basic surgical techniques in the abdominal cavity in a living tissue (anaesthetized pig). Student will work in teams (3 students/team) in a rotational system.

Subject: **BASIC LAPAROSCOPIC SURGICAL TRAINING**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **5**
Practical: **15**

**1st week:**
**Lecture:** History of laparoscopic surgery. Basic principles of laparoscopic surgery. Laparoscopic equipments: insufflator, optics, monitor, laparoscopic instrumentation. (3 hours)
Laparoscopic surgical interventions (clinical lecturer). (2 hours)

**2nd week:**
**Practical:** Practicing the use of laparoscopic instruments in open pelvi-trainer. Operating in three-dimensional field viewing two-dimensional structure by video-imaging.

**3rd week:**
**Practical:** Intracorporal knotting technique on surgical training model in open and closed pelvi-trainer.

**4th week:**
**Practical:** Preparation on chicken thigh and practising intracorporal knotting technique in open and closed pelvi-boxes and MATT (Minimal Access Therapy Technique) trainer.

**5th week:**
**Practical:** Cholecystectomy on isolated liver-gallbladder biopreparate model and/or phantom model in closed pelvi-box and MATT trainer.

**6th week:**
**Practical:** Cholecystectomy on isolated liver-

gallbladder biopreparate model and/or phantom model in closed pelvi-box and MATT trainer.
**Self Control Test**

**Requirements**

**Prerequisite:** Basic Surgical Techniques, Surgical Operative Techniques, Surgery II.
Aim of the course: Students have to learn the laparoscopic equipment and instruments and to perform basic laparoscopic interventions working in open and closed pelvi-trainer, MATT (Minimal Access Therapy Technique) trainer on surgical training models, phantom models and biopreparate model.
Course description: History and basic principles of endoscopic surgery. The use laparoscopic equipment and instruments. Intracorporeal knotting technique in open and closed pelvi-trainer on phantom models and biopreparate models.
Cholecystectomy in closed pelvi-trainer and MATT-trainer on liver-gallbladder phantom model and biopreparate model.

Subject: **BASIC MICROSURGICAL TRAINING. INTRODUCTION TO MICROSURGERY**
Year, Semester: 4th year/1st semester**,** 4th year/2nd semester
Number of teaching hours:
Lecture: **2**
Practical: **10**

**1st week:**
**Lecture:** General principles of microsurgery. Operating microscopes. Microsurgical instruments (scissors, forceps, needle-holders, approximating vessel clamps). Microsurgical suture materials and needles. Clinical and experimental application of microsurgery.

**2nd week:**
**Practical:** Adaptation to the operating microscope at various magnifications - harmony between eyes and hands. Scraping letters by letters from a newspaper with the tip of an injection needle with left and right hand at various magnifications - establishing the coordination between the hands.

**3rd week:**
**Practical:** Fiber removal and reposition with microsurgical forceps on a dry and wet gauze model, from different directions, at various magnifications. Preparation of "free flap" on a 4-layer gauze model for practicing the perception of depth.

**4th week:**
**Practical:** Practicing microsurgical suturing and knotting techniques by closing incisions made from different directions on rubber glove pieces. Presentation of the Microsurgical exhibition.

**5th week:**
**Practical:** Arterial anastomosis: end-to-end vascular anastomosis on the femoral artery of a chicken thigh's biopreparate model.
**Self Control Test**

**Requirements**

**Prerequisite:** Basic Surgical Techniques, Surgical Operative Techniques
Aim of the course: To learn how to use microscope and microsurgical instruments and to perform

different microsurgical interventions.

Course description: 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 (chicken thigh).

Exam: AW5

Subject: **SURGICAL BIOMATERIALS**
Year, Semester: 5th year/2nd semester**,** 5th year/1st semester
Number of teaching hours:
Lecture: **12**

**1st week:**
**Lecture:** Definition of surgical biomaterials. Different types and their clinical application.
**Practical:** Taking stitches with different types of surgical suture materials into skin pad phantom model.

**2nd week:**
**Lecture:** Surgical clips, surgical staplers (clip applying machines) and their application fields. Surgical meshes and their application fields. Presenting the Museum of Surgical Suture Materials and Museum of Surgical Staplers.

**3rd week:**
**Practical:** Application of different bioplasts on porcine spleen biomodel.

**4th week:**
**Lecture:** Tissue adhesives - mode of action, types, application fields (video-demonstration).
**Self Control Test**

**Requirements**

Prerequisite: Surgical Operative Techniques, Basic Microsurgical Training - Introduction to Microsurgery, Surgery II
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.
Exam: AW5

Subject: **SURGICAL OPERATIVE TECHNIQUES**
Year, Semester: 3rd year/2nd semester**,** 4th year/1st semester
Number of teaching hours:
Lecture: **4**
Practical: **8**

**1st week:**
**Lecture:** Overviewing of basic surgical knowledge: handling surgical instruments, basic surgical techniques, pitfalls in suturing techniques. Surgical suture materials. Advanced knotting and suturing techniques.
**Practical:** Practicing knotting techniques on knotting pads and different suturing techniques on gauze model and on surgical training model (simple interrupted suture line, special interrupted suture line - Donati sutures, simple continuous suture line, suture removal). Special knotting techniques. Evaluation of the suture lines, discussion of pitfalls.

**2nd week:**
**Lecture:** Scrubbing. Possible mistakes. Vein preparation, cannulation, preparation of infusion set (video-demonstration). Blood sampling and injection techniques. Different suturing and knotting techniques on biomodels (video-demonstration)
**Practical:** Practicing blood sampling and injection techniques.
Scrubbing. Practicing different suturing and knotting techniques (apodactylic technique) on skin biopreparate model in team work. Practicing vein preparation and cannulation on surgical phantom model, preparation of infusion set.

**3rd week:**
**Lecture:** Suturing techniques in vascular surgery (video-demonstration).
**Practical:** Urinary bladder catheterization on phantom model.
Scrubbing. Vascular sutures on aorta biopreparate model. Vein preparation and cannulation on surgical phantom model.

**4th week:**
**Lecture:** Anastomosis techniques in the surgery of the gastrointestinal tract. End-to-end one-layer intestinal anastomosis technique on biomodel (video-demonstration).
**Practical:** Practicing blood sampling and injection techniques on upper limb phantom model.
Scrubbing. End-to-end one-layer intestinal anastomosis on small bowel biopreparate model.
**Self Control Test**

**Requirements**

**Prerequisite:** Basic Surgical Techniques

Aim of the course: Evoking, deepening, extending and training of basic surgical knowledge acquired during the "Basic Surgical Techniques" subject, working on different surgical training models, phantom models in "dry" circumstances, then following surgical scrub, in the operating room, working on vein pad phantom model and different biopreparate models.

Course description: Revision of basic surgical techniques. Repeating and practicing basic life saving methods - hemostasis, venous cutdown technique, conicotomy - and basic interventions: wound closure with different suturing techniques, blood sampling and injection (i.m., i.v.) techniques on phantom models and biopreparate models.

Exam: AW5

# Division of Radiology and Imaging Science

Subject: **MEDICAL IMAGING**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **16**

**1st week:**
**Seminar:** Digital X-Ray imaging

**2nd week:**
**Seminar:** Ultrasound imaging

**3rd week:**
**Seminar:** CT imaging

**4th week:**
**Seminar:** Magnetic Resonance Imaging I.

**5th week:**
**Seminar:** Radionuclide imaging

**6th week:**
**Seminar:** Risks of medical imaging

**7th week:**
**Seminar:** Multimodal imaging

**Requirements**

The aim of the course is to teach students the basis of how the different medical imaging modalities work with respect to clinical application. With the knowledge that they acquired throughout the first two years of medical school, students will learn, before studying radiology, how this key diagnostic course many fit among the clinical subjects.
One absence is allowed.
Final test: written

# Division of Radiotherapy

Subject: **DEALING WITH IRRADIATION INDUCED SIDE EFFECTS**
Year, Semester: 3rd year/1st semester**,** 3rd year/2nd semester
Number of teaching hours:
Lecture: **5**
Practical: **10**

**1st week:**
**Lecture:** Revision of basic radiotherapeutical knowledge, pitfalls
**Practical:** Introduction of the ward of radiation oncology department

**2nd week:**
**Lecture:** The most frequent gastrointestinal, urinary side effects, diagnoses, treatment and best supportive care
**Practical:** Case report

**3rd week:**
**Lecture:** The most common respiratory, oral and cutaneous side effects, diagnoses, treatment and best supportive care
**Practical:** Case report

**4th week:**
**Lecture:** The most common CNS side effects,

haematological disorders related to radiotherapy, diagnosis, treatment and best supportive care
**Practical:** Case report

**5th week:**
**Lecture:** Best supportive care: quality of life, nutrition, medical exercise, psychosocial support.
Thromboembolic side effects, profilactic LMWH treatment
**Practical:** Case report
Written test

**Requirements**

Min. 5, max. 12 students
Aim of the course: Evoking, deepening and extending the oncology knowledge acquired during the internal- and preventive medicine practices and physiology from the view of radiotherapy. Introduce the treatment modalities for irradiation induced various side effects.

Subject: **RADIOTHERAPY IN THE CLINICAL PRACTICE**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Seminar: **15**

**1st week:**
**Seminar:** Equipments of teletherapy I.
Equipments of teletherapy II.

**2nd week:**
**Seminar:** Teletherapy (processes, clinical aspects)
Locoregional treatment, risk organs

**3rd week:**
**Seminar:** Role of radiotherapy (case reports)
Palliative therapy

**4th week:**
**Seminar:** Special teletherapy techniques
Brachytherapy I.

**5th week:**
**Seminar:** Brachytherapy II.
Brachytherapy III.

**6th week:**
**Seminar:** Eye plaque brachytherapy
Isotope therapy

**Requirements**

The goal is to get to know the process and clinical considerations of radiotherapy (indications, contraindications, equipment).

