

**BULLETIN**

**UNIVERSITY OF DEBRECEN**

**ACADEMIC YEAR 2019/2020**

**FACULTY OF MEDICINE**

Coordinating Center for International Education



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## CHAPTER 1 WELCOME FROM THE DEAN

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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 9 departments of basic sciences, 5 diagnostic departments and 21 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

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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 35 departments; including 21 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 26 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 5

### BASIC MEDICINE COURSE

#### BASIC MEDICINE COURSE - INTRODUCTION TO BIOLOGY

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## CHAPTER 6

### FACULTY OF MEDICINE - DEPARTMENTS OF BASIC SCIENCES

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**CHAPTER 7**  
**FACULTY OF MEDICINE - CLINICAL DEPARTMENTS**

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## CHAPTER 7

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Ms. Judit Lenke Frankó M.D.  
Ms. Zsuzsanna Gaál M.D., Ph.D.  
Ms. Marietta Incze M.D.  
Ms. Flóra Juhász-Ujhelyi M.D.  
Ms. Andrea Katona M.D.  
Ms. Edit Kecskés M.D.  
Ms. Ágnes Kiléber M.D.  
Ms. Eszter Kovács M.D.  
Ms. Dóra Kovács M.D.  
Ms. Krisztina Kovács M.D.  
Ms. Veronika Kovács M.D.  
Ms. Fruzsina Kovács M.D.  
Ms. Flóra Lakatos M.D.  
Ms. Lilla Macsi M.D.  
Ms. Mariann Márki M.D.  
Ms. Viktória Miklós M.D.  
Ms. Brigitta Dóra Nagy M.D.

	Ms. Helga Perényi M.D. Ádám Radványi M.D.
	Ms. Boglárka Schvarckopf M.D.
	Ms. Vanda Soltész M.D.
	Ms. Orsolya Somodi M.D.
	Ms. Vivien Stercel M.D.
	Ms. Dóra Szűcs-Farkas M.D.
	Ms. Anita Tóth M.D.
	Ms. Anita Vadász M.D.
	Ms. Angéla Váradi M.D. Gábor Varga M.D.
	Ms. Melinda Vojtkó M.D.
	Ms. Tímea Kincső Zoltán M.D. Bence Zonda M.D.
Psychologist	Péter Boris
	Ms. Brigitta Munkácsi M.Sc.
	Ms. Erika Tizedes
Academic Advisor	Gábor Mogyorósy M.D., Ph.D. Tamás Szabó M.D., Ph.D. (for Medicine Program students - 5th and 6th year)

**Division of Neonatology**

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-411-600

Full Professor	György Balla M.D., Ph.D., D.Sc., M.H.A.Sc. Gábor Veres M.D., Ph.D., D.Sc.
Assistant Lecturer	Gergely Balázs M.D. István Pataki M.D.
Clinical Assistant	Ms. Edit Polonkai M.D. Ms. Csilla Fehér M.D. Ms. Nóra Katona M.D. Ms. Tünde Kotormán M.D. Tamás Kovács M.D. Ms. Judit Kovács M.D.

	Balázs Kovács-Pászthy M.D.
	Ms. Katalin Nagy M.D.
	Ms. Magdolna Riszter M.D.
Academic Advisor	Ms. Nóra Katona M.D.

**DEPARTMENT OF CLINICAL PHARMACOLOGY IN MEDICINE**

Nagyerdei krt. 98., Debrecen, 4028

Full Professor, Head of Department	Dénes Páll M.D., Ph.D., D.Sc.
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**DEPARTMENT OF PHYSICAL MEDICINE AND REHABILITATION**

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-942

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Head of Department, Associate Professor	Zoltán Jenei M.D., Ph.D.
Associate Professor	Ms. Zsuzsanna Vekerdy-Nagy M.D., Ph.D. habil. (retired)
Assistant Professor	Ms. Rita Szepesi M.D., Ph.D.
PhD Student	Ms. Adél Debreceni-Nagy M.D. Ms. Judit Horváth M.D. Ms. Alexandra Pádár M.A.
Clinical Specialist	Ms. Ágnes Bajusz-Leny M.D. Ms. Adél Debreceni-Nagy M.D. Ms. Judit Horváth M.D.
Resident	Ms. Lilla Szabó M.D.
Neuro-psychologist	Ms. Györgyi Lente M.Sc.
Psychologist	Ms. Eszter Hanvay M.A.
Speech Therapist	Ms. Ildikó Mózesné Kapocska M.A. Ms. Adrienn Polonkai M.A.
Physiotherapist	Ms. Zsuzsa Bodnár M.A. Ms. Kitti Boros, M.A. Ms. Anna Kövérné Kurta M.A. Ms. Szabina Nagy M.A. Ms. Zsófia Oláh M.A. Ms. Alexandra Pádár M.A. Ms. Szabina Susán-Antal M.A. Ms. Éva Anna Szabados M.A.

	Ms. Gabriella Szűrös-Nagy M.A.
	Ms. Anett Takács M.A.
Physiotherapist, Occupational therapist and Rehabilitation expert	Ms. Zsófia Hőgye M.A.
Rehabilitation expert	Ms. Alexandra Pádár M.A.
	Ms. Gabriella Szűrös-Nagy M.A.
Social Worker	Ms. Julianna Kavaleczné Ilyés M.A.
IT Specialist	Ms. Beáta Alíz Dézsi M.Sc.
Social Educator	Ms. Szilvia Baksa M.A.
Occupational therapist	Ms. Zsuzsa Bodnár M.A.

**DEPARTMENT OF PSYCHIATRY**

Nagyerdei krt. 98., Debrecen, 4012, Tel: +36-52-255-240

Associate Professor	Ms. Anikó Égerházi M.D., Ph.D. Ede Frecska M.D., M.A., Ph.D.
Assistant Professor	Roland Berecz M.D., Ph.D.
	Ms. Theodóra Glaub M.D.
Assistant Lecturer	Gábor Andrassy M.D.
	Ms. Edina Cserép M.D. Attila Kovács M.D. Csaba Móré E. M.D., Ph.D.
Clinical Assistant	Ágoston Gajdos M.D. Balázs Jeges M.D.
	Ms. Erzsébet Magyar M.D. Bence Szerdahelyi M.D.
	Ms. Katalin Tolvay M.D.
Psychologist	Ms. Éva Gasparik M.A. Ms. Lili Kövér M.A. Ms. Emese Kulcsár M.A. Ms. Ella Molnár M.A.
	Ms. Annamária Pusztai Ph.D.
Academic Advisor	Ms. Réka Stébel

**DEPARTMENT OF PULMONOLOGY**

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Full Professor, Head of Department	József Balla M.D., Ph.D., D.Sc.
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Assistant Professor	Imre Varga M.D., Ph.D.
Assistant Lecturer	Ms. Andrea Fodor M.D. Tamás Kardos M.D. Ms. Angéla Mikáczó M.D. Ms. Anna Sárközi M.D. Attila Vaskó M.D.
Clinical Assistant	Attila Lieber M.D. Attila Makai M.D. Ms. Zsuzsa Papp M.D. Ms. Ildikó Szűcs M.D.
Candidate Clinical Assistant	Susil Joe Isaac M.D. Ms. Magdolna Körtvély M.D. Ms. Regina Szabó-Szűcs M.D.
Resident	Miklós Kukuly M.D.
Responsible for Educational Matters	Ms. Andrea Fodor M.D.

**DEPARTMENT OF SURGERY**

Móricz Zs. krt. 22, Debrecen, 4032, Tel: +36-52-411-717/55316

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Full Professor, Chairman	László Damjanovich M.D., Ph.D., D.Sc.
Head of Division of Gastroenterology - Oncology	László Damjanovich M.D., Ph.D., D.Sc.
Head of Division of Organ Transplantation	Balázs Nemes M.D., Ph.D.
Professor Emeritus	György Balázs M.D., Ph.D., D.Sc. Géza Lukács M.D., Ph.D., D.Sc. Péter Sápy M.D., Ph.D., D.Sc.
Consultant Surgeon	Zsolt Kanyári M.D.
Associate Professor	Zsolt Szentkereszty M.D., Ph.D. Miklós Tanyi M.D., Ph.D.
Assistant Professor	Roland Fedor M.D., Ph.D.



	Ferenc Győry M.D.
	Csaba Kósa M.D.
	László Orosz M.D.
Assistant Lecturer	Tamás Dinya M.D.
	Attila Enyedi M.D.
	János Pószán M.D.
	Gergely Zádori M.D., Ph.D.
Chief Physician	Csaba Zsigmond Tóth M.D., Ph.D.
Clinical Assistant	Ms. Mónika Andrási M.D.
	Ms. Klaudia Balog M.D.
	Csaba Bánfi M.D.
	Ms. Dorina Bodnár M.D.
	János Deák M.D.
	Tamás Felföldi M.D.
	Gergely Kóder M.D.
	Dávid Kovács M.D.
	Ms. Krisztina Litauszky M.D.
	Gábor Mudriczki M.D.
	Péter Ferenc Nagy M.D.
	Csaba Ötvös M.D.
	Ms. Réka P. Szabó M.D.
	Zsolt Susán M.D.
	Csongor Váradi M.D.
Resident	Balázs Bánffy M.D.
	Gábor Ditrói M.D.
	Lóránt Illésy M.D.
Academic Advisor	Tamás Dinya M.D.

**Division of Operative Techniques and Surgical Research**

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Professor Emeritus	István Furka M.D., Ph.D., D.Sc.
	Ms. Irén Mikó M.D., Ph.D.
Associate Professor	Ms. Katalin Pető M.D., Ph.D.

Assistant Professor	Ádám Deák D.V.M., Ph.D.
Assistant Lecturer	Ms. Viktória Somogyi M.Sc., Ph.D.
	Ms. Erzsébet Ványolos M.Sc., Ph.D.
Assistant Research Fellow	Tamás Lesznyák M.D., D.Pharm.
PhD Student	Ms. Barbara Baráth M.Sc.
	Souleiman Ghanem M.D.
	Balázs Szabó M.D.
	Bence Tánczos M.Sc.
	Gábor Varga M.D.
External Tutor	Ms. Erzsébet Ildikó Takács M.D., Ph.D.
Academic Advisor of Faculty of Medicine	Ms. Katalin Pető M.D., Ph.D.
Academic Advisor of Faculty of Dentistry	Ádám Deák D.V.M., Ph.D.
Academic Advisor of Faculty of Pharmacy	Tamás Lesznyák M.D., D.Pharm.
Academic Advisor of Elective Courses	Ms. Irén Mikó M.D., Ph.D.
	Ms. Erzsébet Ványolos M.Sc., Ph.D.

**DEPARTMENT OF TRAUMATOLOGY AND HAND SURGERY**

Bartók Béla út 2-26., Debrecen, 4031, Tel: +36-52-419-499, +36-52-511-780

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Associate Professor, Head of Department	Béla Turchányi M.D., Ph.D.
Professor Emeritus	Károly Fekete M.D., Ph.D.
	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 Frenzl 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.

Surgeons of the Kenézy Hospital

István Szarukán M.D.  
Zsigmond Varga M.D.  
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.  
Zoltán Mikó M.D.

Ms. Katalin Muraközy M.D.  
Zoltán Németi M.D.  
Zoltán Domokos Pap M.D.  
József Papp M.D.  
Gyula Diós M.D.  
Károly Elek M.D.  
László Gubik M.D.  
Ádám Kristóf Gulyás M.D.  
Ákos Haby M.D.  
Konrád Ökrös M.D.  
Márton József Séber M.D.  
Máté Sulik M.D.  
Bence Gellért Urbán M.D.

Resident

Ms. Katalin Kitti Vass M.D.  
István Szarukán M.D.  
István Frenzl M.D.

Consultant

Academic Advisor

**DEPARTMENT OF UROLOGY**

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-256  
E-mail: drabikgy@hotmail.com, Web: <http://urologia.med.unideb.hu>

Associate Professor, Head of Department	Tibor Flaskó M.D., Ph.D.
Professor Emeritus	Csaba Tóth M.D., Ph.D., D.Sc.
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

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-430

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Full Professor, Head of Department	Csaba Hegedűs M.Sc., Ph.D.
Associate Professor	Ms. Tünde Radics D.M.D., Ph.D.
Senior Research Fellow	Ms. Zsuzsanna Czibulya M.Sc., Ph.D.
Assistant Professor	József Bakó M.Sc., Ph.D. Tamás Bistey D.M.D., Ph.D.
Assistant Lecturer	Ms. Melinda Szalóki M.Sc., Ph.D. Ms. Edit Hrubí 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.
Departmental Engineer	Ms. Ildikó Szilágyi M.Sc.
Clinical Specialist	Ms. Katalin Bukovinszky D.M.D. Gábor Suta D.M.D.
Resident	Ms. Boglárka Berta D.M.D. Ms. Csilla Biacsó D.M.D. Ms. Viktória Bóka D.M.D. Ms. Marianna Dóró D.M.D. Ms. Ildikó Mag D.M.D.
Academic Advisor	István Lampé D.M.D.

### INSTITUTE OF BEHAVIOURAL SCIENCES, FACULTY OF PUBLIC HEALTH

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-594

Web: [nk.unideb.hu](http://nk.unideb.hu)

Full Professor, Head of Department	Ms. Karolina Kósa M.D., M.Sc., Ph.D.
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.

## CHAPTER 8

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### Humanities For Health Care

Titular Professor

Antal Bugán M.A., Ph.D.

Professor Emeritus

Péter Molnár M.D., D.Sc.

Assistant Professor

Sándor Kőműves M.A., Ph.D.

Ms. Judit Molnár M.A., Ph.D.

Roland Tisljár M.A., Ph.D.

Ms. Eszter Tisljár - Szabó M.A., Ph.D.

Assistant Lecturer

János Kristóf Bodnár M.A., Ph.D.

Ms. Márta Füzi M.D.

Ms. Beáta Kovács-Tóth M.A.

Ms. Anikó Ujhelyiné Nagy M.Sc.

PhD Student

Ms. Enikő Csikai M.Sc.

Balázs Fábrián M.Sc.

Ms. Cintia Katona M.Sc.

Ms. Eszter Labancz M.Sc.

Ms. Alexandra Sándor M.Sc.

Invited Lecturer

Bence Döbrössy M.A.

Intern

Ms. Gréta Dezső M.Sc.

Ms. Kitti Katona B.Sc.

Ms. Linda Lajtos M.Sc.

Ms. Bettina Muha M.Sc.

Ms. Annamária Rácz M.Sc.

Ms. Zsanett Usztics M.Sc.

Academic Advisor

Attila Bánfalvi M.A., Ph.D., C.Sc.  
(3rd year Medical Anthropology)

Ms. Karolina Kósa M.D., M.Sc., Ph.D.  
(4th year Behavioural Medicine)

Sándor Kőműves M.A., Ph.D.  
(3rd year Medical Sociology)

Ms. Judit Molnár M.A., Ph.D.  
(5th year Pharmaceutical Psychology)

Roland Tisljár M.A., Ph.D.  
(1st year Basics of behavioural sciences,  
Communication Skills, 3rd year Medical  
Psychology)

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

Móricz Zs. Krt. 22., Debrecen, 4032, Tel: +36-52-25-52-52

E-mail: csotanszek@sph.unideb.hu, Web: www.fam.med.unideb.hu www.nk.unideb.hu

Head of Department, Associate Professor	István Kárpáti M.D., Ph.D.
Full Professor	Imre Rurik M.D., M.Sc., Ph.D., D.Sc.
Professor Emeritus	István Ilyés M.D., M.Sc., 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.
PhD Student	Ms. Csilla Semanova M.Sc.
Clinical Specialist	Ms. Emőke Lengyel M.D.
	Ms. Izabella Szilágyi M.D.
	Ms. Erzsébet Tóth M.D.
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.

**DEPARTMENT OF PREVENTIVE MEDICINE, FACULTY OF PUBLIC HEALTH**

Kassai út 26/b, Debrecen, 4028, Tel: +36-52-512-765

Associate Professor, Head of the Department	János Sándor M.D., Ph.D.
Associate Professor, Head of Public Health, Medicine Division	István Kárpáti M.D., Ph.D.
Associate Professor, Head of Occupational Health Division	Ádám Balázs M.D., M.Sc., Ph.D.
Full professor, Head of Biomarker Analysis Division	Ms. Margit Balázs M.Sc., Ph.D., D.Sc.
Associate Professor, Head of Biostatistics and	János Sándor M.D., Ph.D.

Epidemiology Division

Full Professor

Ms. Róza Ádány M.D., Ph.D., D.Sc.

Associate Professor

Ms. Helga Bárdos M.D., M.Sc., Ph.D.

Sándor Szűcs M.Sc., Ph.D.

Assistant Professor

Ms. Éva Bíró M.D., Ph.D.

Árpád Czifra M.D., Ph.D.

Ms. Szilvia Fialat M.D., Ph.D.

Attila Csaba Nagy M.D., Ph.D.

Károly Nagy Ph.D.

László Pál Ph.D.

Ms. Orsolya Varga M.D., Ph.D.

Assistant Lecturer

Tibor Jenei

Tamás Köbling M.D., Ph.D.

Gábor Rác M.D.

PhD Student

Bayu Bekele Begashaw M.Sc.

Ms. Orsolya Bujdosó M.Sc.

Ms. Llanaj Erand M.Sc.

Ms. Nayla Gomaa Nasr Mohammed M.Sc.

Ms. Nóra Kovács M.Sc.

Szabolcs Lovas M.Sc.

Vikas Patel M.Sc.

Ms. Gabriella Péntes M.Sc.

Ms. Beáta Soltész M.Sc., Ph.D.

Gergő József Szöllősi M.Sc.

Roba Argaw Tessema M.Sc.

Ferenc Vincze M.Sc.

Ms. Diana Wanghesi Njuguna M.Sc.

Ms. Fraihat Nadine Yousef Hasan M.Sc.

Invited Lecturer

József Legoza M.D.

Hungarian Academy of Sciences University of  
Debrecen Public Health Research Group  
Fellow

Ms. Judit Diószegi M.D., Ph.D.

Ms. Krisztina Jámbor M.Sc.

Ms. Viktória Koroknai M.Sc.

Werissa Abebe Nardos M.Sc.

Péter Pikó M.Sc.



	István Szász M.Sc.
	Szabolcs Varga Ph.D.
Academic Advisor	Ms. Valéria Vinczéné Sipos M.Sc.
	Ms. Szilvia Fialat M.D., Ph.D.
	Sándor Szűcs M.Sc., Ph.D.

**DEPARTMENT OF FOREIGN LANGUAGES**

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Head of Department	Ms. Judit Lampéné Zsíros M.A., Ph.D.
Teacher	Ms. Anna Balóné Jóna M.A.
	Ms. Gergely Szilvia Erdeiné M.A.
	Ms. Marianna Fodor M.A.
	Ms. Ildikó Gerő M.A.
	Ms. Judit Kovács, M.A.
	Ms. Mónika Krasznai M.A.
	Ms. Marianna Méhes M.A.
	Ms. Zsuzsa Lívía Mezei M.A.
	László Répás M.A.
	Ms. Katalin Rozman M.A.
	Ben Schutz M.A.
Academic Advisor	Ms. Katalin Rozman M.A.

**INSTITUTE OF SPORT SCIENCE OF UNIVERSITY OF DEBRECEN**

Móricz Zs. krt. 22., Debrecen, 4032, Tel: +36-52-411-600/54436

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Head of Department	László Balogh M.D.
Lecturer	Ms. Katalin Jóna M.Sc.
	Miklós Magyarits M.A.
	Ágoston Nagy Ph.D.
	Ms. Katalin Varga M.Sc.

**DEENK LIFE SCIENCES LIBRARY**

Egyetem tér 1., Debrecen, 4032, Tel: +36-52-518-610  
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Director Libraries	Ms. Gyöngyi Karácsony M.Sc.
Reference Services	Ms. Edit Görögh M.Sc., Ph.D.
Collection Development Department	Ms. Katalin Takácsné Bubnó M.Sc.
Education and Research Support Department	Ms. Judit Éva Fazekas-Paragh M.Sc.

## CHAPTER 9 UNIVERSITY CALENDAR

### UNIVERSITY CALENDAR FOR MEDICINE PROGRAM 2019/2020 ACADEMIC YEAR

**CRASH COURSE OF HUNGARIAN LANGUAGE: August 26 – September 6, 2019**

**OPENING CEREMONY: September 8, 2019**

**GRADUATION CEREMONY: September 14, 2019; December 2019; June 2020;**

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

Year	Course	Examination Period
Basic Medicine Course	September 9 – December 13, 2019 (14 weeks)	December 16, 2019 – January 31, 2020 (7 weeks)
1 <sup>st</sup> year Medicine 2 <sup>nd</sup> year Medicine 3 <sup>rd</sup> year Medicine	September 9 – December 13, 2019 (14 weeks)	December 16, 2019 – January 31, 2020 (7 weeks)
4 <sup>th</sup> year Medicine 5 <sup>th</sup> year Medicine	September 9 – December 13, 2019 (14 weeks – 4 weeks block practice included)	December 16, 2019 – January 31, 2020 (7 weeks)

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

Year	Course	Examination Period
Basic Medicine Course	February 10 – May 15, 2020 (14 weeks)	May 18 – June 12, 2020 (4 weeks)
Basic Medicine Course II.	January 6 – June 12, 2020 (23 weeks)	June 15 – July 3, 2020 (3 weeks)
1 <sup>st</sup> year Medicine 2 <sup>nd</sup> year Medicine 3 <sup>rd</sup> year Medicine	February 10 – May 15, 2020 (14 weeks)	May 18 – July 3, 2020 (7 weeks)
4 <sup>th</sup> year Medicine	February 10 – May 15, 2020 (14 weeks – 3 or 4 weeks block practice included)	May 18 – July 3, 2020 (7 weeks) – 4 <sup>th</sup> year
5 <sup>th</sup> year Medicine		May 18 – July 10, 2020 (8 weeks) – 5 <sup>th</sup> year

#### SUMMER HOSPITAL PRACTICE

Year	Dates in 2020
1 <sup>st</sup> or 2 <sup>nd</sup> year Medicine (Nursing Practice)	July 6 – July 31 or August 3 – August 28, 2020 (4 weeks)
3 <sup>rd</sup> year Medicine (Internal Medicine)	July 6 – July 24 or July 27 – August 14, 2020 (3 weeks)
4 <sup>th</sup> year Medicine (Freely Chosen clinical department)	

## CHAPTER 10

### ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

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#### **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). 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. The ESE is not compulsory for non-repeater students and even who fail may

## ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

continue their study in the second semester, however, they lose their chance to receive bonus points. Exam exemptions and bonus point policy are to improve the students' performance on SCTs and give them a chance to get exemption of the FE (described below) even with SCT scores lower than 40% in the first semester. Exact details of the exemption of ESE:

- one's average score of the three best first semester SCTs is at least 70%, 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 70%, 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 2<sup>nd</sup> semester is at least 70%, AND
- passed all the SCTs with at least 40% in the 2<sup>nd</sup> 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 2 <sup>nd</sup> semester SCTs <b>OR</b> the average of the best 6 SCTs	Bonus points (%)
45.00-49.99	1
50.00-54.99	2
55.00-59.99	3
60.00-64.99	4
65.00-70.00	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.

<b>Percentage (%)</b>	<b>Mark</b>
0 - 59.99:	fail (1)
60.00 - 70.00:	pass (2)
70.00 - 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, 1<sup>st</sup>

Number of teaching hours:

Lecture: **56**

Seminar: **28**

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

**Lecture:**

The chemistry of life 1

Proteins, carbohydrates and lipids 1.

Proteins, carbohydrates and lipids 2.

Proteins, carbohydrates and lipids 3.

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

**Lecture:**

Proteins, carbohydrates and lipids 4.

Nucleic acids

Cells: the working units of life 1. Prokaryotes\*

Cells: the working units of life 2.

**3<sup>rd</sup> 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.

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

**Lecture:**

Cell membranes 2.

Cell membranes 3.

Cell membranes 4.

Energy, enzymes and metabolism 1.

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

**Lecture:**

Energy, enzymes and metabolism 2.

Energy, enzymes and metabolism 3.

Energy, enzymes and metabolism 4.

Pathways that harvest chemical energy 1.

**6<sup>th</sup> 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.

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

**Lecture:**

Cellular signaling and communication 1.

Cellular signaling and communication 2.

Cell cycle and cell division 1.

Cell cycle and cell division 2.

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

**Lecture:**

Cell cycle and cell division 2.

Cell cycle and cell division 2.

Inheritance, genes and chromosomes 1.

Inheritance, genes and chromosomes 2.

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

**Lecture:**

Inheritance, genes and chromosomes 3.

Inheritance, genes and chromosomes 4.

Inheritance, genes and chromosomes 5.

Inheritance, genes and chromosomes 6.

**10<sup>th</sup> 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.

**11<sup>th</sup> 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.

**12<sup>th</sup> 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.

**13<sup>th</sup> 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.)

**14<sup>th</sup> 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, 2<sup>nd</sup>

Number of teaching hours:

Lecture: **42**

Seminar: **28**

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

Lecture:

Tissues, Organs and Organ Systems 1.  
 Tissues, Organs and Organ Systems 2.  
 Tissues, Organs and Organ Systems 3.

Natural Defenses against Disease 2.  
 Natural Defenses against Disease 3.  
 Nutrition, Digestion and Absorption 1.

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

Lecture:

Homeostasis and cellular physiology.  
 Temperature Regulation.  
 Blood, a fluid tissue 1.

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

**Lecture:**

Nutrition, Digestion and Absorption 2.  
 Nutrition, Digestion and Absorption 3.  
 Nutrition, Digestion and Absorption 4.

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

Lecture:

Blood, a fluid tissue 2.  
 Circulation 1.  
 Circulation 2.

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

**Lecture:**

Respiratory system 1.  
 Respiratory system 2.  
 Salt and Water Balance and Nitrogen Excretion 1.

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

Lecture:

Circulation 3.  
 Circulation 4. The lymphatic system.  
 Natural Defenses against Disease 1.

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

**Lecture:**

Salt and Water Balance and Nitrogen Excretion 2.  
 Hormones 1.  
 Hormones 2.

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

**Lecture:**

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

**Lecture:**

Hormones 3.  
 Hormones 4.

## CHAPTER 10

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Hormones 5.

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

#### Lecture:

Neurons and Nervous system 1.  
Neurons and Nervous system 2.  
Neurons and Nervous system 3.

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

#### Lecture:

Neurons and Nervous system 4.  
Neurons and Nervous system 5.  
Sensory systems 1.

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

#### Lecture:

Sensory systems 2.  
Musculoskeletal Systems 1.  
Musculoskeletal Systems 2.

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

#### Lecture:

Musculoskeletal Systems 3.  
Reproduction and Development 1.  
Reproduction and Development 2.

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

#### Lecture:

Reproduction and Development 3.  
Reproduction and Development 4.

Contact person: Dr. Norbert Szentandrásy, Department of Physiology

Recommended book: Sadava, Hills, Heller, Berenbaum: Life (10<sup>th</sup> edition)

Subject: **INTRODUCTION TO PHYSICS I.**

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

Number of teaching hours:

Lecture: 56

Seminar: 28

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

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

#### Lecture:

Motion in one dimension, displacement, velocity, acceleration, motion diagrams. Freely falling objects.

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

#### Lecture:

Vectors and their properties. Components of vectors. Displacement, velocity and acceleration in two dimensions. Motion in two dimensions. Projectile motion.

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

#### Lecture:

The laws of motion. Newton's First, Second and Third Law. Applications of Newton's Laws. Forces of friction.

### 5<sup>th</sup> 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.

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

#### Lecture:

Momentum and impulse. Conservation of momentum. Collisions. Elastic and inelastic collisions. Angular speed and angular acceleration.



Rotational motion under constant angular acceleration.

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

**Lecture:**

Centripetal acceleration. Newtonian gravitation. Kepler's laws. Torque and the two conditions for equilibrium. The center of gravity.

