BULLETIN

UNIVERSITY OF DEBRECEN

ACADEMIC YEAR 2021/2022

FACULTY OF MEDICINE

Coordinating Center for International Education

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CHAPTER 1
WELCOME FROM THE DEAN

Welcome from the Dean

The history of higher education in Debrecen goes back to the 16th century. The city established the Calvinist College of Debrecen in 1538. The College became soon the most important cultural center of the whole country, where a great number of writers, scientists and politicians received their education. In the 18th century the schools of Law and Theology were founded and although no separate School of Medicine existed, physicians were also trained in the College. The Faculty of Medicine is rooted in this spiritual heritage. The present day Debrecen is also famous for its schools and higher educational establishments. The Faculty of Medicine of the University of Debrecen was Central Europe's first campus medical school. It was in the year of the millennium (1896) of Hungary's foundation when the establishment of a modern University was decided upon in Debrecen. The University was officially inaugurated on October 23, 1918 and at that time consisted of four faculties: Arts, Science, Theology and Medicine. The Faculty of Medicine became an independent University Medical School under the supervision of the Ministry of Health in 1951. In 2000 the formerly independent universities of Debrecen formed the University of Debrecen, therefore today the Faculty of Medicine is part of the University of Debrecen. It has 13 departments of basic sciences, 5 diagnostical departments and 22 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 Diagnostic Analysis and MSc programs in Clinical Laboratory Sciences, Molecular Biology and Health Psychology.

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

Best wishes,

László Mátyus

Dean, Faculty of Medicine

CHAPTER 2
INTRODUCTION

The aim of the University of Debrecen is to become a university of medical sciences committed to the prevention and restoration of health of the people, not only in its region but in the entire country. In the past two decades both medical science and health care have entered a new era: the medical science of the 21st century. Molecular medicine is opening up and new possibilities are available for the diagnosis, prevention, prediction and treatment of the diseases. One can witness such a progress in medical sciences that has never been seen before. Modern attitudes in health care should be enforced in practice, including therapeutical approaches that consider the explanation and possible prevention of diseases, and attempt to comprehend and take the human personality into consideration. These approaches demand the application of the most modern techniques in all fields of the medical education.

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

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

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

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

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

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

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

HIGHER EDUCATION IN DEBRECEN

A Brief History

1235: First reference to the town of Debrecen in ancient charters.
1538: Establishment of the “College of Reformed Church” in Debrecen.
1567: Higher education begins in the College.
1693: Declaration of Debrecen as a “free royal town”.
1849: Debrecen serves as the capital of Hungary for 4 months.
1912: Establishment of the State University of Debrecen comprising the Faculties of Arts, Law, Medicine and Theology.
1918: Inauguration of the Main Building of the Medical Faculty by King Charles IV of Hungary.
1921: The Medical Faculty becomes operational.
1932: Completion of buildings of the campus.
1944: Although during the Second World War, Debrecen became the capital of Hungary again (for 100 days), the University itself is abandoned for a while.
1949: The only year when the University has five faculties.
1950: The Faculty of Law idles; the Faculty of Science is established.
1951: The University is split up into three independent organizations: Academy of Theology, Medical School, Lajos Kossuth University of Arts and Sciences.
1991: The “Debrecen Universitas Association” is established.
1998: The “Federation of Debrecen Universities” is founded.
2000. The federation is transformed into the unified “University of Debrecen” with all the relevant faculties and with some 20,000 students.

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

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

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

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

The special training of dentists began in 1976. As a further development the University Medical School established the Health College of Nyíregyháza in 1991. In 1993, as part of a nationwide program, the University was given the rights to issue scientific qualifications and new Ph.D. programs were also launched. Several new programs (e.g. the training of molecular biologists, pharmacists, general practitioners) were commenced in the '90s. The Faculty of Public Health was established in 1999, while the Faculty of Dentistry was founded in 2000.
The Faculty of Medicine celebrated the 90th anniversary of its foundation in October 2008 with a highly successful international scientific conference.

Education at the University of Debrecen
Debrecen, the second largest city of Hungary, is situated in Eastern Hungary. Students enrolled in the various programs (e.g. Medicine, Dentistry, Pharmacy, Public Health, Molecular Biology, etc.) study on a beautiful campus situated in the area called "Great Forest".
The Hungarian Government gives major priorities to the higher education of health sciences in its higher education policy. One of these priorities is to increase the ratio of college level training forms within the Hungarian higher education system. The governmental policy wishes to implement conditions in which the whole health science education system is built vertically from the lowest (post-secondary or certificate) to the highest (PhD-training) levels. In fact, this governmental policy was the reason behind the establishment of the new Health Science Education Center within the Federation of Debrecen Universities (DESZ), based partially on the intellectual resources of the University of Debrecen. The new programs – with specialized training for paramedics – will help to correct the balance of the Hungarian labor-market that became rather unsettled in the past few decades.
The Act of Higher Education (1993) has restored the rights of the medical universities to award postgraduate degrees and residency, and permission was also given to license Physicians' procedures. This kind of training required a new structure, a new administrative apparatus, and a suitable training center. The new residency programs were commenced in 1999.
The introduction of the credit system, starting in September 2003, has been mandatory in every Hungarian university, helping the quantitative and qualitative evaluation of the students' achievements. Admission requirements for Hungarian students are defined at national level, and they are applicable for every student wishing to be enrolled into the Medicine or Dentistry programs.
International students must pass an entrance exam in biology and (depending on their preference) in physics or chemistry. In some special cases it may be possible for the candidates to apply for transfer to higher years on the basis of their previous studies and achievements. International students study in English language. Entrance for certain courses of the Health College is also possible on the basis of a special evaluation (scoring) and an entrance interview.
The syllabuses and classes of all courses correspond to European standards. The total number of contact hours in medical education is over 5,500, which can be divided into three main parts: basic theoretical training (1st and 2nd year), pre-clinical subjects (3rd year) and clinical subjects (4th and 5th year) followed by the internship (6th year). The proportion of the theoretical and practical classes is 30% to 70%; whereas the students/instructors ratio is about 8/1. The first two years of dentistry education are similar to the medicine program, but the former contains a basic dental training that is followed by a three-year-long pre-clinical and clinical training. Besides the medicine and dentistry programs, there are several other courses also available, including molecular biology. The various Health College courses include more and more new curricula.
The Medicine program delivered in English and intended for international students was commenced in 1987; whereas the Dentistry and Pharmacy programs for international students started in 2000 and 2004, respectively. The curriculum of the English language Medicine program meets all the

requirements prescribed by the European medical curriculum, which was outlined in 1993 by the Association of Medical Schools in Europe. Compared to the Hungarian program, the most important differences are:
-Hungarian language is taught,
-More emphasis is laid upon the tropical infectious diseases (as parts of the “Internal Medicine” and “Hygiene and Epidemiology” courses).
Otherwise, the English language curriculum is identical with the Hungarian one. The 6th year of the curriculum is the internship that includes Internal Medicine, Pediatrics, Surgery, Obstetrics and Gynecology, Neurology, and Psychiatry. The completion of these subjects takes at least 47 weeks, although students are allowed to finish them within a 24-month-long period. The successfully completed internship is followed by the Hungarian National Board Examination. Just like the rest of the courses, the internship is also identical in the Hungarian and English programs.
A one-year-long premedical (Basic Medicine) course, which serves as a foundation year, is recommended for those applicants who do not possess sufficient knowledge in Biology, Physics and Chemistry after finishing high school.
After graduation, several interesting topics are offered for PhD training, which lasts for three years. If interested, outstanding graduates of the English General Medicine and Dentistry programs may join these PhD courses (“English PhD-program”). Special education for general practitioners has been recently started and a new system is in preparation now for the training of licensed physicians in Debrecen.

The accredited PhD programs include the following topics:
-Molecular and Cell Biology; Mechanisms of Signal Transduction
-Microbiology and Pharmacology
-Biophysics
-Physiology-Neurobiology
-Experimental and Clinical Investigations in Hematology and Hemostasis
-Epidemiological and Clinical Epidemiological Studies
-Cellular- and Molecular Biology: Study of the Activity of Cells and Tissues under Healthy and Pathological Conditions
-Immunology
-Experimental and Clinical Oncology
-Public Health
-Preventive Medicine
-Dental Research

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

Medical Activity at the Faculty of Medicine
The Faculty of Medicine is not only the second largest medical school in Hungary, but it is also one of the largest Hungarian hospitals, consisting of 40 departments; including 22 different clinical departments. 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.
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 27 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

RECTOR OF THE UNIVERSITY OF DEBRECEN	
Rector	Zoltán Szilvássy M.D., Ph.D., D.Sc.
Address	4032 Debrecen, Egyetem tér 1.
Phone	+36-52-416-060
Phone/fax	+36-52-416-490
E-mail	rector@unideb.hu
COORDINATING CENTER FOR INTERNATIONAL EDUCATION	
Director	Attila Jenei M.Sc., Ph.D.
Address	4032 Debrecen, Nagyerdei krt. 94.
Phone	+36-52-258-058
Fax	+36-52-414-013
E-mail	info@edu.unideb.hu
FACULTY OF MEDICINE	
Dean	László Mátyus M.D., Ph.D., D.Sc.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone	+36-52-258-086
Fax	+36-52-255-150
E-mail	dekan@med.unideb.hu
Vice Dean of Specialization and Further Education	Andrea Szegedi M.D., Ph.D., D.Sc.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone	+36-52-411-717/56432
Fax	+36-52-255-150
E-mail	dekan@med.unideb.hu
Vice-Dean for Scientific Affairs	Zoltán Papp M.D., Ph.D., D.Sc.
Address	4032 Debrecen, Nagyerdei krt. 98.

Phone	+36-52-411-717/54329
Fax	+36-52-255-978
E-mail	dekan@med.unideb.hu

Vice-Dean for Educational Affairs	Norbert Németh M.D., MBA, Ph.D., D.Sc.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone	+36-52-411-717/54226
Fax	+36-52-416-915
E-mail	dekan@med.unideb.hu

DEAN'S OFFICE OF THE FACULTY OF MEDICINE

Head of Dean's Office	Katalin Juhász M.A.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-258-085, +36-52-255-150
E-mail	kjuhasz@edu.unideb.hu

REGISTRAR'S OFFICE

Head of Registrar's Office	Pál Pap M.Sc., Ph.D.
Address	4032 Debrecen, Nagyerdei krt. 94.
Phone/Fax	+36-52-258-001
E-mail	pap.pal@med.unideb.hu

FACULTY OF DENTISTRY

Dean	Kinga Bágyi D.M.D., Ph.D. habil
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-255-208
E-mail	bagyi.kinga@dental.unideb.hu

Vice-Dean for Educational Affairs	Norbert Szentandrássy M.D., Ph.D.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-255-208
E-mail	szentandrassy.norbert@med.unideb.hu

Vice-Dean for General Affairs	István Varga D.M.D., Ph.D.

Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-255-208
E-mail	varga.istvan@dental.unideb.hu

FACULTY OF PHARMACY

Dean	Miklós Vecsernyés Pharm.D.,Ph.D.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-411-717/54033
E-mail	vecsernyes.miklos@pharm.unideb.hu
Vice-Dean For General and Development Affairs	Gábor Halmos Pharm.D,.Ph.D
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-411-600/55292
E-mail	halmos.gabor@pharm.unideb.hu
Vice-Dean for Educational Affairs	Ildikó Bácskay Pharm.D., Ph.D.
Address	4032 Debrecen, Nagyerdei krt. 98.
Phone/Fax	+36-52-411-600/54034
E-mail	bacskay.ildiko@pharm.unideb.hu

FACULTY OF PUBLIC HEALTH

Dean	Judit Zsuga M.D., Ph.D.
Address	4032 Debrecen, Móricz Zsigmond krt. 22.
Phone	+36-52-411-600
Fax	+36-52-255-487
E-mail	dekan@sph.unideb.hu
Vice-Dean for Educational Affairs	Ilona Veres-Balajti
Address	4028 Debrecen, Kassai út 26.
Phone	+36-52-512-765/77134
E-mail	Balajti.ilona@sph.unideb.hu

FACULTY OF HEALTH

Dean	Marianna Móré Ph.D. habil
Address	4400 Nyíregyháza, Sóstói u. 2-4.
Phone	+36-42-598-235
Fax	+36-42-408-656
E-mail	more.mariann@foh.unideb.hu

Vice-Dean for General and Scientific Affairs	Anita Rusinné Fedor Ph.D habil
Address	4400 Nyíregyháza, Sóstói út 2-4.
Phone	+36-42-598-235
Fax	+36-42-408-656
E-mail	fedor.anita@foh.unideb.hu

Vice-Dean for Educational Affairs	Attila Sárváry Ph.D.
Address	4400 Nyíregyháza, Sóstói út 2-4.
Phone	+36-42-598-235
Fax	+36-42-408-656
E-mail	sarvary.attila@foh.unideb.hu

INTERNATIONAL STUDENT UNION DEBRECEN

Internet	https://hu-hu.facebook.com/ISUDebrecen/
E-mail	isudebrecen@gmail.com

DEENK LIFE SCIENCES LIBRARY

Address	4032 Debrecen, Egyetem tér 1.
Phone/Fax	+36-52-518-610
E-mail	info@lib.unideb.hu
Internet	http://lib.unideb.hu/en

CHAPTER 4
ADMINISTRATIVE UNITS

COORDINATING CENTER FOR INTERNATIONAL EDUCATION

Nagyerdei krt. 94., Debrecen, 4032, Tel: +36-52-258-058
E-mail: info@edu.unideb.hu, Web: www.edu.unideb.hu

Director	Prof	Attila Jenei M.Sc., Ph.D.
Program Coordinator	Prof	Ferenc Erdődi M.Sc., Ph.D., D.Sc.
BMC Coordinator	Ms.	Beáta Lontay M.Sc., Ph.D.
Manager Assistant	Ms.	Márta Hajdu M.A.
Marketing Coordinator	Ms.	Eszter Balázsy M.Sc.
	Ms.	Dóra Mónus M.A.
Financial Coordinator	Ms.	Rita Kovács J.D.
Agent Coordinator	Ms.	Katalin Tatár-Györe M.A.
Ranking and Marketing Coordinator	Ms.	Zsófia Münnich M.Sc.
English Program Coordinators	Ms.	Dóra Benkő (Admission, Visa Issues, BMC, US Loans)
	Ms.	Regina Berei (Tuition fee, Financial certificates, Refunds)
	Ms.	Marianna Gyuris (Admission, Visa issues, USMLE, MCCEE, Stipendium Hungaricum Scholarship, Wyckoff Heights)
	Ms.	Ildikó Lakatos M.A. (Admission, Visa Issues)
	Ms.	Enikő Sallai M.Sc. (Tuition fee, Health Insurance)
	Ms.	Mária Tóth M.Sc. (Stipendium Hungaricum Scholarship)
IT Project Coordinator		Imre Szűcs B.Sc.

REGISTRAR'S OFFICE

Nagyerdei krt. 94., Debrecen, 4032, Tel: +36-52-258-020
E-mail: eduoffice@med.unideb.hu; deaokto@med.unideb.hu

Head of Registrar's Office		Pál Pap M.Sc., Ph.D.
Secretary	Ms.	Viktória Rubos-Varga
Neptun Coordinator		Ádám Richárd Jasák
English Program Officer		Gábor Hatvani

	Ms. Bernadett Illó M.A.
	Ms. Éva Ludánszki
	Ms. Réka Rónai M.Sc.
Hungarian Program Officer	Ms. Anna Bakonszegi
	Ms. Zsuzsa Barta (B.A.)
	Tamás Buka M.A.
	Ms. Judit Derzsi M.A.
	Ms. Nóra Faragó M.Sc.
	Ms. Anikó Karcza B.Sc.
	Ms. Andrea Beáta Kondás-Molnár
	Ms. Ágnes Ojtozi M.A.
	Ms. Anna Mária Pásztori B.Sc.

CHAPTER 5
BASIC MEDICINE COURSE

BASIC MEDICINE COURSE - INTRODUCTION TO BIOLOGY

Nagyerdei krt. 98., Debrecen, 4032
Web: www.bmc.unideb.hu

BMC Coordinator	Ms.	Beáta Lontay M.Sc., Ph.D.
Course Coordinator	Ms.	Klára Matesz M.D.,Ph.D.,D.Sc.
Study Advisor		András Penyige M.Sc., Ph.D. (BMC I 1st semester; BMC II)
		Norbert Szentandrássy M.D., Ph.D. (BMC I 2nd semester; BMC II)
Lecturer		János Almássy M.Sc., Ph.D.
	Ms.	Szilvia Benkő M.Sc., Ph.D.
		András Birinyi M.Sc., Ph.D.
	Ms.	Zsuzsanna Birkó M.Sc., Ph.D.
		Gergely Buglyó M.D., Ph.D.
	Ms.	Gabriella Czifra M.Sc., Ph.D.
	Ms.	Krisztina Deák-Pocsai M.Sc., Ph.D.
	Ms.	Beatrix Dienes M.Sc., Ph.D.
	Ms.	Nóra Dobrosi M.Sc., Ph.D.
		János Fodor M.Sc., Ph.D.
		Botond Gaál M.Sc., Ph.D.
	Ms.	Mónika Gönczi M.Sc., Ph.D.
	Ms.	Krisztina Holló M.Sc., Ph.D.
		Balázs Horváth M.D.,Ph.D.
	Ms.	Judit Keserű M.Sc., Ph.D.
		Kornél Kistamás M.Sc., Ph.D.
	Ms.	Adrienn Kovács M.Sc., Ph.D.
		András Mádi M.Sc., Ph.D.
	Ms.	Klára Matesz M.D.,Ph.D.,D.Sc.
		Csaba Matta M.Sc., Ph.D.
		Attila Oláh M.Sc., Ph.D.
	Ms.	Melinda Paholcsek M.Sc., Ph.D.
		Balázs Pál M.D.,Ph.D.
	Ms.	Éva Rácz M.Sc., Ph.D.

	Ms. Beáta Soltész M.Sc., Ph.D.
	Lajos Széles M.Sc., Ph.D.
	Ms. Melinda Szilágyi-Bónizs M.Sc., Ph.D.
	Ms. Krisztina Szirák M.Sc., Ph.D.
	Ms. Mónika Sztretye M.Sc., Ph.D.
	Ms. Andrea Telek M.Sc., Ph.D.
	István Balázs Tóth M.Sc., Ph.D.
	Ms. Angelika Varga M.Sc., Ph.D.
	Ervin Wolf M.Sc., Ph.D.
	Ms. Róza Zákány M.D., Ph.D.

BASIC MEDICINE COURSE - INTRODUCTION TO BIOPHYSICS
Nagyerdei krt. 98., Debrecen, 4032
Web: www.bmc.unideb.hu

BMC Coordinator	Ms. Beáta Lontay M.Sc., Ph.D.
Course Coordinator	György Panyi M.D., Ph.D., D.Sc.
Study Advisor	Attila Jenei M.Sc., Ph.D. (BMC II)
	Zoltán Varga M.Sc., Ph.D., D.Sc. (BMC I)
Lecturer	Zsolt Bacsó M.D., Ph.D.
	Péter Hajdu M.Sc., Ph.D.
	Tamás Kovács M.D., Ph.D.
	László Mátyus M.D., Ph.D., D.Sc.
	Ms. Enikő Nizsalóczki M.Sc.
	György Panyi M.D., Ph.D., D.Sc.
	Ferenc Papp M.Sc., Ph.D.
	G. Tibor Szántó M.Sc., Ph.D.
	János Szöllősi M.Sc., Ph.D., D.Sc., M.H.A.Sc.
	Zoltán Varga M.Sc., Ph.D., D.Sc.
	Ms. Florina Zákány M.D.

BASIC MEDICINE COURSE - INTRODUCTION TO MEDICAL CHEMISTRY
Nagyerdei krt. 98., Debrecen, 4032
Web: www.bmc.unideb.hu

BMC Coordinator	Ms. Beáta Lontay M.Sc., Ph.D.

Course Coordinator	Ms.	Csilla Csortos M.Sc., Ph.D., D.Sc.
Study Advisor		Endre Kókai M.Sc., Ph.D. (BMC I)
	Ms.	Krisztina Tar M.Sc., Ph.D. (BMC II)
Lecturer	Ms.	Éva Bakó M.Sc., Ph.D.
		Péter Bay M.Sc., Ph.D., D.Sc.
		Bálint Bécsi M.Sc., Ph.D.
	Ms.	Anita Boratkó M.Sc., Ph.D.
	Ms.	Csilla Csortos M.Sc., Ph.D., D.Sc.
		Tibor Docsa M.Sc., Ph.D.
		Viktor Dombrádi M.Sc., Ph.D., D.Sc.
		Ferenc Erdődi M.Sc., Ph.D., D.Sc.
	Ms.	Ilona Farkas M.Sc., Ph.D.
		Csaba Hegedűs M.D., L.D.S., Ph.D.
	Ms.	Andrea Kiss M.Sc., Ph.D.
	Ms.	Katalin Kovács M.Sc., Ph.D.
	Ms.	Edit Mikó M.Sc., Ph.D.
	Ms.	Magdolna Szántó D.Pharm., Ph.D.
		László Virág M.D., Ph.D., D.Sc.

CHAPTER 6
FACULTY OF MEDICINE - DEPARTMENTS OF BASIC SCIENCES

DEPARTMENT OF ANATOMY, HISTOLOGY AND EMBRYOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-567
Web: http://www.anat.dote.hu

Associate Professor, Head of the Department		Péter Szücs M.D., Ph.D.
Full Professor, Head of Oral Anatomy Division	Ms.	Klára Matesz M.D.,Ph.D.,D.Sc.
Professor Emeritus		Miklós Antal M.D., Ph.D., D.Sc.
	Ms.	Klára Matesz M.D.,Ph.D.,D.Sc.
		László Módis M.D., Ph.D., D.Sc.
Associate Professor		András Birinyi M.Sc., Ph.D.
		Zoltán Kisvárday M.Sc., Ph.D., D.Sc.
		Ervin Wolf M.Sc., Ph.D.
	Ms.	Róza Zákány M.D., Ph.D.
Assistant Professor	Ms.	Tímea Bácskai M.Sc., Ph.D.
		Botond Gaál M.Sc., Ph.D.
		Zoltán Hegyi M.Sc., Ph.D.
	Ms.	Krisztina Holló M.Sc., Ph.D.
		Tamás Juhász M.Sc., Ph.D.
		Csaba Matta M.Sc., Ph.D.
		Zoltán Mészár M.Sc., Ph.D.
	Ms.	Ildikó Wéber M.Sc., Ph.D.
Assistant Lecturer	Ms.	Anita Balázs M.Sc., Ph.D.
	Ms.	Ildikó Papp M.Sc., Ph.D.
PhD Student	Ms.	Andrea Gajtkó M.Sc.
		Tibor Hajdú M.D.
	Ms.	Éva Kókai M.Sc.
		Miklós Sivadó D.Pharm.
		Mohit Srivastava M.Sc.
		Vince Szegeczki M.D.
	Ms.	Rita Varga M.Sc.
Senior Scientific Officer	Ms.	Petra Talapka Ph.D.
	Ms.	Angelika Varga M.Sc., Ph.D.