# Kenézy Life Sciences Library, University of Debrecen

Subject: **LIBRARY SYSTEM**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Practical: **10**

**1st 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).

**2nd week:**
**Practical:** Electronic Information Resources:
- Electronic journals (EBSCO A-to-Z, Science Direct).
- EBSCOhost Research Data-bases.
- Link collections.

**3rd week:**
**Practical:** Databases:
- Medline.
- Impact Factors.

**4th week:**
**Practical:** Evidence Based MedicineSynopsis of information retrieval

**5th week:**
**Practical:** Test

**Requirements**

Class attendance!

# CHAPTER 21
# TITLES OF THESES

## Department of Anatomy, Histology and Embryology

1. Title: Expression of extracellular matrix molecules in the olfactory system of the rat
2. Title: The role of the extracellular matrix in the regeneration of the nervous system.
Tutor: Klára Matesz M.D.,Ph.D.,D.Sc.

3. Title: Possible applications of morphofunctional matrices for classification of neurons (computer modelling)
Tutor: Ervin Wolf M.Sc., Ph.D.

4. Title: Investigation of contour integration processing in the primary visual cortex using voltage sensitive dye imaging
5. Title: Three-dimensional reconstruction of thalamocortical axons in the primary somatosensory cortex of rats
Tutor: Zoltán Kisvárday M.Sc., Ph.D., D.Sc.

6. Title: Investigation of signalling mechanisms that regulate cartilage development and maturation
Tutor: Róza Zákány M.D., Ph.D.

7. Title: Interrogation of spinal dorsal horn circuits with electrophysiological and optogenetic tools
8. Title: Light- and electron microscopy level analysis of the axons and axon collaterals of spinal lamina I projection neurons
9. Title: Local synaptic connections of projection neurons in spinal lamina I
10. Title: Morphometric analysis of excitatory and inhibitory interneurons in the spinal dorsal horn
Tutor: Péter Szücs M.D., Ph.D.

11. Title: Extracellular matrix in the developing brainstem
Tutor: Ildikó Wéber M.Sc., Ph.D.

12. Title: Extracellular matrix molecules in the motor nuclei of the eye in the mouse
13. Title: Regeneration of the optic nerve in the frog
14. Title: Regeneration of the vestibular system in the rat
Tutor: Botond Gaál M.Sc., Ph.D.

15. Title: Investigation of neuronal network development in the spinal cord
Tutor: Zoltán Mészár M.Sc., Ph.D.

16. Title: The role of the molecular clock in healthy and osteoarthritic chondrocytes
Tutor: Csaba Matta M.Sc., Ph.D.

17. Title: Role of PACAP signalling in cartilage differentiation and regeneration
Tutor: Tamás Juhász M.Sc., Ph.D.

18. Title: Distribution of the extracellular matrix in the red nucleus and pararubral area
Tutor: Éva Rácz M.Sc., Ph.D.

19. Title: The endocannabinoid-mediated modulation of spinal nociception
20. Title: The role of astrocytes in spinal pain processing
Tutor: Zoltán Hegyi M.Sc., Ph.D.

21. Title: Quantitative morphological studies of primary afferent-motoneuron connections in the frog's brainstem
Tutor: András Birinyi M.Sc., Ph.D.

22. Title: Role of pro-inflammatory cytokines in neuron-glia interaction during inflammatory pain states
Tutor: Krisztina Holló M.Sc., Ph.D.

23. Title: Mapping of synapses on dendrites of GABAergic neuron subtypes in the cerebral cortex
Tutor: Petra Talapka Ph.D.

## Department of Biochemistry and Molecular Biology

1. Title: Involvement of phagocytosis of apoptotic cells in the muscle regeneration

following injury
2. Title: Involvement of the impaired clearance of apoptotic cells in the control of insulin sensitivity
3. Title: Molecular mechanisms participating int he engulfment of apoptotic cells
4. Title: Signaling pathways mediating the effect of adenosine in the macrophage chemotaxis
Tutor: Zsuzsa Szondy M.D., Ph.D., D.Sc.

5. Title: Dissecting and aligning the regulatory and effector mechanisms shaping murine M2 macrophages
6. Title: Dissecting the transcriptional network allowing macrophages to control angiogenesis
7. Title: The role of the transcription factor BACH1 in macrophage function and tissue homeostasis
Tutor: László Nagy M.D., Ph.D., M.H.A.Sc.

8. Title: The role of retroviral proteases in the retroviral life cycle.
Tutor: József Tőzsér M.Sc., Ph.D., D.Sc.

9. Title: The role of tissue transglutaminase in rolling and adhesion of neutrophil granulocytes
Tutor: Zoltán Balajthy M.Sc., Ph.D.

10. Title: Saliva biomarkers of oral cancer.
Tutor: Beáta Scholtz M.Sc., Ph.D.

11. Title: Production of dendritic cells and macrophages from embryonic stem cells.
12. Title: Transcriptional reprogramming of murine embryonic stem cell progenitors.
Tutor: István Szatmári M.Sc., Ph.D.

13. Title: Studies in the regulation of tissue specific and cancer specific gene expression by using genomic and bioinformatic tools
Tutor: László Bálint Bálint M.D., Ph.D.

14. Title: Effects of various coeliac autoantibodies on transglutaminase 2 activities and interactome.
15. Title: Modification of the enzymatic activity of transglutaminase 2 by site-directed mutagenesis. Therapeutic utilization of modified transglutaminase 2.
16. Title: Studying structure and function relationship of transglutaminases and its application in translational medicine
Tutor: Róbert Király M.Sc., Ph.D.

17. Title: Quantitative proteomic analysis of the tear proteins of diabetic patients.
Tutor: Éva Csősz M.Sc., Ph.D.

18. Title: Evaluation of the browning potential and inducibility from human fat tissue biopsies
Tutor: Mária Szatmári-Tóth M.Sc., Ph.D.

19. Title: Identification of regulatory SNPs in promoter regions of different species by bioinformatic analyses.
Tutor: Endre Barta M.Sc., Ph.D.

20. Title: The role of aim2 protein and native immune response in inhibiting cell proliferation
Tutor: Máté Demény M.D.,Ph.D.

21. Title: Alterations in structural properties of the transcription machinery in relation to disease development
22. Title: Drug discovery for protein interactions
23. Title: Functional aggregation in innate immunity
24. Title: Molecular factors in cell differentiation
25. Title: New comparative methods of protein evolution and sequence analysis
26. Title: Regulation of protein half-life via protein interactions
27. Title: Studying the re-programming mechanisms of viral proteins.
28. Title: The role of signaling pathway perturbations in cancer development
Tutor: Mónika Fuxreiter M.Sc., Ph.D., D.Sc.

29. Title: Characterization of adipocytes with thermogenic potential
30. Title: In vitro study about the effect of environmental conditions (e.g.: temperature, oxygen availability) on the differentiation potential and beigeing process of primary adipocytes

31. Title: Investigation of the beigeing plasticity of adipocytes, identification of key extrinsic and intrinsic factors
Tutor: Beáta Bartáné Tóth M.Sc., Ph.D.

32. Title: Investigation of novel molecular elements of the browning machinery in different human adipose tissues
33. Title: Investigation of the biological significance of "batokine" secretion in human cell models
Tutor: Endre Károly Kristóf M.D.

34. Title: Characterization of genetic risk factors of chronic pancreatitis
Tutor: András Szabó 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: Role of tumor stem cells in trastazumab resistant breast tumors
Tutor: János Szöllősi M.Sc., Ph.D., D.Sc., M.H.A.Sc.

3. Title: Studying the inactivation of voltage gated potassium ion channels in heterologous expression systems.
Tutor: György Panyi M.D., Ph.D., D.Sc.

4. Title: Epigenetic regulation of nucleosome-DNA cohesion
5. Title: Interactions between ABC transporters and their membrane environment
Tutor: Gábor Szabó M.D., Ph.D., D.Sc.

6. Title: Mathematical analysis and computer modelling of the topology of cell surface proteins.
7. Title: Role of MHC in the organization of cell surface proteins
Tutor: László Mátyus M.D., Ph.D., D.Sc.

8. Title: Examination of the channel function properties of the P170 multidrug pump by patch-clamp.
Tutor: Zoltán Krasznai M.Sc., Ph.D.

9. Title: Cytometry of cytotoxic lymphocytes
10. Title: Physiological roles of the multidrug resistance transporter P-glycoprotein.
Tutor: Zsolt Bacsó M.D., Ph.D.

11. Title: Elucidation of the catalytic mechanism of ABC transporters
Tutor: Katalin Goda M.Sc., Ph.D.

12. Title: Biophysical analysis and functional significance of cell surface protein patterns in T cell-mediated immune responses
Tutor: Andrea Dóczy-Bodnár M.Sc., Ph.D.

13. Title: Studying nuclear receptor function by modern microscopy techniques
Tutor: György Vámosi M.Sc., Ph.D.

14. Title: Quantitative investigation of the associations of ErbB proteins using biophysical and molecular biological methods
15. Title: The correlation between the metastatic potential and chemoresistance of breast tumors with the expression level and association state of ErbB proteins
Tutor: Péter Nagy M.D., Ph.D.

16. Title: Molecular characterization of multicomponent primary human cell cultures produced for regenerating stem cell deficient corneas.
17. Title: Molecular interactions in histopathological diagnosis: development of a FRET application for a confocal fluorescence digital slide scanner.
18. Title: Molecular mechanisms of anticancer immune therapy.
19. Title: Optimizing efficacy and in vivo persistence of reprogrammed (chimeric antigen receptor-transduced) human T cells.
20. Title: Role of molecular interactions between receptor tyrosine kinases and integrins in the therapy resistance of tumors.
Tutor: György Vereb M.D., Ph.D., D.Sc.