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

**Lecture:**

Rotational kinetic energy. Angular momentum. States of matter. Deformation of solids. The Young's's, shear and bulk modulus. Density and pressure. Variation of pressure with depth. Pressure measurements.

**9<sup>th</sup> 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.

**10<sup>th</sup> 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.

**11<sup>th</sup> 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.

**12<sup>th</sup> 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

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

**Lecture:**

Sound. Energy and intensity of sound waves. Doppler effect. Ultrasound. Shock waves, standing waves. The ear and the principles of hearing.

**14<sup>th</sup> 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, 2<sup>nd</sup>

Number of teaching hours:

Lecture: **56**

Seminar: **28**

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

**Lecture:**

Properties of electric charges. Insulators and conductors. Coulomb's law. Electric field. Electric field lines. Electric flux and Gauss's law.

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

**Lecture:**

Electrical energy and capacitance. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

**3<sup>rd</sup> 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.

**4<sup>th</sup> 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.

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

**Lecture:**

Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on current loop and electric motors. Magnetic field of a long straight wire and Ampere's law. Magnetic field

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

**Lecture:**

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

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

**Lecture:**

Alternating current. Resistors, capacitors and inductors in AC circuits. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves.

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

**Lecture:**

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

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

**Lecture:**

Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. Thin lenses. Images formed by lenses. Lens aberrations.

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

**Lecture:**

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

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

**Lecture:**

Quantum physics. Blackbody radiation. Photoelectric effect. Particle theory of light. The production and attenuation of X-ray. Characteristic X-ray.

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

**Lecture:**

Atomic physics. Early model of the atom. Quantum mechanics and the hydrogen atom. The spin magnetic quantum numbers. Lasers and holography.

**13<sup>th</sup> 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.

**14<sup>th</sup> 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

Number of teaching hours:

82

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

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

**Lecture:**

Introduction to Chemistry. Symbols of the elements. Physical and chemical properties  
The SI system of measurement

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

**Lecture:**

The atomic theory. Structure of the atom, nuclear arithmetic  
Mixtures and chemical compounds. Chemical formulas. Naming chemical compounds.

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

**Lecture:**

Atomic, molecular and molar mass relationships. Percent composition and empirical/molecular formulas. Chemical equations, stoichiometry

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

**Lecture:**

Summary of general chemistry 1  
Test #1

**5<sup>th</sup> 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

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

**Lecture:**

Periodic properties  
Chemical bonds: metallic, ionic, and covalent bond. Electron-dot structures

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

**Lecture:**

VSEPR and valence bond theory  
Intermolecular forces

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

**Lecture:**

Summary of general chemistry 2  
Test #2

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

**Lecture:**

The gaseous state  
Liquid and solid state, phase changes. The chemistry of water

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

**Lecture:**

Solutions. Electrolytes and nonelectrolytes  
Chemical equilibrium

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

**Lecture:**

Summary of general chemistry 3  
Test #3

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

**Lecture:**

Acids and bases 1  
Acids and bases 2

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

**Lecture:**

Thermochemistry: internal energy and state functions. Enthalpy. Hess's law  
Redox reactions. Activity series of the elements. Galvanic cells

**14<sup>th</sup> 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**

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

The main-group elements. s-, p-, d-block metals  
Nonmetals: hydrogen, halogens and noble gases

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

Nonmetals: oxygen and sulfur  
Nonmetals: nitrogen, phosphorus and carbon

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

Test #5  
Covalent bonding in organic compounds.  
Classification of organic compounds

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

Alkanes. Nomenclature and isomerism of alkanes  
Reactions of alkanes. Cycloalkanes

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

Unsaturated hydrocarbons  
Aromatic compound: structure and properties

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

Heteroaromatic compounds. Reactions of  
benzene and its derivatives  
Organic halogen compounds

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

Summary of organic chemistry 1  
Test #6

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

Alcohols and phenols  
Ethers, thioethers.

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

Organic sulfur compounds  
Aldehydes, ketones and quinones

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

Nitrogen containing organic compounds:  
aliphatic amines  
Nitrogen containing organic compounds:  
heterocyclic nitrogen compounds. Amines of  
biological importance

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

Summary of organic chemistry 2  
Test #7

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

Carboxylic acids  
Substituted carboxylic acids. Carboxylic acid  
derivatives: esters and amides

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

Carboxylic acid derivatives: halides and  
anhydrides; salts and detergents  
Stereochemistry

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

Summary of organic chemistry 3  
Test #8

Contact person: Dr. Endre Kókai, Department of Medical Chemistry

Recommended books: McMurry, Fay: Chemistry (7th edition)

Erdődi, Csontos: 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

**Reading materials:**

Gerő Ildikó-Kovács Judit: Színesen magyarul.  
2017.

## CHAPTER 11

### ACADEMIC PROGRAM FOR THE INTENSIVE BASIC MEDICINE COURSE

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#### **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 70%, 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 (%)
45.00-49.99	1
50.00-54.99	2
55.00-59.99	3
60.00-64.99	4
65.00-69.99	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 - 70.00:	pass (2)
70.00 - 79.99:	satisfactory (3)
80.00 - 89.99:	good (4)
90.00 - 100:	excellent (5)

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**

**1<sup>st</sup> 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.

**2<sup>nd</sup> 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.

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

**Lecture:** Cells: the working units of life 3.

Cells: the working units of life 4.

Bacterial cell structure

Cell membranes 1.

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

**Lecture:** Cell membranes 2.

Cell membranes 3.

Energy, enzymes and metabolism 1.

Energy, enzymes and metabolism 2.

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

**6<sup>th</sup> 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.

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

**8<sup>th</sup> 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.

**9<sup>th</sup> 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.

**10<sup>th</sup> 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.

**11<sup>th</sup> week:**  
**Lecture:** Regulation of gene expression 1.  
 Regulation of gene expression 2.  
 Regulation of gene expression 3.  
 Regulation of gene expression 4.

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

The mechanism of evolution 2.

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

**14<sup>th</sup> week:**  
**Lecture:** Homeostasis and cellular physiology.  
 Temperature Regulation.  
 Blood, a fluid tissue 1-2.

**15<sup>th</sup> week:**  
**Lecture:** Circulation 1-3. Lymphatic system.

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

**17<sup>th</sup> week:**  
**Lecture:** Nutrition, Digestion and Absorption 2.  
 Energy balance, vitamins and minerals.  
 Respiratory system 1-2.

**18<sup>th</sup> week:**  
**Lecture:** Salt and Water Balance Nitrogen Excretion 1-2.  
 Hormones 1-2.

**19<sup>th</sup> week:**  
**Lecture:** Hormones 3-4.  
 Self Control Test  
 Neurons and Nervous system 1.

**20<sup>th</sup> week:**  
**Lecture:** Neurons and Nervous system 2-5.

**21<sup>st</sup> week:**  
**Lecture:** Sensory systems 1-2.  
 Effectors: Musculoskeletal Systems 1-2.

**22<sup>nd</sup> week:**  
**Lecture:** Musculoskeletal Systems 3.  
 Reproduction and Development 1-2.  
 Reproduction and Development 3-4.



23<sup>rd</sup> week:

**Lecture:** Self Control Test

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

Subject: **INTRODUCTION TO BIOPHYSICS**

Year, Semester: Intensive Basic Medicine Course

Number of teaching hours:

Lecture: 92

Seminar: 138

1<sup>st</sup> 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.

2<sup>nd</sup> 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.

3<sup>rd</sup> week:

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

4<sup>th</sup> 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.

5<sup>th</sup> week:

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

6<sup>th</sup> week:

**Lecture 11-12:** Angular speed and angular acceleration. Rotational motion under constant angular acceleration. Centripetal acceleration.

Newtonian gravitation. Kepler's laws.

7<sup>th</sup> week:

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

8<sup>th</sup> week:

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

9<sup>th</sup> 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.

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

**Lecture 28-29:** Electrical energy and capacitance. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

**15<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> 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<sup>st</sup> 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<sup>rd</sup> week**

**Lecture 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: Basic Medicine Course, 2nd

Number of teaching hours:

Lecture: 56

Seminar: 28

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

<p><b>Lecture:</b> Introduction to Chemistry. Symbols of the elements. Physical and chemical properties The SI system of measurement</p>	<p>Solutions. Electrolytes and nonelectrolytes Summary of general chemistry 2 <b>Test #2</b></p>
<p><b>2<sup>nd</sup> week:</b> <b>Lecture:</b> The atomic theory. Structure of the atom, nuclear arithmetic Mixtures and chemical compounds. Chemical formulas. Naming chemical compounds</p>	<p><b>10<sup>th</sup> week:</b> <b>Lecture:</b> Chemical equilibrium Acids and bases 1</p>
<p><b>3<sup>rd</sup> week:</b> <b>Lecture:</b> Atomic, molecular and molar mass relationships Percent composition and empirical/molecular formulas. Chemical equations, stoichiometry</p>	<p><b>11<sup>th</sup> week:</b> <b>Lecture:</b> Acids and bases 2 Thermochemistry: internal energy and state functions. Enthalpy. Hess's law</p>
<p><b>4<sup>th</sup> week:</b> <b>Lecture:</b> Summary of general chemistry 1 <b>Test #1</b></p>	<p><b>12<sup>th</sup> week:</b> <b>Lecture:</b> Redox reactions. Activity series of the elements. Galvanic cells Summary of general chemistry 3 <b>Test #3</b></p>
<p><b>5<sup>th</sup> week:</b> <b>Lecture:</b> 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</p>	<p><b>13<sup>th</sup> week:</b> <b>Lecture:</b> The main-group elements. s-, p-, d-block metals Nonmetals: hydrogen, halogens and noble gases</p>
<p><b>6<sup>th</sup> week:</b> <b>Lecture:</b> Periodic properties Chemical bonds: metallic, ionic, and covalent bond. Electron-dot structures</p>	<p><b>14<sup>th</sup> week:</b> <b>Lecture:</b> Nonmetals: oxygen and sulfur Nonmetals: nitrogen, phosphorus and carbon</p>
<p><b>7<sup>th</sup> week:</b> <b>Lecture:</b> VSEPR and valence bond theory Intermolecular forces</p>	<p><b>15<sup>th</sup> week:</b> <b>Lecture:</b> Covalent bonding in organic compounds. Classification of organic compounds. Alkanes. Nomenclature and isomerism of alkanes Reactions of alkanes. Cycloalkanes</p>
<p><b>8<sup>th</sup> week:</b> <b>Lecture:</b> The gaseous state Liquid and solid state, phase changes. The chemistry of water</p>	<p><b>16<sup>th</sup> week:</b> <b>Lecture:</b> Unsaturated hydrocarbons Summary of organic chemistry 1 <b>Test #4</b></p>
<p><b>9<sup>th</sup> week:</b> <b>Lecture:</b></p>	<p><b>17<sup>th</sup> week:</b> <b>Lecture:</b> Aromatic compounds: structure and properties Heteroaromatic compounds. Reactions of</p>

## CHAPTER 11

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benzene and its derivatives

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

**Lecture:**

Organic halogen compounds

Alcohols and phenols

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

**Lecture:**

Ethers, thioethers. Organic sulfur compounds

Aldehydes, ketones and quinones

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

**Lecture:**

Summary of organic chemistry 2

**Test #5**

Nitrogen containing organic compounds 1:  
aliphatic amines

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

**Lecture:**

Nitrogen containing organic compounds 2:  
heterocyclic nitrogen compounds. Amines of  
biological importance

Carboxylic acids

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

**Lecture:**

Substituted carboxylic acids. Carboxylic acid  
derivatives 1: esters and amides

Carboxylic acid derivatives 2: halides and  
anhydrides; salts and detergents

**23<sup>rd</sup> 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, Csontos: Organic chemistry for premedical students (2010)

## CHAPTER 12

# ACADEMIC PROGRAM FOR CREDIT SYSTEM

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### ACADEMIC PROGRAM FOR CREDIT SYSTEM

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

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

The general principles of the credit system are the following:

1. Students can be given their degree if, having met other criteria as well, they have collected 360 credits during their studies. Considering the recommended curriculum, this can be achieved in six years.
2. According to the credit regulations, students should obtain an average of 30 credits in each semester.
3. The criterion of obtaining 1 credit is to spend 30 hours (including both contact and non-contact hours) studying the given subject.
4. Credit(s) can only be obtained if students pass the exam of the given subject.
5. Students accumulate the required amount of credits by passing exams on compulsory, required elective and freely chosen subjects. Completion of every single compulsory credit course is one of the essential prerequisites of getting a degree. Courses belonging to the required elective courses are closely related to the basic subjects, but the information provided here is more detailed, and

includes material not dealt with in the frame of the compulsory courses. Students do not need to take all required elective courses, but they should select some of them wisely to accumulate the predetermined amount of credits from this pool. Finally, a certain amount of credits should be obtained by selecting from the freely chosen courses, which are usually not related to the basic (and thus mandatory) subjects, but they offer a different type of knowledge.

6. 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 2019/20.**

**For the previous years' curricula please visit the university's website: [www.edu.unideb.hu](http://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	None
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 Crash Course, 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	AONEB05T4	52	10		ESE*	4	Medical Physiology I. Lecture
2	Neurobiology Practical	AONEB06T4			56	AW5	4	Medical Physiology I. Lecture
2	Nursing practice	AO_NYGY_NURSIN G			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 Sciences
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 Sciences
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	AOBLIM41T7			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	AOBLOGT7			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 I.	AOSEB05T7	12		10	AW5	2	Pathology II., Basic Surgical Techniques
1	Surgery/Small Surgery Block Practice - 4th year	AOBLSUT7			60	SIGN	0	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	10		10	ESE	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	AOBLIM42T8			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	AOBLOGT7			30	SIGN	0	Pathology II., Clinical Biochemistry II.
2	Obstetrics and Gynecology II.	AOSZU09T8	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.	AORAD06T8	10		10	ESE*	1	Radiology and Nuclear Medicine I.
2	Stomatology	AOFOG03T7	10		16	ESE*	2	Pathology II.
2	Surgery II.	AOSEB06T8	10			ESE	3	Surgery I.
2	Surgery/Small Surgery Block Practice - 4th year	AOBLSUT7			60	SIGN	0	Pathology II., Basic Surgical Techniques
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	AOBLIM51T9			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	AOBLNUT9			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	AOBLPET9			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-K1	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	AOBLIM52T10			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	AOBLNUT9			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	AOBLPET9			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.)
1	Transfusiology Lecture	AOTRF01T11L	30			SIGN	0	Successful completion of all compulsory subjects (I-V.)
1	Transfusiology Practical	AOTRF01T11P			10	SIGN	0	Transfusiology Lecture

**Required elective courses for the 1. year**

<b>Sem</b>	<b>Subjects</b>	<b>Neptun code</b>	<b>L</b>	<b>S</b>	<b>P</b>	<b>Exam</b>	<b>Crd</b>	<b>Prerequisites of taking the subject</b>
1	Computer Science	AOINF43T1			28	AW5	3	None
1	Latin Language	AOLAT42T1			28	AW5	2	None
1	Library System	AOKON43T1			10	AW5	1	None

**Required elective courses for the 1. year**

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Computer Science	AOINF43T1			28	AW5	3	None
2	Introduction to students' scientific activities	AOTDK02	10			AW5	1	None
2	Medical Genomics	AOGEN43T2	14		2	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	Enzymology in laboratory medicine and in clinical practice	AOG6311004	14			AW5	1	Biochemistry I. Lecture
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	10			AW5	1	Introduction to students' scientific activities
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 of Great Populations	AOG167605	25			AW5	2	Biochemistry II. Lecture
1	Molecular Oncology and Cancer Prevention	AOMOO41T5	13	2		AW5	1	Biochemistry 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	Enzymology in laboratory medicine and in clinical practice	AOG6311004	14			AW5	1	Biochemistry I. 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	Prop. of Internal Medicine (Int. Med. I.), Clinical Biochemistry II., Pathology II.
1	Fundamentals of sports medicine	AOG620207	12	2	10	AW5	2	Internal Medicine propedeutics, Rheumatology-Immunology
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	Transplantation of the abdominal organs	AOG497907	12		4	AW5	1	Surgery I.
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	Basic Operative Techniques, Operative Techniques Practices, 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	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	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	Fundamentals of sports medicine	AOG620207	12	2	10	AW5	2	Internal Medicine propedeutics, Rheumatology-Immunology
1	Pharmacotherapy	AOG248110	30			AW5	3	Pharmacology 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	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	Thesis I.
2	Travel and Tropical Medicine, Vaccinations	AOG307702	20		5	AW5	2	Microbiology II.

**Required elective courses for the 6. year**

<b>Sem</b>	<b>Subjects</b>	<b>Neptun code</b>	<b>L</b>	<b>S</b>	<b>P</b>	<b>Exam</b>	<b>Crd</b>	<b>Prerequisites of taking the subject</b>
1	Thesis III.	AODIP49T11				AW3	5	Thesis II.

**Required elective courses for the 6. year**

<b>Sem</b>	<b>Subjects</b>	<b>Neptun code</b>	<b>L</b>	<b>S</b>	<b>P</b>	<b>Exam</b>	<b>Crd</b>	<b>Prerequisites of taking the subject</b>
2	Thesis IV.	AODIP50T12				AW5	5	Thesis III.
2	Travel and Tropical Medicine, Vaccinations	AOG307702	20		5	AW5	2	Microbiology II.

## Freely Chosen Courses

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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, Embryology 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, Embryology 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 differentiation	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 of Anatomy, Histology and Embryology	Organization of movements in the brain	AOG100105	1	2	16	AW5	Anatomy, Histology and Embryology I. Lecture	
Department of Anesthesiology and Intensive Care	US-guided techniques in anaesthesiology and ICU	AOG118109	1	1	16	AW5	Pharmacology II.	Ákos Fábrián M.D., Ph.D.

**ACADEMIC PROGRAM FOR CREDIT SYSTEM**

<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
Department of Biochemistry and Molecular Biology	Biochemistry of Apoptosis	AOG167406	1	-	20	AW5	Biochemistry II.	Zsuzsa Szondy M.D., Ph.D., D.Sc.
Department of Biochemistry and Molecular Biology	Retroviral Biochemistry	AOG167506	1	2	20	AW5	Molecular Biology	József Tözsér M.Sc., Ph.D., D.Sc.
Department of 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 Biochemistry and Molecular Biology	Nuclear hormone receptors (Journal club)*	AOG167100 2	2	2	28	AW5	None	László Nagy M.D., Ph.D., M.H.A.Sc.
Department of Cardiology	Valvular heart diseases: diagnosis, examination and patient management in the focus	AOG317808	1	2	16	AW5	Clinical Physiology, Internal Medicine III. (Cardiology, Angiology)	
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	AOPLSURG 02	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.	AOG26108A 1-K1	2	1	30	AW5	None	László Répás M.A.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Foreign Languages	Hungarian Language Elective - Medical II.	AOG26108A 2-K1	2	2	30	AW5	Completion of Hungarian Language Elective Medical I.	László Répás M.A.
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 Forensic Medicine	Stories of the dead - Interesting forensic cases	AOG287307	2	1	30	AW5	Pathology II.	Barbara Dóra Halasi M.D.
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.



**ACADEMIC PROGRAM FOR CREDIT SYSTEM**

<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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 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	1	16	AW5	Internal Medicine II. (Immunology and Rheumatology)	Zoltán Griger M.D., Ph.D. habil.
Department of Internal Medicine	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.
Department of Internal Medicine	Comprehensive Review of Obesity and Associated Disorders	AOG128307	2	1	30	AW5	Propedeutics of Internal Medicine	
Department of Internal Medicine	Early phases of systemic autoimmune diseases	AOG149908	1	2	16	AW5	Internal Medicine II. (Immunology, Rheumatology)	Edit Bodolay M.D., Ph.D., D.Sc.
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.

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<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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 Imaging	Neuroanatomy in the radiological practice	AOG4871106	1	1	14	AW5	Anatomy II., Neuroanatomy	
Department of Medical Imaging	Nobel prize and molecular biology	AOG4871203	1	2	14	AW5	None	Teréz Nyesténé Nagy M.D., B.Sc.
Department of Medical Microbiology	Tumor viruses and oncogenes	AOG427804	1	2	12	AW5	Medical Microbiology II.	György Veress M.Sc., Ph.D.
Department of Medical Microbiology	Interpretive Clinical Bacteriology and Virology	AOG428108	1	2	14	AW5	Medical Microbiology II.	József Kónya Ph.D., 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 immunocompromised	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	AOG4210008	1	2	12	AW5	Medical Microbiology II.	Judit Szabó M.D., Ph.D.
Department of Medical Microbiology	Microbiology of sepsis	AOG4210007	1	1	12	AW5	Medical Microbiology I.	Judit Szabó M.D., Ph.D.

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<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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 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	AOG429110 7	1	1	15	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.
Department of Medical Microbiology	Current concepts and practices in antiviral therapy	AOG429100 7	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.

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<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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 Oncoradiology	Operativ techniques in radiotherapy (brachytherapy)	AOG527810	1	1-2	12	AW5	Radiology II.	Andrea Furka M.D., Ph.D.
Department of Ophthalmology	Diseases of the retina, current concepts on diagnostics and therapy	AOG537802	1	2	15	AW5	None	Valéria Nagy M.D., Ph.D.
Department of Ophthalmology	Microsurgical techniques in ophthalmology	AOG5371010	1	2	15	AW5	successful exam in Basic surgical techniques and Ophthalmology	Lili Takács M.D., Ph.D.
Department of Otorhinolaryngology and Head and Neck Surgery	Reconstructive and voice rehabilitation methods in head and neck surgery	AOG217410	1	1	10	AW5	None	Judit Szilvássy 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 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 Fialat M.D., Ph.D.

**ACADEMIC PROGRAM FOR CREDIT SYSTEM**

<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
Department of Preventive Medicine, Faculty of Public Health	Which country in Europe has the best health care system?	AOG367140 2	1	2	16	AW5	None	Orsolya Varga M.D., Ph.D.
Department of Preventive Medicine, Faculty of Public Health	Meta-analysis	AOG367100 2	1	2	14	AW5	None	Szilvia Fialat M.D., Ph.D.
Department of Preventive Medicine, Faculty of Public Health	Evidence based diet	AOG367160 2	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	Szilárd Gyula Rezes 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 Sports Medicine	Spine protection, ergonomic practical knowledges	AOG620403	1	1	14	AW5	Anatomy, Histology and Embryology I. Lecture + Practical	Sándor Szántó M.D., Ph.D., D.Sc.
Department of Surgery	Surgical Oncology	AOG497408	1	1	10	AW5	Pathology II.	Tamás Dinya M.D.
Department of Traumatology and Hand Surgery	State of the art treatment of big joint's injuries. Diagnostic and treatment of pediatric bone and arthritic injuries	AOG578608	1	2	12	AW5	Traumatology I., Traumatology II.	Ferenc Urbán M.D.
Department of Urology	Urological Laparoscopic Surgery	AOG599707	1	1-2	15	AW5	Basic Surgical Techniques	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.

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<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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)	AOG5910107	1	1-2	15	AW5	Pathology II. and Propedeutics of Internal Medicine	Mátyás Benyó M.D., Ph.D.
Department of Urology	Uro-radiology	AOG5910207	1	1-2	15	AW5	Pathology II. and Propedeutics of Internal Medicine	Csaba Berczi M.D., Ph.D.
Division of Biophysics	Physical foundations of biophysics	AOG157303	1	1	24	AW5	None	György Vámosi M.Sc., Ph.D.
Division of Cardiac Surgery	Cardiac Surgery	AOG607508	1	2	22	AW5	Surgery I.	Tamás Szerafin M.D., Ph.D.
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.
Division of Clinical Laboratory Science	Platelet Function and Platelet Function Disorders	AOG632006	1	2	12	AW5	Clinical Biochemistry II.	Krisztina Péntes-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.

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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	AOCSA01L3	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	AOKLR41T8	1	2	24	AW5	None	Ervin Berényi M.D., Ph.D.
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 Rheumatology	Rheumatology: 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-Awareness Group	AOG359005-K10	2	2	30	AW5	None	Péter Molnár M.D., D.Sc.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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	AOG351110 2-K1	1	2	20	AW5	None	Attila Bánfalvi M.A., Ph.D., C.Sc.
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.	AOG351200 1-K1	1	1	30	AW5	None	Péter Molnár M.D., D.Sc.
Institute of Behavioural Sciences, Faculty of Public Health	Intercultural Health Care	AOG351160 5-K1	2	2	30	AW5	None	Péter Molnár M.D., D.Sc.
Institute of Behavioural Sciences, Faculty of Public Health	Yoga and Meditation II.	AOG351040 1-K1	2	2	30	AW5	None	Péter Molnár M.D., D.Sc.
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.



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Institute of Behavioural Sciences, Faculty of Public Health	Health and Healing in Wolrd Religions	AOG352101	1	1	20	AW5	None	Bence Döbrössy M.A.
Institute of Behavioural Sciences, Faculty of Public Health	Introduction into Research Ethics	AOG352260 7	1	1	20	AW5	None	János Kristóf Bodnár 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	AOG351110 1	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	AOG351100 1	1	1	20	AW5	None	Sándor Kőműves M.A., Ph.D.
Institute of Behavioural Sciences, Faculty of Public Health	End of Life Decisions I. Introduction	AOG351270 1	1	1	15	AW5	None	Sándor Kőműves M.A., Ph.D.
Institute of Behavioural Sciences, Faculty of Public Health	End of Life Decisions II. Last Resorts	AOG351280 1	1	1	15	AW5	None	Sándor Kőműves M.A., Ph.D.
Institute of Behavioural Sciences, Faculty of Public Health	End of Life Decisions III. Cases	AOG351290 2	1	1	15	AW5	End of Life Decisions I. Introduction or End of Life Decisions II. Last Resorts	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	AOPULS020 5	2	-	30	AW5	Medical Physiology II.	Katalin Varga M.Sc.

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<b>Department</b>	<b>Subject</b>	<b>Neptun code</b>	<b>Crd</b>	<b>Sem</b>	<b>Hours</b>	<b>Exam</b>	<b>Prerequisites of taking the subject</b>	<b>Coordinator</b>
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 fulfill 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 given 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-Kenéz 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).

#### 4<sup>th</sup> 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)

##### 1<sup>st</sup> semester

2 weeks Internal Medicine (Cardiology and Angiology)

1 week Obstetrics and Gynecology and 1 week freely chosen or 2 weeks Surgery/Small Surgery

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

## CHAPTER 13

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.

4 <sup>th</sup> 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

### 5<sup>th</sup> YEAR BLOCK PRACTICE

Compulsory: 2\*2 weeks Internal Medicine, 2 weeks Pediatrics or 1 week Neurology

#### 1<sup>st</sup> semester

2 weeks Internal Medicine (Gastroenterology)

2 weeks Pediatrics or 1 week Neurology

#### 2<sup>nd</sup> 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.

5 <sup>th</sup> 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 4<sup>th</sup> and 5<sup>th</sup> year block practice in the academic year 2019/2020:

semester	weeks	dates
1.	11-12	November 19, 2019 - November 29, 2019
	13-14	December 2, 2019 - December 13, 2019
2.	11-12	April 20, 2020 - May 1, 2020
	13-14	May 4, 2020 - May 15, 2020

## 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 órákor?*, 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](http://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. Solutions and colloids.

Chemical equilibrium.

**Seminar:** Lectures of the week.

### 3rd week:

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



theories.

Thermochemistry and thermodynamics.

**Seminar:** Lectures of the week.

**4th week:**

**Lecture:** Chemical kinetics.

Electrochemistry. Thermodynamics of redox reactions.

**Seminar:** Lectures of the week.

**5th week:**

**Lecture:** Introduction to organic chemistry. Stereochemistry.

Saturated and unsaturated hydrocarbons.

**Seminar:** Lectures of the week.

**6th week:**

**Lecture:** Aromatic hydrocarbons.

Organic halogen compounds. Alcohols and phenols.

**Seminar:** Lectures of the week.

**7th week:**

**Lecture:** Aldehydes and ketones and quinones. Ethers. Organic sulfur compounds.

Nitrogen containing organic compounds. Nitrogen containing heterocycles.