Postgraduate Lecturer	Ms.	Krisztina Hegedűs M.Sc.
	Ms.	Eva Katona M.Sc.
	Ms.	Annamária Kenyeres M.Sc.
	Ms.	Lívia Kicska M.Sc.
	Ms.	Gréta Kis M.Sc.
	Ms.	Mónika Szakadát M.Sc.
Junior Scientific Officer	Ms.	Klaudia Dócs M.Sc., Ph.D.
		László Ducza M.Sc.
		Zsolt Kocsis M.D.
		Roland Takács M.Sc., Ph.D.
Invited Lecturer		Tamás Papp M.D., Ph.D.
Course Director		Tamás Juhász M.Sc., Ph.D. (Macroscopic Anatomy)
		Zoltán Mészár M.Sc., Ph.D. (Neurobiology)
		Ervin Wolf M.Sc., Ph.D. (Histology and Embryology)
Academic Advisor for 1st year medical and dental students	Ms.	Ildikó Wéber M.Sc., Ph.D.
Academic Advisor for 1st year pharmacy students	Ms.	Tímea Bácskai M.Sc., Ph.D.
Academic Advisor for 2nd year medical and dental students	Ms.	Ildikó Wéber M.Sc., Ph.D.

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-416-432
E-mail: tokes@med.unideb.hu, Web: http://bmbi.med.unideb.hu

Full Professor, Head of Department		József Tőzsér M.Sc., Ph.D., D.Sc.
Full Professor	Ms.	Mónika Fuxreiter M.Sc., Ph.D., D.Sc.
		László Nagy M.D., Ph.D., M.H.A.Sc.
Professor Emeritus		László Fésüs M.D., Ph.D., D.Sc., M.H.A.Sc.
Associate Professor		Zoltán Balajthy M.Sc., Ph.D.
		Endre Barta M.Sc., Ph.D.
	Ms.	Éva Csősz M.Sc., Ph.D.
	Ms.	Beáta Scholtz M.Sc., Ph.D.
		István Szatmári M.Sc., Ph.D.
Senior Research Fellow		András Mádi M.Sc., Ph.D.

		Lóránt Székvölgyi M.Sc., Ph.D.
Assistant Professor		László Bálint Bálint M.D., Ph.D.
		Róbert Király M.Sc., Ph.D.
		Endre Károly Kristóf M.D., Ph.D.
		Mohamed Mahdi M.D., Ph.D.
		János Mótyán M.Sc., Ph.D.
		Zsolt Sarang M.Sc., Ph.D.
	Ms.	Szilvia Tőkés M.Sc., Ph.D.
Research Fellow	Ms.	Beáta Bartáné Tóth M.Sc., Ph.D.
		Pál Krisztián Bene M.Sc., Ph.D.
		Zsolt Czimmerer M.Sc., Ph.D.
		Gergő Kalló M.Sc., Ph.D.
		Márton Miskei M.Sc., Ph.D.
		Gergely Nagy M.Sc., Ph.D.
		Szilárd Póliska M.Sc., Ph.D.
		András Szabó M.Sc., Ph.D.
	Ms.	Mária Szatmári-Tóth M.Sc., Ph.D.
Junior Research Fellow		Viktor Ambrus M.Sc.
	Ms.	Dóra Bojcsuk M.Sc., Ph.D.
	Ms.	Mária Golda M.Sc., Ph.D.
		Károly Jambrovics M.Sc., Ph.D.
		Norbert Kassay M.Sc.
	Ms.	Éva Péntek-Garabuczi M.Sc., Ph.D.
		Petros Tzerpos M.Sc.
PhD Student		Kumar Ajneesh M.Sc.
	Ms.	Nour Alzaeed M.Sc.
	Ms.	Rini Arianti M.Sc.
	Ms.	Beáta Boros-Oláh M.Sc.
	Ms.	Zsuzsa Csobán-Szabó M.Sc.
	Ms.	Apolka Domokos M.Sc.
	Ms.	Nokhoijav Erdenetsetseg M.D.
	Ms.	Kinga Fedor-Lénárt M.Sc.
		Csaba Fillér M.Sc.
	Ms.	Andrea Guba M.Sc.
		Gyula Hoffka M.Sc.

	Ms.	Lilla Hornyák M.D.
	Ms.	Zsuzsanna Kolostyák M.D.
		Balázs Tibor Kunkli M.Sc.
		Richárd Tamás Linkner M.Sc.
		Márió Miczi M.Sc.
	Ms.	Nataly Morales Granda M.Sc.
	Ms.	Tarban Nastaran M.Sc.
	Ms.	Orsolya Pálné Szén M.Sc.
		Abhirup Shaw M.Sc.
		László Szigeti-Kovács M.Sc.
	Ms.	Vanda Toldi M.Sc.
		Attila Vámos M.Sc.
		János Varga M.Sc.
	Ms.	Boglárka Vinnai M.Sc.
Academic Advisor	Ms.	Szilvia Tőkés M.Sc., Ph.D. (E-mail: tokes@med.unideb.hu, Ext.:64439)

DEPARTMENT OF BIOPHYSICS AND CELL BIOLOGY

Egyetem tér 1., Debrecen, 4032, Tel: +36-52-258-603
E-mail: biophys@med.unideb.hu, Web: http://biophys.med.unideb.hu

Full Professor, Head of Department		György Panyi M.D., Ph.D., D.Sc.
Full Professor		Attila Jenei M.Sc., Ph.D.
		László Mátyus M.D., Ph.D., D.Sc.
		Péter Nagy M.D., Ph.D., D.Sc.
		Gábor Szabó M.D., Ph.D., D.Sc.
		János Szöllősi M.Sc., Ph.D., D.Sc., M.H.A.Sc.
		György Vereb M.D., Ph.D., D.Sc.
Associate Professor		Zsolt Bacsó M.D., Ph.D.
	Ms.	Katalin Goda M.Sc., Ph.D.
		Zoltán Varga M.Sc., Ph.D., D.Sc.
Senior Research Fellow	Ms.	Andrea Dóczy-Bodnár M.Sc., Ph.D.
		György Vámosi M.Sc., Ph.D.
Assistant Professor		Zsolt Fazekas M.Sc., Ph.D.
		Péter Hajdu M.Sc., Ph.D.

		Ferenc Papp M.Sc., Ph.D.
		Gábor Tibor Szántó M.Sc., Ph.D.
		Árpád Szöőr M.D., Ph.D.
Assistant Lecturer		Tamás Kovács M.D., Ph.D.
	Ms.	Florina Zákány M.D.
Research Fellow		Jesus Angel Borrego Terrazas M.Sc., Ph.D.
	Ms.	Éva Hegedüs M.Sc., Ph.D.
		László Imre M.Sc., Ph.D.
	Ms.	Éva Korpos-Pintye-Gyuri M.Sc., Ph.D.
	Ms.	Ágnes Nagyné Dr. Szabó M.Sc., Ph.D.
		Péter Nánási M.D.
	Ms.	Julianna Volkó M.Sc., Ph.D.
Junior Research Fellow		Marco Cozzolino M.Sc.
		István Csomós M.Sc.
	Ms.	Tímea Hajdu M.Sc., Ph.D.
		Ádám Kenesei M.Sc.
		István Rebenku M.Sc.
	Ms.	Tímea Szendi-Szatmári M.Sc.
		László Ujlaky-Nagy M.D.
	Ms.	Orsolya Vörös M.Sc.
PhD Student	Ms.	Ágnes Batta
		Kipchumba Biwott M.Sc.
	Ms.	Marianna Csaplár
		Ádám Fehér M.D.
		Szabolcs Gaál M.D.
	Ms.	Zsuzsanna Gyöngy M.Sc.
		József Kormos M.Sc.
	Ms.	Fadel Lina D.Pharm., M.Sc.
	Ms.	Ghofrane Medyouni M.Sc.
		Endre Nagy
	Ms.	Pialy Sen M.Sc.
	Ms.	Gabriela Serrano Cano Tayde M.Sc.
		Kuljeet Singh M.Sc.
	Ms.	Gabriella Tóth M.Sc.
		Muhammed Naseem Umair M.Sc.

Engineer		Gábor Mocsár M.Sc., Ph.D.
	Ms.	Enikő Nizsalóczki M.Sc.
Educational manager	Ms.	Enikő Nizsalóczki M.Sc.
Visiting Lecturer		László Bene M.Sc., Ph.D.
		Sándor Buglyó M.Sc., Ph.D.
	Ms.	Tímea Hamza-Vecsei M.Sc.
		Pál Pap M.Sc., Ph.D.
Core Facility Manager		Gábor Mocsár M.Sc., Ph.D.

Division of Biophysics
Egyetem tér 1., Debrecen, 4032, Tel: +36 52 258 603
E-mail: biophysedu@med.unideb.hu, Web: http://biophys.med.unideb.hu

Full Professor, Head of Division		Péter Nagy M.D., Ph.D., D.Sc.
Educational manager	Ms.	Enikő Nizsalóczki M.Sc.
Academic Advisor	Ms.	Andrea Dóczy-Bodnár M.Sc., Ph.D.

Division of Cell Biology
Egyetem tér 1., Debrecen, 4032, Tel: +36 52 258 603
E-mail: biophysedu@med.unideb.hu, Web: http://biophys.med.unideb.hu

Full Professor, Head of Division		György Vereb M.D., Ph.D., D.Sc.
Educational manager	Ms.	Enikő Nizsalóczki M.Sc.
Academic Advisor	Ms.	Katalin Goda M.Sc., Ph.D.

Division of Biomathematics
Egyetem tér 1., Debrecen, 4032, Tel: +36 52 258 603
E-mail: biophysedu@med.unideb.hu, Web: http://biophys.med.unideb.hu

Full Professor, Head of Division		Zoltán Varga M.Sc., Ph.D., D.Sc.
Educational manager	Ms.	Enikő Nizsalóczki M.Sc.
Academic Advisor		G. Tibor Szántó M.Sc., Ph.D.

DEPARTMENT OF BEHAVIOURAL SCIENCES

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-594
Web: aok.unideb.hu

Full Professor, Head of Department	Ms.	Karolina Kósa M.D., M.Sc., Ph.D.
Titular Professor		Antal Bugán M.A., Ph.D.
Professor Emeritus		Péter Molnár M.D., D.Sc.
Associate Professor		Attila Bánfalvi M.A., Ph.D., C.Sc.
	Ms.	Ildikó Kuritárné Szabó M.A., Ph.D.
Assistant Professor		János Kristóf Bodnár M.A., Ph.D.
		Sándor Kőmüves M.A., Ph.D.
	Ms.	Judit Molnár M.A., Ph.D.
		Roland Tisljár M.A., Ph.D.
Assistant Lecturer	Ms.	Zita Fekete M.A.
	Ms.	Márta Füzi M.D.
		Ágoston Gajdos M.D.
	Ms.	Beáta Kovács-Tóth M.A.
Research Fellow		Balázs Fábián M.Sc., Ph.D.
	Ms.	Flóra Kenyhercz M.Sc.
PhD Student		László Módis M.D.
		Barnabás Oláh M.Sc.
		Mátyás Osváth M.Sc.
	Ms.	Alexandra Sándor M.Sc.
Invited Lecturer		Bence Döbrőssy M.A.
	Ms.	Szabina Péter Ph.D.
Intern	Ms.	Lilla Stella Bogdán M.Sc.
	Ms.	Lilla Bernadett Bokor M.Sc.
	Ms.	Gréta Dezső M.Sc.
	Ms.	Kitti Katona M.A.
	Ms.	Cintia Katona M.Sc.
	Ms.	Linda Lajtos M.Sc.
	Ms.	Bettina Muha M.Sc.
	Ms.	Nikolett Nagy M.Sc.
	Ms.	Dóra Kata Ötvös M.Sc.
	Ms.	Annamária Rácz M.Sc.
	Ms.	Márta Vincze M.Sc.

		Dávid Vincze M.Sc.
Academic Advisor		Attila Bánfalvi M.A., Ph.D., C.Sc. (3rd year Medical Anthropology)
		János Kristóf Bodnár M.A., Ph.D. (3rd year Bioethics, 4th year Bioethics)
	Ms.	Karolina Kósa M.D., M.Sc., Ph.D. (1st year Basics of Behavioural Sciences, Communication Skills, 4th year Behavioural Medicine, 4-5th year Behavioural Science Final Exam)
		Sándor Kőmüves M.A., Ph.D. (3rd year Medical Sociology)
	Ms.	Judit Molnár M.A., Ph.D. (3rd year Medical Psychology, Pharmaceutical Psychology)

DEPARTMENT OF FAMILY AND OCCUPATIONAL MEDICINE
Móricz Zs. Krt. 22., Debrecen, 4032, Tel: +36-52-25-52-52
E-mail: csotanszek@sph.unideb.hu, Web: www.fam.med.unideb.hu

Associate Professor, Head of Department		László Róbert Kolozsvári M.D., Ph.D.
Professor Emeritus		István Ilyés M.D., M.Sc., Ph.D.
Assistant Lecturer	Ms.	Anna Nánási M.D.
Invited Lecturer		Ádám Hintalan M.D.
	Ms.	Eszter Kovács M.D.
	Ms.	Erzsébet Kovács M.D.
	Ms.	Renáta Laczik M.D., Ph.D.
		Imre Rurik M.D., M.Sc., Ph.D., D.Sc.
		Csaba Sárkány M.D.
		Attila Simay M.D., Ph.D.
	Ms.	Margit Szövetes M.D.
Education Officer, Contact Person	Ms.	Anna Nánási M.D.

DEPARTMENT OF PUBLIC HEALTH AND EPIDEMIOLOGY
Kassai út 26/b, Debrecen, 4028, Tel: +36-52-512-765

Full Professor, Head of Department		János Sándor M.D., Ph.D.
Full Professor	Ms.	Róza Ádány M.D., Ph.D., D.Sc.
	Ms.	Margit Balázs M.Sc., 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 Fiatal M.D., Ph.D.
		Károly Nagy Ph.D.
		László Pál Ph.D.
	Ms.	Orsolya Varga M.D., Ph.D.
Assistant Lecturer		Tibor Jenei
	Ms.	Nóra Kovács M.Sc.
		Gábor Rácz M.D.
		Ferenc Vincze M.Sc.
Assistant Research Fellow		Szabolcs Lovas M.Sc.
	Ms.	Gabriella Pénzes M.Sc.
PhD Student	Ms.	Daria Al Khaiyat M.Sc.
		Bayu Bekele Begashaw M.Sc.
	Ms.	Llanaj Erand M.Sc.
		Kasabji Feras M.Sc.
	Ms.	Nayla Gomaa Nasr Mohammed M.Sc.
	Ms.	Nour Mahrouseh M.Sc.
		Mohammed Merzah M.Sc.
	Ms.	Kurshed Ali Abbas Mohammad M.Sc.
	Ms.	Teuta Muhollari M.Sc.
	Ms.	Shewaye Natae M.Sc.
	Ms.	Diana Wangeshi Njuguna M.Sc.
		Vikas Patel M.Sc.
	Ms.	Petra Selejó M.Sc.
		Carlos Alexandre Soares Andrade
		Roba Argaw Tessema M.Sc.
	Ms.	Jargalsaikhan Undraa M.Sc.
	Ms.	Anna Viktória Varga M.Sc.
	Ms.	Diana Wanghesi Njuguna M.Sc.
	Ms.	Rahul Wasnik M.Sc.
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., Ph.D.
		Werissa Abebe Nardos M.Sc.
		Péter Pikó M.Sc., Ph.D.
		István Szász M.Sc., Ph.D.
Academic Advisor	Ms.	Szilvia Fiatal M.D., Ph.D.
		Sándor Szűcs M.Sc., Ph.D.

DEPARTMENT OF FORENSIC MEDICINE

Egyetem tér 1., Debrecen, 4032, Tel: +36-52-255-865
E-mail: igazsagugy@med.unideb.hu; , Web: http://forensic.unideb.hu

Assistant Lecturer	Ms.	Beáta Ágnes Borsay M.D.
		Péter Gergely M.D., Ph.D.
		Kálmán Rácz M.D.
		Csaba Turzó M.D.
Clinical Assistant		Mihály Fodor M.D.
Resident	Ms.	Barbara Dóra Halasi M.D.
Toxicologist		János Posta
Psychiatrist	Ms.	Erika Tar M.D.

DEPARTMENT OF HUMAN GENETICS

Egyetem tér 1., Debrecen, 4032, Tel: +36-52-416-531
E-mail: humangenetics@med.unideb.hu, Web: https://humangenetics.unideb.hu

Associate Professor, Head of Department		István Balogh M.Sc., D.Sc.
BMC Coordinator		András Penyige M.Sc., Ph.D.
Professor Emeritus		Sándor Biró M.Sc., Ph.D., D.Sc.
Associate Professor		András Penyige M.Sc., Ph.D.
Assistant Professor	Ms.	Zsuzsanna Birkó M.Sc., Ph.D.
		Gergely Buglyó M.D., Ph.D.
	Ms.	Judit Keserű M.Sc., Ph.D.
	Ms.	Melinda Paholcsek M.Sc., Ph.D.
	Ms.	Beáta Soltész M.Sc., Ph.D.
		Lajos Széles M.Sc., Ph.D.
	Ms.	Melinda Szilágyi-Bónizs M.Sc., Ph.D.
Assistant Lecturer	Ms.	Krisztina Szirák M.Sc., Ph.D.

Junior Research Fellow	Ms.	Éva Márton M.Sc.
PhD Student	Ms.	Dóra Anikó Géczi M.Sc.
	Ms.	Alexandra Edit Varga M.Sc.
Academic Advisor of Molecular Biology MSc	Ms.	Krisztina Szirák M.Sc., Ph.D.
Invited Lecturer		Zsigmond Fehér M.D., Ph.D.
		György Vargha M.D., Ph.D.
Academic Advisor for 1st year medical and dental students	Ms.	Judit Keserű M.Sc., Ph.D.
Academic Advisor for 1st year pharmacy students	Ms.	Judit Keserű M.Sc., Ph.D.

DEPARTMENT OF IMMUNOLOGY

Egyetem tér 1., Debrecen, 4032, Tel: +36-52-417-159
Web: www.immunology.unideb.hu

Full Professor, Head of Department		Attila Bácsi M.Sc., Ph.D., D.Sc.
Associate Professor		Gábor Koncz M.Sc., Ph.D.
		Árpád Lányi M.Sc., Ph.D.
Assistant Professor	Ms.	Tünde Fekete M.Sc., Ph.D.
	Ms.	Johanna Mihály M.Sc., Ph.D.
		Attila Szöllősi M.D., Ph.D.
Assistant Lecturer	Ms.	Anett Türk-Mázló M.Sc.
	Ms.	Aliz Varga M.Sc., Ph.D.
Research Fellow		Péter Gogolák M.Sc., Ph.D.
		György Hajas M.Sc., Ph.D.
	Ms.	Kitti Pázmándi M.Sc., Ph.D.
Research Assistant	Ms.	Shahrzad Alimohammadi D.Pharm.
	Ms.	Gabriella Béke M.Sc.
	Ms.	Adrienn Gyöngyösi M.Sc., Ph.D.
	Ms.	Judit Kállai M.Sc.
		Tamás Molnár M.Sc.
		Máté István Sütő M.Sc.
	Ms.	Márta Tóth M.Sc.
	Ms.	Kinga Fanni Tóth M.Sc.
PhD Student	Ms.	Beatrix Ágics M.Sc.
	Ms.	Dóra Bencze M.D.

	Ms.	Hajnalka Halász M.Sc.
	Ms.	Dorottya Horváth M.Sc.
		Szabolcs Muzsai
	Ms.	Zsófia Pénzes M.Sc.
Academic Advisor		Attila Szöllősi M.D., Ph.D.

DEPARTMENT OF LABORATORY MEDICINE

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-340-006
E-mail: info@lmi..hu, Web: www.labmed.hu

Full Professor, Head of Department		János Kappelmayer M.D., Ph.D., D.Sc.
Associate Professor, Head of Division of Clinical Genetics		István Balogh M.Sc., D.Sc.
Full Professor		Péter Antal-Szalmás M.D., Ph.D.
Associate Professor	Ms.	Zsuzsa Hevessy M.D., Ph.D.
		Béla Nagy Jr. M.D., Ph.D.
		Harjit Pal Bhattoa M.D., Ph.D.
Senior Research Fellow	Ms.	Edit Gyimesi M.Sc., Ph.D.
Assistant Professor		Sándor Baráth M.Sc., Ph.D.
	Ms.	Adrienne Kerényi M.D., Ph.D.
	Ms.	Katalin Koczok M.D.
	Ms.	Anikó Ujfalusi M.D., Ph.D.
Assistant Lecturer	Ms.	Beáta Bessenyei M.Sc., Ph.D.
		Gergely Ivády M.D.
	Ms.	Bettina Kárai M.D.
		Zoltán Mezei M.D., Ph.D.
		Gábor Nagy M.D.
Research Fellow		Zsolt Fejes M.Sc., Ph.D.
	Ms.	Ágnes Mosolygó-Lukács M.Sc., Ph.D.
	Ms.	Orsolya Nagy M.D.
	Ms.	Beáta Tóth M.Sc., Ph.D.
PhD Student	Ms.	Bernadett Szilágyi M.Sc.
Lecturer	Ms.	Sarolta Demeter M.D.
Resident	Ms.	Lilla Szabó M.D.
Academic Advisor	Ms.	Adrienne Kerényi M.D., Ph.D.

Division of Clinical Laboratory Science

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-431-956
E-mail: ekatona@med.unideb.hu, Web: crc.med.unideb.hu

Associate Professor, Head of Division	Ms.	Zsuzsanna Bereczky M.D., Dr. habil., Ph.D.
Professor Emeritus		László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc.
Associate Professor	Ms.	Zsuzsa Bagoly M.D., Ph.D.
	Ms.	Éva Katona M.Sc., Ph.D. habil.
Senior Research Fellow		Amir Houshang Shemirani M.D., Ph.D.
Assistant Professor	Ms.	Krisztina Pénzes-Daku M.Sc., Ph.D.
Assistant Lecturer	Ms.	Réka Gindele M.Sc., Ph.D.
Junior Research Fellow		Gábor Balogh M.Sc.
	Ms.	Réka Bogáti M.Sc.
PhD Student	Ms.	Barbara Baráth M.Sc.
	Ms.	Boglárka Hurják M.Sc.
		Rita Angéla Kálmándi M.Sc.
	Ms.	Linda Lóczi M.Sc.
	Ms.	Tünde Miklós M.D.
	Ms.	Dóra Pituk M.Sc.
	Ms.	Farzaneh Sadeghi M.D.
		Ferenc Sarkady M.Sc.
	Ms.	Laura Somodi M.Sc.
	Ms.	Marianna Speker M.Sc.
External Tutor	Ms.	Éva Ajzner M.D., Dr. habil., Ph.D.
		Béla Tóth M.Sc., Ph.D.
Academic Advisor	Ms.	Éva Katona M.Sc., Ph.D. habil.