21. Title: Comparative study on Kv1.3 channels conjugated with fluorescent proteins
Tutor: Péter Hajdu M.Sc., Ph.D.

## Department of Anesthesiology and Intensive Care

1. Title: Experimental testing of the neuromuscular junction
Tutor: Ákos Fábián M.D., Ph.D.

2. Title: Preemptive and preventive analgesia
Tutor: Béla Fülesdi M.D., Ph.D., D.Sc.

3. Title: Tako-tsubo cardiomyopathy in neurocritical care conditions
Tutor: Csilla Molnár M.D., Ph.D.

4. Title: Clinical studies in the field of neuromuscular block and its reversal
Tutor: Adrienn Pongrácz M.D., Ph.D.

## Institute of Behavioural Sciences, Faculty of Public Health

1. Title: Basic issues of psy-complex (psychology, psychotherapy, psychiatry)
2. Title: Changing attitudes towards human phenomena in Western medicine
3. Title: Changing attitudes towards human phenomena in Western medicine
4. Title: Contemporary problems of Psy-complex
5. Title: Contemporary problems of Psy-complex
6. Title: Health and disease in cultural context
7. Title: Health and disease in cultural context
8. Title: Medicalization and its social context
9. Title: Medicalization and its social-cultural context
10. Title: Prolongation of life as a modern Western project
11. Title: Prolongation of life as a modern Western project
12. Title: Sandor Ferenczi: Clinical Diary and the philosophy of doctor-patient relationship
13. Title: The importance of the point of view of psychoanalysis for a humanistic medicine.
Tutor: Attila Bánfalvi M.A., Ph.D., C.Sc.

14. Title: "Becoming a doctor": the process of socialisation
Tutor: Péter Molnár M.D., D.Sc.

15. Title: Challenges of scientific integrity
16. Title: Ethical and legal issues of genetic research
17. Title: Ethical dilemmas of confidentiality in healthcare
18. Title: Ethical institutions in healthcare
19. Title: Ethical issues in genetics
20. Title: Ethical issues of research in the medical and health sciences
21. Title: Professional ethics and the system of gratitude money in Hungary
22. Title: Research ethical questions in public health research
23. Title: The ethical governance of scientific publications
24. Title: The ethics of end-of-life decisions
Tutor: Péter Kakuk M.A., Ph.D.

25. Title: Genomic applications through the lens of health policy
26. Title: Patient safety and staff safety in hospitals
27. Title: Quality management in hospitals
28. Title: Work environment within hospitals
Tutor: Viktor Dombrádi M.Sc., Ph.D., D.Sc.

29. Title: Health impairment related to occupational hazards
30. Title: Work related stress and burnout amongst healthcare workers
Tutor: László Róbert Kolozsvári M.D., MBA, Ph.D.

31. Title: End of Life Decisions
32. Title: End of life decisions
Tutor: Sándor Kőmüves M.A., Ph.D.

33. Title: Evolutionary Psychopathology
34. Title: Humor and Mental Health
35. Title: Life History Strategy elements in mate choice, attachment, and mental health
Tutor: Roland Tisljár M.A., Ph.D.

36. Title: Psychological interventions in dental practice
Tutor: Eszter Tisljár - Szabó M.A., Ph.D.

## 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: Short-term results of operations accomplished in A-type aortic dissections
Tutor: Tamás Maros M.D.

4. Title: Tricuspid valve surgery review of the literature
Tutor: István Szentkirályi M.D.

5. Title: Sutureless aortic valve implantation - rewiew of the literature
Tutor: Lehel Palotás M.D.

## Department of Family and Occupational Medicine, Faculty of Public Health

1. Title: Evaluation of the primary health care system of......(the country of origin of student). Recommendations for changes
2. Title: Nutritional factors in prevention and development of diseases
3. Title: The roles of physical activity in disease prevention
Tutor: Imre Rurik M.D., M.Sc., Ph.D., D.Sc.

4. Title: Cardiovascular risk factors and risk assessment
5. Title: Cardiovascular risk factors and risk assessment
6. Title: Continuing care of patients with high cardiovascular risk in primary care
7. Title: Continuing care of patients with high cardiovascular risk in primary care
Tutor: Zoltán Jancsó M.D., Ph.D.

8. Title: Advantages of computer-aided diagnosis in primary care
9. Title: Advantages of computer-aided diagnosis in primary care
10. Title: Evaluation of the primary health care system of ........(the country of origin of student). Recommendations for changes
11. Title: Health impairment related to occupational hazard
12. Title: Work related stress and burnout among healthcare workers
Tutor: László Róbert Kolozsvári M.D., MBA, Ph.D.

13. Title: Effects of burnout on work efficiency
14. Title: Psychosocial etiological factors in the workplace
15. Title: Psychosocial etiological factors in the workplace
16. Title: Stress as a risk factor in the working environment
17. Title: Stress, as a risk factor in the working environment
Tutor: Tímea Ungvári M.Sc.

18. Title: Physical, mental and social aspects of aging
19. Title: Physical, mental and social aspects of aging
20. Title: The family physician as gatekeeper
21. Title: The family physician as gatekeeper
Tutor: Anna Nánási M.D.

## Department of Preventive Medicine, Faculty of Public Health

1. Title: Health-related behaviours among adolescents
2. Title: Health-related behaviours among adolescents
3. Title: Mental health of health care workers
4. Title: Mental health of students
5. Title: Mental health of students
6. Title: Social support among university students
Tutor: Éva Bíró M.D., Ph.D.

7. Title: The use of Molecular genetic techniques for the detection of genome alterations in malignant diseases (review the literature)
Tutor: Margit Balázs M.Sc., Ph.D., D.Sc.

8. Title: Analysis of factors affecting risk perceptions (study)
9. Title: Gene-environment interactions and obesity (systematic review)
10. Title: Prevalence of obesity (trend analysis)

11. Title: The effect of neighborhood environment on physical activity and diet (systematic review)
12. Title: The effect of school based health promotion programs on nutrition (systematic review)
Tutor: Helga Bárdos M.D., M.Sc., Ph.D.

13. Title: Burden of diseases attributed to environmental risk factors in European countries
14. Title: Mortality due to environmental risk factors in European countries
Tutor: Sándor Szűcs M.Sc., Ph.D.

15. Title: Genomic and environmental determinants of cardiovascular diseases (genetic epidemiology analyses)
16. Title: Genomic determinants of cardiovascular diseases
Tutor: Szilvia Fiatal M.D., Ph.D.

17. Title: Monitoring type 2 diabetes design strategies
18. Title: Prevalence of type 2 diabetes (specific region)
Tutor: Attila Csaba Nagy M.D., Ph.D.

19. Title: Evaluation of chronic care for adult over-weighted in general medical practice
20. Title: Evaluation of chronic care for adult over-weighted in general medical practice
21. Title: Evaluation of chronic care for adult smokers in general medical practice
22. Title: Evaluation of chronic care for adult smokers in general medical practice
23. Title: Evaluation of chronic care for diabetes mellitus in general medical practice
24. Title: Evaluation of chronic care for diabetes mellitus in general medical practice
25. Title: Evaluation of chronic care for hypertension in general medical practice
26. Title: Evaluation of chronic care for hypertension in general medical practice
27. Title: Evaluation of foreign aid for the health sector in medium and low income countries
Tutor: János Sándor M.D., Ph.D.

28. Title: Genetic epidemiology of obesity (literature review)
29. Title: Genetic epidemiology of obesity (literature review)
30. Title: The role of the FTO gene in the development of metabolic syndrome
31. Title: The role of the FTO gene in the development of metabolic syndrome
Tutor: Károly Nagy Ph.D.

32. Title: Pesticide use in developed and developing countries
33. Title: Pesticide use in developed and developing countries
Tutor: László Pál Ph.D.

34. Title: Genotoxic exposures in the work- and ambient environment
35. Title: Genotoxic exposures in the work- and ambient environment
36. Title: Health impact assessment of policies, programs and projects
37. Title: Health impact assessment of policies, programs and projects
38. Title: Investigation of workplace hazards
39. Title: Investigation of workplace hazards
40. Title: Occupational diseases
41. Title: Occupational diseases
Tutor: Balázs Ádám M.D., M.Sc., Ph.D.

## Division of Cardiology

1. Title: Ablation in atrial fibrillation
2. Title: Novel treatment modalities in atrial fibrillation (catheter ablation, surgery and pacemakers)
Tutor: Zoltán Csanádi M.D., Ph.D., D.Sc.

3. Title: Flow calculation in 3D reconstructed coronary arteries
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: Interventional treatment of chronic total coronary occlusions
Tutor: Tibor Szűk M.D., Ph.D.

7. Title: Supraventricular arrhythmias.
Tutor: Csaba Kun M.D.

8. Title: Stem cell therapy after myocardial infarction
Tutor: László Balogh M.D.

9. Title: Cardiac rehabilitation in coronary disease
10. Title: Modern antithrombotic therapy
Tutor: Nóra Homoródi M.D.

11. Title: Cardiovascular complications of dermatomyositis.
Tutor: Andrea Péter M.D.

12. Title: Examining preventive measures for early myocardial damage caused by doxorubucin chemotherapy in a rat model
Tutor: Dániel Czuriga M.D., Ph.D.

13. Title: Invasive hemodynamic measurements in heart failure patients
Tutor: László Fülöp M.D., Ph.D.

14. Title: The role and location of the transtelephonic ECG system in emergency patient care.
Tutor: Ildikó Rácz 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 angiotensin II in cardiovascular diseases
3. Title: Vascular alterations leading to hypertension.
Tutor: Attila Tóth M.Sc., Ph.D., D.Sc.

4. Title: Endogenous regulation of the renin-angiotensin-aldosterone system and its clinical significance
Tutor: Miklós Fagyas M.D., Ph.D.

5. Title: Investigating mechanisms contributing to the myogenic tone of the coronary arteries
Tutor: Viktória Csató M.Sc., Ph.D.