**Seminar:** Lectures of the week.

**8th week:**

**Lecture:** Carboxylic acids and carboxylic acid derivatives.

Amino acids and peptides.

**Seminar:** Lectures of the week.

**9th week:**

**Lecture:** Proteins (Structure and classification)

Proteins in action. (Function, regulation)

**Seminar:** Lectures of the week.

**10th week:**

**Lecture:** Carbohydrates.

Glycolysis and tricarboxylic acid cycle. Metabolic regulation.

**Seminar:** Lectures of the week.

**11th week:**

**Lecture:** Lipids.

Nucleotides and nucleic acids.

**Seminar:** Lectures of the week.

**12th week:**

**Lecture:** Coordination chemistry. Alkaline (earth) metals.

Transition metals: iron, copper, zinc.

**Seminar:** Lectures of the week.

**13th week:**

**Lecture:** Non-metals: oxygen, oxygen-derived reactive intermediates, selenium, halogens

Gaseotransmitters (NO, CO, H<sub>2</sub>S) and other inorganic gases of medical relevance (N<sub>2</sub>O, NO<sub>2</sub>).

**Seminar:** Lectures of the week.

**14th week:**

**Lecture:** Toxic metals and nonmetals.

Information on the final exam in Medical Chemistry. Research opportunities at Dept. of Medical Chemistry.

Closing lecture.

**Seminar:** Lecture of the week.

## Requirements

### Requirements

The program consists of lectures and 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 (Max. 6 absences are allowed)

Control tests 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. The student may get exemption from 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 modules is at least "pass (2)". The second part of the final exam is an oral exam covering all 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 modules of the exam must be taken and results of previous control tests or exam modules cannot be considered.

Subject: **MEDICAL CHEMISTRY PRACTICAL**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Practical: **42**

#### **1st week:**

**Practical:** Laboratory and fire safety instructions.

Chemical calculations. Concentration of solutions.

Laboratory techniques: laboratory equipments, volumetric apparatus. (Micro)pipetting.

#### **2nd week:**

**Practical:** Quantitative analysis. Acid-base

titrations: strong acid-strong base, weak acid-strong base titrations.

Introducing and using titrators.

#### **3rd week:**

**Practical:** Ion exchange chromatography.

Paper chromatography: separation of food dyes and separation of amino acids.

Gel filtration.

**4th week:****Practical:** Spectrophotometry.

Photometric determination of inorganic phosphate.

Quantitative protein analysis: Biuret assay.

Bradford assay.

Assay of glucose. Enzymatic determination of glucose in blood serum.

**5th week:****Practical:** Electrometric pH measurement.**6th week:****Practical:** Reaction kinetics. Kinetic study of the saponification reaction of ethylacetate. (Effect of concentration and temperature on the rate.)**7th week:****Practical:**

Qualitative analysis of mono- and disaccharides.

Polarimetric analysis of carbohydrates.

**8th week:****Practical:** Enzyme kinetics.

Assay of catalase activity.

**9th week:****Practical:** Enzyme kinetics.

Assay of glycogen phosphorylase activity.

**10th week:****Practical:** Identification of proteins using SDS-polyacrylamide gel electrophoresis (PAGE) and Western blot.**11th week:****Practical:** Measuring superoxide anion radical production.

Assaying superoxide dismutase (SOD) activity.

Detection of radical scavenging compounds (antioxidants) with ABTS decolorization assay.

**12th week:****Practical:** Photometric determination of iron.

Detection of nitric oxide production by macrophage cells (Griess assay).

**13th week:****Practical:** Detection of hydroxyl radicals produced in the Fenton's reaction. Effect of metal ion chelator and hydroxyl radical scavenger compounds.**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 besides the manual work. If the mark is fail (1), student should take the practical examination on the last week of the practicals. 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.

## 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:** Matematikai alapok, Counting techniques (permutations and combination)

**3rd week:**

**Lecture:** 4. Probability distributions (discrete, continuous), 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, continuous), 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

**1. 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.

**2. Short description of the course:**

Brief introduction to the most basic concepts of calculus (slope, fitting, area under the curve); counting techniques; descriptive statistics; algebra of events; probability. Descriptive statistics. Random variables; statistical distributions and their properties; binomial, Poisson and normal distributions. Sampling techniques and characterization of samples; central limit theorem. Hypothesis testing (z, t, F and chi<sup>2</sup> tests). Clinical implications of conditional probability, epidemiologic investigations.

**3. Type of the exam:**

Colloquium. The final exam can be taken during the exam period of the second semester, but only for those students whose signing of the lecture book has already been accepted.

**4. Requirements for the Biostatistics course:**

**4.1. Lectures:**

Attendance to lectures is advised. If a student is present on every lecture, he/she receives 10 bonus points which is added to the result of part B of the final exam and/or the course test (see 4.4). Attendance to the lectures will be checked randomly. The student will lose the 10 bonus points, obtainable for attendance to every biostatistics lecture, if he/she misses one of the lectures. No kind of certificate, including a medical certificate, is accepted for the absences

**4.2. Seminars:**

Attendance to seminars is mandatory. Students must not miss more than two (2) seminars. No kind of certificates, including a medical certificate, are accepted for the absences. Making up for missed classes is not possible.

**4.3. Conditions for signing the lecture book:**

Signing of the lecture book is denied if there are more than 2 absences from groupwise seminars.

**4.4. Grade-offering course test and 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.

Usually exams will be held once a week during the exam period. The exam is written. The structure of the final exam:

- part A: minimum requirement questions and short calculations (descriptive statistics, binomial and Poisson distribution, standardization of a normal distribution, etc.). Maximum score of part A is 40 points.
- part B: test questions (true or false questions, multiple choice questions, etc.), assay questions, calculations. Maximum score of part B is 100 points.

•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
- $55 \leq FS < 65$  pass
- $65 \leq FS < 75$  satisfactory
- $75 \leq FS < 85$  good
- $85 \leq FS$  excellent

Evaluation of the grade-offering test and the final exam is identical.

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.

### **5. Reading materials:**

Wayne W. Daniel: Biostatistics, A foundation for Analysis in the Health Sciences, John Wiley&Sons

### **6. 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.

### **7. Information for repeaters:**

For repeaters the attendance on seminars is not compulsory. 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.

### **8. 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.

### **9. 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, diagnostic and therapeutic 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

**Subject:** BIOPHYSICS LECTURE

**Year, Semester:** 1st year/1st semester

**Number of teaching hours:**

Lecture: 28

Seminar: 28

**Subject code:** AOBIF05T1

**ECTS Credit:** 4

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

**Semester recommended to take:** 1st year 1st semester.

**Semester for the regular course:** 1st.

**Prerequisites of the course:** No prerequisites.

**Teaching staff:** Prof. Dr. Péter Nagy and the members of the Department

**Educational manager:** Enikő Nizsalóczki

**E-mail:** biophysedu@med.unideb.hu

**Office hours:** The location and time of office hours are posted on the website.

**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) understanding the physical background of diagnostic tools (e.g. ECG, MRI, PET) and therapeutic approaches; (3) development of novel diagnostic and therapeutic tools; (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:**

- Educational material uploaded to the educational website (e-Learning surface) of the Department;
- Medical Biophysics textbook (Editors: S. Damjanovich, J. Fidy, J. Szöllösi, Medicina, Budapest, 2009, ISBN: 978-963-226-127-0).

**Web page of the Department:** <http://biophys.med.unideb.hu/en> and the link to the Moodle (e-Learning) within.

**Exam:** Written exam during the exam period after the 1st semester of the academic year. Students who attended the course and were granted with signature in a previous semester can take the exam in the 2nd semester as well, in the frame of the exam course (see Requirements, point 9).

**Requirements**

**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 in the first week of the semester. The talks are graded on a scale of 0-3. This grade counts toward the bonus points earned during the semester. Students obtaining less than 3 points for the presentation may prepare an additional one (in the student's own group) given that spots are still available. In this case the better score is considered for bonus points (the two presentations are not cumulative).

To get the maximum 3 points for the presentation the followings must be fulfilled:

- \* 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. The presentation file should be provided on a USB memory stick or other USB storage device.

**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 the signature:**

\* 7 or fewer absences from seminars;

\* Biophysics Practical course is completed successfully (i.e. the student passed the course).

**5. Self-control tests:** There will be 2 self-control tests (SCT) during the semester. Topics and dates of the SCTs are provided on the departmental web site in the first week of the semester. 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 I of the Biophysics final exam (minimum requirement questions, see point 6);

(ii) according to  $X_{ave}$  students may earn SCT bonus points counted to the FE result are as follows:

$X_{ave}$  – SCT 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. 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 (or in the summer exam period for students registered for the exam course, see point 9).

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 in the 1st week of the semester. 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 point 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 is 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.

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 - 54.99
pass (2)	55 - 64.99
satisfactory (3)	65 - 74.99
good (4)	75 - 84.99
excellent (5)	85 -

#### 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 (e-Learning).

**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 minimal) 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:**

Only those students may register for the exam course:

- \* who attended the Biophysics Lecture course in a previous semester and were granted with signature (for conditions of the signature, see point 4);
- \* OR – in the case of students who took Biophysics before the academic year of 2018/19 – completed the practical part of the unified Biophysics course successfully (i.e. completed all the labs and passed the practical exam).

Exam topics: all the material covered in the semester immediately preceding the semester in which the exam course is taken.

Points 1-5 and 8 are irrelevant.

Rules regarding the exams (point 6-7) apply to the exam course completely.

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.

For further information, check the web site of the Department (<https://biophys.med.unideb.hu/>) and the link to the Moodle (e-Learning) within.

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:** Measurement of Nuclear Radiation and Determination of Attenuation Coefficient.

**4th week:**

**Practical:** Measurement of Nuclear Radiation and Determination of Attenuation Coefficient.

**5th week:**

**Practical:** Light Microscopy and Fluorescence Microscopy.

**6th week:**

**Practical:** Light Microscopy and Fluorescence

Microscopy.

**7th week:**

**Practical:** Optical Measurements.

**8th week:**

**Practical:** Optical Measurements.

**9th week:**

**Practical:** Computer Tomography Modelling and Blood Pressure Measurement.

**10th week:**

**Practical:** Computer Tomography Modelling and Blood Pressure Measurement.

**11th week:**

**Practical:** Principles of Ultrasound Imaging.

**12th week:**

**Practical:** Principles of Ultrasound Imaging.

**13th week:**

**Practical:** Spare lab.

**14th week:**

**Practical:** Lab exam (only for students where the final score is below 3.5, see Requirements 7/3.).

### Requirements

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

**Semester recommended for taking the subject:** 1st year, 1st semester

**Semester for the regular course:** 1st

**Prerequisites of the course:** No prerequisites

**Teaching staff:** Dr. Andrea Dóczy-Bodnár and members of the Department

**Educational manager:** Enikő Nizsalóczy (e-mail: biophysedu@med.unideb.hu)

**Office hours:** The location and time of office hours are posted on the website.

**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:**

- Introduction to the practicals
- Completion of labs

**3. Compulsory reading:** material posted on the eLearning page of the course.

**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 website:** biophys.med.unideb.hu and the eLearning page of the course.

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

**7. Requirements:**

7/1. 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.

7/2. Evaluation of labs: 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.

7/3. Determination of the end-semester practical grade (PG): Students will be graded on a five-point scale based on the score of the written quizzes (QG) and the lab grades (LG). At the end of the semester both the scores of the written quizzes and those of the lab grades will be summed and averaged. The final practical grade will be determined as follows:

Students, who completed all the labs (i.e.  $LG > 0$  for all labs) but their  $QG\_average + LG\_average$  score is not enough (i.e. less than 3.5) to pass should take a lab exam on the 14th week. The practical grade will be determined on the basis of their performance at the exam.

7/4. Making up missed labs: Maximum two labs (missed for any reasons) can be made up 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.

If the labs are not fully completed by the end of week 13 (i.e. during the regular and spare labs), the signature for the course is denied. If the course is not completed successfully (denied signature or failed lab exam) the signature for the Biophysics Lecture course is denied as well.

### **8. Information for repeaters:**

8/1. Repeaters should attend and must complete all the labs. Points 7/1 – 7/4 apply to repeaters completely.

8/2. The following special rules apply to those repeater students who took the unified (theory+practicals) biophysics course before the academic year of 2018/19.

-These students have to be registered for the biophysics courses (lecture, seminar, practice) with the "old" code (AOBIF02T1) by the Educational Office.

-Students who completed all the labs and passed the lab exam will receive exemption from repeating them upon request. Such exemption requests have to be submitted online through the eLearning page of the course by the end of week 2.

-Students with incomplete labs or failed lab exam must attend and complete all labs during the semester. Points 7/1 – 7/4 apply completely for the completion and evaluation of the labs.

### **9. Exam course:** No exam course is announced.

Further information is available on the web page of the Department of Biophysics and Cell Biology ([biophys.med.unideb.hu](http://biophys.med.unideb.hu)). The above information is subject to change if unforeseen circumstances

arise. These changes will be posted on the website.

## 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 first 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 care 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-news-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: 1. 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. 1. Cross section of compact bone (Schmorl stain). 2. Longitudinal section of compact bone (Schmorl stain). 3.

Intramembranous ossification (skull of a rat, HE stain) 4. Enchondral ossification and the epiphysial plate. (rabbit knee joint, HE stain) 5. Enchondral ossification and the epiphysial plate. (rabbit knee joint, Azan stain) 6. Enchondral ossification and the epiphysial plate. (rat knee joint, toluidin-blue stain).

**Self Control Test****11th week:**

**Lecture:** The differentiation of the ectoderm and mesoderm. Blood.

**Seminar:** Histology: Muscle tissue 1. Striated muscle (HE stain). 2. Striated muscle (iron-H stain). 3. The smooth muscle (large intestine, HE stain) 4. The cardiac muscle (HE stain) 5. The cardiac muscle (PTAH) Demonstration: Electron micrographs of longitudinal sections of striated muscle.

**12th week:**

**Lecture:** The differentiation of the entoderm, the

folding of the embryo. Bone marrow.

**Seminar:** Histology: The microscopic structure of blood vessels. 1. 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**

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 three times 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 an “Anatomy Bonus”) the examiner will only ask two of the topics on the "A" chance exam if the student try every part of the exam at the "A" chance exam. No bonus will be counted on "B" and "C" chances. 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 =  $(a1+a2+a3)/3$  OR anatomy =  $(a1+a2+5)/3$  in case of an “Anatomy 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 =  $(\text{anatomy} + \text{histology} + \text{embryology})/3$

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.

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 discs and menisci. Describe the joint capsule, extracapsular and intraarticular ligaments, bursal cavities and other accessory parts of the joint. - Classification of synovial joints. Freedom, axes and planes of movements at synovial joints. Correlation between the shape of the articular surface and the freedom of movements. Function of individual joints: their contribution to the action of the upper limb.

**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. Abductor 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 transection. Note the relationships of the fascia of back and thigh (thoracolumbar, gluteal fascia, iliotibial tract). **b.** Dissection of the dorsal surface of the lower limb. Cut the tendo calcaneus and fold back the triceps surae. Dissection of the 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. **b.** ESE

### 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 another student's group. Altogether, compensation of three practices is allowed.

Rules of the End Semester Examination (ESE)

The exam is an oral examination conducted with the aid of anatomical preparations in the dissecting room, in the time of the practicals 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 ESE is 4 (good) or 5 (excellent) the student will earn a “Anatomy Bonus” for the Final Examination of the “Anatomy, Histology and Embryology – I. Lectures” course.

In case the student fails the ESE, the exam can be repeated once in last week of the semester. Improvement of the ESE's mark is not allowed.

Registration for the examination:

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

## 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  $K_M$  and  $v_{max}$ . Multisubstrate reactions. Enzyme inhibition: irreversible and reversible inhibition of enzymes. Competitive, non-competitive and uncompetitive inhibition. Regulation of the enzymes by allostery. Medical significance of enzymes. Isoenzymes.

**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 spliceosome. 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: ubiquitination 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 immunoprecipitation.

### 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 of the semester:** attendance in the 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 will 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 from the seminar teachers). The seminar bonus points will be added to the test 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. We can't accept more absences even with medical paper. Students can't make up a seminar with another group. Seminars are not obligatory for repeaters (if they have got a signature previously). Only those students can collect seminar bonus points, who don't miss more than three seminars (applies 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 gets 1.25 points. With the two control tests 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: 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 accepts the grade, it will be registered in the Neptun and the grade can be improved once during the exam period. Those who decline the offered grade are obliged to take the 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 70 points during the semester (or didn't accept the offered grade) have to take a written exam in the exam period. The written exam is composed of 40 single choice test questions (one correct answer must be marked among five possible answers; each good answer gets 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, 90-110 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 the written part of the biochemistry and molecular biology final exam. Only the points collected on the theoretical course of the subject will be included in the point collecting system. 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.

Passing the course “Molecular Biology Practical” is a required condition for obtaining the signature for “Molecular Biology Lecture”.

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

Every laboratory practices have to 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 education official of the department). There will be three practices during the semester: “Introduction”, “PCR” and “Study of phosphatases”. Schedule of the practices will be posted on our website. Students have to prepare notebooks during the practices. By each notebook 5 points can be earned. According to these points, students will get a practice grade at the end of the semester: 0-8.5 points fail; 9-10 points pass; 10.5-11.5 points satisfactory; 12-13 points good; 13.5-15 points excellent. 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](http://bmbi.med.unideb.hu/Education/Molecular%20Biology/GM,%20Dent/Information%20about%20practices)), notebooks can be printed from this website as well! Practical course won't be signed for those students who miss even one practice or don't prepare acceptable notebooks. Practices are not obligatory for repeaters (if they have got signature previously). Passing the course “Molecular Biology Practical” is a required condition for obtaining the signature for “Molecular Biology Lecture”.

## 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](http://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 I.

### 4th week:

**Lecture:** (10) Gene regulation in eukaryotes II. (11) Epigenetics, the genetic role of RNA. (12) Transmission genetics. Genes and alleles. Genotype and phenotype. Monohybrid cross. Mendel's 1st law. Reciprocal cross and test cross. Autosomal and X-linked genes.  
**Self Control Test (1st test in extra time on Monday morning.)**

### 5th week:

**Lecture:** (13) Dihybrid cross. Mendel's 2nd law. Different types of inheritance. Dominant and

recessive genes: a molecular view. Genotype and phenotype. Extranuclear inheritance. (14) Gene interactions, epistasis, lethal genes. Multiple alleles. (15) The genetic basis of complex inheritance

**6th week:**

**Lecture:** (16) Mutation and repair. (17) Human genetic diversity. DNA polymorphism. (18) Human genetic diversity. Genetics of blood types and MHC.

**7th week:**

**Lecture:** (19) Population genetics. (20) The molecular, biochemical and cellular basis of genetic diseases I. (21) The molecular, biochemical and cellular basis of genetic diseases II.

**8th week:**

**Lecture:** (22) The treatment of genetic diseases. (23) Cancer genetics and genomics. (24) Pharmacogenetics, pharmacogenomics Ecogenetics and ecogenomics.

**9th week:**

**Lecture:** (25) Human gene mapping and disease

gene identification I. (26) Human gene mapping and disease gene identification II. (27) Bacterial genetics.

**Self Control Test (2nd test in extra time on Monday morning.)**

**10th week:**

**Lecture:** (28) Developmental genetics and birth defects. (29) Genomics, proteomics, the human genome project.. (30) Prenatal diagnosis. Personalized medicine. Genetic counseling and ethical issues.

**11th week:**

**Lecture:** Medical genomics lectures

**12th week:**

**Lecture:** Medical genomics lectures

**13th week:**

**Lecture:** Medical genomics lectures  
**Self Control Test (3rd test in extra time.)**

**14th week:**

**Lecture:** Medical genomics lectures

**Requirements**

**Conditions of signing the subject:**

During the semester there will be three self-control tests offered in the 4th, 9th and 13th weeks. The questions include multiple choice and short essay questions, figures, pedigrees, definitions, etc. Based on the % average of the three tests a final grade will be offered according to the next table:

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 electronic lecture book.

Bonuses based on mark of Medical Genetics Practical are added as percentages to the average of the three tests. Bonuses calculated from practical mark are as follows: fail (1) - 0 bonus; pass (2) - 1 bonus; satisfactory (3) - 2 bonuses; good (4) - 3 bonuses; excellent (5) - 4 bonuses.

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:**

Those repeaters who have a signature from the previous year (i.e. they failed, or they are repeaters because they have never taken Genetics exam) should register for the subject electronically during the first weeks of the semester. They can take the three midterm tests in order to qualify for an offered grade based on these tests, or for test bonuses and they take the regular exam at the end of the semester. They cannot have practical bonuses.

Students, who did not earn a signature in the previous year 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 calculated from their practical mark (see above). 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.

Maximum number of bonus points is 14.

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>

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.

**Self Control Test**

**5th week:**

**Practical:** Study of X chromatin: the Barr body. Demonstration of mammalian chromosomes. Preparation of metaphase spreads. (Laboratory practical.)

**6th week:**

**Practical:** Complementation test. The gene concept. (Laboratory practical.)

**7th week:**

**Practical:** Induction of beta-galactosidase in E. coli cells. (Laboratory practical.)

**8th week:**

**Practical:** Seminar on mendelian genetics II.

Problem solving. Pedigree analysis.

Polymorphisms. Molecular genetics of inherited human diseases. Mutation, repair.

**9th week:**

**Practical:** Seminar on population genetics.

**Self Control Test**

**10th week:**

**Practical:** Seminar on treatment of genetic diseases, cancer genetics, developmental genetics.

**11th week:**

**Practical:** Detection of human polymorphism by polymerase chain reaction. (Laboratory practical.)

**12th week:**

**Practical:** PCR evaluation of the human polymorphism experiment. Transformation of E. coli by plasmid DNA. (Laboratory practical.)

**13th week:**

**Practical:** Seminar on bacterial genetics, developmental genetics, linkage analysis.

**Self Control Test**

**14th week:**

**Practical:** Medical genomics seminar

### Requirements

#### Conditions of signing the lecture book:

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

The presence of students at laboratory practices and seminars is obligatory and will be recorded. Students are responsible for signing the list of attendance. The professor refuses his/her signature



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 13th weeks in Medical Genetics. The questions include multiple choice and short essay questions, figures, pedigrees, definitions, etc. Selected ones (three in each test) will be considered as practical questions and based on the sum of the points of the nine practical questions a final mark will be offered according to the next table:

Points	Mark
3.00 - 4.50	pass (2)
4.75 - 6.00	satisfactory (3)
6.25 - 7.50	good (4)
7.75 - 9.00	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.

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>

## 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 intracellular 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: intermediate filaments, actin cytoskeleton

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

### 6th week:

**Lecture:** 11. Cell-cell and cell-matrix contacts

12. Cellular energetics, mitochondrion

**Seminar:** Material related to lectures 9-10.

### 7th week:

**Lecture:** 13. Calcium homeostasis

14. Osmo-, volume and pH regulation

**Seminar:** Material related to lectures 11-12.

### 8th week:

**Lecture:** 15. Nucleus, Chromatin

16. Cell division cycle

**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. Cell fates. Differentiation.

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. From genes to cell function: overview of the main regulatory mechanisms

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.

**Prerequisites of the course:** No prerequisites.

**Teaching staff:** Prof. Dr. György Vereb and the members of the Department

**Education manager:** Enikő Nizsalóczki (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 (@ elearning.unideb.hu).

**Recommended:** The in depth full-text version of the course material can be found in:

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 and take notes on them during the

lecture. Slides of central importance will be marked accordingly.

**Course home page:** <https://biophys.med.unideb.hu/en/node/632>  
<https://elearning.med.unideb.hu/course/view.php?id=1171>

**Signature:** Signing for the course can be denied if the student has missed more than 2 seminars. Passing the course “Cell Biology Practical” is a required condition for obtaining the signature for “Cell Biology Lecture”.

**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 5-15 min in length and 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 and need to be passed for acquiring a signature in for this course.

### **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 for offering 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  $SCT_{ave}$ .

There will also be at least two self-control tests that can be completed at predefined times on the

eLearning system. The average score of these tests will be converted into bonus points and used when determining offered grades (see 5.4.1). Exact dates and topics for these electronic tests will be announced at the lectures during the semester.

## 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 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 given exam period, but not in consecutive semesters.

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 % result of SCTs ( $SCT_{ave}$ )

4 points for reaching 30%, +1 for each additional 10% reached 10 points 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  $SCT_{ave} \geq 50\%$  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 grade 5 points maximum
  3. Average % result of eLearning self control tests  
4 points for reaching 30%, +1 for each additional 10% reached 10 points maximum
- Total: 115 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 without writing a Part A test.)

5.4.2. Those who achieve  $SCT_{ave} \geq 66\%$  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. The actual requirements for taking a Cell Biology exam course can be checked at the Department's website: <https://biophys.med.unideb.hu/en/description-and-requirement-cell-biology>  
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. If Part A is passed in the exam, the % result of Part B expressed as points is converted to a grade as per 5.3.

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: multidrug  
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:** Dr. Katalin Goda and members of the Department

**Education manager:** Enikő Nizsalóczi (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 on the eLearning site.

Relevant parts of the Cell Biology Lecture course (see there).

**Course home page:** <https://biophys.med.unideb.hu>, [elearning.med.unideb.hu](http://elearning.med.unideb.hu)

**Signature:** Signing for the course can be denied if the student has not performed all the lab practices or any one 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 a log must be written into the book in a way that allows reproducing the work done. So it must document what the student has actually done, the results obtained

(including graphs and color drawings), and their interpretation. The lab tutor will only sign the log up-on proper, independent completion of the lab. All labs must be accepted by a valid signature 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 test at the beginning of the lab, graded on a scale of 0-5 according to the following table:

Number of correct answers	Test Points (TP)
less than 5	0
5	1
6	2
7	3
8	4
9-10	5

A TP of 0 results automatically in dismissal from the lab.

**Furthermore, if the student's participation in the lab is not acceptable, the lab tutor will dismiss the student from the lab immediately, and the lab will be considered failed.**

TP  $\geq 1$  are averaged and, after rounding, yield the final practical grade. If the average of the TP is below 1.5, it results in a practical grade 1 (fail). In these cases, a written lab exam can be done for the pass (2) mark before the exam period (covering the topics of all labs).

The practical grade cannot be improved in the exam period.

Since all labs must be accepted in order to receive the end of term signature (and a practical grade), those missing a lab are offered one (1) extra occasion to make up for the missed lab during the remedial week. This offer includes both the cases of writing a lab test of grade 0 earlier, and labs missed because of certified illness. In the latter case, certificates must be filed with the Education coordinator in Office Hours at the earliest possible occasion, so the student can be assigned a remedial lab appointment.

### Information for repeaters

The following special rules apply to those repeater (Medicine or Dentistry) students who took the unified (theory + practicals) Cell Biology course before the academic year of 2018/19.

1. These students have to be registered for the Cell Biology course (lecture, seminar, practice) with the "old" code (Medicine students: AOSEJ02T2, Dentistry students: FOSEJ04D2).
2. Students who completed all the labs and passed the lab exam will be exempted from repeating the labs. They must fill in a questionnaire about their previous studies in the e-learning system by the end of week 3.
3. The questionnaire can be found under the menu item Cell Biology Lecture Course: <https://elearning.med.unideb.hu/mod/questionnaire/view.php?id=38301>



4. Students with incomplete labs or a failed lab exam must attend and complete all labs during the semester. At the end of the semester scores of the written quizzes will be summed and evaluated as in the „Cell Biology Practical” course as described above. Students need to do all the labs and need to achieve a passing grade in order to receive a signature for their „Cell Biology” course. Grading of the course will be identical to the grading of the new „Cell Biology Lecture” course.

## 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 longitudinal section 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). Demonstration Tooth grinding (Fuchsin) **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. Hypophysis 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 epididymis.

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

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the Faculty of Medicine, University of Debrecen are valid.

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 three times 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. The self controls cover the topics of lectures and seminars of the semester, and include relevant material from official textbooks. Three Midterm examinations will cover the following topics:

Histology 1: Histology of the lip, tongue, salivary glands, teeth (including development), larynx, lymphatic tissue, skin, endocrine system.