Division of Clinical Genetics

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36 52 340 006
E-mail: bessenyei.beata@med.unideb.hu, Web: www.kbmpi.hu, www.klinikaigenetika.hu

Associate Professor, Head of Division		István Balogh M.Sc., D.Sc.
Academic Advisor	Ms.	Beáta Bessenyei M.Sc., Ph.D.

DEPARTMENT OF MEDICAL CHEMISTRY

Egyetem tér 1., Debrecen, 4032, Tel: +39-52-412-345
E-mail: medchem@med.unideb.hu, Web: chemistry.med.unideb.hu

Full Professor, Head of Department		László Virág M.D., Ph.D., D.Sc.
Full Professor		Péter Bay M.Sc., Ph.D., D.Sc.
	Ms.	Csilla Csortos M.Sc., Ph.D., D.Sc.
		Viktor Dombrádi M.Sc., Ph.D., D.Sc.
		Ferenc Erdődi M.Sc., Ph.D., D.Sc.
Professor Emeritus		Pál Gergely M.Sc., Ph.D., D.Sc., M.H.A.Sc.
Associate Professor	Ms.	Beáta Lontay M.Sc., Ph.D.
	Ms.	Karen Uray M.Sc., Ph.D.
Assistant Professor	Ms.	Éva Bakó M.Sc., Ph.D.
	Ms.	Anita Boratkó M.Sc., Ph.D.
		Tibor Docsa M.Sc., Ph.D.
		Csaba Hegedűs M.D., L.D.S., Ph.D.
	Ms.	Edit Kapitányné Mikó M.Sc., Ph.D.
	Ms.	Andrea Kiss M.Sc., Ph.D.
		Endre Kókai M.Sc., Ph.D.
	Ms.	Katalin Kovács M.Sc., Ph.D.
	Ms.	Krisztina Tar M.Sc., Ph.D.
Research Fellow		Bálint Bécsi M.Sc., Ph.D.
		Máté Ágoston Demény M.D., Ph.D.
		Zoltán Kónya M.Sc., Ph.D.
	Ms.	Tünde Kovács M.Sc., Ph.D.
	Ms.	Zsuzsanna Polgár M.Sc., Ph.D.
	Ms.	Adrienn Sipos M.Sc., Ph.D.
	Ms.	Magdolna Szántó D.Pharm., Ph.D.
Junior Research Fellow	Ms.	Evelin Major M.Sc.
	Ms.	Emese Tóth M.Sc.
PhD Student	Ms.	Dóra Antal M.Sc.
	Ms.	Eliza Guti M.Sc.
		Zoltán Hajnády M.Sc.
	Ms.	Ilka Keller M.D.
	Ms.	Nikolett Király M.Sc.
		Patrik Bence Kovács M.Sc.

		Máté Nagy-Pénzes M.Sc.
	Ms.	Boglárka Rauch M.Sc.
	Ms.	Szandra Schwarcz M.Sc.
	Ms.	Dóra Szeőcs M.Sc.
	Ms.	Zsófia Thalwieser M.Sc.
		Gyula Ujlaki M.Sc.
Invited Lecturer	Ms.	Ilona Farkas M.Sc., Ph.D.
		Béla Tóth M.Sc., Ph.D.
Academic Advisor	Ms.	Anita Boratkó M.Sc., Ph.D. (Msc. in Molecular Biology)
	Ms.	Katalin Kovács M.Sc., Ph.D.
	Ms.	Beáta Lontay M.Sc., Ph.D.

DEPARTMENT OF MEDICAL MICROBIOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-425
E-mail: mikro@med.unideb.hu, Web: elearning.med.unideb.hu

Full Professor, Head of Department		József Kónya M.D., Ph.D., D.Sc.
Professor Emeritus		Lajos Gergely M.D., D.Sc.
Associate Professor		Gábor Kardos M.D., Ph.D.
		László Majoros M.D., Ph.D.
	Ms.	Krisztina Szarka M.Sc., Ph.D.
		György Veress M.Sc., Ph.D.
Assistant Professor	Ms.	Eszter Csoma M.Sc., Ph.D.
	Ms.	Zsuzsanna Dombrádi M.Sc., Ph.D.
		Renátó Kovács M.Sc., Ph.D.
	Ms.	Anita Szalmás M.Sc., Ph.D.
Assistant Lecturer	Ms.	Eszter Gyöngyösi M.Sc., Ph.D.
	Ms.	Brigitta László M.Sc., Ph.D.
PhD Student		Zsolt Barnabás Éles M.Sc.
		Lajos Forgács M.Sc.
	Ms.	Krisztina Jeles M.Sc.
	Ms.	Melinda Katona M.Sc.
		Balázs Koleszár D.V.M.
		József Bálint Nagy M.Sc.
	Ms.	Leila Rahmani M.Sc.

Biologist	Ms.	Aliz Bozó M.Sc., Ph.D.
	Ms.	Fruzsina Kovács M.Sc.
	Ms.	Fruzsina Nagy M.Sc.
Specialist	Ms.	Evelin Bukta M.D.
	Ms.	Anita Kozák M.D.
Academic Advisor of Faculty of Medicine		György Veress M.Sc., Ph.D.
Academic Advisor of Faculty of Dentistry		György Veress M.Sc., Ph.D.
Academic Advisor of Faculty of Pharmacy		László Majoros M.D., Ph.D.

DEPARTMENT OF PATHOLOGY
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-245
Web: pathol.med.unideb.hu

Full Professor, Head of Department		Gábor Méhes M.D., D.Sc.
Full Professor, Head of Division of Oral Pathology		Balázs Dezső M.D., D.Sc.
Professor Emeritus		Péter Molnár M.D., D.Sc.
		Zoltán Nemes M.D., D.Sc.
Assistant Lecturer		Lukács Baráth M.D.
	Ms.	Judit Bedekovics M.D., Ph.D.
		László Bidiga M.D.
		Yi-Che Chang Chien M.D.
		Tamás Csonka M.D.
		Zoltán Hendrik M.D.
		Csaba Molnár M.D.
	Ms.	Sarolta Molnár M.D.
	Ms.	Brigitta Orlik M.D.
		Sándor Csaba Szász M.D.
		László Tóth M.D., Ph.D. habil.
Resident	Ms.	Vanda Aranyi M.D.
	Ms.	Lídia Balázs M.D.
Academic Advisor		Csaba Molnár M.D.

DEPARTMENT OF PHARMACOLOGY AND PHARMACOTHERAPY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-009
Web: http://pharmacology.med.unideb.hu

Full Professor, Head of Department		Zoltán Szilvássy M.D., Ph.D., D.Sc.
Professor Emeritus	Ms.	Judith Gergely D.Pharm., Ph.D., D.Sc.
Associate Professor	Ms.	Ilona Benkő M.D., Ph.D.
		Rudolf Gesztelyi M.D., Ph.D.
		Béla Juhász D.Pharm., Dr. habil., Ph.D.
		Róbert Pórszász M.D., Dr. habil., MBA, Ph.D.
		József Szentmiklósi M.D., Ph.D.
Senior Research Fellow		József Németh M.Sc., Ph.D.
Assistant Professor	Ms.	Rita Kiss M.D., Ph.D.
		Attila Megyeri M.D., Ph.D.
Assistant Lecturer	Ms.	Ágnes Cseppentő M.D.
	Ms.	Diána Kovács M.Sc., Ph.D.
		Balázs Varga D.Pharm., Ph.D.
Research Fellow	Ms.	Zsuzsanna Gál M.Sc., Ph.D.
PhD Student	Ms.	Mariann Bombicz D.Pharm.
	Ms.	Beáta Lelesz M.Sc., Ph.D.
		Dániel Priksz D.Pharm.
Nutricionist	Ms.	Katalin Szabó M.Sc.
Chemist		Lajos Veress M.Sc.
Junior Lecturer	Ms.	Mariann Bombicz D.Pharm.
	Ms.	Andrea Kurucz M.D.
Administration officer	Ms.	Andrea Szalai B.Sc., M.Sc.
	Ms.	Judit Vári
Academic Advisor		Róbert Pórszász M.D., Dr. habil., MBA, Ph.D.

DEPARTMENT OF PHYSIOLOGY

Nagyerdei krt. 98., Debrecen, 4012, Tel: +36-52-255-575
Web: http://phys.med.unideb.hu

Full Professor, Head of Department	László Csernoch M.Sc., Ph.D., D.Sc.
Full Professor, Head of Sport Physiology Division	János Magyar M.D.,Ph.D.,D.Sc.

Full Professor, Head of Dental Physiology and Pharmacology Division		Péter Nánási M.D., Ph.D., D.Sc.
Full Professor		Tamás Bányász M.D., Ph.D., D.Sc.
Associate Professor	Ms.	Szilvia Benkő M.Sc., Ph.D.
		Balázs Pál M.D.,Ph.D.
		Norbert Szentandrássy M.D., Ph.D.
Senior Research Fellow	Ms.	Beatrix Dienes M.Sc., Ph.D.
		Péter Szentesi M.Sc., Ph.D.
Assistant Professor		János Almássy M.Sc., Ph.D.
		Balázs Horváth M.D.,Ph.D.
		Attila Oláh M.D., Ph.D.
	Ms.	Mónika Szentandrássyné Gönczi M.Sc., Ph.D.
		István Balázs Tóth M.Sc., Ph.D.
Research Fellow	Ms.	Gabriella Czifra M.Sc., Ph.D.
	Ms.	Krisztina Deák-Pocsai M.Sc., Ph.D.
	Ms.	Nóra Dobrosi M.Sc., Ph.D.
		János Fodor M.Sc., Ph.D.
	Ms.	Erika Herczeg-Lisztes M.Sc., Ph.D.
	Ms.	Mónika Sztretye M.Sc., Ph.D.
	Ms.	Andrea Telek-Haberberger M.D., Ph.D.
Junior Research Fellow	Ms.	Ágnes Angyal M.Sc.
		Norbert Balogh M.Sc.
	Ms.	Adrienn Kovács M.Sc., Ph.D.
		Gergő Kovács M.Sc.
PhD Student	Ms.	Dorottya Ádám M.Sc.
		Ahmad Alatshan M.Sc.
		József Arany M.Sc.
	Ms.	Dóra Baranyai M.Sc.
		Tsogbadrakh Bayasgalan M.Sc.
		Eduárd Bíró M.Sc.
	Ms.	Andrea Csemer M.Sc.
		Csaba Dienes D.Pharm.
		Martin Hanyicska M.Sc.
		Tamás Hézső M.D.
		Dénes Kiss M.D.

		Zsigmond Kovács M.D.
		Árpád Kunka M.D.
	Ms.	Zsuzsa Magyar M.Sc.
		Zsolt Raduly D.Pharm.
		Zoltán Singlár M.Sc.
		László Szabó M.Sc.
	Ms.	Kinga Fanni Tóth M.Sc.
	Ms.	Anita Vladár M.Sc.
External Lecturer		Gáspár Bánfalvi Ph.D., D.Sc. (Professor Emeritus)
		Balázs Lukács M.Sc., Ph.D.

DEPARTMENT OF SPORTS MEDICINE

Nagyerdei Park 12., Debrecen, 4032, Tel: +36-52-411-600/75930

Full Professor, Head of Department		Sándor Szántó M.D., Ph.D., D.Sc.
Assistant Professor	Ms.	Zsuzsanna Gyurcsik M.D., Ph.D.
Assistant Lecturer	Ms.	Katalin Gulyás M.D.
PhD Student		Tóbiás Módy M.D.

CHAPTER 7
FACULTY OF MEDICINE - CLINICAL DEPARTMENTS

DEPARTMENT OF ANESTHESIOLOGY AND INTENSIVE CARE

Nagyerdei krt. 98, Debrecen, 4032, Tel: +36-52-255-347
Web: http://aitt.med.unideb.hu/

Full Professor, Head of Department		Béla Fülesdi M.D., Ph.D., D.Sc.
Associate Professor	Ms.	Judit Hallay M.D., Ph.D.
	Ms.	Csilla Molnár M.D., Ph.D.
Assistant Professor		Ákos Fábián M.D., Ph.D.
		György Koszta M.D., Ph.D.
		Zsolt Oláh M.D., Ph.D.
	Ms.	Adrienn Pongrácz M.D., Ph.D.
		Péter Siró M.D., Ph.D.
		Béla Tankó M.D., Ph.D.
		Tamás Végh M.D., Ph.D.
Assistant Lecturer	Ms.	Judit Gyulaházi M.D., Ph.D.
Resident		Dániel Andráskó M.D.
	Ms.	Boglárka Balla M.D.
	Ms.	Sarah Uchechi Choko M.D.
		Zoltán Csernyák M.D.
		Csaba Csipkés M.D.
	Ms.	Marianna Fedor M.D.
	Ms.	Réka Gulya M.D.
	Ms.	Fariba Javdani M.D.
	Ms.	Veronika Kovács M.D.
		Péter Luterán M.D.
	Ms.	Dorottya Szántó M.D.
Senior Consultant	Ms.	Gabriella Szűcs M.D., Ph.D., D.Sc.
Specialist		László Asztalos M.D., Ph.D.
	Ms.	Krisztina Béczy M.D.
	Ms.	Gyöngyi Békési M.D.
	Ms.	Mariann Berhés M.D.
		Ferenc Bodnár M.D.
	Ms.	Emese Csoba M.D.

Ms. Marina Czurkó M.D.
Róbert Duris M.D.
Ms. Edit Éberhardt M.D.
Ms. Irén Erdei M.D.
Ms. Orsolya Farkas M.D.
Ms. Andrea Fodor M.D.
Ms. Babett Fodor M.D.
Ms. Judit Gál M.D.
Zoltán Gyöngyösi M.D.
Endre Hajdu M.D.
Ms. Zsuzsa Jakab M.D.
Ms. Enikő Jánvári M.D.
Ms. Lenke Jenei Kluch M.D.
Ms. Marianna Juhász M.D.
Ms. Zsuzsanna Kovács M.D.
István László M.D.
István Máté M.D.
Dániel Nagy M.D.
György Nagy M.D.
Ms. Réka Nemes M.D.
Ms. Erzsébet Németh M.D.
Ms. Lívia Orosz M.D.
Ms. Tünde Palatka M.D.
Balázs Pálóczi M.D.
Ms. Enikő Papp M.D.
Lóránd Csaba Papp M.D.
Ms. Éva Simon M.D.
Gábor Sira M.D.
Tamás Sotkovszki M.D.
Zoltán Szabó-Maák M.D.
Ms. Katalin Szamos M.D.
Ms. Katalin Szatmári M.D.
Szilárd Szatmári M.D., Ph.D.
Ms. Ildikó Szűcs M.D.
Gergely Takács M.D.

	Béla Takács M.D.
	Ms. Adrienn Timkó M.D.
	Ms. Magdolna Váradi M.D.
	Dávid Richárd Varga M.D.
	Ms. Györgyi Vass M.D.
	Ms. Andrea Vencel M.D.
	András Zudor M.D.
Academic Advisor	Ákos Fábián M.D., Ph.D.

DEPARTMENT OF CARDIOLOGY
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-928

Chairman	Zoltán Csanádi M.D., Ph.D., D.Sc.

Division of Cardiac Surgery
Móricz Zs. krt. 22., Debrecen, 4032, Tel: +36-52-255-306
E-mail: szivsebeszet.titkarsag@med.unideb.hu

Associate Professor, Head of Division	Tamás Szerafin M.D., Ph.D.
Professor Emeritus	Árpád Péterffy M.D., D.Sc.
Assistant Lecturer	Péter Csizmadia M.D.
	Tamás Debreceni M.D.
	Ms. Andrea Molnár M.D., Ph.D.
Chief Physician	Ambrus Horváth M.D.
Clinical Assistant	Tamás Maros M.D.
	Lehel Palotás M.D.
	István Szentkirályi M.D.
Candidate Clinical Assistant	Ákos Attila Berczi M.D.
	Gergely Ditrói M.D.
Resident	Ákos Mandzák M.D.

Division of Cardiology
Móricz Zs. krt. 22., Debrecen, 4032, Tel: +36-52-255-928
E-mail: kardiologia@med.unideb.hu, Web: http://en.debkard.hu

Full Professor, Head of Department	Zoltán Csanádi M.D., Ph.D., D.Sc.
Full Professor	István Édes M.D., Ph.D., D.Sc.

Associate Professor	Ms.	Judit Barta M.D., Ph.D.
		Attila Borbély M.D., Ph.D.
		Zsolt Kőszegi M.D., Ph.D.
Assistant Professor	Ms.	Annamária Bódi M.D., Ph.D.
		Marcell Clemens M.D., Ph.D.
		Dániel Czuriga M.D., Ph.D.
	Ms.	Andrea Daragó M.D., Ph.D.
		Tibor Fülöp M.D., Ph.D.
		László Fülöp M.D., Ph.D.
		Szabolcs Gergely M.D., Ph.D.
		Attila Kertész M.D., Ph.D.
		Rudolf Kolozsvári M.D., Ph.D.
	Ms.	Ildikó Rácz M.D., Ph.D.
		Tibor Szűk M.D., Ph.D.
Assistant Lecturer	Ms.	Ágnes Balogh M.D., Ph.D.
	Ms.	Nóra Erdei M.D., Ph.D.
	Ms.	Zita Hertelendi M.D., Ph.D.
	Ms.	Nóra Homoródi M.D.
		Csaba Jenei M.D.
	Ms.	Alexandra Kiss M.D., Ph.D.
		Bertalan Kracskó M.D.
		László Nagy M.D.
		László Tibor Nagy M.D.
		Sándor Sipka M.D., Ph.D., D.Sc.
		Gábor Szabó M.D.
Cardiologist		László Balogh M.D.
	Ms.	Edit Fiák M.D.
		Ferenc Győry M.D.
		Gábor Kolodzey M.D.
		Csaba Kun M.D.
	Ms.	Edina Nagy-Baló M.D., Ph.D.
	Ms.	Andrea Péter M.D.
	Ms.	Ágnes Orsolya Rácz M.D.
		Ferenc Ruzsnavszky M.D., Ph.D.
		Gábor Sándorfi M.D.

	Ms.	Krisztina Mária Szabó M.D.
	Ms.	Andrea Szegedi M.D.
		Miklós Szokol M.D.
		Gusztáv Vajda M.D.
		István Varga M.D.
PhD Student	Ms.	Ildikó Forgács M.Sc.
		Ádám Illési M.D.
	Ms.	Tímea Bianka Papp M.D.
	Ms.	Lilla Szuromi M.D.
Resident		István Tibor Altorjay M.D.
		Szabolcs Gaál M.D.
		Géza Horváth M.D.
	Ms.	Judit Kecskés M.D.
		Árpád Kovács M.D., Ph.D.
	Ms.	Anita Kurczina M.D.
	Ms.	Andrea Kurucz M.D.
	Ms.	Krisztina Medvés-Váczi M.D., Ph.D.
	Ms.	Tímea Bianka Papp M.D.
	Ms.	Niké Posta M.D.
	Ms.	Réka Urbancsek M.D.
Educational Advisor		Dániel Czuriga M.D., Ph.D.

Division of Clinical Physiology

Móricz Zs. út. 22., Debrecen, 4032, Tel: +36-52-255-978
E-mail: klinfiz@med.unideb.hu, Web: http://klinfiz.unideb.hu

Full Professor, Head of Division		Zoltán Papp M.D., Ph.D., D.Sc.
Full Professor		Attila Tóth M.Sc., Ph.D., D.Sc.
Assistant Professor		Miklós Fagyas M.D., Ph.D.
Assistant Lecturer	Ms.	Beáta Bódi M.Sc., Ph.D.
	Ms.	Viktória Csató M.Sc., Ph.D.
Research Assistant		Azeem Jalil Umar Muhammad M.D.
PhD Student	Ms.	Enikő Edit Enyedi M.Sc.
	Ms.	Hajnalka Gulyás M.Sc.
		Antal Ráduly M.D.
	Ms.	Fruzsina Sárkány M.D.

		Attila Ádám Szabó M.D.
Laboratory Assistant	Ms.	Ivetta Mányiné Siket
Secretariat	Ms.	Krisztina Kass
Laboratory Analyst	Ms.	Lilla Mártha M.Sc.
Administrator	Ms.	Zsófia Pólik M.Sc.
	Ms.	Regina Szamosi M.Sc.
Academic Advisor		Miklós Fagyas M.D., Ph.D.

DEPARTMENT OF MEDICAL IMAGING
Nagyerdei krt. 98, Debrecen, 4032, Tel: +36-52-255-510

Full Professor, Head of Department		Ervin Berényi M.D., Ph.D.
Research Fellow	Ms.	Mónika Béresová M.Sc.

Division of Nuclear Medicine and Translational Imaging
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-510
E-mail: nmiroda@med.unideb.hu, Web: http://petunia.atomki.hu/Learning

Head of Division, Associate Professor		György Trencsényi M.Sc., Ph.D.
Full Professor		Ervin Berényi M.D., Ph.D.
Professor Emeritus		László Galuska M.D., D.Sc.
		Lajos Trón M.Sc., Ph.D., D.Sc.
Associate Professor		Miklós Emri M.Sc., Ph.D.
	Ms.	Ildikó Garai M.D., Ph.D.
Senior Research Fellow		László Balkay M.Sc., Ph.D.
		István Kertész M.Sc., Ph.D.
Assistant Professor		István Hajdu M.Sc., Ph.D.
		István Jószai M.Sc., Ph.D.
Research Fellow		Gábor Opposits M.Sc., Ph.D.
		Dezső Szikra M.Sc., Ph.D.
Junior Research Fellow	Ms.	Adrienn Kis M.Sc.
PhD Student	Ms.	Viktória Arató D.Pharm.
	Ms.	Noémi Dénes M.Sc.
	Ms.	Lilla Egeresi M.Sc.
	Ms.	Barbara Gyuricza M.Sc.
	Ms.	Piroska Kallós-Balogh M.Sc.
	Ms.	Ibolya Kálmán-Szabó M.Sc.