## Division of Nuclear Medicine and Translational Imaging

1. Title: Development of interactive E-learning material for nuclear medicine
Tutor: József Varga M.Sc., Ph.D.

2. Title: Assessment of Diabetic Foot with Different Nuclear Medicine procedures
Tutor: Ildikó Garai M.D., Ph.D.

## Division of Radiology and Imaging Science

1. Title: Analysis of Pediatric Radiology Examinations
Tutor: Nóra Vrancsik M.D.

## Department of Medical Imaging

1. Title: Posttherapeutic I-131 whole body SPECT/CT in patients with thyroid cancer
2. Title: The role of Tc99m-Tektrotyd SPECT/CT to evaluate metastatic neuroendocrine tumors
Tutor: Ildikó Garai M.D., Ph.D.

3. Title: Localisation of anatomical regions of CT scans with machine learning methods
Tutor: Zoltán Barta M.D.

## 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: Ca++-binding proteins in Streptomyces

7. Title: Isolation of mono-ADP-ribosylated proteins from pro- and eukaryotic cells.
Tutor: András Penyige M.Sc., Ph.D.

8. Title: Analysis of an A factor non-producer bald mutant Streptomyces griseus strain with respect of antibiotic production and cell differentiation.
Tutor: Zsuzsanna Birkó M.Sc., Ph.D.

9. Title: Chromosome-tracking studies in complex diseases.
Tutor: György Vargha M.D., Ph.D.

10. Title: Factor-C: a protein regulating differentiation in Streptomycetes.
Tutor: Judit Keserű M.Sc., Ph.D.

11. Title: Copy number variation of WT-1 gene in hematological conditions
Tutor: Gergely Buglyó M.D., Ph.D.

12. Title: Functional analysis of the Streptomyces facC gene in Aspergillus
Tutor: Melinda Paholcsek M.Sc., Ph.D.

13. Title: Global analysis of the human blood plasma epitome and interactome in health and disease.
14. Title: Use of comparative monoclonal antibody proteomics to detect three dimensional conservation relevant to protein function.
Tutor: László Takács M.D., Ph.D., D.Sc., M.H.A.Sc.

15. Title: Study of antibiotic production and differentiation in Streptomyces bacteria.
16. Title: Study the role of miRNAs in oncogenic disorders.
Tutor: Melinda Szilágyi-Bónizs M.Sc., Ph.D.

## Department of Clinical Oncology

1. Title: Immune mechanisms against tumors
Tutor: Andrea Szegedi M.D., Ph.D., D.Sc.

2. Title: Re-purposing of clinical drugs for cancer prevention
Tutor: Iván Uray 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: The role of the HOFI/SH3PXD2B adaptor protein in the regulation of the tumor microenvironment
Tutor: Árpád Lányi M.Sc., Ph.D.

3. Title: The role of innate immune cells in the development of allergic responses
4. Title: The role of innate lympoid cells (ILC) in human diseases
Tutor: Attila Bácsi M.Sc., Ph.D.

5. Title: Altered differentiation of monocyte derived dendritic cells and their functional differences
Tutor: Péter Gogolák M.Sc., Ph.D.

6. Title: Investigation of phytocannabinoid effects on human monocyte-derived dendritic cells
7. Title: Investigation of transient receptor potential channels on human monocyte-derived dendritic cells
Tutor: Attila Szöllősi M.D., Ph.D.

8. Title: Identification of new viral senzors and new regulatory mechanisms in the antiviral responses of human dendritic cells
9. Title: Role of dendritic cells in the development of autoimmune diseases
Tutor: Kitti Pázmándi M.Sc., Ph.D.

10. 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.

## Division of Clinical Oncology

1. Title: Prognostic factors in colorectal cancer
Tutor: Csilla András M.D., Ph.D.

2. Title: Treatment modalities in pancreas cancer
Tutor: Péter Árkosy M.D., Ph.D.

3. Title: Current treatment of metastatic kidney cancer based on clinical evidencies
4. Title: Treatment options of metastatic castration-resistant prostate cancer
Tutor: Balázs Juhász M.D.

5. Title: Haemostatic disorders in malignant diseases
Tutor: Anita Árokszállási M.D.

6. Title: Palliation in oncology
Tutor: Éva Szekanecz M.D., Ph.D.

## Department of Laboratory Medicine

1. Title: Evaluation of known and novel autoantibodies in the diagnostics of autoimmune and immune-mediated disorders
2. Title: Identification of novel biomarkers for the detection and prediction of cirrhosis associated infections
Tutor: Péter Antal-Szalmás M.D., Ph.D.

3. Title: Vitamin D status in colorectal carcinoma
Tutor: Harjit Pal Bhattoa M.D., Ph.D.

4. Title: Cytogenetic aberrations in infertility
5. Title: Genetic examinations in t(12;21) positive childhood acute lymphoblastic leukemia
Tutor: Anikó Ujfalusi M.D., Ph.D.

6. Title: Analysis of serum human epididymis protein 4 (HE4) in the follow-up of cystic fibrosis patients
7. Title: Investigation of platelet microRNA expressions in septic conditions
Tutor: Béla Nagy Jr. M.D., Ph.D.

8. Title: Genetic predisposition in autoimmune diseases
9. Title: Investigations of miRNAs in autoimmune diseases
Tutor: Erika Zilahi M.Sc., Ph.D.

## Division of Clinical Laboratory Science

1. Title: Effect of alfa2-plasmin inhibitor polymorphisms on the risk of thrombosis
2. Title: Effect of FXIII on smooth muscle cell functions
3. Title: Investigation of alfa2-plasmin inhibitor and fibrinogen interaction
4. Title: Method development for the detection of various alpha2 plasmin inhibitor isoforms
Tutor: Éva Katona null

5. Title: Inherited hemostasis disorders; laboratory and molecular genetic aspects
6. Title: Laboratory monitoring of the new generation oral anticoagulants
7. Title: New diagnostic methods in Protein S deficiency.
Tutor: Zsuzsanna Bereczky M.D., Dr. habil., Ph.D.

8. Title: Characterization of the heparin-antithrombin interaction with surface plasmon resonance
Tutor: Krisztina Pénzes-Daku M.Sc., Ph.D.

9. Title: Fibrinolytic marker levels and polymorphisms in ischemic stroke patients
10. Title: Local hemostasis alterations in the left atrium of patients with atrial fibrillation
Tutor: Zsuzsa Bagoly M.D., Ph.D.

## Division of Radiotherapy

1. Title: Comparing the efficacy of postoperative adjuvant irradiation and salvage irradiation in prostate cancer patients
Tutor: Hilda Urbancsek M.D.

2. Title: Adjuvant radiotherapy in patients with melanoma and the risk factors for recurrence
Tutor: Ádám Dér M.D.

3. Title: The role of aminotracers in the complex treatment, diagnosis and follow-up of solid cerebrospinal patients
4. Title: Using modern amino acid based PET tracers in glioblastoma multiforme patients in the design of 3D irradiation based on PET/CT/MR fusion
Tutor: Adrienn Opauszki M.D.

5. Title: Determining retrospective 4DCT based trajectory of lung tumors

6. Title: Dosimetric aspects of extracranial stereotactic radiotherapy in non-small cell lung cancer patients
Tutor: Mihály Simon

7. Title: Dealing with irradiation induced side effects
8. Title: Neoadjuvant radio-chemotherapy of rectal cancer
9. Title: Palliative and supportive care in radiooncology
10. Title: Radiotherapy of breast cancer
Tutor: Andrea Furka M.D., Ph.D.

11. Title: Determining acute and chronic side effects after extracranial stereotactic radiotherapy in non-small cell lung cancer patients
Tutor: Emese Csiki M.D.

12. Title: Determining therapeutic response, survival, prognostic factors after extracranial stereotactic radiotherapy in non-small cell lung cancer patients
Tutor: Árpád Kovács Dr. habil.

13. Title: The role of radiotherapy in patients with benign diseases
Tutor: Erika Szántó M.D.

## Department of Dermatology

1. Title: Ablative laser treatment in Hailey-Hailey disease
2. Title: DNA repair mechanisms
3. Title: Genetic susceptibility in psoriasis
4. Title: Indications in ablative Er:YAG laser
5. Title: Methods of sunprotection
Tutor: Éva Remenyik M.D., Ph.D., D.Sc.

6. Title: Chemical burns - special features and treatment options
7. Title: Dermatofibrosarcoma protuberans - therapeutic possibilities
8. Title: Possibilities of skin grafting in the reconstruction of defects after removal of skin tumors
9. Title: Role of NPWT (Negative Pressure Wound Therapy) in the treatment of burns
10. Title: Role of subcutaneous island pedicle flap in the reconstruction of defects after removal of skin tumors
Tutor: István Juhász M.D., Ph.D., C.Sc.

11. Title: Deformities and discolorations of the nails: relation to other medical conditions. Overview of the literature and case reports.
Tutor: Éva Szabó M.D., Ph.D.

12. Title: Different applications of the latissimus dorsi musculocutaneous flap
Tutor: Zoltán Péter M.D.

13. Title: New approaches in the classification and therapy of chronic urticaria
14. Title: Possibility of allergen specific immuntherapy in the treatment of atopic dermatitis
Tutor: Krisztián Gáspár M.D., Ph.D.

15. Title: Melanoma diagnostics, risk factors
Tutor: Borbála Kiss M.D.,Ph.D.

16. Title: Lipid disorder associated dermatological symptoms
17. Title: Pathogenesis and therapy of acne
18. Title: Role of lipid environment in the activation of dermal macrophages
Tutor: Dániel Törőcsik M.D., Ph.D.

19. Title: New therapies in severe psoriasis vulgaris
20. Title: Opalizumab therapy in chronic urticaria
Tutor: Andrea Szegedi M.D., Ph.D., D.Sc.

## Affiliated Department of Infectology

1. Title: Epidemiological investigation of an outbreak of leptospirosis
2. Title: Epidemiological study into the association between body mass index and the frequency of wound infection after cesarean section at Kenézy Hospital
Tutor: László Kardos M.D., M.Sc., Ph.D.