Histology 2: Histology of the respiratory, digestive systems.

Histology 3: Histology of the urogenital system.

Evaluation of the midterm examinations:

Midterm examinations will be evaluated with points. Based on the sum of the points the student may earn 1 or 2 "Histology Bonus".

24 – 30 points (and all three SCTs are above 6 points) = 2 Histology Bonuses

18 – 23 points = 1 Histology Bonus

0 – 22 points = no Histology Bonus

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 "Anatomy, Histology and Embryology II. Practical" course. The Final exam is an oral examination that consists of two parts:

Part 1 – Anatomy + systems embryology (in the Dissecting Room; 4 topics /a1-a4/ from different regions of the human body with the continuous aid of anatomical preparations, and one more systems embryology topic /e1/).

If the student has a 4 (good) or 5 (excellent) mark from the "Anatomy, Histology and Embryology – II. Practical" course (earned 1 or 2 "Anatomy Bonus") the examiner will ask three topics (in case of 1 Anatomy Bonus) or only two topics (in case of 2 Anatomy Bonuses) on the "A" chance exam. The Bonuses cannot be used on "B" and "C" chances. The examiner decides which topic will be excluded from the exam. The embryology topic cannot be excluded. If the student fails any of the topics the examiner will not ask the remaining topics and the exam will be terminated. The anatomy and embryology topics are evaluated together, thus on the "B" and "C" examinations the student will have to redo all the topics again.

The 1st mark of the final examination =  $(a1+a2+a3+a4+e1)/5$  (rounded up from x.5 to the nearest integer)

The topic excluded due to an Anatomy Bonus is 5 in the calculation.

Part 2 - Histology (In the Histology seminar rooms; 3 histology slides /h1-h3/ and 1 general embryology /e2/ topic).

If the student earned one or two Histology Bonus(es) during the semester the examiner will ask two slides (in case of 1 Histology Bonus) or only one slide (in case of 2 Histology Bonuses) on the "A"

chance exam. The Bonuses cannot be used on "B" and "C" chances. The examiner decides which slides will be excluded from the exam. The embryology topic cannot be excluded. If the student fails any of the topics the examiner will not ask the remaining topics and the exam will be terminated. The histology slides and embryology topic are evaluated together, thus on the "B" and "C" examinations the student will have to redo all the topics again.

The 2nd mark of the final examination =  $(h_1+h_2+h_3+e_2)/4$  (rounded up to the nearest integer from x.5)

The topic excluded due to a Histology Bonus is 5 in the calculation.

Calculation of the mark for the final examination

The mark of the final examination is the average of the 1st and 2nd mark (rounded up from x.5 to the nearest integer)

Final mark =  $(\text{Part 1} + \text{Part 2}) / 2$

Registration for the examination:

Students are supposed to register for the exam through the NEPTUN system.

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 Vth and VIIth 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 middle part of the neck. Sulcus lateralis linguae, muscles of the floor of the mouth. Topography of the salivary glands. Dissection of the scalenotracheal fossa. Branches of the subclavian artery. Repetition of the superficial regions of the head and neck.

### 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 nuchal 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 your atlases with 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. End Semester Exam (ESE)

**a.** Male and female genital organs - demonstration of excised preparations. Placenta. Sacral plexus. **b.** ESE

### 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 another student's group. Altogether, compensation of three practices is allowed.

#### Rules of the End Semester Examination (ESE)

The exam is an oral examination conducted with the aid of anatomical preparations in the dissecting room, in the time of the practicals 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 ESE is 4 (good) the student will earn 1 “Anatomy Bonus”, while if the result of the ESE is 5 (excellent) the student will earn 2 “Anatomy Bonuses” for the Final Examination of the “Anatomy, Histology and Embryology – II. Lectures” course.

In case the student fails the ESE, the exam can be repeated once in the last week of the semester. Improvement of the ESE's mark is not allowed.

#### Registration for the examination:

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

## 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 mitochondrial 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 sphingolipids 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 of arginine and ornithine, their precursor functions: NO, creatine,

polyamines. Aspartate and asparagine degradation and synthesis in the oxaloacetate pathway. Degradation of amino acids in the succinyl-CoA pathway. The vitamin requirements and enzyme deficiencies in the propionyl CoA succinyl CoA conversion. Degradation of isoleucine and valine, related enzyme deficiencies. Comparison of leucine degradation with the degradation of isoleucine and valine. Degradation of lysine and tryptophane, their precursor functions. Carnitine synthesis. Degradation of phenylalanine and tyrosine, related enzyme deficiencies and precursor functions. Synthesis and degradation of catecholamines.

**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 the seminars. Only those students can get offered grade or take the exam of the theoretical course, who fulfilled the requirements of the practical course as well.

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 collecting 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 20 points can be collected by the seminar tests. Based on the test results, from 60% 8 points, from 65% 10 points, from 70% 12 points, from 75% 14 points, from 80% 16 points, from 85% 18 points, from 90% 20 points can be collected (please ask for more details the seminar teachers). The seminar 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. Further absences can't be accepted even with medical paper. Students can't make up seminars with another group.

Seminars are not obligatory for repeaters, if they have got signature previously. Seminar points

earned in the previous year will be automatically transferred into this year. Seminar points collected earlier, cannot be counted. Only those students can collect seminar points in this semester, who don't miss more than three seminars.

**Achievements during the semester will be evaluated in terms of points.** During the semester 110 points can be collected by the seminar tests (20 points) and by the two control tests from the material of the lectures (90 points). Control tests consist of all together 72 single- and multiple choice test questions (each for 1.25 points).

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

In the first semester, **grade will be offered** on the basis of the collected points for all those students, who collected at least 70 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 70 points, have to take a written exam in the exam period.

At the written **end-semester exam** 100 points can be collected, the test consists of 40 single- and multiple choice test questions from the lecture material (each question for 2.5 points). 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, and 90-100 excellent).

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

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).

Passing the course "Biochemistry I. Practical" is a required condition for obtaining the signature for "Biochemistry I. Lecture".

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

**Every laboratory practices have to be performed**, if someone is absent due to any serious reason, the missing experiment has to be performed within the three weeks practice period joining another group, after obtaining permissions from the education official of the department. There will also be a possibility after each three weeks period, on Monday afternoon, to do a make-up lab. For this make-up practice students have to be registered until the previous Friday 12 a.m. on email. Schedule of the practices will be posted on the homepage of the Department (bmbi.med.unideb.hu). During the practices students have to prepare notebooks. Students will write a starting test at the beginning of each practice and a final test from the material of the practices (on week 11). According to the points that are collected by the notebooks and practice tests, students will get a practice grade. 60% of the points have to be reached for the acceptance of the course. Practices are not obligatory for repeaters (if they have got a signature previously). Passing the course "Biochemistry I. Practical" is a required condition for obtaining the signature for "Biochemistry I. Lecture".

## 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

0-59

60-69

70-79

80-89

##### Grade

fail (1)

pass (2)

satisfactory (3)

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](http://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.

### 2nd week:

#### Lecture:

Red blood cells. Iron circulation.

Jaundice. Blood types.

Hemostasis 1

Hemostasis 2. White blood cells.

Electrical properties of the cell membrane

### 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

### 4th week:

#### Lecture:

Electrophysiology of cardiac myocyte

Mechanics and contractility of cardiac myocyte

Cardiac electrophysiology, ECG

The cardiac cycle

Cardiac mechanics

### 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

### 6th week:

#### Lecture:

Microcirculation

Lymphatic circulation, venous circulation

Components of vascular tone

Cardiovascular reflexes I.

Cardiovascular reflexes II.

### 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

**8th week:**

**Lecture:**

Measurement of intracellular Ca<sup>2+</sup> concentration  
 Mechanics of respiration  
 Compliance, work of breathing  
 Gas transport in the blood  
 Control of breathing

**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

**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

**11th week:**

**Lecture:**

Regulation of body temperature  
 Energetics of muscle contraction  
 Exercise physiology  
 Circulatory shock I.  
 Circulatory shock II.

**12th week:**

**Lecture:** Cardiovascular regulations under physiological and pathological conditions

**Self Control Test**

**14th week:**

**Self Control Test (Remedial)**

**Requirements**

1. Signature of the semester

Attendance of lectures and seminars is compulsory. The signature of the semester may be refused in case of more than three absences from the seminars. Completion of a missed seminar with a different group is not possible.

Each student must attend on seminars with the group specified by the Education Office. For continuous updates on all education-related matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

The Medical Physiology I lectures are listed at the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site, too.

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 [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

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
- one's Medical Physiology I. Practical mark is at least satisfactory (3); and
- (s)he has fewer than 5 lecture absences; and
- the Dept. of Physiology does not refuse the signature of semester.

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.

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 eeg recordings – recognition of eeg 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 uterine smooth muscle function

**9th week:**

**Practical:** Computer simulation of the Frank-Starling 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:** Lab exam

### Requirements

#### 1. Signature of the semester

Attendance of laboratory practices is compulsory. The signature of the semester may be refused in case of more than two absences from the practices.

All missed practices 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 on laboratory practices with the group specified by the Education Office. For continuous updates on all education-related matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

#### 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 Lab Exam. As a precondition of attending the Lab Exam, the fully completed Exercise Book (with all the verified topics) must be presented during the Lab Exam. Students are expected to perform the given experiment on their own and must be familiar with theoretical background also.

If the evaluation of the Lab Exam is 'fail' (1) then the Lab Exam can be repeated once during the exam period. There will be only one date for the improvement of the Lab Exam during the exam period.

Improvement of the successful Lab Exam grade is NOT possible during the regular examination period.

If the final evaluation of the Lab Exam is 'fail' (1) then one cannot take Medical Physiology I. end-semester exam (ESE).

If the final evaluation of the Lab Exam is 'pass' (2) then ESE mark based on the average score of mid-semester tests will NOT be offered even if the average score of the three mid-semester tests is above 60%.

## Department of Anatomy, Histology and Embryology

Subject: **NEUROBIOLOGY LECTURE**

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 vegetative 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 one 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

none

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 ESE includes all material delivered during the course (including lectures, seminars, and theoretical material from the Neurobiology Practical course). Students can only sign up for the ESE examination in the NEPTUN system after passing the "Neurobiology Practical "course. 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

Improvement of the grade is possible during the regular examination. The previous grade will be

discarded.

(For more details see the elearning website of the Faculty of Medicine.)

Subject: **NEUROBIOLOGY PRACTICAL**

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's cut, 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, circulation of 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:** Practical exam

### 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 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 on the same week with a different group subject to available space in the given room. Make up for practicals are only allowed twice in the semester. 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 subject 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. Course thematics can be downloaded from the elearning website of the Faculty of Medicine.

#### 2. Evaluation during the semester

None

#### 3. Examination

The semester is closed by an oral Practical exam (conducted in the dissecting room of the Department of Anatomy, Histology and Embryology). 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 material of the Practical exam covers all practices conducted by the Departments of Anatomy and Physiology. The practical exam is evaluated by a grade between 1 and 5 (1-fail, 2-pass, 3-satisfactory, 4-good, 5-excellent). If the evaluation of the Practical Exam is `fail` (1) then the Practical Exam can be repeated once during the exam period. There will be only one date for the improvement of the Practical Exam during the exam period.

Improvement of the grade is possible during the regular examination period. The previous grade will be discarded.

(For more details see the e-learning website of the Faculty of Medicine)

## 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. Posttranslational 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 sytem. 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 metabolism 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 barrier and the transport processes in the CNS

**11th week:**

**Lecture:** Neurobiochemistry II: Metabolical processes in the CNS, synthesis of neurotransmitters. Enzymatic processes in the production and degradation of neurotransmitters. Metabolism of the central nervous system, energy producing 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 the seminars. Only those students can get offered grade or take the exam of the theoretical course, who fulfilled the requirements of the practical course as well.

**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 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 20 points can be collected by the seminar tests. Based on the test results, from 60% 8 points, from 65% 10 points, from 70% 12 points, from 75% 14 points, from 80% 16 points, from 85% 18 points, from 90% 20 points can be collected (please ask for more details the seminar teachers). The seminar 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. Further absences can't be accepted even with medical paper. Students can't make up seminar with another group.

Seminars are not obligatory for repeaters (if they have got signature previously). Seminar points earned in the previous year will be automatically transferred into this year. Seminar points collected earlier, cannot be counted. Only those students can collect seminar points in this semester, who don't miss more than three seminars.

**Achievement during the semester will be evaluated in term of points.** During the semester 110 points can be collected by the seminar tests (20 points) and by the two control tests from the material of the lectures (90 points). Control tests consist of all together 72 single- and multiple choice test questions (each for 1.25 points).

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 10 exam bonus points, those who reach 80 points will get 16 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 100 points can be collected, the test consists of 40 single- and multiple choice test questions (each for 2,5 points) from "Molecular Biology" (5 questions), "Metabolism" (10 questions), "Cell- and organ biochemistry" (25 questions). Oral exam can be taken only if the student collects at least 60 % (60 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 two short „starting" questions: one basic question of molecular biology and a question about a basic medical orientation problem (of which biochemical background have to be explained). The „starting" questions have to be answered immediately. After properly answering the „starting" questions, students will have three theoretical questions (from metabolism, from cell- and from organ biochemistry). Questions of the oral examination will be posted on the website of the department at the end of the semester.

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).

Passing the course "Biochemistry II. Practical" is a required condition for obtaining the signature for "Biochemistry II. Lecture".



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.

**Self Control Test**

### Requirements

**Every laboratory practices must be performed**, if someone is absent due to any serious reason, the missing experiment has to be performed within the three weeks practice period joining another group, after obtaining permissions from the education official of the department. There will also be a possibility after each three weeks period, on Monday afternoon, to do a make-up lab. For this make-up practice students have to be registered until the previous Friday 12 a.m. on email. Schedule of the practices will be posted on the homepage of the Department ([bmbi.med.unideb.hu](http://bmbi.med.unideb.hu)). During the practices students have to prepare notebooks. Students will write a starting test at the beginning of each practice and a final test from the material of the practices at the end of the whole practice period. According to the points that are collected by the notebooks and practice tests, students will get a practice grade. 60% of the points have to be reached for the acceptance of the course. Practices are not obligatory for repeaters (if they have got a signature previously). Passing the course “Biochemistry II. Practical” is a required condition for obtaining the signature for “Biochemistry II. Lecture”.

## 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

#### 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 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.

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

If the final score 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](http://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

**Practical:** Remedial lab

**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 and seminars is compulsory. The signature of the semester may be refused in case of more than three absences from the seminars. 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.

Each student must attend on seminars with the group specified by the Education Office. For continuous updates on all education-related matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

The Medical Physiology II lectures are listed at the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site, too.

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 [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

Depending on the average result of the five self-controls of 2019/2020 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.

These special advantages are withdrawn

- if the signature of the semester is refused; or
- if the final evaluation of the Lab Exam is worse than `satisfactory` (3); or
- in cases of more than four lecture absences.

- 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 2019/2020 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 score 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%.

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 uterine 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:** Lab exam

### Requirements

1. Signature of the semester

Attendance of laboratory practices is compulsory. The signature of the semester may be refused in case of more than two absences from the practices.

All missed practices 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 on laboratory practices with the group specified by the Education Office. For continuous updates on all education-related matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

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 Lab Exam. As a precondition of attending the Lab Exam, the fully completed Exercise Book (with all the verified topics) must be presented during the Lab Exam. Students are expected to perform the given experiment on their own and must be familiar with theoretical background also.

If the evaluation of the Lab Exam is `fail` (1) then the Lab Exam can be repeated once during the exam period. There will be only one date for the improvement of the Lab Exam during the exam period.

Improvement of the successful Lab Exam grade is NOT possible.

If the final evaluation of the Lab Exam is `fail` (1) then one cannot take Medical Physiology II end-semester exam (ESE).

If the final evaluation of the Lab Exam is `pass` (2) then all special advantages listed at the Medical Physiology II are withdrawn!

## 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](http://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 histocompatibility (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:** Structure and function of proteins encoded by the major histocompatibility (MHC) gene complex. Processing and presentation of antigens. T-lymphocytes. Requirements and consequences of T-cell activation.

### 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. The role of innate lymphoid cells in immunresponse.

**Seminar:** 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.

**5th week:**

**Lecture:** Generation of B-cell receptor diversity. Antigen-independent differentiation of B-lymphocytes. Antigen-dependent differentiation of B-lymphocytes. B-cell activation. Production of various antibody isotypes and their functions.

**Seminar:** 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. The role of innate lymphoid cells in immunoresponse.

**Self Control Test****6th week:**

**Lecture:** Effector function of helper T-cell. Activation and function of cytotoxic T-lymphocytes. T-cell development. Central tolerance. Mechanisms of peripheral tolerance.

**Seminar:** Generation of B-cell receptor diversity. Antigen-independent differentiation of B-lymphocytes. Antigen-dependent differentiation of B-lymphocytes. B-cell activation. Production of various antibody isotypes and their functions.

**7th week:**

**Lecture:** The function of regulatory T-cells. The development of immunological memory. Monoclonal antibodies. Vaccination.

**Seminar:** Effector function of helper T-cell. Activation and function of cytotoxic T-lymphocytes. T-cell development. Central tolerance. Mechanisms of peripheral tolerance.

**8th week:**

**Lecture:** Tumor immunology. Tumor antigens and immune response to tumors. Escape mechanisms of tumors, suppression of anti-tumor responses.

**Seminar:** The function of regulatory T-cells. The development of immunological memory. Monoclonal antibodies. Vaccination.

**9th week:**

**Lecture:** The immune response to intracellular pathogens. The immune response to extracellular pathogens. Hypersensitivity reactions, Type I hypersensitivity (Allergy). Hypersensitivity reactions, Type II-IV hypersensitivity.

**Seminar:** Tumor immunology. Tumor antigens and immune response to tumors. Escape mechanisms of tumors, suppression of anti-tumor responses.

**Self Control Test****10th week:**

**Lecture:** Mechanisms of the development of autoimmune diseases. Characteristics of the organ-specific autoimmune diseases.

Characteristics of the systemic autoimmune diseases. The immune system in pregnancy.

**Seminar:** The immune response to intracellular pathogens. The immune response to extracellular pathogens. Hypersensitivity reactions, Type I hypersensitivity (Allergy). Hypersensitivity reactions, Type II-IV hypersensitivity.

**11th week:**

**Lecture:** Congenital immunodeficiencies I (B-cell deficiencies). Congenital immunodeficiencies II (T-cell deficiencies). The immune response associated with tissue and organ transplantation. Hematopoietic stem-cell transplantation.

**Seminar:** Mechanisms of the development of autoimmune diseases. Characteristics of the organ-specific autoimmune diseases. Characteristics of the systemic autoimmune diseases. The immune system in pregnancy.

**12th week:**

**Lecture:** Trends/Perspective in immunology R&D technology.

**Practical:** Congenital immunodeficiencies. The utility of flow cytometry in diagnosis, in clinical- and basic medical research.

**Self Control Test****13th week:**

**Practical:** Agglutination, qualitative determination of rheumatoid factor.

**14th week:**

**Practical:** The methodology of the Enzyme Linked Immunosorbent Assay (ELISA) and its

use in clinical diagnosis, clinical and basic research.

### 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 12.).

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 4-7 and 9-12, 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](http://www.elearning.med.unideb.hu)).

Lecture materials and other information concerning education can be found on our website at [www.elearning.med.unideb.hu](http://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 venousvascular 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

Attendance of the lectures is not compulsory; however, it is highly recommended. Certain parts of the knowledge may not be accessible in the textbooks but may be asked during the exams.

Attendance of the practices is compulsory. Nobody can be absent from any practice unless due to well-documented reasons. The missed practice should be replaced within one week.

Examination:

Written test: 20 questions from the pool of the minimum questions (pass limit is 90%).

Practical examination (oral): bedside history taking, physical examination and laboratories.

Theoretical examination (oral): 2 topics are asked from the exam topic pool.

The minimum questions and the theoretical exam topics are available on <https://elearning.med.unideb.hu>; under the tag *Education*.

Exam seats will be available on the Neptun. We recommend to plan ahead carefully since the department will not provide extra seats once Neptun is opened for the exam period. Students that fail on the written exam may not proceed to the oral parts on the same day. Students having a successful written exam but failing either on the practical or the theoretical exam should retake both oral parts of the exam (this applies to improvement exams, as well).

Suggested reading: Lynn S. Bickley: Bates' Guide to Physical Examination & History Taking. Twelfth edition; LWW, 2016 or later.

## 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 acute 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 acute and chronic leukemias and lymphomas II.  
19. Laboratory diagnostics of acute 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 diseases. 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 ABO 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:** Immunoassay

**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 Mycoplasmas)

**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. Cholesterosis 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, heterogeneity and progression).- Characteristics of benign and malignant tumors. Differentiation and anaplasia.

**Practical:** 22. Bronchopneumonia with lung abscess 23. Septic abscesses in the myocardium 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. Keratoacanthoma 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, immunosuppression, 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. Polymyositis 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 lymphocytic 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. In the 2nd semester slides comes form the 1st and 2nd semester.

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

<p><b>5th week:</b>  <b>Lecture:</b> Role of viruses in the malignant transformation. I. Carcinogenic DNA viruses.</p>	<p>cancer diagnosis and to search for alterations in the cancer genome</p>
<p><b>6th week:</b>  <b>Lecture:</b> Role of viruses in the malignant transformation. II. Carcinogenic RNA viruses.</p>	<p><b>10th week:</b>  <b>Lecture:</b> Cancer stem cells</p>
<p><b>7th week:</b>  <b>Lecture:</b> Chemical carcinogenesis. Carcinogenic chemicals in the environment</p>	<p><b>11th week:</b>  <b>Lecture:</b> Epidemiology of malignant diseases</p>
<p><b>8th week:</b>  <b>Lecture:</b> Tumor immunology in clinical practice</p>	<p><b>12th week:</b>  <b>Lecture:</b> Cancer screening. Cancer registries</p>
<p><b>9th week:</b>  <b>Lecture:</b> Molecular biological techniques in</p>	<p><b>13th week:</b>  <b>Lecture:</b> Prevention strategies in cancer</p>

### 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 programmes 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 suture materials. Suturing and knotting techniques.

**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 suturing techniques on surgical training model.

### 4th week:

**Lecture:** Asepsis, antiseptics. 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:** Tracheostomy and conicotomy - video-demonstration.

**Practical:** Conicotomy on phantom model.

Repeat: Scrubbing. Wound closure with different suturing techniques on biopreparate model.

### 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: Scrubbing. Wound closure with different suturing techniques on biopreparate model.

### 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. Parenchymal stitches on spleen biopreparate model. Repeat: Wound closure with different suturing techniques on biopreparate model.

**11th week:**

**Lecture:** Bioplasts and tissue adhesives. Drains, punctures (thoracal, abdominal).

**Seminar:** Application of surgical tissue adhesives and bioplasts.

**Practical:** Repeat: Scrubbing. Vein preparation, cannulation on phantom model. Wound closure with different suturing 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 into the new surgical techniques, procedures.

**Seminar:** Repeating of all practices by video-demonstration.

**Practical:** Repeat: Scrubbing. Wound closure with different suturing 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 seminars/practices from the 1st to the 5th 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 lectures from the 1st to the 5th 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](http://www.surg.res.dote.hu)

All the supplementary materials (handouts) required for 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 legitimacy.

**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 text analysis.

**15th week:**

**Seminar:** 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:** Basic Course Information

**2nd week:**

**Lecture:** Introduction to Sociology

**3rd week:**

**Lecture:** Introduction to Medical Sociology

**4th week:**

**Lecture:** Medicalization

**5th week:**

**Seminar:** The concept of health measuring health at population level civilisation illnesses.

The concept of risk factor

**6th week:**

**Seminar:** Presentations I.

**7th week:**

**Seminar:** Presentations II.

**8th week:**

**Seminar:** Exam

**12th week:**

**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](http://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 autoimmune diseases

2. Systemic lupus erythematosus. (SLE)

3. Antiphospholipid syndrome. Plasmapheresis

**Practical:** UCTD.

### 2nd week:

**Lecture:** 4. Raynaud's syndrome.

5. Systemic sclerosis.

6. Undifferentiated connective tissue disease

(UCTD) Mixed Connective tissue disease

(MCTD).

**Practical:** SLE, APS.

### 3rd week:

**Lecture:** 7. Adult immunodeficiencies, immunity and pregnancy

8. Sjögren's syndrome, secondary vasculitides

9. Systemic vasculitides

**Practical:** PSS and Raynaud's syndrome.

MCTD.

### 4th week:

**Lecture:** 10. Immunomodulation in the treatment of autoimmune diseases.

11. Organspecific autoimmune diseases.

12. Coeliac disease, food allergy

**Practical:** Sjögren's syndrome and vasculitis.

### 5th week:

**Lecture:** 13. Idiopathic inflammatory myopathies.

14. Laboratory diagnostics of autoimmune, allergic diseases and immunodeficiencies.

15. Atopic, allergic diseases

**Practical:** Polymyositis and dermatomyositis.

### 6th week:

**Lecture:** 16. Introduction to rheumatology: history taking, physical exam, diagnostics and therapy

17. Tumor immunology

18. Rheumatoid arthritis.

**Practical:** Physical examination. Presentation of case with RA and other types of arthritis.

**7th week:**

**Lecture:** 19. Spondyloarthritides  
20. Early arthritis and special forms of RA (Felty, Caplan, juvenile idiopathic arthritis, adult onset Still's syndrome)

21. Reactive and septic arthritides

**Practical:** Presentation of a case with RA and spondyloarthritides.

**8th week:**

**Lecture:** 22. Osteoporosis. Metabolic bone diseases.

23. Crystal deposition diseases.

24. Osteoarthritis, spondylosis. Low back pain.

**Practical:** Presentation of a case with gout, osteoporosis and other arthritides.

**9th week:**

**Lecture:** 25. DMARD therapy in inflammatory arthritides, pain management

26. Soft tissue rheumatism, compression syndromes.

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,  $\geq 85\%$ ), 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. Pathobiochemistry 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, bacteremia, 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, Rubella virus

**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

14. Herpesviruses II

**Practical:** Cestodes, Nematodes

**8th week:**

**Lecture:** 15. Adenoviridae, Parvoviridae

16. Picornaviridae, Reoviridae

**Practical:** Laboratory diagnosis of viral infections

**9th week:**

**Lecture:** 17. Rabies, slow virus infections

18. Arbo- and Reoviruses

**Practical:** Respiratory tract infections caused by viruses

**10th week:**

**Lecture:** 19. AIDS viruses

20. Human tumor viruses

**Practical:** Agents of viral skin rash. Congenital virus infections

**11th week:**

**Practical:** Agents of viral gastroenteritis. Hepatitis viruses

**12th week:**

**Practical:** 4th WRITTEN EXAMINATION (Parasitology, Virology)

**Self Control Test**

**13th week:**

**Practical:** Epidemics in human history

**14th week:**

**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. - Infectious 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 peripheral 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 naevus 61. Superficial spreading

malignant melanoma 62. 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. Intra bronchial 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 ventriculi 77. 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 thyroiditis 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. Inherited 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. Chondroma 98. 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. In the 2nd semester slides comes from the 1st and 2nd semester.

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  $Ca^{2+}$ -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 arrhythmias,



evaluation of ECG recordings.

**5th week:**

**Lecture:** Heart failure (molecular pathophysiology).

**Seminar:** Conduction disorders, ECG signs 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 10th week 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 adviser 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](http://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-psychico-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 sociocultural 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 (vulnerability, 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.

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### 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

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### Department of Internal Medicine

Subject: **INTERNAL MEDICINE BLOCK PRACTICE I. - 4TH YEAR**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Practical: **60**

### Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY BLOCK PRACTICE - 4TH YEAR**

Year, Semester: 4th year/1st semester, 4th year/2nd 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 of Obstetrics and Gynecology. History taking in pregnancy

**2nd week:**

**Lecture:** Physiological pregnancy

**Practical:** Essential points of obstetric history. Special aspects of 1st, 2nd and 3rd trimester of pregnancy. Calculation and estimation of gestational age.