	Ms.	Mariann Nagy M.Sc.
		Dániel Szücs M.Sc.
		Norman Félix Vas M.Sc.
Resident	Ms.	Zita Képes M.D.
	Ms.	Anna Rebeka Kovács M.D.
		Márton Mikó M.D.
		Iván Gábor Nagy M.D.
	Ms.	Flóra Ötvös M.D.
Chemist	Ms.	Anikó Fekete M.Sc., Ph.D.
	Ms.	Viktória Forgács M.Sc.
	Ms.	Tünde Miklovicz M.Sc.
	Ms.	Enikő Németh Várhalminé M.Sc.
	Ms.	Judit Péliné Szabó M.Sc.
		Norbert Pótári M.Sc.
		Béla Rubleczky M.Sc.
Pharmacist	Ms.	Zsuzsanna Ésik D.Pharm.
		Gergely Farkasinszky D.Pharm.
Specialist		Zoltán Barta M.D.
		Bence Farkas M.D.
		Iván Mihovk M.D.
Invited Lecturer		Sándor Kristóf Barna M.D.
Invited Lecturer, Associate Professor (ret.)		József Varga M.Sc., Ph.D.
Academic Advisor		István Hajdu M.Sc., Ph.D.

Division of Radiology and Imaging Science

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-136
E-mail: gallasz.szilvia@med.unideb.hu, Web: radiologia.unideb.com

Full Professor, Head of Department		Ervin Berényi M.D., Ph.D.
College Associate Professor	Ms.	Réka Révészné Tóth M.Sc., Ph.D.
Professor Emeritus		Mózes Péter M.D., Ph.D.
Assistant Professor	Ms.	Ivett Belán M.D.
	Ms.	Klára Benkő M.D.
		Béla Clemens M.D.
		Gábor Endes M.D.
	Ms.	Zsuzsanna Ferenczi M.D.

	Ms. Tímea Gajda M.D.
	László Jámbor M.D.
	Ms. Edina Kósik M.D.
	Ms. Lilla Ladányi M.D.
	Gábor Lakatos M.D.
	Ádám Leskó M.D.
	Ms. Judit Maráz M.D.
	Ms. Nóra Mátyás M.D.
	Tamás Miskolczi M.D.
	Ms. Judit Nagy M.D.
	Ms. Edit Nagy M.D.
	Ms. Tímea Nyisztor-Csáki M.D.
	Ms. Mónika Pajor M.D.
	Ms. Zsuzsanna Pákozdy M.D.
	Tamás Papp M.D., Ph.D.
	Ms. Éva Pásztor M.D.
	Máté Sik M.D.
	Ms. Judit Tóth M.D.
	Ms. Anita Tresó M.D.
	Ms. Nóra Vrancsik M.D.
Senior Lecturer	Ms. Judit Tóth M.D.
Assistant Lecturer	Ms. Teréz Nyesténé Nagy M.D., B.Sc.
Research Fellow	Ms. Marianna Nagy M.Sc.
	Ms. Szilvia Rácz M.Sc.
PhD Student	Gergő Veres
Clinical Assistant	Ms. Tímea Balla M.D.
	Ms. Melinda Bán M.D.
	Ms. Veronika Deczkiné Gaál M.D.
	Ms. Zsófia Fülesdi M.D.
	Márton Oláh M.D.
	Bence Gábor Papp M.D.
	Bence Pelyvás M.D.
	Attila Mátyás Petró M.D.
	Mustafa Sayed-Ahmad M.D.
	Ms. Annamária Silye M.D.

	Ms.	Nikoletta Vasas M.D.
	Ms.	Enikő Verebi M.D.
Resident		János Bencze M.D.
	Ms.	Ivett Deák M.D.
		András Dubnicz M.D.
		Máté Filep M.D.
	Ms.	Rebeka Kádár M.D.
	Ms.	Kincső Kovács M.D.
	Ms.	Bettina Kurtán M.D.
Molecular Biologist	Ms.	Eszter László
Academic Advisor	Ms.	Éva Pásztor M.D.

DEPARTMENT OF CLINICAL ONCOLOGY
Nagyerdei krt. 98, Debrecen, 4032, Tel: +36-52-255-840
E-mail: onkologia.klinika@med.unideb.hu

Associate Professor, Head of Department		Péter Árkosy M.D., Ph.D. habil.
Assistant Professor	Ms.	Csilla András M.D., Ph.D. habil.
	Ms.	Andrea Gonda M.D., Ph.D.
	Ms.	Borbála Kiss M.D.,Ph.D.
	Ms.	Éva Szekanecz M.D., Ph.D.
Clinical Specialist	Ms.	Anita Árokszállási M.D., Ph.D.
	Ms.	Ingrid Balogh M.D.
	Ms.	Edit Béres M.D.
		Balázs Juhász M.D.
	Ms.	Mónika Mailáth M.D.
	Ms.	Enikő Varga M.D.
Resident	Ms.	Csilla Ambrus M.D.
	Ms.	Enikő Sebestyén M.D.
	Ms.	Kitti Szuna M.D.
		József Virga M.D., Ph.D.
Academic Advisor	Ms.	Csilla András M.D., Ph.D. habil.
Senior Research Scientist		Iván Uray M.D., Ph.D.

DEPARTMENT OF ONCORADIOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-585

Associate Professor, Head of Department	Árpád Kovács M.D., Ph.D. habil.
Clinical Specialist	Ms. Mária Besenyői M.D.
	Ms. Emese Csiki M.D.
	Ádám Dér M.D.
	Ms. Erzsébet Kollák M.D.
	Ms. Erika Szántó M.D.
	Ms. Hilda Urbancsek M.D.
Resident	Sanad Isam Al-Syed M.D.
	Márton Barabás M.D.
	Ms. Zsuzsanna Barta M.D.
	Tamás Purczel M.D.
	Ms. Dóra Solymosi M.D.
	Imre Törő M.D.
Psychologist	Ms. Judit Magyari
Physicist	István Balogh
	Gergely Hócza
	Attila Kovács M.D.
	Mihály Simon

DEPARTMENT OF DERMATOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-204
E-mail: dermatologia@med.unideb.hu, Web: www.dermatologia.med.unideb.hu

Full Professor, Head of Department	Ms. Andrea Szegedi M.D., Ph.D. D.Sc.
Clinical Chief Physician, Head of Unit of Burns and Dermatologic Surgery	Zoltán Péter M.D.
Full Professor	István Juhász M.D., Ph.D., C.Sc.
	Ms. Éva Remenyik M.D., Ph.D., D.Sc.
Full Professor, Head of Division of Human Surgery and Operative Techniques	István Juhász M.D., Ph.D., C.Sc.
Professor Emerita	Ms. Irén Horkay M.D., Ph.D., D.Sc.
Professor Emeritus	János Hunyadi M.D., Ph.D., D.Sc.
Associate Professor	Ms. Gabriella Emri M.D., Ph.D.
	Ms. Éva Szabó M.D., Ph.D.

		Dániel Törőcsik M.D., Ph.D.
Assistant Professor		Krisztián Gáspár M.D., Ph.D.
Assistant Lecturer	Ms.	Emese Gellén M.D., Ph.D.
	Ms.	Irina Sawhney M.D.
	Ms.	Tünde Várvölgyi M.D.
Clinical Assistant	Ms.	Irén Erdei M.D.
	Ms.	Lenke Jenei Kluch M.D.
	Ms.	Krisztina Steuer-Hajdu M.D.
		Imre Lőrinc Szabó M.D.
	Ms.	Zita Szentkereszty-Kovács M.D.
	Ms.	Zita Zatik M.D.
Candidate Clinical Assistant	Ms.	Anikó Csordás M.D.
	Ms.	Nóra Felföldi M.D.
	Ms.	Lilla Pogácsás M.D.
	Ms.	Ágnes Tósaki M.D.
	Ms.	Beatrix Ványai M.D.
	Ms.	Ráhel Orsolya Varga M.D.
Resident	Ms.	Lilla Soltész M.D.
Academic Advisor of Faculty of Medicine		Krisztián Gáspár M.D., Ph.D.
Academic Advisor of Faculty of Dentistry		István Juhász M.D., Ph.D., C.Sc.

DEPARTMENT OF EMERGENCY MEDICINE

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-411-717/53516
E-mail: ujvarosy.dora@gmail.com

Full Professor, Head of Department		Zoltán Szabó M.D., Ph.D.
Associate Professor		Sándor Somodi M.D., Ph.D.
Assistant Professor		Zoltán Vincze M.D., Ph.D.
Assistant Lecturer		Tamás Ötvös M.D.
	Ms.	Dóra Ujvárosy M.D.
Resident	Ms.	Csilla Gulyás M.D.
	Ms.	Janka Juhász M.D.
	Ms.	Lilla Kovács M.D.
	Ms.	Nóra Kovács M.Sc.
		Márk Molnár M.D.
		Tamás Pataki M.D.
	Ms.	Veronika Sebestyén M.D.

	Ms.	Lilla Végh M.D.
Specialist		Imre Csige M.D.
		Imre Juhász M.D.
	Ms.	Mária Németh M.D.
	Ms.	Alida Magdolna Páll M.D.
		Zoltán Szegedi M.D.
		Szabolcs Tóth M.D.
Invited Lecturer		Zoltán Szatmári M.D.
Education Officer, Contact Person		Tamás Ötvös M.D.
	Ms.	Dóra Ujvárosy M.D.
Academic Advisor		Péter Kovács M.D., D.Sc.
		István Lőrincz M.D., Ph.D.

AFFILIATED DEPARTMENT OF INFECTOLOGY

Bartók Béla út 2-26., Debrecen, 4031, Tel: +36206207587
E-mail: infektologia.tanszek@med.unideb.hu, Web: www.infektologia.med.unideb.hu

Head of Department		István Zsolt Várkonyi M.D., Ph.D.
Associate Professor		Zsolt Barta M.D., Ph.D.
Infectologist		Imre Bakos M.D.
	Ms.	Éva Anna Kenéz M.D.
		Mohamed Faisal Mahdi M.D., Ph.D.
	Ms.	Olena Misák M.D.
	Ms.	Éva Sándor M.D.
Lecturer	Ms.	Beáta Lénárt
		Mohamed Mahdi M.D., Ph.D.
Resident		Elemér László Bakos M.D.
	Ms.	Bella Gabányi M.D.
	Ms.	Tímea György M.D.
	Ms.	Viktória Lipták M.D.
		Gergely Lovász M.D.
	Ms.	Zsuzsanna Nagy M.D.
	Ms.	Eszter Szekeres M.D.
Biologist	Ms.	Lilla Virág Szappanos
Senior Consultant		Viktor Jancsik M.D.
	Ms.	Ilona Szigeti M.D.

Specialist	Ms.	Tímea Durzák M.D.
		László Kardos M.D., M.Sc., Ph.D.
		Zoltán Panyiczki M.D.
Education Officer, Contact Person	Ms.	Bella Gabányi M.D.
Junior Lecturer	Ms.	Viktória Takács M.D.
Educational Advisor		Zsolt Barta M.D., Ph.D.
Invited Lecturer		Ferenc Bodnár M.D.
	Ms.	Mariann Kozma M.D.
	Ms.	Eszter Vitális M.D.

DEPARTMENT OF INTERNAL MEDICINE

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-525
E-mail: titkarsag@belklinika.com, Web: elearning.med.unideb.hu

Full Professor, Head of Department		József Balla M.D., Ph.D., D.Sc.
Education Officer, Contact Person		Péter Fülöp M.D., Ph.D. habil. (Building "A")
	Ms.	Melinda Nagy-Vincze M.D., Ph.D. (Building "C")
		László Váróczy M.D., Ph.D. habil. (Building "B")
Full Professor		Pál Soltész M.D., Ph.D., D.Sc.
Associate Professor		Zoltán Csiki M.D., Ph.D.
		György Pfliegler M.D., Ph.D. habil.
Assistant Professor	Ms.	Katalin Veres M.D., Ph.D.
	Ms.	Boglárka Brúgós M.D., Ph.D.
Chief Physician	Ms.	Edit Szomják M.D.
PhD Student		Kristóf Gál M.D.
Clinical Specialist		Sándor Halmi M.D.
		Ervin Szocska M.D.
	Ms.	Adrienn Szabó M.D.
Resident	Ms.	Melinda Nánásy-Vass M.D.
Invited Lecturer	Ms.	Renáta Laczik M.D., Ph.D.
	Ms.	Orsolya Tímár M.D.

Division of Clinical Immunology
Nagyerdei krt. 98, Debrecen, 4012, Tel: 06-52-255-218

Associate Professor, Head of Division	Ms.	Tünde Tarr M.D., Ph.D. habil.
Professor Emerita	Ms.	Edit Bodolay M.D., Ph.D., D.Sc.
Professor Emeritus		Sándor Sipka M.D., Ph.D., D.Sc.
Associate Professor		János Gaál Dr. habil., Ph.D.
		Zoltán Griger M.D., Ph.D. habil.
	Ms.	Antónia Szántó M.D., Ph.D. habil.
Assistant Professor	Ms.	Ildikó Fanny Horváth M.D., Ph.D.
	Ms.	Gyöngyike Emese Majai M.D., Ph.D.
		Gábor Papp M.D., Ph.D.
	Ms.	Éva Zöld M.D., Ph.D.
Assistant Lecturer	Ms.	Melinda Nagy-Vincze M.D., Ph.D.
Research Fellow	Ms.	Ágnes Gyetvai M.Sc., Ph.D.
	Ms.	Krisztina Szabó M.Sc., Ph.D.
Junior Research Fellow	Ms.	Ilona Jámbor M.Sc.
PhD Student		István Fedor M.D.
Clinical Specialist	Ms.	Nikolett Farmasi M.D.
	Ms.	Gabriella Herczeg M.D.
	Ms.	Edit Posta M.D.
Registrar	Ms.	Zsófia Aradi M.D.
	Ms.	Nikolett Nagy M.D.
	Ms.	Regina Gréta Papp M.D.
	Ms.	Bianka Perge M.D.
	Ms.	Katalin Tillinger-Szabó M.D.
Resident		Tibor Béldi M.D.
	Ms.	Adrienn Faller M.D.
	Ms.	Kincső Mezei M.D.
	Ms.	Viktória Orosz M.D.
	Ms.	Dorottya Szinay M.D.
		Bence Tóth M.D.
	Ms.	Anett Vincze M.D.
Educational Advisor	Ms.	Melinda Nagy-Vincze M.D., Ph.D.

Division of Endocrinology
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-600

Full Professor, Head of Division		Endre Nagy M.D., Ph.D., D.Sc.
Associate Professor		Miklós Bodor M.D.,Ph.D.
Chief Consultant	Ms.	Judit Boda M.D.
Clinical Assistant	Ms.	Annamária Erdei M.D., Ph.D.
	Ms.	Annamária Gazdag M.D., Ph.D.
	Ms.	Andrea Gazsó M.D.
	Ms.	Ildikó Hircsu M.D.
	Ms.	Liliána Rajnai M.D.
	Ms.	Lívia Sira M.D.
Candidate Clinical Assistant	Ms.	Inez Lengyel M.D.
		Bálint Velkey M.D.
Biologist	Ms.	Erika Csanádiné Galgóczi M.Sc.
	Ms.	Mónika Lestárné Katkó M.Sc., Ph.D.

Division of Gastroenterology
Nagyerdei krt. 98., Debrecen, 4012, Tel: +36-52-255-601
E-mail: altorjay@med.unideb.hu

Full Professor, Head of Division		István Altorjay M.D., Ph.D., D.Sc.
Associate Professor		Károly Palatka M.D., Ph.D. habil.
	Ms.	Mária Papp M.D., Ph.D. habil.
		István Tornai M.D., Ph.D. habil.
Assistant Professor		Tamás Bubán M.D.
		Tamás Tornai M.D., Ph.D.
	Ms.	Zsuzsa Vitális M.D., Ph.D.
Assistant Lecturer		Sándor Kacska M.D.
Chief Consultant		Csaba Várvölgyi M.D.
Clinical Specialist		László Dávida M.D.
	Ms.	Ildikó Földi M.D., Ph.D.
		György Kovács M.D.
	Ms.	Eszter Pályu M.D., Ph.D.
	Ms.	Nóra Sipeki M.D., Ph.D.
Resident	Ms.	Laura Altorjay M.D.
	Ms.	Krisztina Eszter Fehér M.D.
		Tamás Janka M.D.

Division of Haematology

Nagyerdei krt. 98, Debrecen, 4012, Tel: 06-52-255-152/55152
E-mail: illesarpaddr@gmail.com, Web: 2bel.med.unideb.hu

Full Professor, Head of Division	Árpád Illés M.D., Ph.D., D.Sc.
Professor Emeritus	Zoltán Boda M.D.,Ph.D.,D.Sc.
	Miklós Udvardy M.D., Ph.D., D.Sc.
Associate Professor	Lajos Gergely M.D., D.Sc.
	Ms. Zsófia Miltényi M.D., Ph.D. habil.
	György Pfliegler M.D., Ph.D. habil.
	László Váróczy M.D., Ph.D. habil.
Assistant Professor	Péter Batár M.D., Ph.D.
	Ms. Boglárka Brúgós M.D., Ph.D.
	Gyula Reményi M.D., Ph.D.
	Ms. Ágota Schlammadinger M.D., Ph.D.
	Ms. Zsófia Simon M.D.,Ph.D.
Assistant Lecturer	Ádám Jóna M.D., Ph.D.
	Ferenc Magyari M.D., Ph.D.
	Ms. Edit Páyer M.D.
	Róbert Szász M.D.
Research Fellow	Ms. Marianna Szarvas
Clinical Specialist	Ms. Gabriella Mezei M.D.
	Ms. Renáta Nyilas M.D.
	Ms. Ildikó Pál M.D.
	Ms. Zita Radnay M.D.
	Ms. Katalin Rázsó M.D.
Registrar	Ms. Adrienn Márton M.D.
Resident	Ms. Réka Ráhel Bicskó M.D.
	Ms. Annamária Edit Gál M.D.
	Ms. Anna Kenyeres M.D.
	Ms. Evelin Kiss M.D.
	Ms. Szilvia Lovas M.D.
	Ms. Nóra Obajed-Al Ali M.D.
	László Imre Pinczés M.D.
	Ms. Lilla Sebestyén M.D.
	Péter Pambó Vekszler M.D.

Academic Advisor	László Váróczy M.D., Ph.D. habil.

Division of Metabolism

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-600
E-mail: titkarsag@belklinika.com, Web: elearning.med.unideb.hu

Full Professor, Head of Division	György Paragh M.D., Ph.D., D.Sc.
Full Professor	Dénes Páll M.D., Ph.D., D.Sc.
Associate Professor	Zoltán Balogh M.D., Ph.D. habil.
	Péter Fülöp M.D., Ph.D. habil.
	Ms. Mariann Harangi M.D., Ph.D. habil.
	Miklós Káplár M.D., Ph.D. habil.
	Ms. Éva Katona M.Sc., Ph.D. habil.
Senior Research Fellow	Ms. Ildikó Dánielné Seres M.Sc., Ph.D.
	Zsolt Karányi M.Sc.
Assistant Professor	Ms. Henrietta Dér M.D., Ph.D.
	György Kerekes M.D., Ph.D.
	Szabolcs Lengyel M.D., Ph.D.
	Ferenc Sztanek M.D., Ph.D.
Assistant Lecturer	Tamás Köbling M.D., Ph.D.
Research Fellow	Ms. Hajnalka Lőrincz M.Sc., Ph.D.
	Ms. Anita Szentpéteri M.Sc.
Chief Consultant	Ms. Franciska Tizedes M.D.
Clinical Assistant	Ms. Regina Esze M.D.
	Ms. Krisztina Gaál M.D., Ph.D.
	Ms. Andrea Kahler M.D.
	Ms. Judit Kéri M.D.
	Ms. Julianna Kulcsár M.D.
	Ms. Réka Szentimrei M.D.
	Ms. Noémi Zsíros M.D., Ph.D.
Candidate Clinical Assistant	Ms. Barbara Cogoi M.D.
	Ms. Judit Kaluha M.D.
	Ms. Beáta Kovács M.D.
	Ms. Szilvia Ujfalusi M.D.
Resident	Ms. Bíborka Nádró M.D.
	István Puskás M.D.

Division of Nephrology
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-414-227

Full Professor, Head of Division of Nephrology	József Balla M.D., Ph.D., D.Sc.
Associate Professor	István Kárpáti M.D., Ph.D.
	János Mátyus M.D., Ph.D.
	László Ujhelyi M.D., Ph.D.
Clinical Assistant	Gergely Becs M.D.
	Thomas Ben M.D., Ph.D.
	Ms. Csilla Markóth M.D.
	Ms. Zita Váradi M.D.
Candidate Clinical Assistant	Ms. Ibolya File M.D.
	Dávid Hutkai M.D.
Senior Consultant	Ms. Csilla Trinn M.D.

Division of Rheumatology
Móricz Zsigmond krt. 22., Debrecen, 4032, Tel: +36-52-255-091
E-mail: reuma.titkarsag@med.unideb.hu, Web: www.rheumatology.hu

Full Professor, Head of Division	Zoltán Szekanecz M.D., Ph.D., D.Sc.
Full Professor	Ms. Gabriella Szűcs M.D., Ph.D., D.Sc.
Associate Professor	Ms. Szilvia Szamosi M.D.
Assistant Professor	Ms. Nóra Bodnár M.D., Ph.D.
Assistant Lecturer	Levente Bodoki M.D., Ph.D.
	Ms. Zsófia Pethő M.D.
	Ms. Edit Végh M.D.
Clinical Specialist	Ms. Ágnes Horváth M.D.
	Ms. Boglárka Soós M.D.
Resident	Ms. Zsuzsanna Gyetkó M.D.
	Attila Hamar M.D.
	Zsolt Molnár M.D.
	Ms. Rebeka Szelkó-Falcsik M.D.
	Ms. Dóra Tari M.D.

DEPARTMENT OF NEUROLOGY

Móricz Zs. str. 22., Debrecen, 4032, Tel: +36-52-255-255
E-mail: neuro@med.unideb.hu, Web: neurology.med.unideb.hu; neurology.dote.hu

Full Professor, Head of Department		László Oláh M.D., Ph.D., D.Sc.
Full Professor		László Csiba M.D., Ph.D., D.Sc., M.H.A.Sc.
Professor Emeritus		István Fekete M.D., Ph.D.
Associate Professor	Ms.	Judit Boczán M.D., Ph.D.
	Ms.	Tünde Csépány M.D., Ph.D.
	Ms.	Klára Edit Fekete M.D., Ph.D.
Assistant Professor		Norbert Kozák M.D., Ph.D.
Assistant Lecturer	Ms.	Krisztina Csapó M.D.
	Ms.	Katalin Réka Czuriga-Kovács M.D., Ph.D.
	Ms.	Lilla Rácz M.D.
	Ms.	Katalin Judit Szabó M.D., Ph.D.
Clinical Assistant		Tamás Árokszállási M.D.
		Richárd Csabalik M.D.
	Ms.	Tünde Erdélyi M.D.
	Ms.	Aletta Andrea Harman M.D.
		Gergely Hofgárt M.D.
	Ms.	Kitti Bernadett Kovács M.D., Ph.D.
		Tibor Csaba Rab M.D.
		Róbert Rostás M.D.
	Ms.	Dóra Sulina M.D.
Candidate Clinical Assistant	Ms.	Krisztina Szonja Bábel M.D.
	Ms.	Eszter Balogh M.D.
		Máté Héja M.D.
	Ms.	Lilla Hudák M.D.
		Márk Kozák M.D.
		István Szegedi M.D.
Resident	Ms.	Melinda Altorjay M.D.
		Péter Árvai M.D.
		Viktor Bencs M.D.
	Ms.	Alexandra Berki M.D.
	Ms.	Zsófia Mészáros M.D.