3. Title: Incidence of candidemia and treatment of Debrecen University
Tutor: Eszter Vitális M.D.

4. Title: Celiac disease
5. Title: Inflammatory bowel diseases
Tutor: Zsolt Barta M.D., Ph.D.

6. Title: Management of infection with the human immunodeficiency virus type 2 (HIV-2)
7. Title: Pathomechanism of HIV dual infection, characterization of clinical features and disease prognosis
Tutor: Mohamed Mahdi M.D.

8. Title: Fecal microbiota transplant and Clostridium difficile infection
9. Title: Immunosuppressed conditions and Clostridium difficile infections
10. Title: Travel medicine and vaccines
Tutor: István Zsolt Várkonyi M.D., Ph.D.

11. Title: Association between vancomycin resistant Enterococcus (VRE) incidence and Clostridium difficile infection
12. Title: Physiological roles and infectious disease related aspects of the intestinal flora
Tutor: Ildikó Makai M.D.

## Department of Medical Chemistry

1. Title: Investigation of Ser/Thr protein phosphatase in pathogenic fungi
Tutor: Viktor Dombrádi M.Sc., Ph.D., D.Sc.

2. Title: Interaction of protein phosphatase 1 catalytic subunit with regulatory proteins
Tutor: Ferenc Erdődi M.Sc., Ph.D., D.Sc.

3. Title: Regulation of macrophage activation
Tutor: László Virág M.D., Ph.D., D.Sc.

4. Title: Signal transduction pathways in pulmonary endothelial cells
Tutor: Csilla Csortos M.Sc., Ph.D., D.Sc.

5. Title: Structural and functional investigation of a fungus specific protein phosphatase
Tutor: Ilona Farkas M.Sc., Ph.D.

6. Title: Study of metabolic processes with special regard to the involvement of mitochondrial activity.
Tutor: Péter Bay M.Sc., Ph.D., D.Sc.

7. Title: Application of High-Content Screening in Life Sciences
Tutor: Endre Kókai M.Sc., Ph.D.

8. Title: Signalling pathways in endome
9. Title: Study of the role of protein phosphatase in wound healing
Tutor: Beáta Lontay M.Sc., Ph.D.

10. Title: Inhibition of sodium-glucose cotransporter of kidney by glucose-based compounds also interfering with glycogenolysis
Tutor: Tibor Docsa M.Sc., Ph.D.

11. Title: Regulation of protein phosphatase-1 by inhibitory proteins and the translocation of the targing subunit
Tutor: Andrea Kiss M.Sc., Ph.D.

12. Title: High-Throughput Screening
Tutor: Csaba Hegedűs M.Sc., Ph.D.

13. Title: Autophagy in physiological and pathological processes
Tutor: Katalin Kovács M.Sc., Ph.D.

14. Title: Study of protein-protein interaction in the neurodegenerative Huntington's disease.
Tutor: Krisztina Tar M.Sc., Ph.D.

## Department of Medical Microbiology

1. Title: Antimicrobial cell-mediated immunity measured by mRNA tests
Tutor: József Kónya D.Sc.

2. Title: Evaluation of in vitro efficacy of different new antibiotics against multiresistant bacteria
Tutor: Judit Szabó M.D., Ph.D.

3. Title: Role of HPV in head and neck cancers
Tutor: Krisztina Szarka M.Sc., Ph.D.

4. Title: Evaluation of fungicidal effect of

antifungal agents using time-kill curves
5. Title: New and older agents in antifungal chemotherapy
Tutor: László Majoros M.D., Ph.D.

6. Title: Prevalance of human polyomaviruses
Tutor: Eszter Csoma M.Sc., Ph.D.

7. Title: Effects of human papillomavirus oncoproteins on cellular signaling pathways in keratinocytes
Tutor: Anita Szalmás M.Sc., Ph.D.

8. Title: Molecular epidemiology of aminoglycoside resistance in nosocomial Gram negative bacteria
Tutor: Gábor Kardos M.D., Ph.D.

9. Title: Intratypical variation of human papillomaviruses
Tutor: György Veress M.Sc., Ph.D.

10. Title: The importance of fungal quorum-sensing in antifungal therapy against Candida biofilms.
Tutor: Renátó Kovács M.Sc., 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. habil.

4. Title: Lipid abnormalities in hypothyreoidism.
5. Title: The function of LDL in lipid metabolism
Tutor: György Paragh M.D., Ph.D., D.Sc.

6. Title: Diagnostic tests and imaging techniques in endocrinology.
Tutor: Endre Nagy M.D., Ph.D., D.Sc.

7. Title: Adipokines and Insulin Resistance
8. Title: Insulin resistance and non-alcoholic fatty liver disease
9. Title: Obesity: Diagnosis and Treatment
10. Title: Obesity: Etiology and Co-morbidities
Tutor: Péter Fülöp M.D., Ph.D. habil.

11. Title: Diabetic neuropathy and oxidative stress
Tutor: Ferenc Sztanek M.D., Ph.D.

12. Title: Characteristics of rare systemic vasculitides
13. Title: Sjögren's syndrome associated with other autoimmune disease
Tutor: Margit Zeher M.D., Ph.D., D.Sc.

14. Title: Basics of pharmacotherapy in the elderly
Tutor: Gyula Bakó M.D., Ph.D., D.Sc.

15. Title: Immunoregulatory abnormality in undifferentiated connective tissue disease
16. Title: Interstitial lung diseases in MCTD.
17. Title: The presence of antiphospholipide antibodies in the disease course of the MCTD
18. Title: Vascular involvement in mixed connective tissue disease.
19. Title: Vascular risk factors in undifferentiated connective tissue disease
Tutor: Edit Bodolay M.D., Ph.D., D.Sc.

20. Title: Dermato/polymyositis overlap with antiphospolipide syndrome.
21. Title: Genetical study in myositis
22. Title: Improvement of quality of life in polymyositis and dermatomyositis patients by physiotherapy
Tutor: Katalin Dankó M.D.,Ph.D.,D.Sc.

23. Title: Familiar antiphospholipid syndrome
Tutor: Pál Soltész M.D., Ph.D., D.Sc.

24. Title: Autoimmune disorders and GI tract
Tutor: Zsolt Barta M.D., Ph.D.

25. Title: Ischemic colitis.
26. Title: Life quality of Raynaud syndrome
Tutor: Zoltán Csiki M.D., Ph.D.

27. Title: The disease course after stent implantation in peripheral arterial disease
Tutor: György Kerekes M.D., Ph.D.

28. Title: Novel therapeutical approaches in multiple myeloma
29. Title: The impact of multi-drug resistance genes in the prognosis of lymphoproliferative disorders
Tutor: László Váróczy M.D., Ph.D. habil.

30. Title: Inherited and acquired thrombophilia
31. Title: New direct oral anticoagulants
32. Title: Stem cell therapy in peripheral arterial disorders
Tutor: Zoltán Boda M.D.,Ph.D.,D.Sc.

33. Title: Gastric cancer: clinics and treatment
34. Title: Gastrointestinal bleeding
35. Title: Gluten sensitive enteropathy
36. Title: Inflammatory bowel diseases.
37. Title: Lymphomas in the gastrointestinal tract.
Tutor: István Altorjay M.D., Ph.D., D.Sc.

38. Title: Langerhans histiocytosis
39. Title: Osteosclerotic myeloma
40. Title: Therapeutic challenges in rare haemostatic disorders
Tutor: György Pfliegler M.D., Ph.D. habil.

41. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C
42. Title: Pathomechanism of alcoholic hepatitis
43. Title: Signs, diagnostics and treatment of portal hypertension.
44. Title: Therapeutic options in primary sclerotizing cholangitis
45. Title: Treatment of autoimmune hepatitis
Tutor: István Tornai M.D., Ph.D. habil.

46. 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.Sc., Ph.D. habil.

47. Title: Chronic neutrophilic leukaemia
Tutor: Béla Telek M.D., Ph.D.

48. Title: Biological treatment of ulcerative colitis
49. Title: Extraintestinal association in IBD
Tutor: Károly Palatka M.D., Ph.D. habil.

50. Title: The role of Willebrand factor in various internal diseases.
Tutor: Ágota Schlammadinger M.D., Ph.D.

51. Title: Bacterial infection in liver cirrhosis
52. Title: Clinical significance of chronic pancreatitis
53. Title: Current therapeutic options of acute pancreatitis
Tutor: Zsuzsa Vitális M.D., Ph.D.

54. Title: Diagnosis and treatment of chronic lymphocytic leukemia
55. Title: Novel therapeutic approches in the treatment of multiple myeloma
56. Title: Philadelphia negative chronic myeloproliferative neoplasms - novel genetic and therapeutic improvements
57. Title: Recent advances in the management of chronic ITP
Tutor: Péter Batár M.D., Ph.D.

58. Title: Are the bacterial infections predictable in liver cirrhosis?
59. Title: Role of serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases.
Tutor: Mária Papp M.D., M.Sc., Ph.D. habil.

60. Title: Gastoesophageal reflux disease
Tutor: László Dávida M.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.D., D.Sc.

4. Title: Functional analysis of malignant lymphomas using image analysis
5. Title: Mitotic failures and cancer progression
6. Title: Molecular diagnostics of solid tumors
Tutor: Gábor Méhes M.D., D.Sc.

## 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: Anxiety in the dental chair: pharmacological treatment
4. Title: Arrhythmic patient in dentistry
5. Title: Optional title in pharmacology
6. Title: Parkinson patient in the dental chair
7. Title: Pharmacological and clinical significance of adenosine receptor antagonists
8. Title: Pharmacological and non-pharmacological treatment of endothelial dysfunction
9. Title: Pharmacology of antidepressive drugs: dental implications
10. Title: Pharmacotherapy of trigeminal neuralgia
Tutor: József Szentmiklósi M.D., Ph.D.