**3rd week:**

**Lecture:** Antenatal care

**Practical:** Differentiation of low-risk and high-risk pregnancy. Physical exam of the pregnant woman.

**4th week:**

**Lecture:** Labour

**Practical:** To be held in the Center for Medical Simulation: mechanism of labour. Hands-on training in manual maneuvers during delivery. Demonstration of instrumental vaginal delivery. Physical and instrumental methods of

examination of the intrauterine fetus. Hands-on training in obstetric ultrasound with simulation equipment.

**5th week:**

**Lecture:** Fetal assessment

**Practical:**

to be held in the Center for Medical Simulation: mechanism of labour. Hands-on training in manual maneuvers during delivery. Demonstration of instrumental vaginal delivery Physical and instrumental methods of examination of the intrauterine fetus. Hands-on training in obstetric ultrasound with simulation equipment

**6th week:**

**Lecture:** Preterm labour

**Practical:**

Identifying risk factors for preterm birth. Physical examination of the pregnant woman.

**7th week:**

**Lecture:** Preeclampsia

**Practical:**

Practice of antenatal care. Examinations for recognizing preeclampsia

**8th week:**

**Lecture:** Haemorrhagic complications

**Practical:** Laboratory tests in pregnancy.

Physical exam of postpartum patients, recognizing postpartum complications.

**9th week:**

**Lecture:** Interventional obstetrics

**Practical:**

Caesarean section. Informed consent in obstetrics.

**10th week:**

**Lecture:** Miscarriage, abortion, ectopic pregnancy

**Practical:**

Early pregnancy complications, use of ultrasound in the diagnosis.

**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. Makeups must be done in the same week as when the missed practice was, because different topics are scheduled for each week. Signature in the lecture book will be declined if more than one absence is on record at the end of the semester.

Block practices (5x6 hours) are organized according to the curriculum. Students are allocated to a named tutor, and take part in patient care actively under their supervision at wards and at 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 at the exam.

End of semester exams (ESE) (oral) are taken in the exam period, 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 and on the departmental website. 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/1st 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 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 II Lecture, Medical Physiology II Lecture

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](http://www.dresscodeguide.com); [www.dresscode.hu](http://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](http://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. Environmental 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 studies 14. 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

**10th week:**

**Lecture:** 29. Interventional studies 30. Screening

**Seminar:** 19. Clinical trials 20. Screening programs

### Requirements

Attendance of lectures is highly recommended. At the end of the second semester, Endre Jeney Memorial Contest will be open to students who have attended at least 60-60% of the lectures in the two semester. Student participation is recorded electronically in lectures. At the end of the lectures, students answer questions related to the topic of the lecture. Students who respond correctly will receive bonus points that will be credited to the results of the Memorial Contest. The Contest will cover first and second semester lectures and seminars.

Attendance of the laboratory practices, group seminars is obligatory. The head of the Department may refuse to accept the semester 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) students are required to take a written test which will cover the topics of all lectures and seminars of the first semester using the e-learning system. 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 [www.elearning.med.unideb.hu](http://www.elearning.med.unideb.hu)

## Department of Surgery

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:** Lecture 1: 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.

Subject: **SURGERY/SMALL SURGERY BLOCK PRACTICE - 4TH YEAR**

Year, Semester: 4th year/1st semester, 4th year/2nd 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.

## 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: delayed 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. Pneumothorax, 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 inervation. 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, orthoses. Traction treatment.

**9th week:**

**Practical:** Operative fracture treatment. Implantations. Metallosis, corrosion, metal allergy. Types of osteosyntheses. Diagnostic and operative arthroscopy. Basic principles of osteosyntheses.

**10th week:**

**Practical:** Treatment of seriously injured patients. ATLS (Advanced Trauma Life Support). Resuscitation.

### Requirements

The lectures will take place in the Augustza big lecture hall. We strongly advise to participate on the lectures, because the official 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:

emphasized 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 stenosis 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 the heart.

### 5th week:

**Lecture:** 9. Pathomechanism, symptoms and diagnosis of heart failure. Classification of cardiomyopathies.  
10. Pharmacological therapy of acute and chronic heart failure.  
**Practical:** Peripheral artery disease.

### 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, bicuspid 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:** Musculoskeletal radiology.

**Practical:** Musculoskeletal 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. Lectures are interactive to increase student attendance.

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 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:** 1.Lecture: Developmental disorders, surgery of the cleft lip and palate, craniofacial surgery

2.Lecture.:Inflammatory diseases of the maxillofacial region

**Practical:** 1.practice: Anatomy of the maxillofacial region.

Physical and complementary examinations, imaging techniques in OMF surgery.

Local anaesthesia in the oral cavity.

2. practice: Simple tooth extraction and possible complications.

Instruments of the tooth extraction.

Dentoalveolar surgery

### 7th week:

**Lecture:** 3. Lecture: Dental and maxillofacial traumatology.

4. Lecture: Head and neck oncology

**Practical:** 1.Practice Cysts of the jaws. Diseases of the sinus.

2. Practice Orthognathic surgery.

### 8th week:

**Lecture:** 5. Lecture: Oral Medicine

6. Lecture: Restorative Dentistry

**Practical:** 1.practice: Treatment and prevention of periodontal diseases.

2.practice: Dental caries and diseases of the dental pulp and their treatments.

Focal infections.

### 9th week:

**Lecture:** 7.Lecture: Prosthetic Dentistry.

Implantology. The basic principles of gnathology.

8.Lecture Pediatric Dentistry. Preventive Dentistry.

**Practical:** 1 practice: Possibilities of replacing missing teeth. Oral rehabilitations. Removable and fixed prosthodontics.

2.practice: Prevention,

Pediatric Dentistry,

Orthodontics.

### 10th week:

**Lecture:** 9. Lecture: Differential diagnosis of the

facial pain. Neurological diseases of the head and neck region. Disorders of the temporomandibular joints	10.Lecture: Orthodontics.
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### 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. During the semester the number of uncompensated practical occasion cannot exceed one (2 hours). The number of compensated practices can be max. 1 occasion.

All absences need to be certified.

The exam is ESE, an electronic 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 datamanagement 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 scarce resources.

**Seminar:** Distributive justice in the clinic.

#### 6th week:

**Seminar:** Confidentiality and datamanagement in clinical practice.

#### 7th week:

**Seminar:** Informed consent in practice.

#### 8th week:

**Seminar:** Ethics of end-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: **4TH YEAR SUMMER PRACTICE**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Practical: **90**

Subject: **INTERNAL MEDICINE BLOCK PRACTICE II. - 4TH YEAR**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Practical: **60**

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. Congenital 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

**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. Makeups must be done in the same week as when the missed practice was, because different topics

are scheduled for each week. Signature in the lecture book will be declined if more than one absence is on record at the end of the semester.

Block practices (5x6 hours) are organized according to the curriculum. Students are allocated to a named tutor, and take part in patient care actively under their supervision at wards and at 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 at the exam.

End of semester exams (ESE) (oral) are taken in the exam period, 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 and on the departmental website. Information on the practical part of the exam will be spread out during the semester.

## 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, agonists 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 hormone

**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  
 $\beta$ -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:** Antihelminthic 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 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 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 have to be failed. For further details visit our website: [pharmacology.med.unideb.hu](http://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 diseases 2.

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.

Nosocomial infections: surveillance and prevention

### 3rd week:

**Lecture:** 7. Epidemiology of nosocomial infections 8. Vaccines and immunization 9. 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 care 10. 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 care 12. 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 promotion 14. 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. Health policy analysis 16. Health technology assessment and economic evaluation

### 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)

**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**

Attendance of lectures is highly recommended. At the end of the second semester, Endre Jeney Memorial Contest will be open to students who have attended at least 60-60% of the lectures during the two semester. Student participation is recorded electronically in lectures. At the end of the lectures, students answer questions related to the topic of the lecture. Students who respond correctly will receive bonus points that will be credited to the results of the memorial contest. The contest will cover first and second semester lectures and seminars.

Attendance of group seminars, laboratory practices is obligatory. The head of the department may refuse to accept the semester 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.

The final exam (at the end of the second semester) consists of a written part and a practical exam (oral and written). The oral practical 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 lectures and seminars of the full academic year. It is composed of three parts: environmental health (environmental health, nutrition & health, occupational health) epidemiology (biostatistics, methods, clinical epidemiology, non-communicable diseases, and communicable diseases), and health promotion and health policy/economics 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.

-if the student's calculated average is between  $x.25 \leq$  and  $\geq x.75$ , the student will get the opportunity to get a better mark by having extra oral questions

- if the student refuses the opportunity to improve he / she will get the worse grade

- if the average is below  $x.25$  or above  $x.75$  the grade is automatically recorded

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. In case of failed exam the student is obliged to repeat only the failed part of the final exam, the accepted grade(s) are considered in the evaluation of the final grade. In case of successful exam the student can choose part(s) to improve, the accepted grade(s) are considered in the evaluation of the final grade.

The slides of lectures and seminars can be downloaded from [www.elearning.med.unideb.hu](http://www.elearning.med.unideb.hu)

## 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, emphysema, 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 immunopathogenetic based pulmonary disease. Interstitial 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.

### 15th week:

**Lecture:** Collection of chest X-ray for the exam.

### Requirements

The rules written in the statute 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, he/she will not get signature.

The final examination will consist of a practical (X-ray examination) and an 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 suprapubic 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, testicular 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. Nosocomial 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. Congenital 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:** Genomic medicine I-II.

### 4th week:

**Lecture:** Personalized medicine. Pharmacogenetics.

### 5th week:

**Lecture:** Biochemical genetics. Hereditary cancer genetics.

### 6th week:

**Lecture:** Quality management in genetic testing, risk assessment in monogenic diseases. Clinical cytogenetics.

### 7th week:

**Lecture:** Genetic counselling I. Prenatal diagnostics.

### 8th week:

**Lecture:** Genetic counselling II. Syndromology.

### 9th week:

**Lecture:** Genetics of mental retardation. Genetics of multifactorial diseases.

### 10th week:

**Lecture:** Genetics of infertility. Case presentations, interpretation of test results.

## 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 in endocrinology.

Radioiodine therapy of hyperthyroidism.

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 "Izotópdiaagnosztika/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:

Lecture: **10**

Practical: **10**

**6th week:**

**Lecture:** Introduction. Psychological aspects of somatic diseases: cardiovascular and respiratory diseases.

**Practical:** Introduction. Assessing prior

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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-psychosocial 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

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### 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, nosocomial 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:** 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

**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:** Bloodstream infections and sepsis

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 /Department of Pediatric Infectious

Diseases, Pediatric Clinic, University of Debrecen, Clinical Centre

**7th week:**

**Lecture:**

Gastrointestinal infections. Urinary infections.

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 / University of Debrecen Clinical Centre

**8th week:**

**Lecture:**

Zoonoses

Exanthematous 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

**9th week:**

**Lecture:**

HIV/AIDS. Tropical infections

Traveller's 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

**10th week:**

**Lecture:**

Vaccination

Infectious disease's News. Summary

**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

**Requirements**

**Course objectives:** to instill 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, dermatological prescriptions

### 6th week:

**Lecture:** Mycotic infections Systemic 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

**15th week:**

**Lecture:** Examination week

**Seminar:** Examination week

**Practical:** Examination week

### Requirements

Requirements for signing the lecture book:

Presence of the students is recorded at all practices and compulsory lectures assigned.

Attendance is obligatory at all practicals and compulsory lectures. Presence can be checked up during as well as at the end of the occasions. If the student is not present at the control, it is considered as an absence.

The number of missed practicals can not exceed 1 occasions (2 practical hours). Absences superior to this number are subjects to compensation. A maximum of 2 practicals (4 practical hours) can be compensated during one semester. Compensations performed beyond the semester will be charged for each occasion.

No signature will be given in lecture book with more than 1 uncompensated practice and 2 unattended compulsory lectures..

The written tests (prescription test, patient admission test) have to be completed, otherwise no signature will be given in lecture book.

Lectures are very important sources of information. No regard will be taken to anyone's absence, with other words: at any test during the semester, including the final exam, questions concerning topics that were discussed only at a lecture, where the student was absent, may and will be asked from any student.

## Department of 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 (A00XY03T9) 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 BLOCK PRACTICE I. - 5TH YEAR**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Practical: **60**

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. Irritable bowel syndrome

**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:** Disorders of the oesophagus and the stomach

**7th week:**

**Lecture:** 1. Acute pancreatitis. 2. Chronic pancreatitis, pancreatic tumors.

**Practical:** Disorders of the small and large intestines

**8th week:**

**Lecture:** 1. Diabetes mellitus: pathomechanism, types, clinical symptoms and complications. 2. Management of type 2 diabetes mellitus

**Practical:** Endoscopic presentation

**9th week:**

**Lecture:** 1. Type 1 diabetes mellitus, insulin therapy 2. Case presentation. Obesity: etiology, diagnosis and treatment. Gout.

**Practical:** Disorders of the liver and the pancreas

**10th week:**

**Lecture:** 1. Primary and secondary hyperlipoproteinemias: types, symptoms and treatment. Porphyrias 2. Electrolyte disorders, metabolic bone disorders

**Practical:** Diabetes mellitus. Disorders of lipid metabolism

**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, 5th year/1st 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 Monday 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 Csépany Tünde Cecília, deputy: Dr. Csapó Krisztina

Office hours at Secretary: Monday, Wednesday, Friday 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 Csépany Tünde Cecília, deputy: Dr. Csapó Krisztina

Office hours at Secretary: Monday, Wednesday, Friday 13:00-14:00

**Material for students: [neurology.dote.hu](http://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.

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 BLOCK PRACTICE - 5TH YEAR**

Year, Semester: 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Practical: **60**

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: Gábor Veres 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.  
Neonatal characteristics of renal function, urinary tract disorders. Lecturer: Dr. Tamás Szabó M.D., Ph.D.

### 3rd week:

**Lecture:** Special problems of prematurity (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.D.

### 4th week:

**Lecture:** Gastrointestinal disorders in infancy. Lecturer: Gábor Veres M.D., Ph.D., D.Sc.  
Hemolytic disease of the newborn. Jaundice in the neonatal and infant period. Lecturer: Katalin Szakszon M.D., Ph.D.

### 5th week:

**Lecture:** Congenital and acquired 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 leukomalacia. Habilitation. Lecturer: Ilona György M.D., Ph.D.

### 6th week:

**Lecture:** Birth injuries. Lecturer: Katalin Szakszon M.D., Ph.D.  
Cardiac emergencies in newborns and infants. Lecturer: Gábor Mogyorósy M.D., Ph.D.



**7th week:**

**Lecture:** Immunodeficiencies and autoimmune diseases in childhood

Lecturer: Rita Káposzta M.D., Ph.D.

Fluid and electrolyte balance. Acid-base balance disorders: acidosis, alkalosis. Lecturer: Tamás Kovács M.D.

**8th week:**

**Lecture:** Hypo- and hyperglycemia, metabolic diseases, screening. Lecturer: Enikő Felszeghy M.D.

**9th week:**

**Lecture:** Intrauterine and neonatal infections.

Lecturer: György Balla M.D., Ph.D., D.Sc.

Diseases of central nervous system in newborns

Lecturer: Andrea Nagy M.D.

**10th week:**

**Lecture:** Principles and practice of mechanical ventilation

Lecturer: Tamás Kovács M.D.

Failure to thrive in children.

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 psychiatry. Overlap between psychiatry 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 Delhi. 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, O<sub>2</sub> 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-electrolyte 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 the 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 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, hepatocellular 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.

## 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 BLOCK PRACTICE II. - 5TH YEAR**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Practical: **60**

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,

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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: [www.1000questions.com](#), 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. Csépanyi Tünde Cecília, deputy: Dr. Csapó Krisztina

Office hours at Secretary: Monday, Wednesday, Friday 13:00-14:00

**Material for student: [neurology.dote.hu](http://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. Practical exam will be performed at the leader of the group after the last practice.

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. Tumors. 6. Strabismus

**Practical:** Keratometry, topography, contact lenses. Low vision aids.

### 4th week:

**Lecture:** 7. Glaucoma. 8. Diseases of the uvea and the vitreous

**Practical:** Visual field, perimetry. Color vision.

### 5th week:

**Lecture:** 9. Orbit and the Lids. 10. 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](http://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 of the external and middle ear, disorders of the pinna and external canal.

Acute suppurative otitis media  
Chronic otitis media and complications of otitis media

### Practical:

Exposition of general methods in otorhinolaryngology. Demonstration of instruments required at basic examinations: practicing of their use. (Use of the head mirror, otological examination with aural-speculum, examination with Otoscopy, rhinoscopy anterior, rhinoscopy posterior, laryngeal examination with mirror, pharyngeal examination). Physiology of hearing-practice in audiometry (whispering speech, conversational speech, examination s with tuning-fork, threshold audiometry, objective audiometry and special tests). Audiometrical methods in practice.

### 2nd week:

**Lecture:** 1. Anatomy of the cochlea. Disorders of the inner ear (inner ear diseases)

Audiological examination.

Rehabilitation of the hearing loss.

**Practical:** Symptomatology of ear diseases,

Investigation of functioning of auditory tube

(Valsalva's experiment, Politzer's test,

tympanometry). Vestibular examinations.

Evaluation of spontaneous vestibular symptoms.

Included examinations. (Rotational examination

of electrical rotatory chair, electrony

stagnography, analysis of optokinetic and

positional nystagmus). Demonstration of

examination methods.

### 3rd week:

**Lecture:** 1. Disorders of the nose and paranasal sinus

Tumors of the nose and paranasal sinuses

**Practical:** Exposition and demonstration of ear operations, Tympanoplastical operations.

Antrotomy, mastoidectomy, the essence of radical ear operation. (Operating theatre, videoprogram). Nose and paranasal sinus operations, nasal endoscopy videoprogram). Demonstration of maxillary sinus puncture. Indications of tonsillectomy and adenotomy. Sight of the operation. Control method of epistaxis. Anterior nasal packing and Belloque-tamponade.

**4th week:**

**Lecture:** 1. The pharynx (inflammatory disorders, neoplasm)  
The larynx (inflammatory disorders)

**Practical:** Diff. diagnosis of cervical masses. Cervical nodes, cervical trigones. Importance of cryosurgery in otorhinolaryngological practice. Examination of patients. Malignant diseases of larynx. Presentation of larynx operations/video or Operating theater/. Examination of patients. Examinations with the endoscope in otorhinolaryngological practice.  
Written test of ORL

**5th week:**

**Lecture:** 1. Benign and malignant disorders of the larynx

The salivatory glands.  
Differential diagnosis of neck masses

**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.  
Practical exam

**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, gastroesophageal 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

## 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. Csépany Tünde Cecília, deputy: Dr. Csapó Krisztina

Office hours at Secretary: Monday, Wednesday, Friday 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.

The slides of the lectures and up-to-date information can be found at website: [neurology.dote.hu](http://neurology.dote.hu)

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 psychotherapeutic ward and 2 weeks in general psychiatric 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 small and large group 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 examine psychiatric patient, etc.

Oral: three titles

If the student could not pass the examination, he/she must spend two more weeks 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 Faculty of Medicine 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:

one screening question. Its proper answer is the condition for the continuance of the exam.

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 (3 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

## CHAPTER 19

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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

### Affiliated Department of Infectology

Subject: **TRAVEL AND TROPICAL MEDICINE, VACCINATIONS**

Year, Semester: 4th year/2nd semester, 5th year/2nd semester, 6th year/2nd semester

Number of teaching hours:

Lecture: **20**

Practical: **5**

**1st week:**

**Lecture:** Principles of travel medicine, accessing travel health information, travelling for immunocompromised or immunosuppressed individuals.

**2nd week:**

**Lecture:** Tropical diseases from a public health perspective. Infection control, antibiotic prophylaxis

**3rd week:**

**Lecture:** Vector-born and protozoal infections in the tropics (Chagas-disease, Malaria profilaxis, Common Intestinal Roundworms, the Eosinophilic Patient with Suspected Parasitic Infections, Trematodes, Filarial Infections)

**4th week:**

**Lecture:** Common food and water-born infections (Approach to Diarrhea in Returned Travellers, Leptospirosis, Typhoid fever)

**5th week:**

**Lecture:** Viral hemorrhagic fevers, exotic infections. (Leishmaniasis, Viral Hepatitis in Travelers and Immigrants, Yellow fever vaccinations)

**6th week:**

**Lecture:** Tropical bacterial and fungal infections

**7th week:**

**Lecture:** Sexually transmitted diseases in the tropics, with emphasis on HIV (Gonococcal and Chlamydial Infections and Foreign Travel, Pelvic Inflammatory Disease, Syphilis, Genital Ulcer Disease)

**8th week:**

**Lecture:** Impact of neglected tropical diseases, preventive measures, implementing effective public health strategies

**9th week:**

**Lecture:** Role of - and implementation of vaccinations as prophylactic measures in travel medicine. (Pre-travel Advice, Urban Medicine, Jet Health, Immunization for Travelers, Malaria Prevention, Water Disinfection, Jet Lag, Motion Sickness, Cold Exposure, and Heat Illness)

**10th week:**

**Lecture:** Advice for Special Travelers (High Altitude Travel, Dive Medicine, Pediatric Travelers, Students Abroad, Advice for Women Travelers). Conclusion and highlight of the course, discussion of material

### Requirements

Course objectives:

There is an unmet need for a broader transfer of knowledge related to travel health, vaccinations and tropical diseases among doctors. It is well-known that Hungarian physicians are working abroad and, although mostly Hungarians work in a European environment, there is a growing

interest for working in tropical countries far away from Hungarian.

In recent years, Hungarian medical assistance activities have increased considerably in the most disadvantaged areas of the world. Charity actions with local authorities help tens of thousands of patients. The most popular are the help-actions following the disasters, but in many cases the Hungarian experts do their job without major publicity.

One of the most important objectives of the Travel and Tropical Medicine, Vaccinations course is to provide participants with theoretical and practical training in the diagnosis, therapy and care of tropical diseases.

An International Vaccinations Centre, ImMed training facilities in Travel and Tropical Medicine/Vaccinations can be the area which can contribute to the development of Hungarian medical education / further education. ImMed and the University of Debrecen (UD) organize joint practical training in the International Vaccinations Centre. Here students can really get acquainted with the daily problems of local healthcare, travel health, required immunization schedules, malaria profilaxis and the tropical diseases.

## DEENK Life Sciences Library

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).

### **2nd week:**

**Practical:** Electronic Information Resources:

- Electronic journals.
- Link collections.

### **3rd week:**

**Practical:** Databases:

- Medline.
- Impact Factors.

### **4th week:**

**Practical:** Databases

### **5th week:**

**Practical:** Test

## Requirements

Department of Biochemistry and Molecular Biology

Subject: **MOLECULAR MECHANISM OF DISEASES OF 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 immunodefects

**6th week:**

**Lecture:** Cancer I.

**7th week:**

**Lecture:** Cancer II.

**8th week:**

**Lecture:** Cancer II.

**9th week:**

**Lecture:** Osteoporosis

**10th week:**

**Lecture:** Immune-deficiencies

**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, 1 corridor), and on the department

## Department 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 dysregulation 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.

## Department of Clinical Pharmacology

Subject: **CLINICAL PHARMACOLOGY**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Lecture: **20**

Seminar: **8**

Practical: **2**

Department of Foreign Languages

Subject: **LATIN LANGUAGE**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Practical: **28**

**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:**

**Practical:** Chapter 8: Muscles Latin prefixes,  
Latin and Greek prefixes related to numerals and  
quantities; Latin numerals - Word quiz 9

**14th week:**

**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](http://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: **14**

Practical: **2**

### **11th week:**

**Lecture:** 1. Medical genome biology: relevance and history. Molecular medicine, personalized medicine, philosophical aspects.

2. Basics of DNA and protein sequence comparison.

3. Technologies for testing human genome sequence variability

### **12th week:**

**Lecture:** 4. Technology and medical application of High throughput / Next Generation Sequencing. Methylation analysis and significance

5. Practical and technical aspects of gene

expression analysis. Gene expression pattern changes in disease, medical relevance, examples. Cancer genome.

6. Databases

### **13th week:**

**Lecture:** 7. Biology of free nucleic acids, microRNA, lncRNA.

8. Biomarkers in disease diagnosis, biobanking. Multivariate diagnostics. Multivariate statistics.

Genomics in drug discovery and biotechnology

9. Immuno proteomics, methods and applications of multivariate protein diagnostics.



**14th week:**

**Lecture:** 10. Human genome sequence and variability, haplotype variation. Genetic maps.  
11. Genomescan technology, global genetic association and its relevance to multigenic diseases.  
12. Personalized genomics, examples.

Significance of comprehensive genome analysis in medicine.

**Practical:** Expression and comprehensive genomics. GWAS.

**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 (but it is not the prerequisite of the signature).

- To encourage the attendance of the lectures we give 10 bonuses for 12 attendance (less bonus for less presence), which is proved by a photo sent to a specified e-mail address in a specified time interval taken from a specified lecture slide - so bring electronic equipment capable for photo taking and for internet usage.
- If you were not able to take or send the photo you have the possibility to sign an attendance sheet.
- Photo will be made from attended students, and if there are more e-mails received than the number of the attended students, random students will not get the bonus.
- The bonuses are percentages that will be added to the result of the examination.

Only those students are eligible to get bonuses, who registered for the subject Medical genomics electronically.

The bonuses can be used only during the end-of-semester examination period, cannot be transferred to the next school-year.

Second year students may also register for Medical genomics, they can even take the examination with their valid signature in the Neptun, even if they did not pass last year. Students not having a signature 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): 0-49.99%, satisfactory (3): 50.00-64.99%, good (4): 65.00-74.99%, excellent (5): 75.00-100%. Repeated examinations are possible according to general university rules.

Lectures will be held at times and locations given for medical genetics lectures, during week 11-14.

Practical: week 14, 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.)

Facultative seminars: Two seminars (2×45 min) will be held in lecture circumstances (see dates, times, locations in the program). These are facultative seminars for bonuses (1 bonuses for each).

Bring electronic equipment capable for internet usage.

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: **CLINICAL GERONTOLOGY**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **30**

Subject: **DIETETICS IN THE EVERYDAY PRACTICE AND BEYOND. NUTRITIONAL THERAPY I.**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **24**

Subject: **DIETETICS IN THE EVERYDAY PRACTICE AND BEYOND. NUTRITIONAL THERAPY II.**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **20**

Practical: **4**

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. Neuropathologic alterations.

**Self Control Test**

**10th week:**

**Lecture:** Diseases of the locomotor system in the elderly.

**Self Control Test**

### Requirements

Subject: **PROBLEM BASED LEARNING - SKILLS' TRAINING**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Seminar: **20**

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
- 300

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 prophylaxis of AIDS
9. Dermatological 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: **INTRODUCTION TO STUDENTS' SCIENTIFIC ACTIVITIES**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Lecture: **10**

Subject: **STUDENTS' SCIENTIFIC ACTIVITY FOR BEGINNERS**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Lecture: **10**

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.)

**15th week:**

**Practical:** Watch your DNA!(Mutations/DNA damage and their detection.)

**16th week:**

**Practical:** Do your blood vessels leak? (Transendothelial permeability measurements by ECIS.)

**17th week:**

**Practical:** Interact with me!(How and why proteins "touch" each other? Methods used to study protein-protein interactions.)

**18th week:**

**Practical:** How to create green cells? (Transfection with GFP.)

**19th week:**

**Practical:** Heat shock(Induction of heat shock in cell lines: expression of Hsp-s. Protection from cytotoxic insults.)

**20th week:**

**Practical:** Where is my protein?(Subcellular localization of proteins by immunostaining+compartment-specific markers. Cell fractionation and Western blotting.)

**21st week:**

**Practical:** Inhibitors of protein phosphatases - dangerous biological weapons?(Phosphatase inhibitory and cytotoxic effects of microcystin and other biotoxins.)