DEPARTMENT OF NEUROSURGERY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-419-418

Full Professor, Head of Department	László Bognár M.D., Ph.D. habil.
Associate Professor	Álmos Klekner M.D., Ph.D. habil.
	László Novák M.D., Ph.D. habil.
	Sándor Szabó M.D., Ph.D.
Clinical Chief Physician	József Dobai M.D.
Assistant Professor	Gábor Fekete M.D., Ph.D.
Assistant Lecturer	Gábor Hutóczki M.D., Ph.D.
Clinical Physician	Péter Ruszthi M.D.
	Rahmani Mohammad Tayeb M.D.
Resident	Emanuel Gutema M.D.
	Dávid Horsai M.D.
	Ms. Dorottya Juhász M.D.
	Nándor Orosz M.D.
Academic Advisor	László Novák M.D., Ph.D. habil.

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-144
E-mail: gyvarga@med.unideb.hu

Associate Professor, Head of Department	Zoárd Krasznai M.D., Ph.D., habil
Full Professor	Róbert Póka M.D., Dr. habil., Ph.D.
Professor Emeritus	Antal Borsos M.D., Ph.D., D.Sc.
	Zoltán Hernádi M.D., Ph.D., D.Sc.
	Zoltán Tóth M.D., Ph.D., D.Sc.
Associate Professor	Ádám Balogh M.D., Ph.D., D.Sc. (retired)
	Attila Jakab M.D., Ph.D. habil.
	Tamás Szilveszter Kovács M.D., Ph.D.
	Rudolf Lampé M.D., Ph.D. habil.
	Ms. Olga Török M.D., Ph.D. habil.
Assistant Professor	Tamás Deli M.D., Ph.D.
	Bence Kozma M.D., Ph.D.
	Csaba Móré M.D., Ph.D.
	Tamás Sápy M.D., Ph.D.

		Péter Török M.D., Ph.D. habil.
	Ms.	Szilvia Vad M.D., Ph.D.
Assistant Lecturer		Péter Daragó M.D.
		Balázs Erdődi M.D.
		János Lukács M.D.
		Szabolcs Molnár M.D.
		László Orosz M.D., Ph.D.
		Gergő Orosz M.D.
Clinical Assistant		Levente Barna M.D.
	Ms.	Szilvia Csehely M.D.
		Péter Damjanovich M.D.
		Zsolt Farkas M.D.
	Ms.	Ágnes Kövér M.D.
	Ms.	Eszter Maka M.D.
	Ms.	Mónika Orosz M.D.
		Jashanjeet Singh M.D.
		Attila Sipos M.D., Ph.D.
Resident		Balázs Ditrói M.D.
	Ms.	Erzsébet Koroknai M.D.
	Ms.	Nóra Krasnyánszki M.D.
	Ms.	Luca Lukács M.D.
	Ms.	Olga Stercel M.D.
	Ms.	Judit Szőke M.D.
		Zoltán Tándor M.D.
	Ms.	Beáta Vida M.D.
Psychologist	Ms.	Zsuzsa Török M.A., Ph.D.
Biologist	Ms.	Zsuzsanna Buczkó M.Sc.
	Ms.	Ildikó Zsupán M.Sc.
Academic Advisor (IV-VI. Years)		Balázs Erdődi M.D.
		Tamás Szilveszter Kovács M.D., Ph.D.

DEPARTMENT OF OPHTHALMOLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-456
E-mail: szemklinika@med.unideb.hu, Web: http://szemklinika.unideb.hu/

Head of Department, Associate Professor	Ms.	Mariann Fodor M.D., Dr. habil., Ph.D.
Full Professor		László Módis M.D., Ph.D., D.Sc.

Professor Emeritus		András Berta M.D., Ph.D., D.Sc.
Associate Professor	Ms.	Judit Damjanovich M.D., Ph.D.
	Ms.	Valéria Nagy M.D., Ph.D.
	Ms.	Lili Takács M.D., Ph.D.
Assistant Professor	Ms.	Beáta Kettesy M.D., Ph.D.
		Bence Lajos Kolozsvári M.D., Ph.D.
	Ms.	Annamária Nagy M.D., Ph.D.
	Ms.	Bernadett Ujhelyi M.D.,Ph.D.
Assistant Lecturer	Ms.	Zita Steiber M.D., Ph.D.
	Ms.	Éva Surányi M.D., Ph.D.
Chief Physician		Attila Vajas M.D.
Clinical Specialist	Ms.	Beáta Bajdik M.D.
		Szabolcs Balla (M.D)
	Ms.	Erika Papp M.D.
	Ms.	Anikó Rentka M.D., Ph.D.
	Ms.	Lilla Simon M.D.
	Ms.	Eszter Zöld M.D.
Resident	Ms.	Zsuzsa Réka Dömötör M.D.
	Ms.	Zsuzsa Zsófia Flaskó M.D.
		János ifj. Aranyosi M.D.
	Ms.	Orsolya Pásztor M.D.
	Ms.	Dorottya Polyák-Pásztor M.D., Ph.D.
Academic Advisor	Ms.	Éva Surányi M.D., Ph.D.

DEPARTMENT OF ORTHOPEDIC SURGERY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-815
E-mail: szcsenge@med.unideb.hu, Web: ortopedia.med.unideb.hu

Full Professor, Head of Department	Zoltán Csernátony M.D., Ph.D., D.Sc.
Professor Emeritus	János Rigó M.D., Ph.D.
	Kálmán Szepesi M.D., Ph.D., D.Sc.
Assistant Professor	János Szabó M.D., Ph.D.
Assistant Lecturer	Tamás Bazsó M.D.
	Zsolt Hunya M.D.
	Zoltán Karácsonyi M.D.

		Henrik Rybaltovszki M.D.
	Ms.	Csenge Szeverényi M.D., Ph.D.
Clinical Assistant		István Soltész M.D.
		Dániel Szabó M.D.

DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY

Nagyerdei krt. 98. sz., Debrecen, 4032, Tel: +36-52-255-805
E-mail: orl.office@med.unideb.hu

Head of Department, Associate Professor		Judit Szilvássy M.D., Ph.D. habil.
Associate Professor		László Tóth M.D., Ph.D. habil.
Assistant Professor		Tamás Batta M.D., Ph.D.
		Szilárd Gyula Rezes M.D., Ph.D.
Assistant Lecturer	Ms.	Gyöngyi Bertalan M.D.
Clinical Specialist		Balázs József Jászberényi M.D.
		Dávid Kovács M.D.
		Zoltán Papp M.D.
	Ms.	Erika Pászti M.D.
	Ms.	Zsuzsanna Piros M.D.
Candidate Clinical Assistant	Ms.	Anna Bódi M.D.
		Sándor Gergő Elek M.D.
	Ms.	Anna Orsolya Flaskó M.D.
		Gábor Lakatos M.D.
Resident		András Szilágyi M.D.
Academic Advisor		Szilárd Gyula Rezes M.D., Ph.D.

DEPARTMENT OF PEDIATRICS

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-411-717/55289
E-mail: mogyoros@med.unideb.hu, Web: www.pediatrics.dote.hu

Associate Professor, Head of Department		Tamás Szabó M.D., Ph.D.
Full Professor		Csongor Kiss M.D., Ph.D., D.Sc.
		György Balla M.D., Ph.D., D.Sc., M.H.A.Sc.
	Ms.	Ilma Korponay-Szabó M.D., Ph.D., D.Sc.
	Ms.	Beáta Erika Nagy M.A., Ph.D.
Associate Professor		Gábor Mogyorósy M.D., Ph.D.

	Ms.	Rita Káposzta M.D., Ph.D.
	Ms.	Éva Nemes M.D., Ph.D.
		István Szegedi M.D., Ph.D.
Assistant Professor	Ms.	Andrea Berkes M.D., Ph.D.
	Ms.	Enikő Felszeghy M.D.,Ph.D.
	Ms.	Katalin Szakszon M.D., Ph.D.
Senior Lecturer	Ms.	Andrea Nagy M.D.
Assistant Lecturer	Ms.	Erika Bálega M.D.
		Gergely Balázs M.D.
		István Pataki M.D.
		Zsolt Bene M.D.
	Ms.	Éva Juhász M.D.
	Ms.	Ágnes Papp M.D.
		László Sasi Szabó M.D.
Research Assistant	Ms.	Katalin Megyesán (permanently away)
Clinical Assistant	Ms.	Mónika Bessenyei M.D.
	Ms.	Erika Biró M.D.
	Ms.	Bernadett Bíró M.D.
	Ms.	Boglárka Fehér M.D.
	Ms.	Zsuzsanna Gaál M.D., Ph.D.
	Ms.	Anita Grabicza M.D.
		Péter Juhász M.D.
	Ms.	Orsolya Kadenczki M.D.
	Ms.	Veronika Kovács M.D.
	Ms.	Erzsébet Ilona Lakatos M.D.
	Ms.	Ágnes Magyar M.D.
	Ms.	Gabriella Merő M.D.
	Ms.	Eszter Mracskóné Kovács M.D. (permanently away)
	Ms.	Klára Nagy-Erdei M.D.
	Ms.	Tímea Kincső Nagyné Zoltán M.D.
	Ms.	Helga Perényi M.D. (permanently away)
		Miklós Petrás M.D., Ph.D.
		Zsolt Reiger M.D.

	Ms. Boglárka Schvarckopf M.D.
	Ms. Orsolya Somodi M.D. (permanently away)
	Ms. Brigitta Sveda M.D.
	Levente Szabó M.D.
	Ms. Edit Szikszay M.D.
	Ms. Petra Varga M.D.
	Ms. Zsuzsa Zele M.D. (permanently away)
	András Balajthy M.D., Ph.D.
	Ms. Csilla Fehér M.D. (permanently away)
	Ms. Nóra Katona M.D.
	Ms. Tünde Kotormán M.D.
	Tamás Kovács M.D.
	Balázs Kovács-Pászthy M.D.
	Ms. Katalin Nagy M.D. (permanently away)
	Ms. Magdolna Riszter M.D.
	Ms. Tímea Rózsa M.D.
Resident	Ms. Anett Agócs M.D.
	Ms. Marie Al-Muhanna M.D. (permanently away)
	Ms. Flóra Ambrus M.D.
	Ms. Zsanett Bara M.D.
	Ms. Zsófia Barkaszi-Szabó M.D. (permanently away)
	Ms. Eszter Anna Bartha M.D.
	Ms. Ágnes Bodnár M.D.
	Ms. Flóra Bodnár M.D. (permanently away)
	Ms. Beáta Bujdosó M.D.
	Ms. Barbara Cseke M.D.
	Ms. Angéla Czibere-Váradi M.D.
	Ms. Ildikó Dán M.D.
	Ms. Ágnes Deák M.D. (permanently away)

Ms. Renáta Dr. Baloghné Dr. Hudák
(permanently away)

Ms. Marietta Dr. Hutkainé Dr. Incze

Ms. Fruzsina Erdős M.D.

Ms. Judit Lenke Frankó M.D.
(permanently away)

Ms. Boglárka Gréz Balázsné Dankó M.D.

Ms. Ildikó Hamza M.D.

Ms. Lilla Illésy-Macsi M.D.

Ms. Bettina Juhász M.D.

Ms. Flóra Juhász-Ujhelyi M.D.
(permanently away)

Ms. Andrea Katona M.D.

Ms. Edit Kecskés M.D.

Ms. Ágnes Kiléber M.D.

Ms. Emese Csenge Kiss M.D.

Ms. Mariann Márki M.D.

Ms. Brigitta Dóra Mátyás-Nagy M.D.
(permanently away)

Ms. Viktória Miklós M.D.

Ms. Renáta Molnár M.D.

Gergő Nagy M.D.

Ms. Anita Oroszné Dr. Szücs

Ms. Zsófia Pék-Bodnár M.D.
(permanently away)

Ms. Krisztina Plásztánné Kovács M.D.
(permanently away)

Ádám Radványi M.D.

Ms. Szabina Révész M.D.

Ms. Fanni Rüdiger M.D.

Ms. Dóra Schnémann M.D.
(permanently away)

Ms. Vanda Soltész M.D.
(permanently away)

Ms. Vivien Stercel M.D.

Ms. Kinga Szabó M.D.

Ms. Dóra Szűcs-Farkas M.D.

	Ms.	Zsanett Tári M.D.
	Ms.	Brigitta Tóth M.D.
	Ms.	Anita Vadász M.D.
		Gábor Varga M.D.
	Ms.	Melinda Vojtkó M.D.
		Bence Zonda M.D.
Psychologist	Ms.	Emma Bezgédi
		Péter Boris
	Ms.	Brigitta Munkácsi M.Sc.
	Ms.	Erika Tizedes
Academic Advisor	Ms.	Éva Juhász M.D.
		Csongor Kiss M.D., Ph.D., D.Sc.
		Gábor Mogyorósy M.D., Ph.D.
	Ms.	Nóra Katona

DEPARTMENT OF CLINICAL PHARMACOLOGY IN MEDICINE
Nagyerdei krt. 98., Debrecen, 4028

Full Professor, Head of Department	Dénes Páll M.D., Ph.D., D.Sc.

DEPARTMENT OF PHYSICAL MEDICINE AND REHABILITATION
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-942
E-mail: orfmt@med.unideb.hu, Web: http://rehabilitacio.med.unideb.hu

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.	Alexandra Balázsné Pádár M.A.
	Ms.	Adél Debreceni-Nagy M.D.
	Ms.	Judit Horváth M.D.
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. Zsuzsanna Mile M.A.
	Ms. Ildikó Mózesné Kapocska M.A.
Physiotherapist	Ms. Laura Balázsi M.A.
	Ms. Alexandra Balázsné Pádár M.A.
	Ms. Zsuzsa Bodnár M.A.
	Ms. Beáta Bódor M.A.
	Ms. Kitti Boros, M.A.
	Ms. Kira Gyarmati-Kosztolányi M.A.
	Ms. Szabina Nagy M.A.
	Ms. Zsófia Oláh M.A.
	Ms. Éva Anna Szabados M.A.
	Ms. Dorottya Szanyi M.A.
	Ms. Evelin Varga M.A.
Physiotherapist, Occupational therapist and Rehabilitation expert	Ms. Zsófia Hőgye M.A.
Rehabilitation expert	Ms. Alexandra Balázsné Pádár 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 Andrássy M.D.
	Ms. Edina Cserép M.D.
	Attila Kovács M.D.
	Csaba Móré E. M.D.
Clinical Assistant	Ágoston Gajdos M.D.
	Szabolcs Garbóczy 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.
	Ms.	Zsanett Usztics M.Sc.
Academic Advisor	Ms.	Anita Fortunyák M.Sc.

DEPARTMENT OF PULMONOLOGY
Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-222

Full Professor, Head of Department		József Balla M.D., Ph.D., D.Sc.
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.
Chief Physician		László Brugós M.D., Ph.D.
	Ms.	Zsuzsanna Orosz M.D., Ph.D.
Clinical Assistant		Susil Joe Isaac M.D.
		Attila Lieber M.D.
		Attila Makai M.D.
	Ms.	Zsuzsa Papp M.D.
	Ms.	Ildikó Szűcs M.D.
Candidate Clinical Assistant	Ms.	Magdolna Körtvély M.D.
	Ms.	Regina Szabó-Szűcs M.D.
Resident		Tamás Kovács M.D.
		Miklós Kukuly M.D.
	Ms.	Judit Maklári M.D.
	Ms.	Boglárka Ágnes Valkó 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
Web: http://www.sebeszet.deoec.hu

Associate Professor, Head of Department	Dezső Tóth M.D., Ph.D. habil.
Head of Division of Organ Transplantation	Balázs Nemes M.D., Ph.D.
Full Professor	László Damjanovich M.D., Ph.D., D.Sc.
Consultant Surgeon	Zsolt Kanyári M.D.
Professor Emeritus	Géza Lukács M.D., Ph.D., D.Sc.
	Péter Sápy M.D., Ph.D., D.Sc.
Associate Professor	Zsolt Szentkereszty M.D., Ph.D.
	Miklós Tanyi M.D.,Ph.D.
Assistant Professor	Attila Enyedi M.D.
	Roland Fedor M.D., Ph.D.
	Ferenc Győry M.D.
	Csaba Kósa M.D.
	László Orosz M.D., Ph.D.
	Gergely Zádori M.D., Ph.D.
Assistant Lecturer	Tamás Dinya M.D.
	Dávid Kovács M.D.
	Ms. Réka P. Szabó M.D.
	János Pósán M.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.
	Péter Kolozsi M.D.
	Ms. Krisztina Litauszky M.D.
	Gábor Mudriczki M.D.
	Péter Ferenc Nagy M.D.
	Csaba Ötvös M.D.
	Zsolt Susán M.D.

		Csongor Váradi M.D.
		Zsolt Varga M.D.
Resident	Ms.	Gyöngyi Bernscherer M.D.
		Gábor Ditrói M.D.
		Balázs Gergely M.D.
		Gergő Haba M.D.
		Lóránt Illésy M.D.
		Dániel Mátyási M.D.
Academic Advisor		Tamás Dinya M.D.

DEPARTMENT OF OPERATIVE TECHNIQUES AND SURGICAL RESEARCH
Móricz Zs. krt. 22., Debrecen, 4032, Tel: +36-52-416-915
Web: https://surgres.unideb.hu

Full Professor, Head of Department		Norbert Németh M.D., MBA, Ph.D., D.Sc.
Professor Emeritus		István Furka M.D., D.Sc., C.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	Ms.	Barbara Baráth M.Sc.
		Tamás Lesznyák M.D., D.Pharm.
PhD Student	Ms.	Anna Orsolya Flaskó M.D.
		Ádám Mátrai M.Sc.
		Ádám Varga M.Sc.
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.	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
E-mail: dbtrauma@med.unideb.hu

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

Chief Surgeons of the Kenézy Hospital		József Balázs M.D.
		Béla Barta M.D.
	Ms.	Danie Czakó M.D.
		Zoltán Dézsi M.D.
		István Frendl M.D.
		Péter Horkay M.D.
		Árpád Kiss M.D.
		Bojko Lazarov Szeferinkin M.D.
		Levente Molnár M.D.
		András Nagy M.D.
		István Szarukán M.D.
Surgeons of the Kenézy Hospital		Árpád Barkaszi M.D.
		Péter Berényi M.D.
		Miklós Bíró M.D.
		Aurél Bogdán M.D.
		Balázs Cs. Kiss M.D.
		Subuh Deeb Mahmoud M.D.
		Márton Árpád Fésüs M.D.
		Szabolcs Gorzsás M.D.
		László Gubik M.D.
		Ádám Kristóf Gulyás 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.
		Márton József Séber M.D.
Resident		Gábor Bordás M.D.
		Gyula Diós M.D.

		Károly Elek M.D.
		Ákos Haby M.D.
		Tamás Jánvári M.D.
	Ms.	Zsuzsanna K. Nagy M.D.
		Konrád Ökrös M.D.
		Máté Sulik M.D.
		Attila Szabó M.D.
		Bence Gellért Urbán M.D.
	Ms.	Katalin Kitti Vass M.D.
Consultant		István Szarukán M.D.
Academic Advisor		István Frendl M.D.

DEPARTMENT OF UROLOGY

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-255-256
E-mail: drabik.gyula@med.unideb.hu, 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.
Clinical Assistant	Ms.	Alexandra Barkóczi M.D.
		János Dócs M.D.
		Tamás Somogyi M.D.
		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
Web: http://dental.unideb.hu/

Full Professor, Head of Department		Csaba Hegedűs M.D., L.D.S., 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.
	Ms.	Melinda Szalóki M.Sc., Ph.D.
Assistant Lecturer	Ms.	Edit Hrubi D.M.D.
	Ms.	Rita Mohácsi D.M.D.
	Ms.	Anita Pétercsák D.M.D.
	Ms.	Márta Szegedi D.M.D.
Departmental Engineer	Ms.	Ibolya Kálmán-Szabó M.Sc.
	Ms.	Ildikó Szilágyi M.Sc.
Clinical Specialist	Ms.	Katalin Bukovinszky D.M.D.
		Gábor Suta D.M.D.
		Márton Suta D.M.D.
Resident	Ms.	Sára Csermák D.M.D.
	Ms.	Ildikó Mag D.M.D.
Academic Advisor		István Lampé M.D., L.D.S.

DEPARTMENT OF FOREIGN LANGUAGES

Nagyerdei krt. 98., Debrecen, 4032, Tel: +36-52-258-030
E-mail: ilekt@med.unideb.hu, Web: ilekt.med.unideb.hu

Head of Department	Ms.	Katalin Rozman M.A.
Teacher	Ms.	Annamária Balóné Jóna M.A.
	Ms.	Szilvia Erdeiné Gergely M.A.
	Ms.	Marianna Fodor M.A.
	Ms.	Ildikó Gerő M.A.
	Ms.	Mariann Gulyásné Szitás M.A.
	Ms.	Judit Kovács, M.A.
	Ms.	Mónika Krasznai M.A.

	Ms.	Zsuzsa Lívia Mezei M.A.
		László Répás M.A.
		Benjamin Schutz M.A.
Academic Advisor	Ms.	Annamária Balóné Jóna M.A.

INSTITUTE OF SPORT SCIENCE OF UNIVERSITY OF DEBRECEN

Móricz Zs. krt. 22., Debrecen, 4032, Tel: +36-52-411-600/54436
E-mail: sport@med.unideb.hu

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.

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Education and Research Support Department	Ms.	Judit Éva Fazekas-Paragh M.Sc.