11. Title: Emerging roles of prostaglandin DP1 and DP2 receptors in acute and chronic aspects of allergic diseases
12. Title: Optional title in pharmacology
13. Title: Pharmacological treatment of acute decompensated heart failure (ADHF)
14. Title: Pharmacology of herbal remedies
15. Title: Pharmacology of neurogenic inflammation
16. Title: Pharmacotherapy of Amyotrophic Lateral Sclerosis (ALS)
17. Title: Pharmacotherapy of Duchenne Muscular Dystrophy (DMD)
18. Title: Possible pharmacological exploitations of TRPV1 receptors
19. Title: Use of Histone deacetylase inhibitors (HDI): Novel advances in cancer treatment
Tutor: Róbert Pórszász M.D., Dr. habil., MBA, Ph.D.

20. Title: Effect of colony stimulating factors or other drugs on bone marrow-derived cell lines
21. Title: How insulin resistance influences drug effects
22. Title: Selected topic in field experimental hemato-oncology
Tutor: Ilona Benkő M.D., Ph.D.

23. Title: Connections between rheumatoid arthritis and periodontal disease with a focus on pharmacotherapy
24. Title: Optional title on cancer chemotherapy
Tutor: Attila Megyeri M.D., Ph.D.

25. Title: Class I antiarrhythmic agents: dental implications
26. Title: Optional title in pharmacology
27. Title: Pharmacotherapy of bronchial asthma: dental implications
28. Title: Reflux disease and the dental patient
Tutor: Ágnes Cseppentő M.D.

29. Title: Optional title on antibacterial chemotherapy
Tutor: Zsuzsanna Gál M.Sc., Ph.D.

30. Title: Optional title in pharmacology
Tutor: Béla Juhász D.Pharm., Dr. habil., Ph.D.

31. Title: Optional title in pharmacology
Tutor: Balázs Varga D.Pharm., Ph.D.

32. Title: Optional title in pharmacology
Tutor: Mariann Bombicz D.Pharm.

33. Title: Optional title in pharmacology
Tutor: Dániel Priksz D.Pharm.

## Department of Physiology

1. Title: Expression and significance of the TASK channels in physiological and pathological conditions
Tutor: Péter Szücs M.D., Ph.D.

2. Title: Alterations of intracellular calcium concentration in pathological conditions
Tutor: László Csernoch M.Sc., Ph.D., D.Sc.

3. Title: Regional differences in the electrophysiological properties of cardiomyocytes
Tutor: Péter Nánási M.D., Ph.D., D.Sc.

4. Title: Role of afterdepolarization mechanisms in the arrhythmogenesis
Tutor: Tamás Bányász M.D., Ph.D.

5. Title: Electrophysiological properties of mammalian cardiac tissues
Tutor: János Magyar M.D.,Ph.D.,D.Sc.

6. Title: Beat-to beat variability of cardiac repolarization
Tutor: Norbert Szentandrássy M.D., Ph.D.

7. Title: Studies on ion channels incorporated into artificial membranes
Tutor: István Jóna M.Sc., Ph.D., D.Sc.

8. Title: Role of late sodium current in the arrhythmogenesis
Tutor: Balázs Horváth M.D.,Ph.D.

9. Title: Role of potassium channels in neuron function
Tutor: Balázs Pál M.D.,Ph.D.

10. Title: Properties of vanilloid receptors
Tutor: István Balázs Tóth M.Sc., Ph.D.

11. Title: Role of Protein Kinase C isoforms in cell function.
Tutor: Gabriella Czifra M.Sc., Ph.D.

## Department of Emergency Medicine

1. Title: Cardiac rhythm disturbances. Hypertensive emergencies.
Tutor: Zoltán Szabó M.D., Ph.D.

## Division of Gastroenterology

1. Title: Gastric cancer: clinics and treatment
2. Title: Gastrointestinal bleeding
3. Title: Gluten sensitive enteropathy
4. Title: Inflammatory bowel diseases
5. Title: Lymphomas in the gastrointestinal tract
Tutor: István Altorjay M.D., Ph.D., D.Sc.

6. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C
7. Title: Pathomechanism of alcoholic hepatitis
8. Title: Signs, diagnostics and treatment of portal hypertension
9. Title: Therapeutic options in primary sclerotizing cholangitis
10. Title: Treatment of autoimmune hepatitis
Tutor: István Tornai M.D., Ph.D. habil.

11. Title: Biological treatment of ulcerative cholitis
Tutor: Károly Palatka M.D., Ph.D. habil.

12. Title: Are the bacterial infections predictable in liver cirrhosis?
13. Title: Role of the serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases
Tutor: Mária Papp M.D., M.Sc., Ph.D. habil.

14. Title: Bacterial infection in liver cirrhosis
15. Title: Current therapeutic options of acute pancreatitis
Tutor: Zsuzsanna Vitális M.D., Ph.D.

## Division of Haematology

1. Title: Immunotherapy of B-cell lymphomas
2. Title: The role of PET/CT imaging in lymphomas
Tutor: Lajos Gergely M.D., Ph.D. habil.

3. Title: Diagnosis and treatment of chronic lymphocytic leukemia
4. Title: Novel therapeutic approaches in the treatment of multiple myeloma
5. Title: Philadelphia negative myeloproliferative meoplasms - novel genetic and therapeutic improvements
6. Title: Recent advances in the management of chronic ITP
Tutor: Péter Batár M.D., Ph.D.

## Division of Rare Diseases

1. Title: Langerhans histiocytosis
2. Title: Osteosclerotic myeloma
3. Title: Therapeutic challenges in rare haemostatic disorders
Tutor: György Pfliegler M.D., Ph.D. habil.

## Division of Rheumatology

1. Title: Cardiopulmonary manifestation in systemic sclerosis
2. Title: Pulmonary arterial hypertension in systemic sclerosis.

Tutor: Gabriella Szűcs M.D., Ph.D.

3. Title: Rheumatology 2017 - modern diagnostics and therapy.

Tutor: Zoltán Szekanecz M.D., Ph.D., D.Sc.

4. Title: Osteoporosis in systemic sclerosis
5. Title: Quality of life in systemic sclerosis

Tutor: Szilvia Szamosi M.D.,Ph.D.

6. Title: Diagnosis and therapy of early arthritis
7. Title: Modern therapy of vasculitides

Tutor: Edit Végh M.D.

8. Title: Extra-articular manifestations in ankylosing spondylitis

Tutor: Nóra Bodnár M.D.

9. Title: Extra-articular manifestations of ankylosing spondylitis
10. Title: Modern treatment of spondyloarthritides

Tutor: Sándor Szántó M.D.,Ph.D.

11. Title: Therapeutic opportunities in ankylosing spondylitis

Tutor: Katalin Gulyás M.D.

12. Title: Therapeutic opportunities in psoriatic arthritis

Tutor: Zsófia Pethő M.D.

## Department of Neurology

1. Title: Cerebral hemodynamics and cognitive dysfunction in treated and non-treated stroke patients
2. Title: Neurosonological investigations in acute and chronic stroke patients
3. Title: Non-invasive investigation of endothelial dysfunction.

Tutor: László Csiba M.D., Ph.D., D.Sc., M.H.A.Sc.

4. Title: Comorbidity in Multiple sclerosis

Tutor: Tünde Csépány M.D., Ph.D.

5. Title: Cerebral vasoreactivity after epileptic seizure
6. Title: Cerebral vasoreactivity after sleep deprivation
7. Title: Short-term changes in cerebral vasoreactivity after decrease of elevated blood pressure

Tutor: László Oláh M.D., Ph.D., D.Sc.

8. Title: Immunological relations of narcolepsy
9. Title: Obstructive sleep apnea and cardiovascular risk

Tutor: Norbert Kozák M.D., Ph.D.

## Department of Neurosurgery

1. Title: Do middle cerebral artery aneurysms exhibit right sided dominance?
2. Title: Treatment of multiple cerebral metastases: clinical results

Tutor: Sándor Szabó M.D., Ph.D.

3. Title: Current treatment of intraventricular hemorrhage

Tutor: László Novák M.D., Ph.D. habil.

4. Title: Connection of proteoglycans and cell membrane receptors in the peritumoral extracellular matrix

Tutor: Álmos Klekner M.D., Ph.D. habil.

5. Title: History of neurosurgical radiosurgery.

Tutor: József Dobai M.D.

6. Title: Vertebroplasty.

Tutor: Péter Ruszthi M.D.

## Department of Obstetrics and Gynecology

1. Title: Clinical trials of new drugs for the treatment of osteoporosis

Tutor: Ádám Balogh M.D., Ph.D., D.Sc.

2. Title: Diagnosis and Treatment of Endometrial Cancer
3. Title: Diagnosis and Treatment of Ovarian

Cancer
4. Title: Diagnosis and Treatment of Vulvar Cancer
5. Title: Screening /Diagnosis and Treatment of Cervical Cancer
Tutor: Zoltán Hernádi M.D., Ph.D., D.Sc.

6. Title: Non-invasive prenatal testing for chromosomal aneuploidies
Tutor: Olga Török M.D., Ph.D. habil.

7. Title: Efficiency and safety of first line chemotherapy in ovarian cancer
8. Title: Efficiency and safety of second and subsequent line chemotherapy in ovarian cancer
9. Title: Efficiency of HPV vaccination
10. Title: Fetal assessment by biophysical profile
11. Title: Marker studies in ovarian cancer
12. Title: Molecular medicine and ovarian cancer
13. Title: Molecular medicine and prenatal diagnosis
14. Title: Neoadjuvant chemotherapy of cervical cancer
15. Title: Placental atherogenesis
16. Title: Surgical treatment of recurrent ovarian cancer
17. Title: Surgical treatment of vulval cancer
18. Title: The role of inherited and acquired thrombophilia in reproductive health
19. Title: The role of lymphadenectomy in the treatment of endometrial cancer
20. Title: The role of preoperative MRI in cervical cancer
21. Title: Trends in operative delivery
Tutor: Róbert Póka M.D., Dr. habil., Ph.D.