**22nd week:**

**Practical:** Green tea - enemy of cancer cells? (Effect of polyphenolic compounds on proliferation of cancer cell.)

### Requirements

Min. 1, max. 10 students (Preference will be given to students who obtained good marks in Medical Chemistry.) Aim of the course: The course provides a unique opportunity to investigate important medical problems at the cellular and the molecular level or in animal experiments. Enrolled students choose a topic from the list. Students will work in small groups (2-3 students/group) and will be assigned a tutor who will supervise their activities and labwork. First, students make a thorough literature search to understand the medical problems in question, 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:  $\beta$ -lactam antibiotics.

**4th week:**

**Lecture:** Non- $\beta$ -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.

**15th week:**

**Seminar:** Consultation.

**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, haemangioblastoma.

**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 transferr 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 development, normal and abnormal growth and pubertal development. Intersexuality. Pubertal obesity and hyperandrogenism.

**3rd week:**

**Lecture:** 3. Clinical Reproductive Endocrinology (Lecturer: 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 reproductive 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 techniques (ART).

**9th week:**

**Lecture:** 9. Menopause (Lecturer: Jakab, Attila M.D., Ph.D.): Epidemiological issues of the menopause. Physiology of the menopausal transition. Postmenopausal Hormone Replacement Therapy (HRT). Postmenopausal 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 cryopreservation. 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 Oncoradiology

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  
Isotop therapy

**Requirements**

The goal is to get to know the process and clinical considerations of radiotherapy (indications, contraindications, equipments).

**Department of Ophthalmology**

Subject: **OPHTHALMOLOGICAL ASPECTS OF WOUND HEALING PROCESSES**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **7**

Seminar: **4**

Practical: **4**

**1st week:**

**Lecture:** Basic ophthalmological anatomy.  
Basics of wound healing processes.  
**Seminar:** Overview and application of instruments used for practical trainings, learning appropriate techniques.  
**Practical:** Learning appropriate techniques of instruments used for practical trainings.

**2nd week:**

**Lecture:** Corneal lesions and refractive surgeries. What does the tear film affect in wound healing processes?  
**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.

**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.

**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

**6th week:**

**Lecture:** Practices in Ophthalmological Operations

**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 facilitate specialization of students interested in operative professions.

## 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 tract 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 komp.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. Musculoskeletal rehabilitation. - Rita Szepesi M.D.

**6th week:**

**Lecture:** The role of physical therapy in medical rehabilitation - Ilona Balajti Mrs. Veres, PT  
Orthotics and prosthetics 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 dietician

**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 nutritionist

**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 Högye 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 Ca<sup>2+</sup> 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 matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

### 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 verification 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 [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site

(Department of Physiology menu item).

### 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 [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

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 work 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 elearning.med.unideb.hu web site (Department of Physiology menu item).

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 elearning.med.unideb.hu web site (Department of Physiology menu item).

**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  $[Ca^{2+}]_i$

**3rd week:**

**Lecture:**  $[Ca^{2+}]_i$  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 matters, please check the [elearning.med.unideb.hu](http://elearning.med.unideb.hu) web site (Department of Physiology menu item).

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 verification 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 Sports Medicine

Subject: **FUNDAMENTALS OF SPORTS MEDICINE**

Year, Semester: 4th year/1st semester, 5th year/1st semester

Number of teaching hours:

Lecture: **12**

Seminar: **2**

Practical: **10**

**1st week:**

**Lecture:** Sandor Szanto: Sections of sports medicine, activities of sports physicians (1 hour lecture)

Janos Magyar: Fundamentals of sports physiology, anatomic and functional adaptations of organ systems (1 hour lecture)

Sandor Szanto: Cardiopulmonary exercise testing (1 hour lecture, 1 hour practice)

**2nd week:**

**Lecture:** Laszlo Balogh: Cooperation between trainers and sport physicians, using of sport physician's findings in designing of trainings (1

hour lecture, 1 hour practice)

Nora Erdei: Fundamentals and examination techniques in sports cardiology (1 hour lecture, 1 hour practice)

**3rd week:**

**Lecture:** Sandor Szanto: Sudden cardiac death of athletes, possibilities for prevention, physiological and pathological ECG findings (1 hour lecture, 1 hour practice)

Zoltan Karacsonyi: Acute sport injuries and their treatments (1 hour lecture, 1 hour practice)

**4th week:**

**Lecture:** Kata Gulyas: Sport illnesses and their treatments (1 hour lecture, 1 hour practice)  
Daniel Takacs: Prevention of sport injuries, functional testing of musculoskeletal system, treatment of sport injuries from the aspect of physical therapist (1 hour lecture, 1 hour practice)

**5th week:**

**Lecture:** Zsuzsa Gyurcsik: Rehabilitation in musculoskeletal diseases, physical exercises, choices of physical therapy (1 hour lecture, 1

hour practice)

Emilia Zsanda: Fundamentals of nutrition of athletes, fluid supplementation and food supplements (1 hour lecture, 1 hour practice)

**6th week:**

**Lecture:** Robert Orosz: Sports psychology, relationship between poise of mind and physical capacity (1 hour lecture, 1 hour practice)  
Sandor Szanto: Consultation and exam (2 hours)

## Department of Surgery

Subject: **TRANSPLANTATION OF THE ABDOMINAL ORGANS**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **12**

Practical: **4**

## 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 calcaneus. 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. Osteochondritis 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.

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### Requirements

The lectures will take place in the Augustza big lecture hall. We strongly advise to participate on the lectures, because the official textbook doesn't include all the diagnostic and therapeutic knowledge. Sign of the lecture book will take place the week before the exam period, at the secretariat of the Department of Trauma and Hand Surgery.

Type of the exam: oral exam (AW5).

In case of the unsatisfactory mark, the student can repeat the exam with the certification of the Education Department.

## 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)

5th 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](http://www.uroweb.org)).

Closing test: multiple choice questions, MCQ

## Division of Biomathematics

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:** Word processor programs, MS Word I.

**3rd week:**

**Practical:** Word processor programs, MS Word II.

**4th week:**

**Practical:** Word processor programs, MS Word III.

**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:2016) 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% = garde 1 (fail); 61%-70% = grade 2 (pass); 71% - 80% = grade 3 (satisfactory); 81% - 90% = grade 4; (good) 91% = garde 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 Licence) or are not required to write the exemption test, they should show their ECDL certificate to the educational manager of the department and they will be exempted automatically.

## Division of Biophysics

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, Szöllösi 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.

## Division of Cell Biology

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**

Neptun code: AOG157403-K1, ECTS: 2 credit points

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

## 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 polymorphism 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: **ENZYMOLGY IN LABORATORY MEDICINE AND IN CLINICAL PRACTICE**

Year, Semester: 2nd year/2nd semester, 3rd year/2nd semester

Number of teaching hours:

Lecture: **14**

**1st week:**

**Lecture:** Characteristics of enzyme function, conditions (effect of pH, temperature), classification of enzymes (Enzyme Commission, E.C.)

of monomeric and oligomeric enzymes, Hill coefficient). Multienzyme complexes.

**5th week:**

**Lecture:** The most important enzymes in medical laboratories, their determination, their diagnostic significance I.

**2nd week:**

**Lecture:** The most important definitions of enzyme kinetics. Michaelis Menten model, interpretation and definition of KM, and VMAX.

**6th week:**

**Lecture:** The most important enzymes in medical laboratories, their determination, their diagnostic significance II.

**3rd week:**

**Lecture:** Types of enzyme inhibitions. Enzyme regulation.

**7th week:**

**Lecture:** Enzyme deficiencies.

**4th week:**

**Lecture:** Kinetics of allosteric enzymes (kinetics

**Requirements**

Min. 5, max. 50 students.  
 Biochemistry I. 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 Operative Techniques and Surgical Research

Subject: **ADVANCED SURGICAL OPERATIVE TECHNIQUES**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **4**

Practical: **20**

**1st week:**

**Lecture:** Scrubbing and behavioural 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.

**6th 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.

Presentation of the Janos Veres Memorial Place.

**3rd week:**

**Practical:** Intracorporal knotting technique on surgical training model in open and closed pelvi-trainer.

**4th week:**

**Practical:** Preparation on chicken thigh biopreparate model and practising intracorporal knotting technique in open and closed pelvi-boxes and MATT (Minimal Access Therapy Technique) trainer.



**5th week:**

**Practical:** Cholecystectomy on isolated porcine liver-gallbladder bioprepate model and/or phantom model in closed pelvi-box and MATT trainer.

**6th week:**

**Practical:** Cholecystectomy on isolated porcine liver-gallbladder bioprepate 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 bioprepate 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 bioprepate models.

Cholecystectomy in closed pelvi-trainer and MATT-trainer on liver-gallbladder phantom model and bioprepate 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.

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.

**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.

**4th week:**

**Practical:** Practising microsurgical suturing and knotting techniques by closing incisions made from different directions on rubber glove pieces. Presentation of the Microsurgical exhibition.

**3rd week:**

**Practical:** Fiber removal and reposition with

**5th week:**

**Practical:** Arterial anastomosis: end-to-end vascular anastomosis on the femoral artery of a chicken thigh's bioprepate 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

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 in team-work 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. Presentation of the Museum of Surgical Suture Materials.

**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 bioprepate 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 bioprepate 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 bioprepate 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 bioprepate models. Course description: Revision of basic surgical techniques. Repeating and practicing basic life saving methods - hemostasis, venous cutdown technique, conicotomy - and basic interventions - blood sampling and injection (i.m., i.v.) techniques, wound closure with different suturing techniques - on phantom models and bioprepate models.

Exam: AW5

## Division of Radiology and Imaging Science

Subject: **BASIC PRINCIPLES AND INTRODUCTION TO CHEST RADIOLOGY**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Seminar: **18**

Subject: **MAGNETIC RESONANCE IMAGING: FROM BASICS TO PRACTICE**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Seminar: **24**

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

## Faculty of Medicine

Subject: **FREELY CHOSEN BLOCK PRACTICE**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Practical: **30**

## CHAPTER 21

### TITLES OF THESES

#### **Department of Anatomy, Histology and Embryology**

1. Title: Possible applications of morphofunctional matrices for classification of neurons (computer modelling)  
Tutor: Ervin Wolf M.Sc., Ph.D.
2. Title: Correlation analysis of functional brain maps
3. Title: Investigation of contour integration processing in the primary visual cortex using voltage sensitive dye imaging  
Tutor: Zoltán Kisvárdy M.Sc., Ph.D., D.Sc.
4. Title: Investigation of signalling mechanisms that regulate cartilage development and maturation  
Tutor: Róza Zákány M.D., Ph.D.
5. Title: Interrogation of spinal dorsal horn circuits with electrophysiological and optogenetic tools
6. Title: Light- and electron microscopy level analysis of the axons and axon collaterals of spinal lamina I projection neurons
7. Title: Local synaptic connections of projection neurons in spinal lamina I
8. Title: Morphometric analysis of excitatory and inhibitory interneurons in the spinal dorsal horn  
Tutor: Péter Szücs M.D., Ph.D.
9. Title: Extracellular matrix in the developing brainstem  
Tutor: Ildikó Wéber M.Sc., Ph.D.
10. Title: Matrix metalloproteases in vestibular lesion  
Tutor: Botond Gaál M.Sc., Ph.D.
11. Title: Investigation of neuronal network development in the spinal cord  
Tutor: Zoltán Mészár M.Sc., Ph.D.
12. Title: The role of the molecular clock in healthy and osteoarthritic chondrocytes  
Tutor: Csaba Matta M.Sc., Ph.D.

13. Title: Role of PACAP signalling in cartilage differentiation and regeneration  
Tutor: Tamás Juhász M.Sc., Ph.D.

14. Title: Distribution of the extracellular matrix in the red nucleus and parabrachial area  
Tutor: Éva Rácz M.Sc., Ph.D.

15. Title: The endocannabinoid-mediated modulation of spinal nociception

16. Title: The role of astrocytes in spinal pain processing  
Tutor: Zoltán Hegyi M.Sc., Ph.D.

17. Title: Quantitative morphological studies of primary afferent-motoneuron connections in the frog's brainstem  
Tutor: András Birinyi M.Sc., Ph.D.

18. Title: Role of pro-inflammatory cytokines in neuron-glia interaction during inflammatory pain states  
Tutor: Krisztina Holló M.Sc., Ph.D.

19. 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: Dissecting and aligning the regulatory and effector mechanisms shaping murine M2 macrophages

2. Title: Dissecting the transcriptional network allowing macrophages to control angiogenesis

3. 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.

4. Title: The role of retroviral proteases in the retroviral life cycle.  
Tutor: József Tózsér M.Sc., Ph.D., D.Sc.

5. Title: The role of tissue transglutaminase in rolling and adhesion of neutrophil granulocytes  
Tutor: Zoltán Balajthy M.Sc., Ph.D.

6. Title: Saliva biomarkers of oral cancer.  
Tutor: Beáta Scholtz M.Sc., Ph.D.

7. Title: Production of dendritic cells and macrophages from embryonic stem cells.

8. Title: Transcriptional reprogramming of murine embryonic stem cell progenitors.  
Tutor: István Szatmári M.Sc., Ph.D.

9. 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.

10. Title: Effects of various coeliac autoantibodies on transglutaminase 2 activities and interactome.

11. Title: Modification of the enzymatic activity of transglutaminase 2 by site-directed mutagenesis. Therapeutic utilization of modified transglutaminase 2.

12. Title: Studying structure and function relationship of transglutaminases and its application in translational medicine  
Tutor: Róbert Király M.Sc., Ph.D.

13. Title: Quantitative proteomic analysis of the tear proteins of diabetic patients.  
Tutor: Éva Csősz M.Sc., Ph.D.

14. Title: Evaluation of the browning potential and inducibility from human fat tissue biopsies  
Tutor: Mária Szatmári-Tóth M.Sc., Ph.D.

15. Title: Identification of regulatory SNPs in promoter regions of different species by bioinformatic analyses.  
Tutor: Endre Barta M.Sc., Ph.D.

16. Title: Alterations in structural properties of the transcription machinery in relation to disease development

17. Title: Drug discovery for protein interactions

18. Title: Functional aggregation in innate immunity

19. Title: Molecular factors in cell differentiation

20. Title: New comparative methods of protein evolution and sequence analysis

21. Title: Regulation of protein half-life via protein interactions

22. Title: Studying the re-programming mechanisms of viral proteins.

23. Title: The role of signaling pathway perturbations in cancer development  
Tutor: Mónika Fuxreiter M.Sc., Ph.D., D.Sc.

24. Title: Characterization of adipocytes with thermogenic potential

25. Title: In vitro study about the effect of environmental conditions (e.g.: temperature, oxygen availability) on the differentiation potential and beiging process of primary adipocytes

26. Title: Investigation of the beiging plasticity of adipocytes, identification of key extrinsic and intrinsic factors  
Tutor: Beáta Bartáné Tóth M.Sc., Ph.D.

27. Title: Investigation of novel molecular elements of the browning machinery in different human adipose tissues

28. Title: Investigation of the biological significance of “batokine” secretion in human cell models  
Tutor: Endre Károly Kristóf M.D.

29. 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 trastuzumab 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

Tutor: Gábor Szabó M.D., Ph.D., D.Sc.

5. Title: Mathematical analysis and computer modelling of the topology of cell surface proteins

6. Title: Role of MHC in the organization of cell surface proteins

Tutor: László Mátyus M.D., Ph.D., D.Sc.

7. Title: Cytometry of cytotoxic lymphocytes

8. Title: Physiological roles of the multidrug resistance transporter P-glycoprotein

Tutor: Zsolt Bacsó M.D., Ph.D.

9. Title: Elucidation of the catalytic mechanism of ABC transporters

Tutor: Katalin Goda M.Sc., Ph.D.

10. Title: Development of machine learning-based methods for identification of cellular components

11. Title: Effect of the lipid composition of the cell membrane on membrane protein clustering and on cell biological processes related to the cell membrane

12. Title: Role of changes in the dynamic properties of the cell membrane in the protective role of methane against hypoxia-reperfusion injury

Tutor: Péter Nagy M.D., Ph.D., D.Sc.

13. Title: Membrane biophysical and cell biological effects of cyclodextrins

14. Title: The role of the Hv1 proton channel in vascular smooth muscle cells

Tutor: Zoltán Varga M.Sc., Ph.D., D.Sc.

15. 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.

16. Title: Ligand dependence of nuclear receptor function studied by single molecule microscopy

17. Title: Studying the function and interactions of interleukin-2 and -15 receptors by advanced microscopy

Tutor: György Vámosi M.Sc., Ph.D.

18. Title: Generating and characterizing multicomponent primary human cell cultures for transplantation therapy of stem cell deficient corneas

19. Title: Molecular interactions in histopathological diagnosis: applying FRET in a confocal fluorescence digital pathology slide scanner

20. Title: Optimizing reprogrammed, chimeric antigen receptor (CAR) -transduced human T cells for tumor therapy

21. Title: Role of receptor tyrosine kinases and integrins in the therapy resistance of tumors

Tutor: György Vereb M.D., Ph.D., D.Sc.

22. Title: Ion channel expression of engineered T cells used in cancer immunotherapy

23. Title: Ion channel expression of tumor infiltrating T cell populations

Tutor: Péter Hajdu M.Sc., Ph.D.

### **Department of Anesthesiology and Intensive Care**

1. Title: Experimental testing of the neuromuscular junction

Tutor: Ákos Fábrián M.D., Ph.D.

2. Title: Preemptive and preventive analgesia

Tutor: Béla Fülesdi M.D., Ph.D., D.Sc.

3. Title: The role of hypothermia in neuroprotection

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: The importance of the point of view of psychoanalysis for a humanistic medicine.  
Tutor: Attila Bánfalvi M.A., Ph.D., C.Sc.

13. Title: End of life decisions  
Tutor: Sándor Kómüves M.A., Ph.D.

14. Title: Evolutionary Psychopathology
15. Title: Humor and Mental Health
16. Title: Life History Strategy elements in mate choice, attachment, and mental health  
Tutor: Roland Tisljár M.A., Ph.D.

### **Division of Cardiac Surgery**

1. Title: The effect of carbon dioxide deairing during valve surgery - review of the literature  
Tutor: Tamás Szerafin M.D., Ph.D.

2. Title: Short-term results of operations accomplished in A-type aortic dissections  
Tutor: Tamás Maros M.D.

3. Title: Tricuspid valve surgery review of the literature  
Tutor: István Szentkirályi M.D.

4. Title: Sutureless aortic valve implantation - review of the literature  
Tutor: Lehel Palotás M.D.

5. Title: Non-occlusive mesenteric ischaemia after cardiac surgery-review of the literature  
Tutor: Tamás Debreceni 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 amongst healthcare workers

Tutor: László Róbert Kolozsvári M.D., MBA, Ph.D.

13. Title: Physical, mental and social aspects of aging

14. Title: Physical, mental and social aspects of aging

15. Title: The family physician as gatekeeper

16. 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: Mental health of health care workers

3. Title: Mental health of youth

4. Title: Relationship between health literacy and health status

Tutor: Éva Bíró M.D., Ph.D.



5. 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.

6. Title: Gene-environment interactions and obesity (systematic review)

7. Title: Prevalence of obesity (trend analysis)

8. Title: The effect of neighborhood environment on physical activity and diet (systematic review)

9. Title: The effect of school based health promotion programs on nutrition (systematic review)

Tutor: Helga Bárdos M.D., M.Sc., Ph.D.

10. Title: Burden of diseases attributed to environmental risk factors in European countries

11. Title: Mortality due to environmental risk factors in European countries

Tutor: Sándor Szűcs M.Sc., Ph.D.

12. Title: Genomic and environmental determinants of cardiovascular diseases (genetic epidemiology analyses)

13. Title: Genomic determinants of cardiovascular diseases

Tutor: Szilvia Fiatal M.D., Ph.D.

14. Title: Monitoring type 2 diabetes design strategies

15. Title: Prevalence of type 2 diabetes (specific region)

Tutor: Attila Csaba Nagy M.D., Ph.D.

16. Title: Evaluation of chronic care for adult overweighted in general medical practice

17. Title: Evaluation of chronic care for adult overweighted in general medical practice

18. Title: Evaluation of chronic care for adult smokers in general medical practice

19. Title: Evaluation of chronic care for adult smokers in general medical practice

20. Title: Evaluation of chronic care for diabetes mellitus in general medical practice

21. Title: Evaluation of chronic care for diabetes mellitus in general medical practice

22. Title: Evaluation of chronic care for hypertension in general medical practice

23. Title: Evaluation of chronic care for hypertension in general medical practice

24. Title: Evaluation of foreign aid for the health sector in medium and low income countries

Tutor: János Sándor M.D., Ph.D.

25. Title: Genetic epidemiology of obesity (literature review)

26. Title: Genotoxicity evaluation of environmental and occupational chemical exposures

27. Title: The role of the FTO gene in the development of metabolic syndrome

Tutor: Károly Nagy Ph.D.

28. Title: Pesticide use in developed and developing countries

29. Title: Pesticide use in developed and developing countries

Tutor: László Pál Ph.D.

30. Title: Genotoxic exposures in the work- and ambient environment

31. Title: Genotoxic exposures in the work- and ambient environment

32. Title: Health impact assessment of policies, programmes and projects

33. Title: Health impact assessment of policies, programmes and projects

34. Title: Investigation of workplace hazards

35. Title: Investigation of workplace hazards

36. Title: Occupational diseases

37. Title: Occupational diseases

Tutor: Ádám Balázs 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: Targeted temperature management after cardiac arrest: outcome

Tutor: Szabolcs Gergely M.D., Ph.D.

13. Title: Inotropes and inodilators in advanced heart failure: clinical implications

14. Title: Novel pharmacological therapies in heart failure

Tutor: Attila Borbély M.D., Ph.D.

15. Title: Assessment of right ventricle function with 3D echocardiography

Tutor: Csaba Jenei M.D.

16. Title: Examining ischaemic and arrhythmogenic side effects of 5-fluorouracil chemotherapy in oncology patients

17. Title: Translational research in a cardio-oncological small animal model

Tutor: Dániel Czuriga M.D., Ph.D.

18. Title: Invasive hemodynamic measurements in heart failure patients

Tutor: László Fülöp M.D., Ph.D.

19. 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: Study of a gene regulating differentiation in bacteria.

Tutor: Sándor Biró M.Sc., Ph.D., D.Sc.

3. Title: Analysis of mono-ADP-ribosylated proteins from pro- and eukaryotic cells.

Tutor: András Penyige M.Sc., Ph.D.

4. 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.

5. Title: Study of mitochondrial copy number changes in glioblastoma.

Tutor: Judit Keserű M.Sc., Ph.D.

6. Title: miRNA-profiling of regressive Wilms' tumors.

7. Title: Studying the role of long non-coding RNAs in glioblastoma.

Tutor: Gergely Buglyó M.D., Ph.D.

8. Title: Functional analysis of the *Streptomyces facC* gene in *Aspergillus*

Tutor: Melinda Paholcsek M.Sc., Ph.D.

9. Title: Global analysis of the human blood plasma epitome and interactome in health and disease.

10. 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.

11. Title: Exosomes, as possible biomarkers.

Tutor: Beáta Soltész M.Sc., Ph.D.

12. Title: Study the role of microRNAs in ovarian cancer.

Tutor: Melinda Szilágyi-Bónizs M.Sc., Ph.D.

13. Title: Cell-free nucleic acids as biomarkers in diagnosis of diseases.

14. Title: The role of non-coding RNAs in development of tumors.

Tutor: Bálint Nagy M.Sc., Ph.D. habil., D.Sc.

### Department of Immunology

1. Title: The role of the HOF1/SH3PXD2B adaptor protein in the regulation of the tumor microenvironment

Tutor: Árpád Lányi M.Sc., Ph.D.

2. Title: The role of innate immune cells in the development of allergic responses

3. Title: The role of innate lymphoid cells (ILC) in human diseases

Tutor: Attila Bácsi M.Sc., Ph.D.

4. Title: Altered differentiation of monocyte derived dendritic cells and their functional differences

Tutor: Péter Gogolák M.Sc., Ph.D.

5. Title: Investigation of phytocannabinoid effects on human monocyte-derived dendritic cells

6. Title: Investigation of transient receptor potential channels on human monocyte-derived dendritic cells

Tutor: Attila Szöllősi M.D., Ph.D.

7. Title: Identification of new viral sensors and new regulatory mechanisms in the antiviral responses of human dendritic cells

8. Title: Role of dendritic cells in the development of autoimmune diseases

Tutor: Kitti Pázmándi M.Sc., Ph.D.

9. Title: Study of non-apoptotic cytotoxic processes during immune response, new way of killing apoptosis resistant tumor cells

Tutor: Gábor Koncz M.Sc., Ph.D.

**Department of 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 bladder cancer
4. Title: Treatment options of metastatic castration-resistant prostate cancer  
Tutor: Balázs Juhász M.D.
5. Title: Cardiological side effects of fluorouracyl in oncological patients  
Tutor: Anita Árokszállási M.D.
6. Title: Palliation in oncology  
Tutor: Éva Szekanez M.D., Ph.D.
7. Title: Prognostic factors in low grade and high grade gliomas
8. Title: Treatment options in advanced and metastatic breast cancer  
Tutor: József Virga M.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 heterogeneity on the risk of thrombosis

2. Title: Investigation of alfa2-plasmin inhibitor and fibrinogen interaction

3. Title: Method development for the detection of various alpha2 plasmin inhibitor isoforms  
Tutor: Éva Katona M.Sc., Ph.D. habil.

4. Title: Inherited hemostasis disorders; laboratory and molecular genetic aspects

5. Title: Laboratory monitoring of the new generation oral anticoagulants

6. Title: Protein S deficiency – genotype-phenotype interactions

Tutor: Zsuzsanna Bereczky M.D., Dr. habil., Ph.D.

7. Title: Characterization of the heparin-antithrombin interaction with surface plasmon resonance

8. Title: New methods for investigating the interactions of blood coagulation proteins

Tutor: Krisztina Péntes-Daku M.Sc., Ph.D.

9. Title: Fibrinolytic marker levels and polymorphisms in inflammatory bowel diseases

10. Title: Investigating the role of PAI-1 4G/5G polymorphism on the outcome of thrombolytic therapy in patients with ischaemic stroke

Tutor: Zsuzsa Bagoly M.D., Ph.D.

**Department of Oncoradiology**

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 immunotherapy 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 assessment of

needlestick and sharps injuries at Kenézy Hospital

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.

### **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 Erdódi 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 Csontos 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 targeting 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 Ph.D., 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 hypothyroidism.

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: Autoimmune disorders and GI tract

Tutor: Zsolt Barta M.D., Ph.D.

13. Title: The disease course after stent implantation in peripheral arterial disease

Tutor: György Kerekes M.D., Ph.D.

14. Title: Novel therapeutical approaches in multiple myeloma

15. Title: The impact of multi-drug resistance genes in the prognosis of lymphoproliferative disorders

Tutor: László Váróczy M.D., Ph.D. habil.

16. Title: Inherited and acquired thrombophilia

17. Title: New direct oral anticoagulants

18. Title: Stem cell therapy in peripheral arterial disorders

Tutor: Zoltán Boda M.D., Ph.D., D.Sc.

19. Title: Gastric cancer: clinics and treatment

20. Title: Gastrointestinal bleeding

21. Title: Gluten sensitive enteropathy

22. Title: Inflammatory bowel diseases.

23. Title: Lymphomas in the gastrointestinal tract.

Tutor: István Altorjay M.D., Ph.D., D.Sc.

24. Title: Langerhans histiocytosis

25. Title: Osteosclerotic myeloma

26. Title: Therapeutic challenges in rare haemostatic disorders

Tutor: György Pfliegler M.D., Ph.D. habil.

27. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C

28. Title: Pathomechanism of alcoholic hepatitis

29. Title: Signs, diagnostics and treatment of portal hypertension.

30. Title: Therapeutic options in primary sclerotizing cholangitis

31. Title: Treatment of autoimmune hepatitis  
Tutor: István Tornai M.D., Ph.D. habil.

32. 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.