CHAPTER 9
UNIVERSITY CALENDAR

CRASH COURSE OF HUNGARIAN LANGUAGE: August 23 – September 3, 2021
OPENING CEREMONY: September 5, 2021
GRADUATION CEREMONY: September 18, 2021; December 2021; June 2022;

1st SEMESTER

Year	Course	Examination Period
Basic Medicine Course	September 6 – December 10, 2021 (14 weeks)	December 13, 2021 – January 28, 2022 (7 weeks)
1st year Medicine 2nd year Medicine 3rd year Medicine	September 6 – December 10, 2021 (14 weeks)	December 13, 2021 – January 28, 2022 (7 weeks)
4th year Medicine 5th year Medicine	September 6 – December 10, 2021 (14 weeks – 4 weeks block practice included)	December 13, 2021 – January 28, 2022 (7 weeks)

2nd SEMESTER

Year	Course	Examination Period
Basic Medicine Course	February 7 – May 13, 2022 (14 weeks)	May 16 – June 10, 2022 (4 weeks)
Basic Medicine Course II.	January 10 – June 17, 2022 (23 weeks)	June 20 – July 8, 2022 (3 weeks)
1st year Medicine 2nd year Medicine 3rd year Medicine	February 7 – May 13, 2022 (14 weeks)	May 16 – July 1, 2022 (7 weeks)
4th year Medicine	February 7 – May 13, 2022 (14 weeks – 3 or 4 weeks block practice included)	May 16 – July 1, 2022 (7 weeks) – 4th year
5th year Medicine		May 16 – July 8, 2022 (8 weeks) – 5th year

SUMMER HOSPITAL PRACTICE

Year	Dates in 2022
1st or 2nd year Medicine (Nursing Practice)	July 4 – July 29 or August 1 – August 26, 2022 (4 weeks)
3rd year Medicine (Internal Medicine)	July 4 – July 22 or July 25 – August 12, 2022 (3 weeks)
4th year Medicine (Freely Chosen clinical department)	

CHAPTER 10
ACADEMIC PROGRAM FOR THE BASIC MEDICINE COURSE

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

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

Class Behavior

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

Requirements

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

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

The knowledge of students will be tested 4 times during each semester using a written test system by **Self Control Tests (SCT).** The first semester is ended with an **End of Semester Examination** (ESE) covering the topics of all lectures and seminars of the first semester. Three dates will be set for the ESE during the winter examination period. Unsuccessful students may repeat the ESE twice (B and C chances). 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 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 2nd semester is at least 70%, AND
- passed all the SCTs with at least 40% in the 2nd semester, AND
- (s)he has a maximum of 3 seminar absences for a given subject per semester.

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

The average of the ESE score three times and the best 3 2nd semester SCTs **OR** 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.

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)

Absence for any reason counts as 0%.

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

Subject: **INTRODUCTION TO BIOLOGY I.**
Year, Semester: Basic Medicine Course, 1st
Number of teaching hours:
Lecture: **56**

Seminar: **28**

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

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

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

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

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

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

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

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

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

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

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

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

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

Regulation of gene expression 2. (Eukaryotic reg.)

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

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

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

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

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

3rd **week:**
Lecture:
Blood, a fluid tissue 2.
Circulation1.
Circulation 2.

4th **week:**
Lecture:
Circulation 3.
Circulation 4. The lymphatic system.
Natural Defenses against Disease 1.

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

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

7th **week:**
Lecture:
Respiratory system 1.
Respiratory system 2.
Salt and Water Balance and Nitrogen Excretion 1.

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

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

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

11th **week:**
Lecture:
Neurons and Nervous system 4.

Neurons and Nervous system 5.
Sensory systems 1.

12th **week:**
Lecture:
Sensory systems 2.
Musculoskeletal Systems 1.
Musculoskeletal Systems 2.

13th **week:**
Lecture:
Musculoskeletal Systems 3.
Reproduction and Development 1.
Reproduction and Development 2.

14th **week:**
Lecture:
Reproduction and Development 3.
Reproduction and Development 4.

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

Subject: **INTRODUCTION TO PHYSICS I.**
Year, Semester: Basic Medicine Course, 1st
Number of teaching hours:
Lecture:56
Seminar: 28

1st **week:**
Lecture:
Introduction, requirements. Standards of length, mass, time. Significant figures. Prefixes. Conversion of units. Coordinate systems, trigonometry.
Radians, vectors and scalars, geometry, equation solving, problem solving, graphing. Functions, calculator usage

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

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

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

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

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

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

8th **week:**
Lecture:

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

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

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

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

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

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

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

Contact person: Dr. György Panyi, Full Professor, Department of Biophysics
Recommended book: Serway-Vuille: College Physics, Brooks/Cole

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Contact person: Dr. György Panyi, Full 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:
Lecture: **56**
Seminar: **28**

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

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

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

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

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

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

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

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

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

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

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

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

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

14th week:
Lecture:
Summary of general chemistry 4
Test #4

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

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

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

3rd week:
Lecture:
Test #5

Covalent bonding in organic compounds.
Classification of organic compounds

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

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

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

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

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

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

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

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

12th week:
Lecture:
Carboxylic acids
Substituted carboxylic acids. Carboxylic acid derivatives: esters and amides

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

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

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

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

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

2nd week:
Practical: 2. lecke II. rész

3rd week:
Practical: 3. lecke

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

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

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

7th week:
Practical: 8. lecke

8th week:
Practical: 9. lecke

9th week:
Practical: 10. lecke

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

11th week:
Practical: 13. lecke

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

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

CHAPTER 11
ACADEMIC PROGRAM FOR THE SHORT BASIC MEDICINE COURSE

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

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

Class Behavior

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

Requirements

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

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

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

Exemption from FE is offered for students who achieve excellent academic performance during their studies under the following circumstances:
- the average score of the five best SCTs (out of 6) is at least 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**

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

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

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

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

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

6th **week:**
Lecture: The cell cycle and cell division 2.
The cell cycle and cell division 3.

The cell cycle and cell division 4.
Inheritance, genes and chromosomes 1.

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

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

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

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

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

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

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

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

15th week:
Lecture: Circulation 1-3. Lymphatic system.

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

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

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

19th week:
Lecture: Hormones 3-4.
Self Control Test
Neurons and Nervous system 1.

20th week:
Lecture: Neurons and Nervous system 2-5.

21st week:
Lecture: Sensory systems 1-2.
Effectors: Musculoskeletal Systems 1-2.

22nd week:
Lecture: Musculoskeletal Systems 3.
Reproduction and Development 1-2.
Reproduction and Development 3-4.

23rd week:
Lecture: Self Control Test

Academic advisors: Dr. András Penyige, Department of Human Genetics
Dr. Norbert Szentandrássy, Department of Physiology

Recommended book: Sadava, Hills, Heller, Berenbaum: Life (10th edition)

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

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

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

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

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

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

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

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

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

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

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

11th **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.

12th **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.

13th **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.

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

15th **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.

16th **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.

17th **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.

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

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

20th **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.

21st **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.

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

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

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

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

2nd **week:**
Lecture:
The atomic theory. Structure of the atom, nuclear

arithmetic
Mixtures and chemical compounds. Chemical formulas. Naming chemical compounds

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

19th **week:**
Lecture:

Ethers, thioethers. Organic sulfur compounds
Aldehydes, ketones and quinones

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

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

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

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

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

CHAPTER 12
ACADEMIC PROGRAM FOR CREDIT SYSTEM

ACADEMIC PROGRAM FOR CREDIT SYSTEM

The introduction of the credit system became compulsory in every Hungarian university, including the University of Debrecen by September, 2003. The aim of the credit system is to ensure that the students' achievements can be properly and objectively evaluated both quantitatively and qualitatively.
A credit is a relative index of cumulative work invested in a compulsory, a required elective or a freely chosen subject listed in the curriculum. The credit value of a course is based upon the number of lectures, seminars and practical classes of the given subject that should be attended or participated in (so called "contact hours"), and upon the amount of work required for studying and preparing for the examination(s). Together with the credit(s) assigned to a particular subject (quantitative index), students are given grades (qualitative index) on passing an exam/course/class. The credit system that has been introduced in Hungary meets the standards of the European Credit Transfer System (ECTS). The introduction of the ECTS promotes student mobility, facilitates more effective organization of students' exchange programs aimed at further education in foreign institutions, and allows recognition of the students' work, studies and achievements completed in various foreign departments by the mother institution. Credit-based training is flexible. It provides a wider range of choice, enables the students to make progress at an individual pace, and it also offers students a chance to study the compulsory or required subjects at a different university, even abroad. Owing to the flexible credit accumulation system, the term "repetition of a year" does not make sense any longer. It should be noted, however, that students do not enjoy perfect freedom in the credit system either, as the system does not allow students to randomly include subjects in their curriculum or mix modules. Since knowledge is based on previous studies, it is imperative that the departments clearly and thoroughly lay down the requirements to be met before students start studying a subject.

The general principles of the credit system are the following:

1. Students can be given their degree if, having met other criteria as well, they have collected 360 credits during their studies. Considering the recommended curriculum, this can be achieved in six years.

2. According to the credit regulations, students should obtain an average of 30 credits in each semester.

3. The criterion of obtaining 1 credit is to spend 30 hours (including both contact and non-contact hours) studying the given subject.

4. Credit(s) can only be obtained if students pass the exam of the given subject.

5. Students accumulate the required amount of credits by passing exams on compulsory, required elective and freely chosen subjects. Completion of every single compulsory credit course is one of the essential prerequisites of getting a degree. Courses belonging to the required elective courses are closely related to the basic subjects, but the information provided here is more detailed, and includes material not dealt with in the frame of the compulsory courses. Students do not need to

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

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

7. According to the qualification requirements, professional (compulsory and required elective) courses fall into three modules. The basic module provides the theoretical basis of medicine, and ensures that the necessary practical skills are developed. The preclinical module lays down the foundations of clinical knowledge, while in the clinical module the students are taught clinical medicine, and they attend practical classes to ensure proper command of the medical procedures. The credits accumulated in the different modules for compulsory and required courses should show the following distribution: basic module: 92-124, preclinical module: 44-64, and clinical module:136-188 credits.

8. The pilot curricula show the recommended pacing of compulsory courses. If these courses are carefully supplemented with credits obtained from the necessary number of required elective and freely chosen courses, students can successfully accumulate the credits required for their degree within 12 semesters.

9. In the case of two-semester subjects, when students have to pass a final exam, they get higher credits in the semester of the final examination since preparation for a final examination takes up more non-contact hours from the students' time.

10. There are 16 compulsory final examinations in the curriculum; therefore one final exam is worth at least 10 credits.

11. The diploma work is worth 20 credits.

12. Internship in the final year is compulsory; students get 1 credit per week.

13. Regulations concerning the training of students in the credit system prescribe a minimum amount of credits for certain periods as outlined in the Rules and Regulations for English Program Students.

14. Although Physical Education and Summer Internship are not recognized by credits, they have to be completed to get the final degree (see the rules outlined in the Information section about the conditions).

15. Evaluation of the students' achievements needed for grants or applications is described in Rules and Regulations for English Program Students.

16. Further information is available in the Rules and Regulations for English Program Students.
We very much hope that the system of training will contribute to the successful completion of your studies.
We wish you good luck with your university studies.

The model curriculum on the following pages applies to those students who started their studies on Medicine Program in the academic year 2021/22.

Compulsory courses for the 1. year

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

Compulsory courses for the 1. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Anatomy, Histology and Embryology I. Lecture	AOANA07T2	28	28		ESE	5	None
2	Anatomy, Histology and Embryology I. Practical	AOANA08T2			56	AW5	3	None
2	Cell Biology Lecture	AOSEJ05T2	28	28		ESE*	4	None
2	Cell Biology Practical	AOSEJ06T2			20	AW5	2	None
2	First aid and reanimation	AOELS03T1	6		20	AW5	2	None
2	Hungarian Language I/2.	AOHUN02T2			28	AW5	2	Hungarian 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	28		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_NURSING			120	SIGN	0	has to be completed before the 3rd year

Compulsory courses for the 3. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	Basic Oncology	AOONK02T5	13			AW5	1	Medical Genetics Lecture, Biochemistry II. Lecture
1	Basic Surgical Techniques	AOMUT02T5	14	5	23	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	5	23	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		ESE	1	Basics of Behavioural Siences
2	Pathology II.	AOPAT04T6	42		45	FE	6	Pathology I., Immunology

Compulsory courses for the 4. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	Internal Medicine Block Practice I. - 4th year	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	Medical Psychology
2	Bioethics	AOETI02T99	10	10		ESE	2	Medical Anthropology
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	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	Behavioural Sciences Final Exam	AOMAG02T8				FE	0	Behavioural Medicine, Bioethics
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

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	Computer Science	AOINF43T1			28	AW5	3	None
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Latin Language	AOLAT42T1			28	AW5	2	None
1	Library System	AOKON43T1			10	AW5	1	None

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Computer Science	AOINF43T1			28	AW5	3	None
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Medical Genomics	AOGEN43T2	12		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
1	Advanced students' scientific activity	AOTDK06	10			AW5	2	For the prerequisites please check the following website: www.oltdk.unideb.hu
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Students' scientific activity for beginners	AOTDK04	10			AW5	1	None

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Advanced students' scientific activity	AOTDK06	10			AW5	2	For the prerequisites please check the following website: www.oltdk.unideb.hu
2	Enzymology in laboratory medicine and in clinical practice	AOG6311004	14			AW5	1	Biochemistry I. Lecture + Practical
2	History of Medicine	AOORT44T1	26			AW5	2	None
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	None
2	The Regulatory Role of the Cell Membrane in Physiological and Pathological Conditions	AOSEM42T4	20			AW5	2	Medical Physiology I. Lecture

Required elective courses for the 3. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	History of Medicine	AOORT44T1	26			AW5	2	None
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	Refraction, refractive errors, corrections, refractive surgery	AOREF42T9	5			AW5	1	None
1	Social acceptance of people with disabilities	AOFOGY42T5	20		2	AW5	2	None
1	Vaccines	AOG4291505	28			AW5	2	Microbiology, Physiology of Procaryotes, Molecular Virology

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	Enzymology in laboratory medicine and in clinical practice	AOG6311004	14			AW5	1	Biochemistry I. Lecture + Practical
2	Fundamental Clinical Neuroscience	AOG458606	10	10	10	AW5	2	Pathology I.
2	History of Medicine	AOORT44T1	26			AW5	2	None
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	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 Chest Radiography	AOG4871307		18		AW5	1	Pathology II.
1	Fundamentals of sports medicine	AOG620207	12	2	10	AW5	2	Internal Medicine propedeutics, Rheumathology-Immunology
1	Geriatric Medicine	AOGER42A7	20			AW5	3	Internal Medicine II (Immunology and Rheumatology)
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Medical imaging reporting	AOG469207		6	18	AW5	2	Anatomy II., Physiology II, Propedeutics of Internal Medicine
1	Surgical anatomy - selected chapters	AOG518407	24		2	AW5	2	Basic Surgical Techniques
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	Clinical studies in practice	AOOKF208	14	14		AW5	2	Pharmacology I.
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	Fundamentals of sports medicine II.	AOG620608	11	3	10	AW5	2	Fundamentals of sports medicine
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Holistic & Integrative Medicine	AOG128408	38			AW5	2	None
2	Magnetic resonance imaging: from basics to practice	AOMRE41T8		24		AW5	1	Biophysics Lecture
2	Metabolic Imaging (PET/CT) in Oncology	AOG469507	6		18	AW5	2	Pathology II., Internal Medicine I.
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		18		AW5	1	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 anatomy - selected chapters	AOG518407	24		2	AW5	2	Basic Surgical Techniques
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	Advanced Surgical Operative Techniques	AOHMGY42T10	4		20	AW5	2	Basic microsurgical training.Introduction to microsurgery; Surgery II.
1	Basic laparoscopic surgical training	AOG517607-K10	5		15	AW5	2	Basic Surgical Techniques; Surgical Operative Techniques; Surgery II.
1	Clinical Pharmacology	AOKFA42T9	20	8	2	AW5	2	Pharmacology II.
1	Facts and Recent Achievements of Andrology	AOAND41A8		30		AW5	2	Urology
1	Fundamentals of sports medicine	AOG620207	12	2	10	AW5	2	Internal Medicine propedeutics, Rheumathology-Immunology
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Medical imaging reporting	AOG469207		6	18	AW5	2	Anatomy II., Physiology II, Propedeutics of Internal Medicine
1	Pharmacotherapy	AOG248110	30			AW5	3	Pharmacology II.
1	Surgical anatomy - selected chapters	AOG518407	24		2	AW5	2	Basic Surgical Techniques
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	Clinical studies in practice	AOOKF208	14	14		AW5	2	Pharmacology I.
2	Facts and Recent Achievements of Andrology	AOAND41A8		30		AW5	2	Urology
2	Fundamentals of sports medicine II.	AOG620608	11	3	10	AW5	2	Fundamentals of sports medicine
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Holistic & Integrative Medicine	AOG128408	38			AW5	2	None
2	Metabolic Imaging (PET/CT) in Oncology	AOG469507	6		18	AW5	2	Pathology II., Internal Medicine I.
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 anatomy - selected chapters	AOG518407	24		2	AW5	2	Basic Surgical Techniques
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

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

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
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 + Practical	