22. Title: Meiotic abnormalities and their clinical significance in human reproduction
23. Title: Role of Doppler ultrasound in antenatal care
Tutor: Tamás Szilveszter Kovács M.D., Ph.D.

24. Title: Anovulatory infertility
25. Title: Examination of genetic concerns about the safety of assisted reproduction
26. Title: Role of antimullerian hormone (AMH) in clinical practice
27. Title: Ultrasound dating in pregnancy
Tutor: Attila Jakab M.D., Ph.D. habil.

28. Title: Vaginal Birth After Cesarean
Tutor: Alpár Gábor Juhász M.D., Ph.D.

29. Title: Cervical cancer prevention: the role and the future of HPV vaccination besides conventional screening
30. Title: New treatment strategies in ovarian cancer
Tutor: Zoárd Krasznai M.D., Ph.D.

31. Title: Role of endoscopy in infertility work-up
Tutor: Péter Török M.D., Ph.D.

32. Title: Pregnancy care in PCOS patients
33. Title: Special aspects of pregnancy care in patients with endocrine disorders
34. Title: Thyroid autoimmunity - clinical significance, prevention and treatment in human reproduction
Tutor: Tamás Deli M.D., Ph.D.

35. Title: Transvaginal hydrolaparoscopy - a new method
36. Title: Hysteroscopic treatment of different gynecologic pathologies
37. Title: White blood cell function in preeclampsia
Tutor: Rudolf Lampé M.D., Ph.D.

38. Title: Contraception in the 21st century
Tutor: Balázs Erdődi M.D.

## 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
10. Title: Superoxid anion production of granulocytes in gynecologic cancer
Tutor: Róbert Póka M.D., Dr. habil., Ph.D.

11. Title: Prognostic factors and treatment of cervical cancer
12. Title: The role of CA125 and HE4 in the follow-up of ovarian cancer
Tutor: Zoárd Krasznai M.D., Ph.D.

## Department of Ophthalmology

1. Title: Lamellar and penetrating keratoplasty techniques
2. Title: Surgical treatment of dry eye
Tutor: László Módis M.D., Ph.D., D.Sc.

3. Title: Intraocular tumors
Tutor: Judit Damjanovich M.D., Ph.D.

4. Title: Ocular clinical signs in rare diseases
Tutor: Valéria Nagy M.D., Ph.D.

5. Title: Corneal dystrophies
6. Title: Stem cells of the cornea
Tutor: Lili Takács M.D., Ph.D.

7. Title: Nuclear medicine measurements in the inflammatory disorders of the eye’s anterior segment
8. Title: Prospective study of vascular pathogenesis of eye diseases associated to rheumatologic and immunologic disorders
9. Title: Tear citokine measurements in inflammatory diseases of the anterior segment of the eye associated to immunological and autoimmunological disorders
10. Title: Tear-clearance measurements in dry eye syndrome with dacryoscintigraphy
Tutor: Ádám Kemény-Beke M.D., Ph.D.

11. Title: Contact lens wear and complications
12. Title: Cosmetical contact lenses
Tutor: Beáta Kettesy M.D., Ph.D.

13. Title: Importance of screening in diabetic retinopathy
14. Title: Morfologic changes in glaucoma
Tutor: Adrienne Csutak M.D., Ph.D.

15. Title: Corneal measurments with Pentacam
16. Title: Refractive laser-surgical interventions
Tutor: Bence Lajos Kolozsvári M.D., Ph.D.

17. Title: Examination of peptide receptors in human uveal melanoma
18. Title: Results of orbital decompression surgeries
19. Title: VEGF level in tears after PKP
Tutor: Zita Steiber M.D., Ph.D.

20. Title: Color Doppler in the follow-up of choroidal melanoma after brachytherapy
21. Title: Subtenon TCA in the treatment of radiogen retinopathy
Tutor: Éva Surányi M.D.

22. Title: Molecular genetic analysis of ocular fundus disorders
23. Title: Novel methods for periosteal fixation in ophthalmic plastic surgery
Tutor: Gergely Losonczy M.D., Ph.D.

24. Title: Graves' orbitopathy - current concepts in diagnosis and therapy
25. Title: Pathogenesis of Graves' orbitopathy
Tutor: Bernadett Ujhelyi M.D.,Ph.D.

26. Title: Assessing the safety and efficacy of intravitreal ranibizumab as a preoperative adjunct treatment before vitrectomy surgery in severe proliferative diabetic retinopathy (PDR) compared to standard vitrectomy alone
27. Title: Evaluate and demonstrate the results of the Hungarian Lucentis National Patient Registry
Tutor: Attila Vajas M.D.

28. Title: Congenital ptosis peculiar associated movements of the affected lid
29. Title: Diagnosis and therapy in retinopathy of prematurity
30. Title: Non - surgical and surgical therapy of congenital ptosis
Tutor: Annamária Nagy M.D.

31. Title: Ocular manifestations of Weill-

Marchesani syndrome
32. Title: Pellucid marginal degeneration
Tutor: Mariann Fodor M.D., Ph.D.

33. Title: BCVA change after intravitreal ranibizumab injection
34. Title: IOP change after intravitreal ranibizumab injection
Tutor: Erika Papp M.D.

## Department of Orthopedic Surgery

1. Title: The role of arthrodesis in the treatment of degenerative arthritis of the knee.
2. Title: Treatment options in knee instability.
Tutor: Henrik Rybaltovszki M.D.

## Department of Otorhinolaryngology and Head and Neck Surgery

1. Title: Cochlear implantation
2. Title: The role of the bone anchored hearing aids and the cochlear implantation in hearing rehabilitation
Tutor: László Tóth M.D., Ph.D. habil.

3. Title: Middle ear implantation
4. Title: Pathology and treatment of Cholesteatoma
Tutor: István Sziklai M.D., Ph.D., D.Sc.

5. Title: Current developments in multidisciplinary head and neck oncology
6. Title: Head and neck reconstruction: distant and free flaps
7. Title: Head and neck reconstruction: local and regional flaps
8. Title: Reconstruction of nasal deformities
9. Title: Robotic surgery of the head and neck
10. Title: The impact of neck dissection nodal yield on survival
Tutor: Balázs Bendegúz Lőrincz M.D., Ph.D. habil.

## Department of Pediatrics

1. Title: Contemporary treatment approaches of children with Hemophilia A
Tutor: Csongor Kiss M.D., Ph.D., D.Sc.

2. Title: Adding an Electrocardiogram to the Pre-participation Examination in Competitive Athletes. Review.
Tutor: Gábor Mogyorósy M.D., Ph.D.

3. Title: Hydrocephaly of infants
Tutor: Andrea Nagy M.D.

4. Title: Clinical diagnosis, genetical background and treatment of vitamin-D resistent hypophosphatemic ricket
Tutor: Tamás Szabó M.D., Ph.D.

5. Title: Fungal infections in malignant hematology
Tutor: István Szegedi M.D., Ph.D.

6. Title: Experience with tissue adhesives in lip cleft surgery
Tutor: Ágnes Magyar M.D.

7. Title: Quality of life in chronical pediatric diseases
8. Title: Type 2 siabetes mellitus in childhood, growing incidence
Tutor: Enikő Felszeghy M.D.,Ph.D.

## Department of Physical Medicine and Rehabilitation

1. Title: The importance of multidisciplinary rehabilitation to improve functional capacity, quality of life, cardiovascular function and metabolic parameters of obese patients, those suffering from osteoarthritis.
2. Title: The significance of conductive rehabilitation activities in gait development (gait analysis test)
3. Title: The significance of the (upper extremity) functional capacity of patients with cerebrovascular diseases in the effectiveness of rehabilitation
Tutor: Zoltán Jenei M.D., Ph.D.

4. Title: Assessment of quality of life of people with disabilities or with the risk of disability
5. Title: Goal Attainment Scaling in rehabilitation medicine

6. Title: Treatment of spasticity in children with cerebral palsy
Tutor: Zsuzsanna Vekerdy-Nagy M.D., Ph.D. habil.

## Department of Psychiatry

1. Title: The dietetic and gastroinvestinal basis of autism
Tutor: Csaba Móré E. M.D., Ph.D.

2. Title: Effectiveness of schema therapy in personality disorders
3. Title: Emotion dependent and independent cognitive functions in unipolar depression
4. Title: Significance of disfunctional attitudes in depression and anxiety disorders
5. Title: Theory of mind and mentalization deficits in patients with personality disorders
Tutor: Anikó Égerházi M.D., Ph.D.

6. Title: EMDR – Eye Movement Desensitization and Reprocessing. A novel psychotherapeutic method in trauma reprocessing and other indications. A review from the literature"
Tutor: Katalin Tolvay M.D.

7. Title: Brain imaging in psychiatry.
8. Title: Oxidative stress and chronic inflammation in psychiatric disorders
9. Title: Post-traumatic stress disorder and post-traumatic growth.
10. Title: The neurobiology of depression.
11. Title: The role of mikrobiota in mental health
12. Title: The therapeutic potentials of psychodelics
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 Brugós M.D., Ph.D.

3. Title: The role of extracellular matrix in growing propagation and metastatization of lung cancer
Tutor: Imre Varga M.D., Ph.D.

4. Title: Modern Therapy of NSCLC
Tutor: Tamás Kardos M.D.

## Department of Surgery

1. Title: Surgical treatment of Graves disease with ophthalmopathy
Tutor: Ferenc Győry M.D.

2. Title: Surgical treatment of bowel obstruction in colorectal diseases
Tutor: László Damjanovich M.D., Ph.D., D.Sc.

3. Title: Surgical and endovascular interventions in critical limb ischemia
Tutor: Sándor Olvasztó M.D.

4. Title: Histopathologic examination of the carotid plaques regarding their possible prognostic value
Tutor: Krisztina Litauszky M.D.