33. Title: Chronic neutrophilic leukaemia  
Tutor: Béla Telek M.D., Ph.D.

34. Title: Biological treatment of ulcerative colitis

35. Title: Extraintestinal association in IBD  
Tutor: Károly Palatka M.D., Ph.D. habil.

36. Title: The role of Willebrand factor in various internal diseases.  
Tutor: Ágota Schlammadinger M.D., Ph.D.

37. Title: Bacterial infection in liver cirrhosis

38. Title: Clinical significance of chronic pancreatitis

39. Title: Current therapeutic options of acute pancreatitis  
Tutor: Zsuzsa Vitális M.D., Ph.D.

40. Title: Diagnosis and treatment of chronic lymphocytic leukemia

41. Title: Novel therapeutic approaches in the treatment of multiple myeloma

42. Title: Philadelphia negative chronic myeloproliferative neoplasms - novel genetic and therapeutic improvements

43. Title: Recent advances in the management of chronic ITP  
Tutor: Péter Batár M.D., Ph.D.

44. Title: Are the bacterial infections predictable in liver cirrhosis?

45. Title: Role of serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases.  
Tutor: Mária Papp M.D., Ph.D. habil.

46. Title: Gastroesophageal 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.

### **Division of Angiology**

1. Title: Familial antiphospholipid syndrome

Tutor: Pál Soltész M.D., Ph.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.

### **Division of Clinical Immunology**

1. Title: Immunoregulatory abnormality in undifferentiated connective tissue disease
2. Title: Interstitial lung diseases in MCTD.
3. Title: The presence of antiphospholipide antibodies in the disease course of the MCTD
4. Title: Vascular involvement in mixed connective tissue disease.
5. Title: Vascular risk factors in undifferentiated connective tissue disease  
Tutor: Edit Bodolay M.D., Ph.D., D.Sc.
6. Title: Dermato/polymyositis overlap with antiphospholipide syndrome.
7. Title: Genetical study in myositis
8. Title: Improvement of quality of life in polymyositis and dermatomyositis patients by physiotherapy  
Tutor: Katalin Dankó M.D., Ph.D., D.Sc.

### **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 Szentandrassy 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 sclerosing cholangitis

10. Title: Treatment of autoimmune hepatitis

Tutor: István Tornai M.D., Ph.D. habil.

11. Title: Biological treatment of ulcerative colitis

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., 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 Geriatry**

1. Title: Basics of pharmacotherapy in the elderly

Tutor: Gyula Bakó M.D., Ph.D., D.Sc.

2. Title: Ischemic colitis.

3. Title: Life quality of Raynaud syndrome

Tutor: Zoltán Csiki 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 neoplasms - 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., D.Sc.

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 Csépany M.D., Ph.D.

5. Title: Cerebral vasoreactivity after epileptic

seizure

6. Title: Cerebral vasoreactivity after sleep deprivation

7. Title: Clinical outcome of intravenous thrombolysis in acute stroke patients with alcohol intoxication

8. Title: Short-term changes in cerebral vasoreactivity after decrease of elevated blood pressure

9. Title: Stroke mimics and intravenous thrombolysis: clinical outcome

Tutor: László Oláh M.D., Ph.D., D.Sc.

10. Title: Immunological relations of narcolepsy

11. 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 Ruzshti 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 antimüllerian 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 Erdódi 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: Corneal measurements with Pentacam

14. Title: Refractive laser-surgical interventions  
Tutor: Bence Lajos Kolozsvári M.D., Ph.D.

15. Title: Color Doppler in the follow-up of choroidal melanoma after brachytherapy

16. Title: Subtenon TCA in the treatment of radiogen retinopathy  
Tutor: Éva Surányi M.D.

17. Title: Graves' orbitopathy - current concepts in diagnosis and therapy

18. Title: Pathogenesis of Graves' orbitopathy  
Tutor: Bernadett Ujhelyi M.D., Ph.D.

19. 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

20. Title: Evaluate and demonstrate the results of the Hungarian Lucentis National Patient Registry  
Tutor: Attila Vajas M.D.

21. Title: Congenital ptosis peculiar associated movements of the affected lid

22. Title: Diagnosis and therapy in retinopathy of prematurity

23. Title: Non - surgical and surgical therapy of congenital ptosis  
Tutor: Annamária Nagy M.D.

24. Title: Ocular manifestations of Weill-Marchesani syndrome

25. Title: Pellucid marginal degeneration  
Tutor: Mariann Fodor M.D., Ph.D.

26. Title: BCVA change after intravitreal ranibizumab injection

27. 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: The role of cochlear implant in hearing rehabilitation  
Tutor: László Tóth M.D., Ph.D. habil.
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: Analysis of the aetiology and patomechanism of the development of the otitis media with effusion
4. Title: Modern aspects of tonsillectomy versus tonsillotomy
5. Title: Rehabilitation of speech after total laryngectomy
6. Title: The effectiveness of surgical treatment of focal oto-rhino-laryngological diseases on dermatologic diseases
7. Title: The role of middle and inner ear implants in the rehabilitation of hearing
8. Title: The utility of the neuromonitor during surgeries of the big salivary glands  
Tutor: Szilárd Gyula Rezes M.D., M.Sc., Ph.D.

### **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: Malformations of the central nervous system in the newborns.  
Tutor: Andrea Nagy M.D.
4. Title: Clinical diagnosis, genetical background and treatment of vitamin-D resistant 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: Open versus thoracoscopic approach in the treatment for esophageal atresia  
Tutor: László Sasi Szabó M.D.
8. Title: Quality of life in chronic pediatric diseases
9. Title: Type 2 diabetes mellitus in childhood, growing incidence  
Tutor: Enikő Felszeghy M.D., Ph.D.

### **Department of Physical Medicine and Rehabilitation**

1. Title: Testing the effectiveness of the upper-extremity repetitive task practice and forced aerobic training added to ergotherapy to improve upper limb and cognitive functions
2. Title: The efficiency test of the electromyogram-triggered FES treatment in hemiparetic patients and the visual feedback training in the development of upper limb functions
3. Title: The relationship of physiological and functional changes observed in complex rehabilitation programs (obesity and stroke rehabilitation) with adipocytes  
Tutor: Zoltán Jenei M.D., Ph.D.

### **Department of Psychiatry**

1. Title: The dietetic and gastrointestinal basis of autism  
Tutor: Csaba Mór E. M.D., Ph.D.
2. Title: Cognitive theory and therapy of depression
3. Title: Cognitive theory and therapy of generalized anxiety disorder
4. Title: Effectiveness of Cognitive Behaviour Therapy in OCD
5. Title: Effectiveness of schema therapy in personality disorders
6. Title: Emotion dependent and independent cognitive functions in unipolar depression

7. Title: Significance of dysfunctional attitudes in depression and anxiety disorders

8. Title: Theory of mind and mentalization deficits in patients with personality disorders  
Tutor: Anikó Égerházi M.D., Ph.D.

9. Title: EMDR – Eye Movement Desensitization and Reprocessing. A novel psychotherapeutic method in trauma reprocessing and other indications. A review from the literature"

10. Title: The psychosocial effects of obesity  
Tutor: Katalin Tolvay M.D.

11. Title: Brain imaging in psychiatry.

12. Title: Oxidativ stress and chronic inflammation in psychiatric disorders

13. Title: Post-traumatic stress disorder and post-traumatic growth.

14. Title: The neurobiology of depression.

15. Title: The role of mikrobiota in mental health

16. Title: The therapeutic potentials of psychedelics

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 bronchoscopy in the therapy of lung cancer

Tutor: Imre Varga M.D., Ph.D.

4. Title: Modern Therapy of NSCLC

Tutor: Tamás Kardos M.D.

5. Title: Immunotherapy induced endocrinopathy in NSCLC

6. Title: Soliter metastasis and survival in NSCLC

Tutor: Nóra Bittner M.D., Ph.D.

### **Department of Surgery**

1. Title: Surgical treatment of Graves disease with ophthalmopathy

Tutor: Ferenc Gyóry 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 Pószán 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 hyperparathyroidism

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 metabolic diseases (diabetes, metabolic syndrome) in research (for Medicine and 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: Analysis for laparoscopic skills assessment

9. Title: Hand hygiene and surgical scrub (for Medicine students)

Tutor: Erzsébet Ványolos M.Sc., Ph.D.

10. Title: Instruments and devices used in pharmacological care (for Pharmacy students)

Tutor: Tamás Lesznyák M.D., D.Pharm.

11. Title: Basic Microsurgical Training course at the Microsurgical Education and Training Center of the Department of Operative Techniques and Surgical Research

12. 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 Frenzl 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 (ÁOK)

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 oclidopexy 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., Csontos: 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., Csontos: 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 Szöllősi: 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.

Ed. Dombrádi, V.: Laboratory Practicals in Medical Chemistry.

Medical and Health Science Center, University of Debrecen, 2009.

László Virág, Ferenc Erdődi, Pál Gergely:

Bioinorganic Chemistry for Medical Students 2017.

URL:

<https://elearning.med.unideb.hu/mod/folder/view.php?id=28506>

**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-Gyórfy 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:**

Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell: Gray's Basic Anatomy.

2nd edition. Elsevier, 2018. ISBN: 978-0-323-47404.

Sobotta: Atlas of Human Anatomy I.-II..

14th edition. Urban & Schwarzenberg,. ISBN:

978-0-443-10349-0.

Ross M.H.: Histology. A text and Atlas.  
7th edition. Lippincott Williams & Wilkins,  
2016. ISBN: 978-14698-8931-3.

Sadler, T. W.: Langman's Medical Embryology.  
12th edition. Lippincott Williams & Wilkins,  
2012. ISBN: 978-1-4511-4461-1.

Moore K.L., Dalley, A.F., Agur, A. M. R.:  
Clinically Oriented Anatomy.  
6th edition. Lippincott Williams & Wilkins,  
2009. ISBN: 978-1-60547-652-0.

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.:**

Györfy Erzsébet-Mezei Zsuzsa Livia:  
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.

### **Anatomy, Histology and Embryology I. Practical:**

Richard L. Drake, A. Wayne Vogl, Adam W. M.  
Mitchell: Gray's Basic Anatomy.  
2nd edition. Elsevier, 2018. ISBN: 978-0-323-  
47404.

Sobotta: Atlas of Human Anatomy I.-II..  
14th edition. Urban & Schwarzenberg, . ISBN:  
978-0-443-10349-0.

Moore K.L., Dalley, A.F., Agur, A. M. R.:  
Clinically Oriented Anatomy.  
6th edition. Lippincott Williams & Wilkins,  
2009. ISBN: 978-1-60547-652-0.

E.K. Sauerland: Grant's Dissector.  
11th edition. Williams & Wilkins, 2000. ISBN:  
0-683-03701-3.

**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:**

Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell: Gray's Basic Anatomy.  
2nd edition. Elsevier, 2018. ISBN: 978-0-323-47404.  
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.

Moore K.L., Dalley, A.F., Agur, A. M. R.: Clinically Oriented Anatomy.  
6th edition. Lippincott Williams & Wilkins, 2009. ISBN: 978-1-60547-652-0.

**Multimodal imaging and virtual reality in neurosciences:**

Fred A. Mettler: Essentials of Radiology.  
2. Elsevier , 2005. ISBN: ISBN 0-7216-0527-3.

**Investigation of the embryonic cell-and tissue differentiation:**

Scott F. Gilbert: Developmental Biology.  
6th edition..

**Anatomy, Histology and Embryology II. Practical:**

Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell: Gray's Basic Anatomy.  
2nd edition. Elsevier, 2018. ISBN: 978-0-323-47404.

Sobotta: Atlas of Human Anatomy I.-II..  
14th edition. Urban & Schwarzenberg, ISBN: 978-0-443-10349-0.

E.K. Sauerland: Grant's Dissector.  
11th edition. Williams & Wilkins, 2000. ISBN: 0-683-03701-3.

K. L. More: Clinically Oriented Anatomy.  
4th edition. Lippincott Williams & Wilkins, 2004. ISBN: 0-683-06141-0.

**Biochemistry II. 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 II. 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/2.:**

Fodor Marianna-Rozman Katalin: Beszélek magyarul?! II..

2017. ISBN: 978-963-12-7760-9.

**Neurobiology Lecture:**

John A. Kiernan, Nagalingam Rajakumar: Barr's The Human Nervous System.

10th edition. Wolters Kluwer/Lippincott

Williams&Wilkins, 2014. ISBN: 978-1-4511-7327-7.

Sobotta: Atlas of Human Anatomy I.-II..

14th edition. Urban & Schwarzenberg, ISBN: 978-0-443-10349-0.

L. Komáromy: The Dissection of the Brain. A Topographical and Technical Guide

Medicina, . ISBN: 9-632-26050-3.

Ross, M.H.: Histology. A Text and Atlas.

7th edition. Lippincott Williams & Wilkins, 2016. ISBN: 978-14698-8931-3.

A. Fonyó: Principles of Medical Physiology. Medicina Publishing House, Hungary, 2002.

358

ISBN: 963-242-726-2.

Moore K.L., Dalley, A.F., Agur, A. M. R.: Clinically Oriented Anatomy.

6th edition. Lippincott Williams & Wilkins, 2009. ISBN: 978-1-60547-652-0.

Haines, D.E.: Fundamental Neuroscience Haines. 3rd edition. Churchill Livingstone, 2006. ISBN: 0-443-06751-1.

Estomish Mtui, G. Gruener, P. Dockery: Fitzgerald's Clinical Neuroanatomy and Neuroscience.

7th edition. Elsevier, ISBN: 978-0-70-20-5832-5.

Guyton, A. C., Hall, J. E.: Textbook of Medical Physiology.

12th edition. Saunders, 2010. ISBN: 1-4160-4574-0.

Sadler, T. W.: Langman's Medical Embryology. 12th edition. Lippincott Williams & Wilkins,

2012. ISBN: 978-1-4511-4461-1.

Snell, R.E.: Clinical Neuroanatomy for Medical Students.

5th edition. Lippincott Williams & Wilkins,. ISBN: 0-7817-2831-2.

Purves: Neuroscience.

Fourth Edition. Sinauer Publishing, 2008.

**Functional Anatomy of the Visual System:**

Eric R. Kandel, MD (winner of the Nobel Prize in 2000); James H. Schwartz, MD, PhD; Thomas M. Jessell, PhD; Steven A. Siegelbaum, PhD; and A. J. Hudspeth, PhD: Principles of Neural Science.

Fifth Edition. 2012. ISBN: 13: 978-0071390118.

Gordon M. Shepherd: The Synaptic Organization of the Brain.

Edition: 5. 2003. ISBN: -10: 019515956X.

**Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks:**

Christof Koch and Idan Segev: Methods in Neuronal Modeling, From Synapses to Networks.

MIT Press, Cambridge, Massachusetts, and London, England, 1991., ISBN: ISBN 0-262-61071-X.

**Latin Medical Terminology I.:**

Répás László: Basics of Medical Terminology, Latin and Greek Origins I.  
Répás László, 2016.

**Modern biophysical methods in biology and medicine:**

Damjanovich, S., Fidy, J., Szöllősi, J.: Medical Biophysics.  
1st edition. Medicina, 2009. ISBN: 978 963 226 249 9.

**Neurobiology Practical:**

John A. Kiernan, Nagalingam Rajakumar: Barr's The Human Nervous System.  
10th edition. Wolters Kluwer/Lippincott Williams&Wilkins, 2014. ISBN: 978-1-4511-7327-7.

L. Komáromy: The Dissection of the Brain. A Topographical and Technical Guide  
Medicina, . ISBN: 9-632-26050-3.

Ross, M.H.: 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.

A. Fonyó: Principles of Medical Physiology.  
Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.

Physiology Practice. Exercise Book.  
revised edition.2000.

Physiology Practice. A Laboratory Guide.  
revised edition.2000.

Haines, D.E.: Fundamental Neuroscience Haines.  
3rd edition. Churchill Livingstone, 2006. ISBN: 0-443-06751-1.

Estomish Mtui, G. Gruener, P. Dockery:  
Fitzgerald's Clinical Neuroanatomy and Neuroscience.

7th edition. Elsevier, . ISBN: 978-0-70-20-5832-5.

A.C. Guyton, J. E. Hall: Textbook of Medical Physiology.

11th edition. W.B. Saunders Co., 2005. ISBN: 1007-2160-240-1.

**3rd year****Clinical Biochemistry I.:**

W.J. Marshall and S.K. Bangert: Clinical Chemistry.  
6th edition. Mosby Elsevier Ltd., 2008. ISBN: 9-78072-343460-3.

János Kappelmayer, László Muszbek: Practicals in Clinical Biochemistry.  
Debrecen, 2010.

Hoffbrand A.V., Pettit J.E.: Essential Haematology.

3rd edition. Blackwell Sciences, 1999. ISBN: 0-632-03083-6.

**Pathology I.:**

Kumar-Abbas-Fausto-Mitchell: Basic Pathology.  
8th edition. WB Saunders, 2007. ISBN: 1-4160-2973-7.

Zoltán Nemes: Histopathological Practicals.  
2005.

Zoltán Nemes: The Technique of Gross Pathological Description.  
1993.

**Immunology:**

Fred S. Rosen: Case studies in immunology.  
3rd.2001.

Parham, P.: The Immune System.

Third Edition. Garland Science, 2009. ISBN: 0-8153-4146-6.

Abbas, A. K., Lichtman, A. H., Pillai, S.: Basic Immunology.

4th Edition. Saunders, 2012. ISBN: 1-4557-0707-4.

**Medical Microbiology I.:**

Levinson, W.: Review of Medical Microbiology and Immunology.

14th edition. McGraw Hill, 2016. ISBN: 0-0718-4574-7.

**Hungarian Language III/1.:**

Dr. Paragh György & Dr. Hajnal Judit: 1. Tessék mondani!  
2000.

Lampé, Judit Ph.D.: Jobbulást kívánok I.  
2014.

**Basic Oncology:**

: Basic Science of Oncology.  
Fifth Edition. McGraw-Hill International Editions, 2013.

### **Basic Surgical Techniques:**

Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine.  
4th enlarged edition. Debrecen University Press, 2019. ISBN: 978-963-490-11.  
H.E. Grewe: Grewe's Manual of Basic Surgical Skills. An Introduction to Surgical Procedures. B.C. Decker, 1986. ISBN: 0-941158-84-5.  
G.R. McLatchie, D.J. Leaper: Oxford Handbook of Operative Surgery.  
Oxford University Press, 1996. ISBN: 0-19-262097-5.

### **Dealing with irradiation induced side effects:**

C.A.Perez, L.W.Brady, E.C.Halperin, R.K.Schmidt-Ullrich: Principles and Practice of Radiation Oncology.  
4th edition. Lippincott Williams & Wilkins, . ISBN: 0-7817-3525-4.

### **Dark side of the human mind with anatomical implications:**

K.L. More: Clinically Oriented Anatomy.  
6th edition. Lippincott Williams & Wilkins, 2004. ISBN: 9781-60547-652-0.  
Sobotta: Atlas of Human Anatomy I.-II..  
14th edition. Urban & Schwarzenberg, ISBN: 978-0-443-10349-0.

### **Medical Anthropology:**

Helman C.G.: Culture, Health and Illness. An Introduction to Health Professionals.  
Butterworth-Heinemann, 2000.  
Thomas M. Johnson and Carolyn F. Sargent: Medical Anthropology. A Handbook of Theory and Method.  
Greenwood Press, 1990.  
Byron J. Good: Medicine, Rationality, and Experience. An Anthropological Perspective.  
Cambridge University Press, 1994.

### **Social acceptance of people with disabilities:**

DeLisa / Gans / Walsh: Physical Medicine and Rehabilitation. Principles and practice.  
4th edition. Lippincott Williams & Wilkins, 2005.

Gutenbrunner C, Ward AB, Chamberlain MA: White Book on Physical and Rehabilitation Medicine in Europe.

UEMS, 2006.

International Classification of Functioning. Disability and Health.

World Health Organisation, Geneva, 2001.

### **Propedeutics of Internal Medicine (Internal Medicine I):**

Barbara Bates: A guide to physical examination.  
8. Lippincott-Williams & Wilkins, 2002.

### **Medical Psychology:**

Alan Stoudemire: Human Behavior. An Introduction for Medical Students.

J.B. Lippincott Company, Philadelphia, 1994.

Csabai, M. and Molnar, P.: Health, Illness and Care. A Textbook of Medical Psychology..

Springer, Budapest, 2000.

Edward P. Sarafino: Health Psychology: Biopsychosocial Interactions.

Wiley, 1990.

Márta Csabai and Péter Molnár: Medical Psychology.

Background material. Reprint University of Debrecen, 2008.

### **Pathology II:**

Kumar-Abbas-Fausto-Mitchell: Basic Pathology.  
8th edition. WB Saunders, 2007. ISBN: 1-4160-2973-7.

Zoltán Nemes: Histopathological Practicals.  
2005.

Zoltán Nemes: The Technique of Gross Pathological Description.  
1993.

### **Clinical Physiology:**

John Hampton: The ECG in practice.  
6. Churchill Livingstone, 2013. ISBN: 9780702046438.

John Hampton: The ECG Made Easy.  
8. Churchill Livingstone, 2013. ISBN:



9780702046421.

David R. Ferry: Basic Electrocardiography in Ten Days.

. ISBN: 0-07-135292-9.

S.J., Ganong, W.F.: Pathophysiology of Disease. An Introduction to Clinical Medicine.

McGraw Hill, 2005. ISBN: 0-0714-4159-X.

László Balogh M.D.: ECG Basics.

URL: <http://klinfiz.unideb.hu>

### **Medical Microbiology II.:**

Levinson, W.: Review of Medical Microbiology and Immunology.

14th edition. McGraw Hill, 2016. ISBN: 0-0718-4574-7.

### **Internal Medicine II. (Immunology and Rheumatology):**

Merck Manual.

latest edition. Merck Research Laboratories, ISBN: 0-9119-1016-6.

Klippel JH., Dieppe PA.: Practical rheumatology. 3rd edition. Mosby, 2008. ISBN: 0-723-42429-2.

Abul K. Abbas: Cellular and Molecular Immunology.

8th Edition. Elsevier, 2014. ISBN: 9780323222754.

Robert R. Rich et al: Clinical Immunology: Principles and Practice.

5th. Elsevier, 2018. ISBN: 978-0702068966.

: Lecture notes Kelley's Textbook of Rheumatology.

9th Revised edition. Saunders, 2012.

### **Hungarian Language III/2.:**

Lampé, Judit Ph.D.: Jobbulást kívánok II.. 2014.

### **Clinical Biochemistry II.:**

William J. Marshall, Stephan K. Bangert, Marta Lapsley: Clinical Chemistry.

7th Edition. Mosby-Elsevier, 2012.

János Kappelmayer and László Muszbek: Practicals in laboratory medicine.

Debrecen, 2016.

### **Surgical operative techniques:**

Mikó I., Furka I.: Basic Surgical Techniques,

Faculty of Medicine.

4th enlarged edition. Debrecen University Press, 2019. ISBN: 978-963-490-11.

Brigden R.J.: Operating Theatre Technique (A Textbook for Nurses, Operating Department Assistants, Medical Students, Junior Medical Staff and Operating Theatre Designers).

5th edition. Churchill Livingstone, 1990. ISBN: 0-443-03364-1.

Kirk R.M., Williamson R.C.N.: General Surgical Operations.

4th edition. Churchill Livingstone, 2000. ISBN: 0-443-06396-6.

### **Functional Anatomy of the Visual System:**

Eric R. Kandel, MD (winner of the Nobel Prize in 2000); James H. Schwartz, MD, PhD; Thomas M. Jessell, PhD; Steven A. Siegelbaum, PhD; and A. J. Hudspeth, PhD: Principles of Neural Science.

Fifth Edition. 2012. ISBN: 13: 978-0071390118.

Gordon M. Shepherd: The Synaptic Organization of the Brain.

Edition: 5.2003. ISBN: -10: 019515956X.

### **Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks:**

Christof Koch and Idan Segev: Methods in Neuronal Modeling, From Synapses to Networks.

MIT Press, Cambridge, Massachusetts, and London, England, 1991., ISBN: ISBN 0-262-61071-X.

### **Latin Medical Terminology I.:**

Répás László: Basics of Medical Terminology, Latin and Greek Origins I..

Répás László, 2016.

### **Selected topics of Immunology:**

Peter Parham: The Immune System.

3rd Edition. Garland Science, 2009. ISBN: ISBN: 0-8153-4146-6.

### **Medical Sociology:**

Barry, A.-M. - Yuill, Ch. (Eds.): Understanding

Health. A Sociology Introduction.  
SAGE, 2002.

Armstrong, D.: A New History of Identity. A  
Sociology of Medical Knowledge.  
Palgrave, 2002.

### **Medical Imaging:**

Paul Suetens: Fundamentals of Medical Imaging.  
Cambridge Medicine, 2009.

### **The basics of ultrasound imaging and it's practical application:**

Frederick W. Kremkau: Sonography Principles  
and Instruments.

### **4th year**

#### **Pharmacology I.:**

Katzung, B. G.: Basic and Clinical  
Pharmacology.  
14th edition. McGraw-Hill Education, 2018.  
ISBN: 978-1259641152.

Katzung, B.G., Trevor, A.J.: Pharmacology:  
Examination and Board Review.  
12th edition. Appleton and Lange, Stamford, CT,  
2018. ISBN: 978-1259641022.

Neal M.J.: Medical Pharmacology at a Glance.  
8th edition. John Wiley & Sons Ltd., 2015.  
ISBN: 978-1118902400.

George Brenner, Craig Stevens: Pharmacology.  
5th edition. Elsevier, 2017. ISBN: 978-  
0323391665.

Humphrey Rang, Maureen Dale, James Ritter,  
Rod Flower, Graeme Henderson: Rang & Dale's  
Pharmacology.  
8th edition. Elsevier, 2015. ISBN: 978-  
0702053627.

Laurence L. Brunton (editor): Goodman &  
Gilman's The pharmacological Basis of  
Therapeutics.  
13th edition. McGraw Hill Medical, 2017. ISBN:  
978-1259584732.

#### **Orthopaedic Surgery:**

Miklós Szendrői: Orthopaedics.  
First edition. Semmelweis Publisher, 2008.  
ISBN: 978-963-9656-932.

#### **Radiology and Nuclear Medicine I.:**

Peter Armstrong-Martin L. Wastic: Diagnostic  
imaging.

. ISBN: 0-632-03093-3.

Taylor A., Alazraki N., Schuster D.M.: A  
Clinician's Guide to Nuclear Medicine.  
2nd edition. The Society of Nuclear Medicine,  
Reston, 2006. ISBN: 0-9726-4787-2.

Elgazzar, A. H.: A Concise Guide to Nuclear  
Medicine.

Springer, 2011. ISBN: 3642194257.

Fred A. Mettler: Essentials of Radiology.

2. Elsevier, 2005. ISBN: ISBN 0-7216-0527-3.

Michael Y. M. Chen, Thomas L. Pope, David J.  
Ott.: Basic Radiology.

URL:

<http://accessmedicine.mhmedical.com/book.aspx?bookID=360>

William Herring: Learning Radiology.

Recognizing The Basics.

Elsevier, 2016.

#### **Surgery I.:**

Doherty: Current Surgical Diagnosis and  
Treatment.

13th edition. McGraw-Hill-Companies, 2009.

ISBN: 0-0716-3515-7.

Clive R. G. Quick: Essential Surgery: Problems,  
Diagnosis and Management.

5th Edition. Churchill Livingstone, 2013. ISBN:  
978-0702046742.

#### **Traumatology I.:**

Mark R. Brinker: Review of Orthopaedic  
Trauma.

W. B. Saunders Company, 2001.

David J. Dandy - Dennis J. Edwards: Essential  
Ortopaedics and Trauma.

Churchill Livingstone, 2003.

Gert Krischak: Traumatology for the Physical  
Therapist.

Thieme, 2014. ISBN: 978-3-13-172421-2.

#### **Preventive Medicine and Public Health I.:**

Porta, M.: A dictionary of epidemiology.

5th edition. Oxford University Press, 2008.

ISBN: 0-1953-1450-6.