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Anatomy, Histology and Embryology	An introduction to Anatomy	AOG1001102	1	2	16	AW5	None	
Department of Anatomy, Histology and Embryology	Clinically oriented neuroanatomy	AOG1001306	2	2	32	AW5	Neurobiology	Zoltán Hegyi M.Sc., Ph.D.
Department of Anesthesiology and Intensive Care	US-guided techniques in anaesthesiology and ICU	AOG118109	1	1	16	AW5	Pharmacology II.	Ákos Fábián M.D., Ph.D.
Department of Behavioural Sciences	Inborn Sociality - Socialized Individuality: A New Concept	AOG358902-K8	2	-	30	AW5	None	Péter Molnár M.D., D.Sc.
Department of Behavioural Sciences	The Basic Problems of Medicine	AOG358601	1	1	20	AW5	None	Attila Bánfalvi M.A., Ph.D., C.Sc.
Department of Behavioural Sciences	Madness and Psychiatry (Philosophical Approach)	AOG359602	1	2	20	AW5	None	Attila Bánfalvi M.A., Ph.D., C.Sc.
Department of Behavioural Sciences	Theory of Psychoanalysis and Its Influence on the Concept of Human Being in Medicine	AOG359501-K8	1	1	20	AW5	None	Attila Bánfalvi M.A., Ph.D., C.Sc.
Department of Behavioural Sciences	Psychic Trauma	AOG3511102-K1	1	2	20	AW5	None	Attila Bánfalvi M.A., Ph.D., C.Sc.
Department of Behavioural Sciences	Theoretical and Methodological Questions of Patient Satisfaction Studies	AOG359308	1	2	15	AW5	None	Csilla Kemény M.A., Ph.D.
Department of Behavioural Sciences	Yoga and Meditation I.	AOG3512001-K1	1	1	30	AW5	None	Péter Molnár M.D., D.Sc.
Department of Behavioural Sciences	Intercultural Health Care	AOG3511605-K1	2	2	30	AW5	None	Péter Molnár M.D., D.Sc.
Department of Behavioural Sciences	Yoga and Meditation II.	AOG3510401-K1	2	2	30	AW5	None	Péter Molnár M.D., D.Sc.
Department of Behavioural Sciences	Psychosocial aspects in reproductive medicine	AOG351401	1	1	20	AW5	None	Antal Bugán M.A., Ph.D.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Behavioural Sciences	Evolutionary medicine and psychopathology	AOG351801	1	1	20	AW5	Basics of Behavioural Sciences, Communication Skills	Roland Tisljár M.A., Ph.D.
Department of Behavioural Sciences	Health and Healing in Wolrd Religions	AOG352101	1	1	20	AW5	None	Bence Döbrőssy M.A.
Department of Behavioural Sciences	Introduction into Research Ethics	AOG3522607	1	1	20	AW5	None	János Kristóf Bodnár M.A., Ph.D.
Department of Behavioural Sciences	Philosophy of Medicine in the Lights of Science-Fiction Movies	AOG359902	2	2	26	AW5	None	János Kristóf Bodnár M.A., Ph.D.
Department of Behavioural Sciences	End of Life Topics in Movies	AOG3511001	1	1	20	AW5	None	Sándor Kőmüves M.A., Ph.D.
Department of Behavioural Sciences	End of Life Decisions I. Introduction	AOG3512701	1	1	15	AW5	None	Sándor Kőmüves M.A., Ph.D.
Department of Behavioural Sciences	End of Life Decisions II. Last Resorts	AOG3512801	1	1	15	AW5	None	Sándor Kőmüves M.A., Ph.D.
Department of Behavioural Sciences	End of Life Decisions III. Cases	AOG3512902	1	1	15	AW5	End of Life Decisions I. Introduction or End of Life Decisions II. Last Resorts	Sándor Kőmüves M.A., Ph.D.
Department of Behavioural Sciences	Bioethics on films	AOG3514405	2	1	26	AW5	None	János Kristóf Bodnár M.A., Ph.D.
Department of Behavioural Sciences	Cultural History of Psychiatry	AOG35A201	2	1	28	AW5	None	Ágoston Gajdos M.D.
Department of Biochemistry and Molecular Biology	Biochemistry of Apoptosis	AOG167406	1	-	20	AW5	Biochemistry II.	Zsuzsa Szondy M.D., Ph.D., D.Sc.
Department of Biochemistry and Molecular Biology	Retroviral Biochemistry	AOG167506	1	2	20	AW5	Molecular Biology	József Tőzsér M.Sc., Ph.D., D.Sc.
Department of Biochemistry and Molecular Biology	Adipose tissue biology and molecular mechanisms in the pathogenesis of obesity	AOG168006	1	2	20	AW5	Biochemistry II	Endre Károly Kristóf M.D., Ph.D.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Biochemistry and Molecular Biology	Nuclear hormone receptors (Journal club)*	AOG1671002	2	2	28	AW5	None	László Nagy M.D., Ph.D., M.H.A.Sc.
Department of Dermatology	Wound healing	AOG177205	1	1	12	AW5	None	István Juhász M.D., Ph.D., C.Sc.
Department of Dermatology	Aesthetic Dermatology	AOG177909	1	2	16	AW5	Anatomy, Histology and Embryology II., Medical Physiology II.	Éva Remenyik M.D., Ph.D., D.Sc.
Department of Dermatology	Plastic and reconstructive surgery	AOPLSURG02	1	2	15	AW5	None	István Juhász M.D., Ph.D., C.Sc.
Department of Dermatology	Myths and frequent questions in dermatological allergology - immunology	AOG179906	1	2	15	AW5	Physiology, Immunology	Peter Arkosy M.D., Ph.D. habil.
Department of Foreign Languages	Hungarian Language Elective General II.	AOG269102-K1	2	2	28	AW5	Hungarian Crash Course	László Répás M.A.
Department of Foreign Languages	Hungarian Language Elective General I.	AOG268901-K1	2	1	28	AW5	Hungarian Crash Course	László Répás M.A.
Department of Foreign Languages	Hungarian Language Elective - Medical I.	AOG26108A1-K1	2	1	30	AW5	None	László Répás M.A.
Department of Foreign Languages	Hungarian Language Elective - Medical II.	AOG26108A2-K1	2	2	30	AW5	Completion of Hungarian Language Elective Medical I.	László Répás M.A.
Department of Foreign Languages	Latin Medical Terminology I.	AOG2611002	1	2	30	AW5	Latin language	László Répás M.A.
Department of Foreign Languages	Hungarian Language Elective Medical III.	AOG102607	2	1	28	AW5	Hungarian Language Elective Medical II.	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective Medical IV.	AOG102708	2	2	28	AW5	Hungarian Language Elective Medical III.	Katalin Rozman M.A.
Department of Foreign Languages	Prescription Reading and Writing	AOG102805	2	1	28	AW5	Medical Latin, Medical Physiology II.	Katalin Rozman M.A.
Department of Foreign Languages	Tandem class for Hungarian and foreign students	AOG103002	2	1	30	AW5	Crash Course	Katalin Rozman M.A.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Foreign Languages	Latin Medical Terminology II.	AOG26111	2	2	30	AW5	Latin Medical Terminology I.	László Répás M.A.
Department of Foreign Languages	Hungarian Language Elective General III.	AOG269203	2	1	28	AW5	Hungarian Language I/2.	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective General IV.	AOG269304	2	2	28	AW5	Hungarian Language II/1.	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective General V.	AOG269605	2	1	28	AW5	Hungarian Language II/2.	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective General VI.	AOG269706	2	2	28	AW5	Hungarian Language III/1., Medical Hungarian I.	Katalin Rozman 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 Immunology	Trends and current developments in vaccination	AOG297406	2	2	28	AW5	Immunology	Gábor Koncz M.Sc., Ph.D.
Department of Immunology	Problem-based learning in immunology	AOG297606	1	2	14	AW5	Immunology	Gábor Koncz 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	Inflammatory bowel diseases: clinical, therapeutical and immunological aspects	AOG148709	1	1	8	AW5	Internal Medicine II. (Immunology and rheumatology)	Zoltán Csiki M.D., Ph.D.
Department of Internal Medicine	Modern functional diagnosis of microcirculation.	AOG149110	1	2	8	AW5	Pathology II., Internal Medicine V. (Gastroenterology)	Zoltán Csiki M.D., Ph.D.
Department of Internal Medicine	Acute and chronic liver diseases	AOG138207	1	2	14	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	István Tornai M.D., Ph.D. habil.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Internal Medicine	Current endoscopic practice in gastroenterology	AOG137707	1	1	14	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	István Altorjay M.D., Ph.D., D.Sc.
Department of Internal Medicine	Interesting cases in haemostaseology	AOHAE02T8	1	2	10	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	Zoltán Boda M.D.,Ph.D.,D.Sc.
Department of Internal Medicine	Selected chapters and case presentations in lympho-, and myeloproliferative diseases	AOG137405	1	1	16	AW5	Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine	
Department of Internal Medicine	Clinical cases and differential diagnosis in general medicine	AOG158507	1	1	12	AW5	Pathology II.,Clinical Biochemistry II., Propedeutics of Internal Medicine	
Department of Internal Medicine	Diagnosis and treatment of diseases most frequently found in the practice of our medical intensive care unit	AOG149009	1	-	15	AW5	None	Pál Soltész M.D., Ph.D., D.Sc.
Department of Internal Medicine	Idiopathic inflammatory myopathies, from bench to bedside	AOG149807	1	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.
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	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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 M.D., Ph.D., D.Sc.
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	Introduction to Medical Mycology	AOG4210207	1	1-2	14	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Clinical Mycology	AOG4210107	1	1-2	12	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Malaria	AOG4210407	1	1-2	15	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.
Department of Medical Microbiology	Chapters in the history of medical virology	AOG4210807	1	2	15	AW5	Medical Microbiology II.	György Veress M.Sc., Ph.D.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Medical Microbiology	Antimicrobial agents in clinical practice	AOG429007	2	1	30	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Management of clinical microbiology cases: a simulation practice	AOG4291107	1	1	15	AW5	Medical Microbiology II.	Gábor Kardos M.D., Ph.D.
Department of Medical Microbiology	Current concepts and practices in antiviral therapy	AOG4291007	1	1	14	AW5	Medical Microbiology II.	Anita Szalmás M.Sc., Ph.D.
Department of Medical Microbiology	One Health: the role of animals and the environment in the evolution and epidemiology of infectious diseases	AOG4291705	1	1	15	AW5	None	Gábor Kardos M.D., 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 Neurosurgery	Actual trends in neuro-oncology	AOG277907	1	1	12	AW5	Pathology II., Clinical Biochemistry II.	Álmos Klekner M.D., Ph.D. habil.
Department of Obstetrics and Gynecology	Ultrasound diagnosis in obstetrics and gynecology	AOG557908	1	2	15	AW5	Obstetrics and gynecology I.	Zoltán Tóth M.D., Ph.D., D.Sc.
Department of Obstetrics and Gynecology	Prenatal diagnosis of genetic diseases	AOG558110	1	2	15	AW5	Obstetrics and gynecology I.	Olga Török M.D., Ph.D. habil.
Department of Obstetrics and Gynecology	Practical healthcare in the English-speaking countries in the junior doctors' perspective	AOG558409	1	2	15	AW5	Obstetrics and gynecology II.	Tamás Szilveszter Kovács M.D., Ph.D.
Department of Obstetrics and Gynecology	Gynecological Cancer Detection and Prevention	AOG558009	1	2	16	AW5	Obstetrics and Gynecology I.	Zoltán Hernádi M.D., Ph.D., D.Sc.
Department of Oncoradiology	Operative techniques in radiotherapy (brachytherapy)	AOG527810	1	1-2	12	AW5	Radiology II.	Andrea Furka M.D., Ph.D.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department 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.
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	1-2	15	AW5	Basic surgical techniques	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 Psychiatry	Person-centered psychotherapy	AOG478509	1	1	15	AW5	Neurobiology	Anikó Égerházi M.D., Ph.D.
Department of Public Health and Epidemiology	Introduction to clinical decision making	AOG3671502	2	2	28	AW5	None	Szilvia Fiatal M.D., Ph.D.
Department of Public Health and Epidemiology	Which country in Europe has the best health care system?	AOG3671402	1	2	16	AW5	None	Orsolya Varga M.D., Ph.D.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Public Health and Epidemiology	Meta-analysis	AOG3671002	1	2	14	AW5	None	Szilvia Fiatal M.D., Ph.D.
Department of Public Health and Epidemiology	Evidence based diet	AOG3671602 2	2	2	10	AW5	None	Helga Bárdos M.D., M.Sc., Ph.D.
Department of Public Health and Epidemiology	Workplace hazards in healthcare - Occupational risks for healthcare workers	AOG367801	1	1	20	AW5	None	Károly Nagy Ph.D.
Department of Public Health and Epidemiology	Health Care System in Africa	AOG3672002	1	2	16	AW5	None	
Department of Public Health and Epidemiology	Patient registries in medical research and improving the care provided	AOG3672306	2	2	28	AW5	None	János Sándor M.D., Ph.D.
Department of Public Health and Epidemiology	Health effects of alcohol consumption	AOG3672604	1	2	15	AW5	None	László Pál Ph.D.
Department of Public Health and Epidemiology	Basics of health insurance operation	AOG3672707	1	1	14	AW5	None	Árpád Czifra M.D., Ph.D.
Department of Public Health and Epidemiology	Everything You Always Wanted to Know About the World Health Organization But Were Afraid to Ask	AOG3672902	1	1	16	AW5	None	Orsolya Varga M.D., Ph.D.
Department of Public Health and Epidemiology	Health risks of exposure to dangerous environmental substances	AOG3673103	2	1	30	AW5	None	Károly Nagy Ph.D.
Department of Public Health and Epidemiology	Global climate change and human health	AOG3673204	1	2	15	AW5	None	Sándor Szűcs M.Sc., 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	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Sports Medicine	Spine protection, ergonomic practical knowledge	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 artritic injuries	AOG578608	1	2	12	AW5	Traumatology I., Traumatology II.	István Frendl 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.
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.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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 Cardiology	Valvular heart diseases: diagnosis, examination and patient management in the focus	AOG317808	1	2	16	AW5	Clinical Physiology, Internal Medicine III. (Cardiology, Angiology)	
Division of Clinical Laboratory Science	Platelet Function and Platelet Function Disorders	AOG632006	1	2	12	AW5	Clinical Biochemistry II.	Krisztina Pénzes-Daku M.Sc., Ph.D.
Division of Clinical Laboratory Science	Coagulation factor XIII in health and disease	AOG632607	1	1	15	AW5	grade 4 or 5 in Clinical Biochemistry II., or Complex Pathology II., or membership in the Medical School of University of Debrecen, Student's Scientific Society	László Muszbek M.D., Ph.D., D.Sc., M.H.A.Sc.
Division of Haematology	Innovative cell therapy and clinical practice, with haemopoetic stem cells and beyond	AOG137127	2	2	30	AW5	Pathology II, Clinical Biochemistry II, Medical Microbiology II	Miklós Udvardy M.D., Ph.D., D.Sc.
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 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.

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Division of Radiology and Imaging Science	The basics of ultrasound imaging and it's practical application	AOG487906	1	2	15	AW5	Anatomy, Histology and Embryology II., Pathology I.	
Division of Rheumatology	Reumatology: Research and Clinical	AOG149108	1	2	10	AW5	Internal Medicine II. (Immunology and Rheumatology)	Zoltán Szekanecz M.D., Ph.D., D.Sc.
Division of Rheumatology	Vascular and microcirculation abnormalities in systemic sclerosis	AOG1450007	1	2	10	AW5	Immunology-Rheumatology	Gabriella Szűcs M.D., Ph.D., D.Sc.
Institute of Sport Science of University of Debrecen	Fitness and health	AOFAH0105	2	1-2	30	AW5	None	Katalin Varga M.Sc.
Institute of Sport Science of University of Debrecen	Pulse Control	AOPULS0205	2	-	30	AW5	Medical Physiology II.	Katalin Varga M.Sc.
Institute of Sport Science of University of Debrecen	Pilates and Yoga	AOPYEN01	2	1-2	30	AW5	None	Katalin Varga M.Sc.

CHAPTER 13
INTERIM PRACTICAL BLOCKS

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

The practices can be completed
- at the clinics, departments of the University (in Debrecen);
- at teaching hospitals of the University in Hungary (Debrecen-Kenézy Hospital; in Nyíregyháza, Miskolc, Berettyóújfalu, etc.);
- outside of Hungary (at affiliated and non-affiliated university hospitals).

Fulfillment of the practice outside of Hungary is possible only with the permission of the Sub-Committee for Educational Matters and Credit Transfer.
You are allowed to start the practice in Hungary after the medical check-up with your Health Booklet.
Registration for practice: via Neptun System
Prerequisites: prerequisites of the same 4th and 5th year subject
Students have to register for practice and for the corresponding subject together (in the same semester).

4th YEAR BLOCK PRACTICE

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

2nd semester
2 weeks Internal Medicine (Endocrinology, Nephrology)
1 week Obstetrics and Gynecology and 1 week freely chosen (required elective) or 2 weeks Surgery/Small Surgery

In case you choose Obstetrics and Gynecology in the 1st semester then you have to choose Surgery-Small Surgery in the 2nd semester and vice versa.

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

5th YEAR BLOCK PRACTICE

Compulsory: 2*2 weeks Internal Medicine, 2 weeks Pediatrics or 1 week Neurology
1st semester
2 weeks Internal Medicine (Gastroenterology)
2 weeks Pediatrics or 1 week Neurology

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

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

Calendar for the 4th and 5th year block practice in the academic year 2021/2022:

semester	weeks	dates
1.	11-12	November 15, 2021 - November 26, 2021
	13-14	November 29, 2021 - December 10, 2021
2.	11-12	April 18, 2022 - April 29, 2022
	13-14	May 2, 2022 - May 13, 2022

CHAPTER 14
ACADEMIC PROGRAM FOR THE 1ST YEAR

Department of Behavioural Sciences

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

1st week:
Lecture: Introduction. Behavioural Sciences.

2nd week:
Lecture: Basics of Medical Bioethics.

3rd week:
Lecture: Basics of Medical Anthropology.

4th week:
Lecture: Basics of Medical Sociology.

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

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

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

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

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

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

Requirements

Course objectives:

The aim of the course is to familiarize the students with the most important psychological aspects of health and illness, the psychological characteristic of medical profession as well as the healing/caring process. The main schools of psychology are also introduced. The course is intended to give basic knowledge for the purpose of understanding the phenomena of motivation, memory, socialization, empathy as far as they are relevant for future medical doctors. This means the first steps toward the more specialised courses like medical psychology and behavioural medicine, as well as electives to be introduced in the third and fourth academic years. First year students should pass “End of Semester Examination” (ESE) at the end of the semester. The Department of Behavioural Sciences will adhere to the requirements of the Rules and Regulations for English Program Students. The student must be present and the examination at the designated time. (He/she must explain the reason for any absence from the examination to the Departmental Adviser within 1 day of the day of examination.)

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

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

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

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

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

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

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

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

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

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

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

Requirements

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

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

Department of 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

Department of Foreign Languages

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

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

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

Requirements

9.00 - 10.30: language classes
10.30 - 11:00 break
11.00 - 12.30: language classes

Assessment: five grade evaluation (AW5).

Evaluation: Based on a written final test (80 %) + class participation + daily word quizzes (20 %). Passing the oral exam is a minimal requirement for the successful completion of the Hungarian Crash Course. The oral exam consists of a role-play from a list of situations covered in the coursebook. A further minimal requirement is the knowledge of 200 words.

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

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

1st week:
Practical: Revision

2nd week:
Practical: introducing yourself, registration form, expressing *like doing something*, *a lot – a little*, dialogue in a café, conjugation of verbs

3rd week:
Practical: regular verbs in plural, sights and buildings, buying ice-cream and refreshments, buying an entrance ticket

4th week:
Practical: different means of transport, conjugation of verbs, the ending *–val/-vel*, *something/somewhere*, the conjugation of *come / go / be*

5th week:
Practical: *this / this is / this is a / an*, orientation, shops and stores, ordering, the conjugation of *eat and drink, do you feel like?, there is no / there are no*

6th week:
Practical: Revision
Self Control Test (Mid-term test)

7th week:
Practical: understanding a chat, question words, invitation, connectives: *because, but, and, if, or*, buying a cinema ticket, *what number? which one in order?*

8th week:
Practical: timetable, *where ... to*?, the ending *–ra/-re*, *not ... but*, the future: *will be*

9th week:
Practical: *where?, -n/-on/-en/-ön*, at the market, at the bakery, at the post office

10th week:
Practical: *where .... from?, -ról/-ről, where, where ... to?,* dialogue in a taxi, buying a train ticket, prefixes: *be-, ki-, le-, fel-, vissza-*

11th week:
Practical: Revision

12th week:
Practical: End-term test
Self Control Test (Written and oral 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. The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

Testing, evaluation

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

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If a student fails or misses any word quizzes he / she cannot take the written test. A word quiz can be postponed by a

week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

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

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

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

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

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

Department of Medical Chemistry

Subject: **MEDICAL CHEMISTRY LECTURE**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Lecture: **45**
Seminar: **56**

1st week:
Lecture: Introduction to Medical Chemistry. Quantum theory and the atom. Electronic structure and the periodic table.

Types of chemical bonds. Covalent bonding and properties of molecules.

Seminar: Lectures of the week.

2nd week:
Lecture: Intermolecular forces. 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, H2S) and other inorganic gases of medical relevance (N2O, NO2).
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

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. Functions. Set theory.

2nd week:
Lecture:
2. Conditional probability, Bayes's theorem. Independent events.
3. Descriptive statistics (measure of center and spread; percentile, quartile). Histograms, box and whisker plot.
Seminar: Conditional probability, Bayes's theorem. Independent events.

3rd week:
Lecture: 4.Normal distribution and standard normal distribution.
Seminar: Bayes's theorem. Descriptive statistics.

4th week:
Lecture: 5. Normal distribution and standard normal distribution.
Seminar: Discrete distributions (probability distribution and distribution function). Binomial and Poisson distributions.

5th week:
Lecture: 6. Sampling, representative sample, unbiased estimation. Central limit theorem. Standard error of the mean.
Seminar: Normal distribution and standard normal distribution.

6th week:
Lecture: 7.Hypothesis testing, Level of significance, type I and type II errors. p value. z-test, one sample t-test.
Seminar: Sampling, representative sample, unbiased estimation. Central limit theorem. Standard error of the mean.

7th week:
Lecture: 8.Statistical tests (paired and unpaired t-test, F test).
Seminar: Hypothesis testing, Level of significance, type I and type II errors. p value. z-test, one sample t-test.

8th week:
Lecture: 9.Clinical implications of conditional probability (sensitivity, specificity, positive and negative predictive values). ROC curve. Analysis of discrete random variables. Chi-squared test. Epidemiologic investigations: relative risk, odds ratio. Kaplan-Meier curve.
Seminar: Statistical tests (paired and unpaired t-test, F test).

9th week:
Lecture: 10. Summary
Seminar: Clinical implications of conditional probability (sensitivity, specificity, positive and negative predictive values). Analysis of discrete random variables. Chi-squared test. Epidemiologic investigations: relative risk, odds ratio; Kaplan-Meier curve.

10th week:
Seminar: Summary

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:
Mathematical introduction to the biophysics and biostatistics course (functions, plotting measurements data, fitting, determination of slope, area under the curve, integration). Counting techniques. Set theory, probability, conditional probability, Bayes theorem. Descriptive statistics (determination of mean, median, mode, standard deviation from data set, histograms, box-and-whisker plot). Discrete and continuous random variables; cumulative distribution function, density function. Binomial, Poisson and normal distributions. Sampling techniques and characterization of samples; biased and unbiased estimate, the central limit theorem. Hypothesis testing (z, t, F and chi2 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, seminars:
Attendance to lectures is not mandatory but strongly recommended. At the end of the lectures students write an electronic test of up to 5 minutes three at the end of the lectures containing true-false questions, multiple choice questions, etc, related to the topics of the given/actual lecture for earning bonus points.
Seminars will be held for each group separately. During seminars the lecture topics will be discussed in more detail and sample problems will be solved. Attendance to seminars is mandatory. During the semester on three of the seminars students write a test for earning bonus points. Bonus points earned by the tests written both in the lectures and seminars are added to the test result of part B of the final exam and/or the course test (only to part B, see section 4.3).
Students who complete the colloquium at the end of the second semester as part of the examination course will not be entitled to the bonus points, even if they have already completed the course and have a valid signature (see section 4.3).

4.2. Conditions for signing the lecture book:
Signing of the lecture book is denied if there are more than 2 absences from group-wise seminars. No kind of certificates, including a medical certificate, are accepted for the absences. Making up for missed classes is not possible.

4.3. Grade-offering course test and exam:
Students will write a grade-offering course test between weeks 12-13. 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, normal distribution, etc.). Maximum score of part A is 40 points.
•part B: test questions (true or false questions, multiple choice questions, fill-in questions, open-ended questions), assay questions, calculations, graphs. 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 earned by tests written in the lectures and seminars 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 are added to the score of part B (max 100 points). Based on this final score the following grades are offered:

- FS<60 fail
- 60≤FS<70 pass
- 70≤FS<80 satisfactory
- 80≤FS<90 good
- 90≤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 earned by tests written in the lectures and seminars 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

Description of the course

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.
Course coordinator: Prof. Dr. Péter Nagy
Study advisor: Dr. Andrea Dóczy-Bodnár
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 (lecture slides, textual explanations of lectures ("booklet") and exercises) uploaded to the educational website (e-Learning site) of the Department;
- Medical Biophysics textbook (3rd revised edition, Editors: S. Damjanovich, J. Fidy, J. Szöllősi, Medicina, Budapest, 2019, 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). Students can earn bonus points on the seminars, counted into the result of the final exam, in the following two ways:

- Students may sign up for one short interactive presentation during the semester about the topic of the seminar (7-12 minutes; max. 2 students/seminar). The talks are graded on a scale of 0-3. This grade counts toward the bonus points earned during the semester. One student may sign up for one presentation. The grade of the presentation cannot be improved. The topic list, the requirements and the criteria for evaluation are posted on the web page of the Department on the first week of the semester.

- On each seminar (except for the 1st one) students will write a short electronic test about the topic of the seminar. Taking this electronic test is only possible with the installed tablets available in the seminar room, i.e., students cannot take the test with their own devices. The test on a certain week can only be taken once. During the semester, 13 such tests will be written, and the average of the best 10 quizzes will be calculated (Qave), based on which students will be given bonus points according to the following table:
- $10p – Q_{ave} \geq 90\%$
- $9p – 90\% > Q_{ave} \geq 80\%$
-

- 8p – 80% > Q_{ave} ⌑ 70%
- 7p – 70% > Q_{ave} ⌑ 60%
- 6p – 60% > Q_{ave} ⌑ 50%
- 5p – 50% > Q_{ave} ⌑ 40%
- 4p – 40% > Q_{ave} ⌑ 30%

If a student makes up for a missed seminar with another group, taking the seminar quiz is not guaranteed, it is subject to the availability of tablets installed in the seminar room.

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 corresponding 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 self-control 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. 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 points for the semester are calculated in the following way:

- T: SCT bonus points (0-11)
- Q: bonus points based on the average of the 10 best seminar quizzes (0-10)
- P: seminar presentation bonus points (0-3)

The total number of bonus points (T+Q+P) 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 (T+Q+P; see conditions for the bonus points above)

Grade	
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 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 minimals) are lost
- according to the relevant rules (point 5) self-control tests may be written and exemptions may be obtained again
- in the case of schedule collisions with 2nd year classes we ask students to choose the 2nd year groups such that conflicts with the 1st year subjects can be avoided.

9. Information for Exam Course students:
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.

Bonus points collected for SCTs, seminar quizzes and seminar presentations are valid for the exam course taken **in the same academic year**. If an exemption from writing part I of the Biophysics final exam (minimum requirement questions) has been obtained based on the SCT averages, this exemption is also valid for the exam course taken in the same academic year. Every other student must write the minimum requirement questions, even those who passed this part of the exam in a previous exam period. If a student passes the minimum requirement questions in the exam course,

he/she will be exempted from taking this part again in the same exam period. Otherwise, the structure of the final exam and its evaluation are the same as described in point 6. Rules for calculator usage, described in point 7, also apply.
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 4.0, 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
Course coordinator: Dr. Andrea Dóczy-Bodnár
Coordinator of Practicals: Dr. Zsolt Fazekas
Educational manager: Enikő Nizsalóczki (e-mail: biophysedu@med.unideb.hu)

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

2. Structure of the course:
- Introduction to the practicals
- Completion of labs

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

4. Recommended reading:
-Medical Biophysics (3rd edition, Editors: S. Damjanovich, J. Fidy, J. Szöllősi, Medicina, Budapest, 2019, ISBN: 978-963-226-127-0)
-Biophysics laboratory manual

5. Educational website: biophys.med.unideb.hu and the eLearning page of the course (on https://elearning.med.unideb.hu/).