5. Title: Liver resections for metastases of colorectal cancer
Tutor: János Pósán M.D.

6. Title: Prevention of bronchial stump insufficiency after lung resections
Tutor: István Takács M.D.,Ph.D.

7. Title: The surgical treatment of hyper-parathyroidism
Tutor: Roland Fedor M.D., Ph.D.

8. Title: Different forms of hereditary colorectal cancer among our patients.
Tutor: Miklós Tanyi M.D.,Ph.D.

9. Title: Mesh implantation in the surgical treatment of thoracic defects
Tutor: Attila Enyedi M.D.

## Division of Operative Techniques and Surgical Research

1. Title: Anesthesia in experimental animals (for Medicine and Pharmacy students)
2. Title: Experimental animal models for diabetes in pharmaceutical research (for Pharmacy students)
3. Title: Laser-Doppler in experimental surgery (for Medicine students)
Tutor: Ádám Deák D.V.M., Ph.D.

4. Title: Changes of red blood cell mechanical stability in surgical pathophysiological processes (for Medicine and Dentistry students)
5. Title: Investigation of hemorheological and microcirculatory changes in ischemia-reperfusion, including therapeutical possibilities (for Medicine students)
Tutor: Norbert Németh M.D., MBA, Ph.D.

6. Title: Hemostatic agents (bioplasts) in surgery (for Pharmacy students)
7. Title: Ischemia-reperfusion injury and its prevention with different methods - experimental models (for Medicine students)
Tutor: Katalin Pető M.D.,Ph.D.

8. Title: Instruments and devices used in pharmacological care (for Pharmacy students)
Tutor: Tamás Lesznyák M.D., D.Pharm.

9. Title: Basic Microsurgical Training course at the Microsurgical Education and Training Center of the Department of Operative Techniques and Surgical Research
10. Title: Famous surgeons: William Halsted. Halsted principles. (for Medicine students)
Tutor: Irén Mikó M.D., Ph.D.

## Department of Traumatology and Hand Surgery

1. Title: Bone and ligament injuries of the hand (ÁOK)
2. Title: Exercises of the physiotherapy in the postoperative treatment of the flexor tendon injuries (gyógytornász)
Tutor: István Frendl M.D.

3. Title: Endoscopical treatment of shoulder dislocations (ÁOK, gyógytornász)
4. Title: The operative treatment and physiotherapy of the adult distal humeral fractured patients in our department (gyógytornász)
5. Title: Up-to-date operative treatment of femoral neck fractures (ÁOK)
Tutor: István Szarukán M.D.

6. Title: Fractures of the leg (ÁOK)
7. Title: Physiotherapy after operation of the shoulder instability (gyógytornász)
Tutor: András Nagy M.D.

8. Title: Treatment of open fractures (ÁOK)
Tutor: Péter Horkay M.D.

9. Title: Operative treatment of severe skull injuries (ÁOK)
Tutor: Zoltán Németi M.D.

10. Title: Current concept in operative treatment of proximal tibial fractures
11. Title: Current treatment of intertrochanteric and subtrochanteric femoral fractures on osteoporotic bone
12. Title: Tactics of ligament soft tissue injuries of the knee (ÁOK)
Tutor: Béla Turchányi M.D., Ph.D.

## Department of Urology

1. Title: Role of laparoscopy in urology
Tutor: Tibor Flaskó M.D., Ph.D.

2. Title: Assessment of urinary incontinence
Tutor: László Lőrincz M.D.

3. Title: Different topics regarding prostate and kidney cancer
Tutor: Csaba Berczi M.D., Ph.D.

4. Title: Bladder replacement after radical cystectomy
Tutor: Antal Farkas M.D., Ph.D.

5. Title: Different topics regarding andrology
Tutor: Mátyás Benyó M.D., Ph.D.

6. Title: Pathology of clear cell renal cancer
Tutor: Krisztián Szegedi M.D.

7. Title: Treatment of urethral stricture
Reconstructive urological surgeries
Tutor: Mihály Murányi M.D.

8. Title: Assessment of benign prostate hyperplasia
Tutor: József Zoltán Kiss M.D.

9. Title: Effect of ochidopexy on male fertility
Tutor: Gyula Drabik M.D.

# CHAPTER 22
# LIST OF TEXTBOOKS

## BMC

### Introduction to Biophysics I.:
Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.
Gáspár R.: Physics for BMC students.
University of Debrecen.

### Introduction to Medical Chemistry I.:
McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.

### Introduction to Medical Chemistry II.:
McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
F., Erdődi, Cs., Csortos: Organic Chemistry for Premedical Students.
University of Debrecen, 2011.

### Hungarian Language for BMC students:
Gerő Ildikó-Kovács Judit: Színesen magyarul.
2017.

### Introduction to Biology I.:
Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

### Introduction to Biophysics II.:
Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.
Gáspár R.: Physics for BMC students.
University of Debrecen.

### Introduction to Biology II.:
Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

### English for BMC students:
Clive Oxenden-Christina Latham-Koenig. Paul Seligson: English File 3E Pre-Intermediate Student's Book With Itutor.
3.. Oxford University Press, 2013. ISBN: 9780194598651.
Clive Oxenden-Christina Latham-Koenig. Paul Seligson: English File 3E Pre-Intermediate Student's Book With Itutor.
3.. Oxford University Press, 2013. ISBN: 9780194598651.

## SBMC

### Introduction to Biophysics:
Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.

### Introduction to Medical Chemistry:
McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
F., Erdődi, Cs., Csortos: Organic Chemistry for Premedical Students.
University of Debrecen, 2011.

### Introduction to Biology:
Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

## 1st year

### Biophysics Lecture:
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 Szőllősi: Medical Biophysics.
Medicina, 2009.

## Basics of Behavioural Sciences:

Segerstrale, U., Molnár, P.: Nonverbal Communication: Where Nature Meets Culture.
1st edition. Psychology Press, 1997. ISBN: 0-8058-2179-1.
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.
Smith, E. E., & Nolen-Hocksema, S.: Atkinson and Hilgards's Introduction to Psychology..
16th. Cengage Learning EMEA, 2014. ISBN: 978-1408089026.
Kantor, J. E.: Medical Ethics for Physicians-in-Training.
New York & London: Plenum.,
Helman, C. G.: Culture, Health and Illness.
CRC Press.(Chapter 1.),
Barry, A-M. – Yuill, Ch.: Understanding the Sociology of Health.
SAGE., 2012. ISBN: (Chapters 1., 2.).

## Medical Chemistry Lecture:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
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.
Ed. Dombrádi, V.: Laboratory Practicals in Medical Chemistry.
Medical and Health Science Center, University of Debrecen, 2009.

## Hungarian Crash Course:

Gerő Ildikó-Kovács Judit: Színesen magyarul.
2017.

## Latin Language:

Répás László: Basics of Medical Terminology, Latin and Greek Origins I..
Répás László, 2016.

## Computer Science:

Greg Perry: Microsoft Office .
2007. ISBN: 9789-6396-3737-5.

## Biostatistics:

Wayne W. Daniel: Biostatistics: a foundation for analysis in the health sciences.
7th edition. John Wiley and Sons, New York, 1991. ISBN: 0-471-52988-5.

## Physical foundations of biophysics:

Halliday-Resnick-Walker: Fundamentals of Physics.
.

## Hungarian Language I/1.:

Gál Erika-Győrffy Erzsébet: Egy kicsit magyarul.
2017. ISBN: 978-963-12-9671-6.

## First aid and reanimation:

The St. John Ambulance Association and Brigade, The British Red Cross society: First Aid Manual.
Dorling Kisnerdsley 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.
József Betlehem: First Things to Be Done in Emergencies – Providing First Aid for Health Professionals.
Medicina Könyvkiadó Zrt. , 2012.

## Anatomy, Histology and Embryology I. Lecture:

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.
7th edition. Lippincott Williams &Wilkins, 2016. ISBN: 978-14698-8931-3.
Sobotta: Atlas of Human Anatomy I.-II..
14th edition. Urban & Schwarzenberg, . ISBN:

978-0-443-10349-0.
Sadler, T. W.: Langman's Medical Embryology.
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 Lecture:
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.
4th edition..

## Cell Biology Lecture:
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..

## Latin Medical Terminology I.:
Répás László: Basics of Medical Terminology, Latin and Greek Origins I..
Répás László, 2016.

## Hungarian Language I/2.:
Győrffy Erzsébet-Mezei Zsuzsa Lívia: Magyarules.
2018.

## Medical Genetics Lecture:
Robert L. Nussbaum, Roderick R. McInnes, Huntington F. Willard, Ada Hamosh: Thompson and Thompson Genetics in Medicine.
8th edition. Saunders Elsevier, 2016. ISBN: 978-1-4377-0696-3.
Practical Courses in Genetics.
University Medical School of Debrecen, 2002.
Hartl D. L.: Essential Genetics: A Genomics Perspective.
6th edition. Jones & Bartlett Publishers, 2014. ISBN: 978-1-4496-8688-8.
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.
4th. Garland Science, 2011. 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.

## Medical Genetics Practical:
Practical Courses in Genetics.
University Medical School of Debrecen, 2002.

## 2nd year
## Biochemistry I. Lecture:
Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations.
6th edition. Wiley-Liss, 2006.
Lubert Stryer: Biochemistry.
7th edition. W.H. Freeman and Company, 2012.

## Medical Physiology I. Lecture:
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. :

Fodor Marianna - Rozman Katalin: Beszélek magyarul?! I..
2016. ISBN: 978-963-12-6413-5.

## Anatomy, Histology and Embryology II. Lecture:

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.
Sadler, T. W.: Langman's Medical Embryology.
12th edition. Lippincott Williams &Wilkins, 2012. ISBN: 978-1-4511-4461-1.
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