Rothman, K. J.: Epidemiology: An Introduction. 2nd edition. Oxford University Press, 2012. ISBN: 0-1997-5455-1.  
Liam J. Donaldson, Paul Rutter: Donaldsons' Essential Public Health. 4th edition. CRC Press, 2017. ISBN: 9781909368958.

### **Surgical Oncology:**

Doherty: Current Surgical Diagnosis and Treatment. 13th edition. McGraw-Hill-Companies, 2009. ISBN: 0-0716-3515-7.

Clive R. G. Quick: Essential Surgery: Problems, Diagnosis and Management. 5th Edition. Churchill Livingstone, 2013. ISBN: 978-0702046742.

### **Basic microsurgical training.**

#### **Introduction to microsurgery:**

Robert D. Acland: Practice Manual for Microvascular Surgery. C.V. Mosby Company, 1989. ISBN: 0-8016-0006-5.

Van Dongen J.J., Remie R., Rensema J.W., Van Wunnik G.H.J.: Manual of Microsurgery on the Laboratory Rat, Part 1 (General Information and Experimental Techniques). Elsevier, 1990. ISBN: 0-444-81139-7.

### **Basics of Hemorheology:**

Stoltz J.F., Singh M., Riha P.: Hemorheology in practice. IOS Press, 1999. ISBN: 90-5199-435-4.  
Baskurt, O.K., Hardeman, M.R., Rampling, M.W., Meiselman, H.J.: Handbook of Hemorheology and Hemodynamics. IOS Press, 2007. ISBN: 978-1-58603-771-0.

### **Traumatology II.:**

Mark R. Brinker: Review of Orthopaedic Trauma. W. B. Saunders Company, 2001.  
David J. Dandy - Dennis J. Edwards: Essential Orthopaedics and Trauma. Churchill Livingstone, 2003.  
Gert Krischak: Traumatology for the Physical Therapist.

Thieme, 2014. ISBN: 978-3-13-172421-2.

### **Echocardiography:**

Feigenbaum: Echocardiography.

### **Urological Laparoscopic Surgery:**

Nyirády, Peter - Romics, Imre: Textbook of Urology. 1st. Semmelweis Publisher, 2009. ISBN: 9789639879232.

### **Benign Prostatic Hyperplasia (BPH):**

Nyirády, Peter - Romics, Imre: Textbook of Urology. 1st. Semmelweis Publisher, 2009. ISBN: 9789639879232.  
Emil A., Tanagho, Jack W. McAninch: Smith's general urology. 12th edition. Appleton and lange, 1988. ISBN: 0-8385-8605-8.

### **Uro-radiology:**

Nyirády, Peter - Romics, Imre: Textbook of Urology. 1st. Semmelweis Publisher, 2009. ISBN: 9789639879232.

### **History of Radiology:**

Adrian M. K. Thomas, Arpan K. Banerjee: The History of Radiology. 1st edition. Oxford University Press, 2013. ISBN: 978-0-19-963997-7.  
Ronald L. Eisenberg: Radiology: An Illustrated History. Mosby-Year Book, 1993. ISBN: 0-8016-1526-7.

### **Epidemiology, pathophysiology, diagnosis and treatment of osteoporosis.:**

Murray Favus: Premier on the metabolic bone diseases and disorders of mineral metabolism. Sixth Edition. American society for bone and mineral research, 2006.

### **Surgery/Small Surgery Block Practice - 4th year:**

Doherty: Current Surgical Diagnosis and

Treatment.

13th edition. McGraw-Hill-Companies, 2009.  
ISBN: 0-0716-3515-7.

Clive R. G. Quick: Essential Surgery: Problems,  
Diagnosis and Management.

5th Edition. Churchill Livingstone, 2013. ISBN:  
978-0702046742.

### **Obstetrics and Gynecology I.:**

Symonds, I., Arulkumaran, S. (eds.): Essential  
Obstetrics and Gynaecology.

Fifth Edition. Churchill Livingstone Elsevier,  
2014. ISBN: 978-0-7020-3068-0.

### **Surgical operative techniques:**

Mikó I., Furka I.: Basic Surgical Techniques,  
Faculty of Medicine.

4th enlarged edition. Debrecen University Press,  
2019. ISBN: 978-963-490-11.

Brigden R.J.: Operating Theatre Technique (A  
Textbook for Nurses, Operating Department  
Assistants, Medical Students, Junior Medical  
Staff and Operating Theatre Designers).

5th edition. Churchill Livingstone, 1990. ISBN:  
0-443-03364-1.

Kirk R.M., Williamson R.C.N.: General Surgical  
Operations.

4th edition. Churchill Livingstone, 2000. ISBN:  
0-443-06396-6.

### **Antimicrobial chemotherapy:**

Dr. Krisztina Szarka, Dr. Gábor Kardos:  
Pharmaceutical microbiology I. Antimicrobial  
procedures and chemotherapy. Lecture notes for  
pharmacy students..

Debreceni Egyetem, 2011.

### **Dark side of the human mind with anatomical implications:**

K.L. More: Clinically Oriented Anatomy.

6th edition. Lippincott Williams & Wilkins, 2004.  
ISBN: 9781-60547-652-0.

Sobotta: Atlas of Human Anatomy I.-II..

14th edition. Urban & Schwarzenberg, ISBN:  
978-0-443-10349-0.

### **Stomatology:**

R.A.Cawson: Essentials of Oral Pathology and

Oral Medicine.

Churchill Livingstone, 1998. ISBN: 0-4430-  
5348-0.

Gy. Szabó: Oral and Maxillofacial Surgery.  
Alapítvány a Száj- Arc- és Állcsontsebészeti  
Betegségek Gyógyításáért, 1997.

### **Obstetrics and Gynecology Block Practice - 4th year:**

Symonds, I., Arulkumaran, S. (eds.): Essential  
Obstetrics and Gynaecology.

Fifth Edition. Churchill Livingstone Elsevier,  
2014. ISBN: 978-0-7020-3068-0.

### **Pulmonology:**

Merck Manual.

latest edition. Merck Research Laboratories,  
ISBN: 0-9119-1016-6.

### **Urology:**

Emil A., Tanagho, Jack W. McAninch: Smith's  
general urology.

12th edition. Appleton and lange, 1988. ISBN: 0-  
8385-8605-8.

Jürgen Sökeland: Urology - A Pocket Reference.  
2nd (revised) edition. Gerg Thieme Verlag,  
Stuttgart, 1989. ISBN: 3-13-610702-0.

Nyirády, Peter - Romics, Imre: Textbook of  
Urology.

1st. Semmelweis Publisher, 2009. ISBN:  
9789639879232.

Dr. Paragh György & Dr. Hajnal Judit: 1. Tessék  
mondani!  
2000.

### **Idiopathic inflammatory myopathies, from bench to bedside:**

Robert R Rich et al: Clinical Immunology  
(Principles and practice) I. II.

(3rd Edition). Mosby, 2008.

EULAR: Textbook on Rheumatic diseases.  
Johannes WJ Bijlsma.

### **Pharmacology II.:**

Neal M.J.: Medical Pharmacology at a Glance.  
8th edition. John Wiley & Sons Ltd., 2015.

ISBN: 978-1118902400.

Katzung, B.G., Trevor, A.J.: Pharmacology:

Examination and Board Review.  
12th edition. Appleton and Lange, Stamford, CT, 2018. ISBN: 978-1259641022.

Humphrey Rang, Maureen Dale, James Ritter, Rod Flower, Graeme Henderson: Rang & Dale's Pharmacology.  
8th edition. Elsevier, 2015. ISBN: 978-0702053627.

George Brenner, Craig Stevens: Pharmacology.  
5th edition. Elsevier, 2017. ISBN: 978-0323391665.

Laurence L. Brunton (editor): Goodman & Gilman's The pharmacological Basis of Therapeutics.  
13th edition. McGraw Hill Medical, 2017. ISBN: 978-1259584732.

Katzung, B. G.: Basic and Clinical Pharmacology.  
14th edition. McGraw-Hill Education, 2018. ISBN: 978-1259641152.

### **Internal Medicine IV. (Endocrinology, Nephrology):**

L.M. Tierney, Jr., Stephen J. McPhee, Maxine A. Papadakis: Current Medical Diagnosis and Treatment.  
latest edition. Appleton and Lange, Stamford, CT.

Wynngaarden / Smith / Bennett: Cecil Textbook of Medicine.  
latest edition. W.B. Saunders Co., Richard J Johnson Feehally Mosby: Comprehensive Clinical Nephrology. Harcourt Publishers Limited, 2000.

C. C. Tisher, C. S. Wilcox: Nephrology and Hypertension Hans Officer Series.  
latest edition.

Francis S. Greenspan and Peter H. Forsham: Basic and Clinical Endocrinology.  
latest edition. Lange Medical Publications/Los Altos, California.

### **Obstetrics and Gynecology II.:**

Symonds, I., Arulkumaran, S. (eds.): Essential Obstetrics and Gynaecology.  
Fifth Edition. Churchill Livingstone Elsevier, 2014. ISBN: 978-0-7020-3068-0.

### **Radiology and Nuclear Medicine II.:**

Sutton, D.: Radiology and imaging for medical students.  
5th edition. Churchill Livingstone, 1998. ISBN: 0-443-03955-0.

Peter Armstrong-Martin L. Wastic: Diagnostic imaging.  
. ISBN: 0-632-03093-3.

Taylor A., Alazraki N., Schuster D.M.: A Clinician's Guide to Nuclear Medicine.  
2nd edition. The Society of Nuclear Medicine, Reston, 2006. ISBN: 0-9726-4787-2.

Elgazzar, A. H.: A Concise Guide to Nuclear Medicine.  
Springer, 2011. ISBN: 3642194257.

### **Surgery II.:**

Doherty: Current Surgical Diagnosis and Treatment.  
13th edition. McGraw-Hill-Companies, 2009. ISBN: 0-0716-3515-7.

Clive R. G. Quick: Essential Surgery: Problems, Diagnosis and Management.  
5th Edition. Churchill Livingstone, 2013. ISBN: 978-0702046742.

### **Preventive Medicine and Public Health II.:**

K.J. Rothman: Epidemiology: An Introduction. Oxford University Press Inc., 2002.

Porta, M.: A dictionary of epidemiology.  
5th edition. Oxford University Press, 2008. ISBN: 0-1953-1450-6.

Liam J. Donaldson, Paul Rutter: Donaldsons' Essential Public Health.  
4th edition. CRC Press, 2017. ISBN: 9781909368958.

### **Functional Anatomy of the Visual System:**

Eric R. Kandel, MD (winner of the Nobel Prize in 2000); James H. Schwartz, MD, PhD; Thomas M. Jessell, PhD; Steven A. Siegelbaum, PhD; and A. J. Hudspeth, PhD: Principles of Neural Science.  
Fifth Edition. 2012. ISBN: 13: 978-0071390118.

Gordon M. Shepherd: The Synaptic Organization of the Brain.  
Edition: 5.2003. ISBN: -10: 019515956X.

### **Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks:**

Christof Koch and Idan Segev: Methods in Neuronal Modeling, From Synapses to Networks.

MIT Press, Cambridge, Massachusetts, and London, England, 1991., ISBN: ISBN 0-262-61071-X.

### **Radiotherapy in the clinical practice:**

K.S. Clifford Chao, Carlos A. Perez, Luther W. Brady: Radiation oncology Management Decisions.

Lippincott-Raven, 1999. ISBN: 0-397-58468-7.

C.A.Perez, L.W.Brady, E.C.Halperin, R.K.Schmidt-Ullrich: Principles and Practice of Radiation Oncology.

4th edition. Lippincott Williams & Wilkins, ISBN: 0-7817-3525-4.

### **Reproductive Endocrinology and Infertility:**

Marc A. Fritz and Leon Speroff: Clinical Gynecologic Endocrinology and Infertility. Eighth Edition. Walters Kluwer/Lippincott Williams & Wilkins. Philadelphia, 2011.

### **Problem based learning - Skills' training:**

J.A.A. Hunter: Clinical Dermatology. Blackwell Scientific Publications, 1992.

### **Clinical Genetics:**

Strachan, Tom and Read, Andrew: Human Molecular Genetics.

4th. Garland Science/Taylor & Francis Group, 2011. ISBN: 978-0815341499.

Michael R. Speicher, Arno G. Motulsky, Stylianos E. Antonaraskis: Human Genetics.

4th. Springer, 2010. ISBN: 978-3-540-37653-8.

Read, Donnai: New Clinical Genetics.

3rd. Scion Publishing, 2015. ISBN: 9781907904677.

### **Bioethics:**

Erich H. Loewy, M.D.: Textbook of Healthcare 366

Ethics.

Plenum Press, 1996.

Seedhouse, D.: Ethics: The Heart of Health Care. John Wiley and Sons, Chichester, 1993.

Raanan Gillon, Ann Lloyd: Principles of Health Care Ethics.

John Wiley and Sons, Chichester, 1995.

Wear, S.: Informed Consent. Patient Autonomy and Physician Beneficence Within' Clinical Medicine.

Kluwer Academic Publishers, 1993.

### **Behavioural Medicine:**

Csabai, M. and Molnar, P.: Health, Illness and Care. A Textbook of Medical Psychology..

Springer, Budapest, 2000.

Jane Ogden: Health Psychology.

Open University Press, 1996.

Friedman, H.S., DiMatteo, M.R.: Health Psychology.

Prentice-Hall Inc., 1989.

Synder, J.J.: Health Psychology and Behavioral Medicine.

Prentice-Hall Inc., 1989.

### **Cardiac interventions:**

Nguyen T.N. : Practical Handbook of Advanced Interventional Cardiology .

.

### **Travel and Tropical Medicine, Vaccinations:**

Andrew Brent, Robert Davidson and Anna Seale: Oxford Handbook of Tropical Medicine.

4th edition. Oxford Medical Handbooks, 2014.

ISBN: 9780199692569.

### **5th year**

#### **Forensic Medicine I:**

L. Buris: Forensic Medicine.

Spinger Hungarica, ISBN: 9-6379-2277-6.

#### **Family Medicine:**

Roger Jones: Oxford Textbook of Primary Medical Care 1-2..

2005, Oxford University Press. Alison Langton, 2005. ISBN: 0 19 856580 1.

**Dermatology:**

Gordon C. Sauer: Manual of skin diseases.  
8th edition. J.B. Lippincott Company,  
Philadelphia, 2000.  
J.A.A. Hunter: Clinical Dermatology.  
Blackwell Scientific Publications, 1992.

**Neurology I.:**

Baehr, Frotscher: Duus's Topical diagnosis in  
Neurology.  
5th edition. 2012. ISBN: 978-3-13-612805-3.  
Misulis, Head: Netter's Concise Neurology.  
Elsevier Saunders, 2007.  
Mária Tünde Magyar and László Csiba: Selected  
Topics in Neurology.  
Debrecen University Press, 2015. ISBN:  
9789633183182.  
Laszlo Csiba: Questions and Answers  
(Neurology).  
Debrecen University Press, 2013. ISBN:  
9789633180372.  
Ropper, Samuels, Klein: Adams and Victor's  
Principles of Neurology.  
10th edition. Mc Graw Hill Education, 2014.  
ISBN: 978-0-07-179479-4.  
Lindsay, Bone, Fuller: Neurology and  
Neurosurgery Illustrated.  
5th edition. Churchill Livingstone, ELSEVIER,  
2010. ISBN: 978-0-443-06957-4.

**Emergency Medicine:**

Mary T. Ho, Charles E. Saunders: Current  
Emergency Diagnosis and Treatment.  
4th edition. Appleton and Lange, Stamford, CT,  
1994. ISBN: 0-8385-1347-6.  
Michael Clancy, Colin Robertson, Colin Graham,  
Jonathan Wyatt, Robin Illingworth: Oxford  
Handbook of Emergency Medicine.  
4. Oxford, 2012. ISBN: 978 0 19 958956 2.

**Pediatrics I.:**

Karen J. Marcante & Robert M. Kilegman:  
Nelson Essentials of Pediatrics.  
8th edition. 2018.

**Psychiatry I.:**

Kaplan, H. I., Sadock, B. J.: Synopsis of  
Psychiatry.

11th edition. Williams & Wilkins, 2014. ISBN:  
1-6091-3971-2.

Nancy Andreasen, Donald W. Black: Introductory  
Textbook of Psychiatry.

4th edition. American Psychiatric Press, 2006.

Harold I. Kaplan and Benjamin J. Sadock:  
Pocket Handbook of Clinical Psychiatry.

4th edition. Williams & Wilkins, 2005.

**Surgical Oncology:**

Doherty: Current Surgical Diagnosis and  
Treatment.

13th edition. McGraw-Hill-Companies, 2009.

ISBN: 0-0716-3515-7.

Clive R. G. Quick: Essential Surgery: Problems,  
Diagnosis and Management.

5th Edition. Churchill Livingstone, 2013. ISBN:  
978-0702046742.

**Basics of Hemorheology:**

Stoltz J.F., Singh M., Riha P.: Hemorheology in  
practice.

IOS Press, 1999. ISBN: 90-5199-435-4.

Baskurt, O.K., Hardeman, M.R., Rampling,

M.W., Meiselman, H.J.: Handbook of

Hemorheology and Hemodynamics.

IOS Press, 2007. ISBN: 978-1-58603-771-0.

**Echocardiography:**

Feigenbaum: Echocardiography.

**Urological Laparoscopic Surgery:**

Nyirády, Peter - Romics, Imre: Textbook of  
Urology.

1st. Semmelweis Publisher, 2009. ISBN:

9789639879232.

**Basic laparoscopic surgical training:**

Reddick E.J.: Atlas of Laparoscopic Surgery.

Raven Press, New York, 1993. ISBN: 0-88167-  
923-1.

Cuschieri A., Buess G., Pérrisat J.: Operative

Manual of Endoscopic Surgery.

Springer Verlag, 1992. ISBN: 3-540-53486-5.

**Internal Medicine V.****(Gastroenterology):**

Schoreder, Krupp, Tierney, McPhee: Current Medical Diagnosis and Therapy. latest edition. Appleton and Lange, Stamford, CT.

Merck Manual.

latest edition. Merck Research Laboratories, ISBN: 0-9119-1016-6.

### **History of Radiology:**

Adrian M. K. Thomas, Arpan K. Banerjee: The History of Radiology.

1st edition. Oxford University Press, 2013. ISBN: 978-0-19-963997-7.

Ronald L. Eisenberg: Radiology: An Illustrated History.

Mosby-Year Book, 1993. ISBN: 0-8016-1526-7.

### **Operativ techniques in radiotherapy (brachytherapy):**

C.A.Perez, L.W.Brady, E.C.Halperin, R.K.Schmidt-Ullrich: Principles and Practice of Radiation Oncology.

4th edition. Lippincott Williams & Wilkins, . ISBN: 0-7817-3525-4.

### **Benign Prostatic Hyperplasia (BPH):**

Nyirády, Peter - Romics, Imre: Textbook of Urology.

1st. Semmelweis Publisher, 2009. ISBN: 9789639879232.

Emil A., Tanagho, Jack W. McAninch: Smith's general urology.

12th edition. Appleton and lange, 1988. ISBN: 0-8385-8605-8.

### **Dark side of the human mind with anatomical implications:**

K.L. More: Clinically Oriented Anatomy.

6th edition. Lippincott Williams & Wilkins, 2004. ISBN: 9781-60547-652-0.

Sobotta: Atlas of Human Anatomy I.-II..

14th edition. Urban & Schwarzenberg, ISBN: 978-0-443-10349-0.

### **Pharmacotherapy:**

Chisholm-Burns, Schwinghammer, Wells, Malone, DiPiro, Kolesar, Katz, Matthias: Pharmacotherapy Principles and Practice.

4th edition. Mc Graw Hill, 2016. ISBN: 978-0071835022.

### **Otolaryngology:**

Hans Behrbohm, Oliver Kaschke, Tadeus Nawka, Anrew Swift: Ear, Nose and Throat Disases with Head and Neck Surgery.

3rd edition.. ISBN: 978-3-13-671203-0.

### **Ophthalmology:**

G. Lang: Ophthalmology.

Gerg Thieme Verlag, Stuttgart.

### **Infectology:**

Dennis L. Kasper, Anthony S. Fauci: Harrison's Infectious Diseases.

2nd Revised edition. McGraw-Hill Education - Europe, 2013. ISBN: 0071814825.

Stefan Mauss, Thomas Berg, Jürgen Rockstroh, Christoph Sarrazin, Heiner Wedemeyer:

Hepatology (ebook)

<http://www.hepatologytextbook.com/download/hepatology2017.pdf>.

Eighth Edition, 2017. Medizin Fokus Verlag, Zöllnerstrasse 1, 22761 Hamburg, 2017. ISBN: 978-3-941727-22-9.

Christian Hoffmann, Jürgen K. Rockstroh: HIV 2015/16.

SchrödersAgentur, www.schroede. Medizin Fokus Verlag, Hamburg, 2015. ISBN: 978-3-941727-17-5.

Angela Dramowski, Shaheen Mehtar, Dave Woods: Infection Prevention and Control: A Guide for Healthcare Workers in Low-Resource Settings.

United States. Bettercare, 2014. ISBN: 1920218815.

Kevin a Lenhart: Introductory Case Studies in Infectious Disease Epidemiology.

Createspace, 2013. ISBN: 1492235547.

American Academy of Pediatrics, David W.

Kimberlin , Michael T. Brady, Mary Anne

Jackson , Sarah S. Long: Red Book 2015: Report of the Committee on Infectious Diseases.

30th Revised edition. American Academy of Pediatrics, 2015. ISBN: 1581109261.

Nigar Kirmani, Keith Woeltje, Hilary Babcock:

The Washington Manual: Infectious Diseases: Subspecialty Consult.



2nd Revised edition. Lippincott Williams and Wilkins, 2012. ISBN: 1451113641.

**Idiopathic inflammatory myopathies, from bench to bedside:**

Robert R Rich et al: Clinical Immunology (Principles and practice) I. II. (3rd Edition). Mosby, 2008.  
EULAR: Textbook on Rheumatic diseases. Johannes WJ Bijlsma.

**Forensic Medicine II.:**

L. Buris: Forensic Medicine. Springer Hungarica, ISBN: 9-6379-2277-6.

**Internal Medicine VI. (Haematology, Haemostaseology):**

Merck Manual.  
latest edition. Merck Research Laboratories, . ISBN: 0-9119-1016-6.  
Harrison: Principles of Internal Medicine. latest edition. McGraw-Hill-Companies.  
Hoffbrand A.V., Pettit J.E.: Essential Haematology.  
3rd edition. Blackwell Sciences, 1999. ISBN: 0-632-03083-6.  
Papadakis MA, McPhee SJ, Rabow MW: Current Medical Diagnosis and Treatment. McGraw-Hill Education, 2015.  
: Winthrobe's Hematology.

**Neurology II.:**

Baehr, Frotscher: Duus's Topical diagnosis in Neurology.  
5th edition.2012. ISBN: 978-3-13-612805-3.  
Misulis, Head: Netter's Concise Neurology. Elsevier Saunders, 2007.  
Mária Tünde Magyar and László Csiba: Selected Topics in Neurology.  
Debrecen University Press, 2015. ISBN: 9789633183182.  
Laszlo Csiba: Questions and Answers (Neurology).  
Debrecen University Press, 2013. ISBN: 9789633180372.  
Ropper, Samuels, Klein: Adams and Victor's Principles of Neurology.

10th edition. Mc Graw Hill Education, 2014. ISBN: 978-0-07-179479-4.

Lindsay, Bone, Fuller: Neurology and Neurosurgery Illustrated.  
5th edition. Churchill Livingstone, ELSEVIER, 2010. ISBN: 978-0-443-06957-4.

**Neurosurgery:**

György I. Csécsei: Lecture book of neurosurgery for medical students.  
2003.

Lindsay, Bone, Callander: Neurology and Neurosurgery.

2nd edition. Churchill Livingstone, 1991. ISBN: 0-4430-4345-0.

**Pediatrics II.:**

Karen J. Marcante & Robert M. Kilegman: Nelson Essentials of Pediatrics.  
8th edition.2018.

**Psychiatry II.:**

Kaplan, H. I., Sadock, B. J.: Synopsis of Psychiatry.  
11th edition. Williams & Wilkins, 2014. ISBN: 1-6091-3971-2.  
Nancy Andreasen, Donald W.Black: Introductory Textbook of Psychiatry.  
4th edition. American Psychiatric Press, 2006.  
Harold I. Kaplan and Benjamin J. Sadock: Pocket Handbook of Clinical Psychiatry.  
4th edition. Williams & Wilkins, 2005.

**Functional Anatomy of the Visual System:**

Eric R. Kandel, MD (winner of the Nobel Prize in 2000); James H. Schwartz, MD, PhD; Thomas M. Jessell, PhD; Steven A. Siegelbaum, PhD; and A. J. Hudspeth, PhD: Principles of Neural Science.  
Fifth Edition.2012. ISBN: 13: 978-0071390118.  
Gordon M. Shepherd: The Synaptic Organization of the Brain.  
Edition: 5.2003. ISBN: -10: 019515956X.

**Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks:**

Christof Koch and Idan Segev: *Methods in Neuronal Modeling, From Synapses to Networks*. MIT Press, Cambridge, Massachusetts, and London, England, 1991., ISBN: ISBN 0-262-61071-X.

### **Surgical biomaterials:**

Mikó I., Furka I.: *Basic Surgical Techniques*, Faculty of Medicine. 4th enlarged edition. Debrecen University Press, 2019. ISBN: 978-963-490-11.

### **Principles of Physical Medicine and Rehabilitation:**

DeLisa / Gans / Walsh: *Physical Medicine and Rehabilitation. Principles and practice*. 4th edition. Lippincott Williams & Wilkins, 2005.

Gutenbrunner C, Ward AB, Chamberlain MA: *White Book on Physical and Rehabilitation Medicine in Europe*. UEMS, 2006.

*International Classification of Functioning. Disability and Health*. World Health Organisation, Geneva, 2001.

### **Clinical Oncology:**

Dennis A. Casciato, Mary C. Territo: *Manual of Clinical Oncology*. 2012. Lippincott Williams & Wilkins, 2012.  
Jim Cassidy, Donald Bissett, Roy A.J. Spence OBE, Miranda Payne and Gareth Morris-Stiff: *Oxford Handbook of Oncology*. 2015. Oxford University Press, 2015.

### **Reproductive Endocrinology and Infertility:**

Marc A. Fritz and Leon Speroff: *Clinical Gynecologic Endocrinology and Infertility*. Eighth Edition. Walters Kluwer/Lippincott Williams & Wilkins. Philadelphia, 2011.

### **Aesthetic Dermatology:**

J.A.A. Hunter: *Clinical Dermatology*. Blackwell Scientific Publications, 1992.

### **Advanced Surgical Operative Techniques:**

H.E. Grewe: *Grewe's Manual of Basic Surgical Skills. An Introduction to Surgical Procedures*. B.C. Decker, 1986. ISBN: 0-941158-84-5.

G.R. McLatchie, D.J. Leaper: *Oxford Handbook of Operative Surgery*. Oxford University Press, 1996. ISBN: 0-19-262097-5.

Mikó I., Furka I.: *Basic Surgical Techniques*, Faculty of Medicine. 4th enlarged edition. Debrecen University Press, 2019. ISBN: 978-963-490-11.

### **Anesthesiology and Intensive care:**

Singer, M., A.R. Webb: *Oxford Handbook of Critical Care*. Oxford University Press, 1997. ISBN: 0-19-262542-X.

G.Morgan, Maged Mikhail, Michael Murray: *Clinical Anesthesiology*. 4th. Appleton and Lange, 1996. ISBN: 0-8385-1553-3.

### **Cardiac interventions:**

Nguyen T.N.: *Practical Handbook of Advanced Interventional Cardiology*.

### **Travel and Tropical Medicine, Vaccinations:**

Andrew Brent, Robert Davidson and Anna Seale: *Oxford Handbook of Tropical Medicine*. 4th edition. Oxford Medical Handbooks, 2014. ISBN: 9780199692569.