6. Evaluation: Practical 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. Students write a short quiz before each lab topic. At least 2.5 of 5 points (Quiz Grade, QG) 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 eLearning page of the course.

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:

QG_average+LG_average	End-semester practical grade (PG)
4.00-5.49	pass (2)
5.50-6.99	satisfactory (3)
7.00-8.49	good (4)
8.50-10.00	excellent (5)

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 4.0) to pass should take a lab exam on the 14th week. The lab exam covers the materials of all labs and evaluated on a pass-fail basis (so students passing the lab exam will finish the course with PG=2, otherwise fail). It is not possible to repeat or improve the practical exam.

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.

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 on the eLearning page of the course. Only one occasion will be available for making up a certain lab. A given lab can be repeated/made up only once.

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, with the exception that students completed the labs successfully will get a signature only (required for taking the theoretical part of Biophysics Final Exam).

9. Exam course: No exam course is available.

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

Department of Anatomy, Histology and Embryology

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

1st week:
Lecture: General introduction. Epithelial tissue: covering and lining epithelia.
Seminar: Histology: Introduction to histological methods. The microscope and the resolution. Using the virtual microscope: Case Center and Panoramic Viewer. The evaluation and interpretation of histological sections. Always keep in mind: What you can see in the microscope is a thin almost 2-dimensional) section of a 3 dimensional object. 1. Small intestine (HE)

2nd week:
Lecture: Osteology and arthrology - introduction. The muscular system - general introduction. Innervation of the muscles.
Seminar: Histology: Epithelial tissues: simple covering and lining epithelia 1. Mesothelium (mesentery, Silver impregnation) 2. Endothelium (small intestine, HE stain) 3. Simple squamous epithelium, simple cuboidal epithelium (kidney, HE stain) 4. Simple columnar epithelium with microvilli (small intestine, HE stain) 5. Pseudostratified columnar epithelium ciliated (trachea, HE stain) 6. Demonstration: movement of cilia (video) Make schematic drawings of the epithelial tissues. Identify epithelial tissues on the basis of the distribution and form of nuclei at low-power magnification.

3rd week:
Lecture: Glandular epithelium. Connective tissue - part one.
Seminar: Histology: Stratified epithelial tissues. 1. Stratified squamous nonkeratinizing epithelium (esophagus, HE stain) 2. Stratified squamous keratinizing epithelium (skin, HE stain) 3. Stratified columnar epithelium (urethra masculina, HE stain) 4. Transitional epithelium: urothelium (ureter, HE stain).

4th week:
Lecture: Connective tissue - part two. Clinical anatomy of the upper limb.
Seminar: Histology: Glandular epithelium, pigment epithelium 1. Sebaceous, sweat and apocrine glands (axillary skin, HE stain) 2. Serous and mucous glands (submandibular gland, HE stain) 3. Serous, mucous glands (sublingual gland, PAS+H stain) 4. Pigment epithelium (retina). 5. Pigment containing cells (skin, methyl-green) (Classification of exocrine glands, mechanism of secretion and their microscopical features, the chemical character of the secretion product. Localization of different types of glands in various organs.)

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

6th week:
Lecture: Histology of bone. Development and growth of the bone.
Seminar: Histology: Fibers of the connective tissue 1. Collagen fibers (large intestine, HE stain) 2. Collagen fibers (large intestine, Azan stain) 3. Elastic fibers (aorta, orcein stain) 4. Reticular fibers (liver, silver impregnation) 5. Collagen and elastic fibers (spermatic cord, Van Gieson and Resorcin- fuchsin). Make distinction between collagen and elastic fibers. Fine structure of collagen fibers.

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

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

9th week:
Lecture: Fertilization, beginning of the pregnancy. Clinical anatomy of the lower limb.
Seminar: Histology: The adipose tissue and the cartilage. 1. Fat cells (skin, Osmium + H stain) 2. Hyaline cartilage (trachea, HE stain) 3. Elastic cartilage (epiglottis, orcein stain) 4. Fibrocartilage (knee joint, HE stain) 5. Fibrocartilage (knee joint, Azan stain) 6. Fibrocartilage and hyaline cartilage (knee joint, toluidin-blue stain) 7. Intervertebral disc (HE stain) 8. White and brown adipose tissues (adrenal gland, HE).

10th week:
Lecture: Gastrulation. The early differentiation of the mesoderm. Histology of the blood vessels.
Seminar: Histology: Histology and development of the bone. l. Cross section of compact bone (Schmorl stain). 2. Longitudinal section of compact bone (Schmorl stain). 3. Intramembranous ossification (skull of a rat, HE stain) 4. Enchondral ossification and the epiphysial plate. (rabbit knee joint, HE stain) 5. Enchondral ossification and the epiphysial plate. (rabbit knee joint, Azan stain) 6. Enchondral ossification and the epiphysial plate. (rat knee joint, toluidin-blue stain).
Self Control Test

11th week:
Lecture: The differentiation of the ectoderm and mesoderm. Blood.
Seminar: Histology: Muscle tissue l. Striated muscle (HE stain). 2. Striated muscle (iron-H stain). 3. The smooth muscle (large intestine, HE stain) 4. The cardiac muscle (HE stain) 5. The cardiac muscle (PTAH) Demonstration: Electron micrographs of longitudinal sections of striated muscle.

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

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

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

Requirements

Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the University are valid. The attendance on the seminars is compulsory and presence will be recorded. The head of the department may refuse to sign the Lecture Book if a student is absent more than 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 choose 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 exam. The topic not asked will be chosen randomly (i.e. the student picking a number between 1 and 3).

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

ESE mark = (a1+a2+a3+h1+h2+e1)/6
or
ESE mark = (a1+a2+h1+h2+e1)/5 in case of an “Anatomy Bonus”

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.

Students need to have a valid grade from "Anatomy, Histology and Embryology I. Practical" to get a signature from this subject.

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

1st week:
Practical: Anatomy: Anatomy of the Upper Limb
1A: Introduction to Anatomical Terminology. Directions and planes. Bones of the upper limb. Brief general arthrology. Joints of the upper limb.
Dissection: studying bones and joints of the upper limb on isolated bones and plastic models.
1B: Subcutaneous structures of the upper limb: superficial veins, cutaneous innervation, lymphatic drainage. Pulse points and blood pressure measurement.
Dissection: Skin of the shoulder, arm and forearm removed in one flap: single incision applied in the midline of the volar surface until the wrist, where the cut encircles the wrist. The skin is detached from the subcutaneous fatty tissue and pulled posteriorly then towards the shoulder. Subcutaneous veins and cutaneous nerves are carefully isolated. Volar and dorsal skin of the hand removed on 2B and 3B, respectively.

2nd week:
Practical: Anatomy: Anatomy of the Upper Limb
2A: Axillary fossa: walls, brachial plexus, axillary a.v. and branches, axillary lymphatic apparatus. Thoracohumeral muscles, shoulder muscles, flexors of the arm. Medial and lateral axillary hiatus. Anterior region of arm and medial bicipital groove.
Dissection: the brachial fascia is opened in the medial bicipital groove and continued proximally towards the axillary fossa. Branches of brachial plexus, axillary a.v. and muscles exposed. Skin of thoracic wall, containing mammary gland, also removed and thoracic muscles exposed.
2B: Cubital fossa. Anterior region of forearm. Volar carpal region and carpal tunnel. Palmar region.
Dissection: cubital fascia removed, but bicipital aponeurosis is spared, then structures of cubital fossa exposed. Antebrachial fascia removed until flexor retinaculum, then flexor muscles of forearm are separated. Blood vessels and nerves of forearm remain intact. Palmar dissection follows anatomical layers: skin incised at margins of thenar and hypothenar then detached from aponeurosis and folded distally until metacarpophalangeal joints. Palmar aponeurosis carefully lifted. Neurovascular structures and tendons remain intact. Optional: opening Guyon’s tunnel and transection of flexor retinaculum.

3rd week:
Practical: Anatomy: Anatomy of the Upper Limb
3A: Scapular region. Spinohumeral muscles. Posterior region of arm, extensor muscles of arm.
Dissection: Skin flap detached until paravertebral line. Spinohumeral- and scapular muscles separated. Medial- and lateral axillary hiatus prepared, and triceps brachii muscle mobilized.
3B: Posterior region of forearm. Dorsal carpal region, extensor tendon sheaths. Dorsum of the hand. Radial foveola.
Dissection: Antebrachial fascia removed then extensor muscles of forearm are separated. Blood vessels and nerves of forearm are isolated and remain intact. Dorsal skin of the hand is carefully removed while extensor retinaculum, dorsal venous plexus and cutaneous nerves remain intact.

4th week:
Practical: Anatomy: Anatomy of the Upper Limb and Lower Limb
4A: Review of Upper Limb
4B: Bones, ligaments and joints of pelvic girdle. Pelvis in function: diameters, position, weight transfer.
Dissection: studying bones, ligaments and joints of pelvis on isolated bones, dry preparations, plastic models.

5th week:
Practical: Anatomy: Anatomy of the Lower Limb
5A: Bones and joints of the lower limb. Arches of the foot.
Dissection: studying bones, ligaments and joints of the lower limb on isolated bones and plastic models.
5B: Subcutaneous structures of the lower limb: superficial veins, cutaneous innervation, lymphatic drainage. Pulse points.
Dissection: Skin of the lower limb removed in one flap: single incision applied in the midline of the anterior surface until the ankle, where the cut encircles the ankle. Incision follows the medial margin of patella. The skin is detached from the subcutaneous fatty tissue and pulled backwards then proximally. Subcutaneous veins and cutaneous nerves are carefully isolated. Plantar and dorsal skin of the foot removed on 7B.

6th week:
Practical: Anatomy: Anatomy of the Lower Limb
6A: Subinguinal hiatus: structure and contents, femoral canal. Femoral triangle. Obturator canal. Adductor canal. Femoral a.v., lumbar plexus. Extensor and adductor muscles of thigh.
Dissection: Fascia lata opened longitudinally in the line of the ASIS. Lacunae of subinguinal hiatus prepared. Separation of extensor muscles and cleaning of femoral triangle. Entrance of adductor canal exposed. Separation of the adductor muscles.
6B: Gluteal region. Sacral plexus. Posterior region of thigh. Intramuscular injection sites to the gluteal region.
Dissection: Skin pulled proximally until the origin of gluteus maximus. Gluteus maximus tendon detached from femur then lifted medially. Vessels, nerves and neurovascular gateways of gluteal region prepared. Hamstrings separated.

7th week:
Practical: Anatomy: Anatomy of the Lower Limb
7A: Popliteal fossa. Muscular compartments of the leg. Anterior- and posterior regions of the leg. Medial- and lateral malleolar regions. Slings and stirrup in function.
Dissection: fatty tissue cleared in popliteal fossa. Crural fascia also removed, then muscles of the flexor-, fibular- and extensor compartments are separated.
7B: Plantar region. Dorsum of foot.
Dissection: Plantar dissection follows anatomical layers: skin incised longitudinally on medial and lateral margins of the foot then detached from aponeurosis and folded distally until metatarso-phalangeal joints. Plantar aponeurosis carefully lifted by detaching its proximal end from calcaneus. Neurovascular structures, muscles and tendons of sole remain intact. Recommended: transection of flexor- and peroneal retinaculum. Dorsal skin of foot is carefully removed while bands of the extensor retinaculum, dorsal venous plexus and cutaneous nerves remain intact.

Separation of extensor tendons.

8th week:
Practical: Anatomy: Anatomy of the Lower Limb and Trunk.
8A: Revision
Dissection: completion of Lower Limb.
8B: Anatomy of the vertebral column: vertebrae, ligaments and joints, movements, curvatures.

9th week:
Practical: Anatomy: Anatomy of the thorax and skull.
9A: Bones and joints of the thorax. Respiratory movements. Axial muscles.
Dissection: studying ribs and sternum on isolated bones and skeleton. Dorsal skin removed, to then axial muscles are separated.

9B: Classification of the skull. Connections between bones of the skull. Neurocranium I.: Frontal bone. Parietal bone. Occipital bone.

10th week:
Practical: Anatomy: Anatomy of the skull.
10A: Neurocranium II.: Sphenoidal bone. Temporal bone.Dissection: studying isolated skulls and plastic models.
10B: Neurocranium III.: Calvaria. Internal cranial base.
Dissection: studying isolated skulls and plastic models.

11th week:
Practical: Anatomy: Anatomy of the skull.
11A: Viscerocranium I.: Ethmoidal bone. Maxilla. Palatine bone. Vomer. Inferior nasal concha. Lacrimal bone. Nasal bone. Zygomatic bone.
Dissection: studying isolated skulls and plastic models.

11B: Viscerocranium II.: Mandible. Temporomandibular joint. Hyoid bone.
Dissection: studying isolated skulls and plastic models.

12th week:
Practical: Anatomy: Anatomy of the skull.
12A: Viscerocranium III.: Orbit. Nasal cavity and paranasal sinuses.
Dissection: studying isolated skulls and plastic models.

12B: Viscerocranium IV.: Oral cavity. Temporal- and infratemporal fossae, pterygopalatine fossa.
Dissection: studying isolated skulls and plastic models.

13th week:
Practical: Anatomy: Anatomy of the skull. Rewiev.
13A: Review of the skull.
13B: Review.

14th week:
Practical: Anatomy:
14A: Practical exam.
14B: Practical exam.

Dissection: studying vertebrae on isolated bones, skeleton and plastic models.

Requirements

Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the Faculty of Medicine, University of Debrecen are valid. The presence in practices will be recorded. The head of the department may refuse to sign the subject if a student is absent more than three times from practices in the semester even if he/she has an acceptable reason. Compensation of practices is possible only on the same week at 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 the last week of the semester and once in the exam period. Improvement of the ESE's mark is not allowed.
Detailed information about the practical exam will be published on the e-learning site of the department.

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: Introduction to Molecular Biology. The structure-function relationship of proteins I. Protein structure levels. Domains and subunits. Methods to determine the 3D structure of proteins. The structure-function relationships of proteins, through the examples of collagen and some metabolic enzymes. Protein structure databases. The structure-function relationship of proteins II. Protein folding. Protein dynamics, specific movements: pancreatic lipase and serine proteases. Intrinsically disordered proteins: characteristics and biological functions. Misfolding: protein aggregation diseases.

2nd week:
Lecture: Enzymes I-III. General characterization and classification of enzymes. How do enzymes increase the reaction rate? Principles of the Michaelis-Menten kinetic model and the steady-state kinetic model. Definition and interpretation of kinetic parameters. Reversible and irreversible enzyme inhibition. Principles and visualization of competitive, non-competitive and uncompetitive enzyme inhibition. Regulatory mechanisms of enzymes and their significance.

3rd week:
Lecture: The genetic code. Codons, anticodons. Structure and function of tRNAs and the ribosome. Protein synthesis. The open reading frame. Steps of translation (protein synthesis):

initiation, formation of the peptide-bond, elongation and termination. Antibiotics. Antiviral effect of interferon.
Protein maturation. Assisted protein folding and its enzymes and chaperons. Misfolding: protein aggregation diseases. Protein targeting.

4th week:
Lecture: Isolation and characterization of proteins. Various techniques for separation and purification: altering the ionic strength and pH, chromatography, electrophoretic methods. Determining the amino acid composition, amino acid sequence and higher order structure of proteins.
Immonological techniques. The structure of immunoglobulins. Production of antibodies: polyclonal and monoclonal antibodies. Examples of analytical techniques using antibodies: ELISA, immunohistochemistry, immunofluorescence, confocal microscopy, western blotting.
Posttranslational modifications. Glycosylation, phosphorylation. Protein kinases and phosphatases. Lipid modifications. Carboxylation and hydroxylation. Modifications by bacterial toxins: cholera toxin.

5th week:
Lecture: Protein degradation and turnover, proteases I-II. Biological function of protein processing. Classification of proteolytic enzymes. Structure and fucntion of serine proteases. Protease inhibitors. Lysosomal and ubiquitin-dependent proteasomal protein degradation.
Proteomics. Methods in proteomics: two-dimensional and other electrophoretic approaches, mass spectrometry. Clinical proteomics, biomarkers.

6th week:
Lecture: DNA and genome. Structure of DNA. The components of the human genome. Structure of human chromosomes. The 1000 genome project.
Genome replication. Initiation, synthesis and termination in prokaryotes and eukaryotes. The replication fork. Synthesis of the leading and lagging strand. Replication of chromosome ends (telomers).
Recombination. Genetic recombination. Main types of DNA recombination. The recombinase enzyme. Phage integration, transposition.

7th week:
Lecture: Mutation and DNA repair. Causes and consequences of mutations. DNA repair mechanisms. Diseases caused by defective DNA repair.
Prokaryotic transcription. Function of the prokaryotic RNA polymerase. Characteristics of transcription factors. Transcriptional activation and inhibition in prokaryotes.
Eukaryotic transcription I. Initiation and elongation in eukaryotes. Characteristics of eukaryotic transcription factors. Transcription regulatory regions and their interactions.

8th week:
Lecture: Eukaryotic transcription II. Chromatin structure and transcription. Post-transcriptional modifications of RNA, splicing. Additional functions of RNAs.
Principles of signal transduction. Receptors, receptors tyrosine kinases, G proteins, nuclear rceptors. Secondary messengers. Interactions of signalling pathways.
Molecular biology of viruses I. Classification of viruses. The viral replicative cycle. Viral entry in the cells. Coronaviruses.
Self Control Test

9th week:
Lecture: Molecular biology of viruses II. Viral infection and the body's response. Diagnostic approaches. Virus propagation. Clinical relevances.
Tools and techniques of molecular biology. DNA isolation from cells, characterisation of the purified DNA. DNA modifying enzymes. Recombinant DNA. Ligation of DNA fragments. Plasmid vectors. Steps of DNA cloning. DNA libraries.

10th week:
Lecture: DNA amplification. Oligonucleotides and their synthesis, hybridization. The

polymerase chain reaction (PCR). PCR applications in research and in the clinic.
DNA hybridization and sequencing. Principles of nucleic acid hybridization. Southern blotting. In situ DNA hybridization (FISH, CGH). Principles of DNA sequencing: the chain termination technique and next generation sequencing. Genome projects.
Analysis of changes in gene expression. DNA binding of transcription factors. Detection and quantification of mRNAs: gene specific and global approaches. Methods for studying promoter activity.

11th week:
Lecture: Big Data in Molecular Biology. What is data science? Big Data in medical sciences: phenotypes and "omics". Databases. Bioinformatics, genomics, functional genomics. Genome projects.
Protein expression, site-directed mutagenesis. Recombinant protein expression. Expression vectors. Protein expression in prokaryotic and eukaryotic systems. Fusion proteins. Site-directed mutagenesis.
Model organisms I. Comparison of animal models. Murine models of human diseases. Different approaches for mouse genome manipulation.

12th week:
Lecture: Model organisms II. Mouse genome manipulation: classic transgenesis, gene targeting and conditional mutagenesis. Transplantation model systems.
Mikrobiome. The concept of microbiome. Human enterotypes. Fecal transplantation therapy. Bacterial metabolites. Long-term effects of alterations in the microbiome: the connection with diabetes, psychiatric disorders, ageing, cancer.
Genome editing. Concept and types of genome editing. Small changes, insertions, deletions. Genome editing techniques amd molecular systems: TALEN, zinc finger, CRISPR-Cas9, etc. Therapeutical genome editing, gene therapy.

13th week:
Lecture: Clinical applications of Molecular Biology. Molecular biology techniques in diagnostics: infectious diseases, molecular characterization of tumors. Therapeutical antibodies, recombinant protein therapeutics. Immune-activating antibodies in cancer therapy. Gene therapy, cell therepy. Regenarative medicine, stem cells, Vaccines.

Self Control Test

14th week:
Lecture: Summary

Requirements

Requirements for signing of 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 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 multiple choice test questions (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 (2 x 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 the 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 multiple choice test questions (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, 90-100 excellent). If a student fails the "C" written exam, the department provides him/her a chance to prove his/her knowledge in an oral exam in front of an examination committee. If the student passes the oral exam he/she will be given a grade 2 (pass). The department will provide one examination date per week during the exam period.

Improvement exam: It is allowed to take one improvement exam in the exam period. 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 at least 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 elearning site of the Department (https://elearning.med.unideb.hu), you can login with your university network ID and password.

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

Students will have three practices: “Introduction”, “PCR” and “Study of phosphatases”. Every laboratory practice have to be performed, if someone is absent due to any serious reason, the missing experiment have to be performed within the three-week practical period joining to another group after obtaining permission from the education official of the department. There will also be a possibility after each three-week 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. 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. Please check our elearning site to get more information and the schedule of the practices (https://elearning.med.unideb.hu). Notebooks can be printed from this elearning site 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 at least a pass for the practical course 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.

The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

Testing, evaluation

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

A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If a student fails or misses any word quizzes he / she cannot take the written test. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by

taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

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

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

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

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

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

Department of Human Genetics

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

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

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

3rd week:
Lecture: (7) The function of genes. Gene expression. (8) Gene regulation in prokaryotes. (9) Gene regulation in eukaryotes 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.
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. he 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 intrcellular transport processes
6. Intracellular membrane systems I: lysosome, peroxisome, endoplasmic reticulum
Seminar: Material related to lectures 3-4.

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

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

6th week:
Lecture: 11. 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, Chromtatin
16. Cell division cycle

Seminar: Material related to lectures 13-14.

9th week:
Lecture: 17. Mechanics of the cell cycle
18. Regulation of te 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: 5th ed. of Essential Cell Biology (Alberts et al.,Garland Publ Inc. 2019. ISBN-13:978-0393-6803-62). 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/

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 topics/questions on the spot and the presenter is required to explain the topic. This requires the in depth knowledge of all the topics presented at the lectures and studying the relevant textbook chapters. The presentations are graded on a scale of 0-5. This grade counts toward the bonus points earned during the semester.

3. Labs: Labs are done under a separate subject code 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 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 (=$SCTa_{ve}$) 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 short online quizzes (SOQ) at the beginning of each seminar, covering all the material that is scheduled for discussion in the given seminar. The best 10 scores of these SOQs will be averaged (SOQ_{ave}) and converted into bonus points and used when determining offered grades (see 5.4.1).

5. Final Exam (written):

5.1. Parts of the Final Exam. The exam is a written exam 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. 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 exam, including short essays (~20-25% of the total score), fill-in, short answer, multiple choice, relation analysis, sketch-recognition, term-recognition, as well as simple choice and true-or-false 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)
60-69.9 points: pass (2)
70-79.9 points: satisfactory (3)
80-89.9 points: good (4)
reaching, and above 90 points: excellent (5)

5.4. Exemptions

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

1. SCT_{ave} % expressed as points, 100 points maximum
2. Presentation grade, 5 points maximum
3. Result of short online quizzes (SOQ_{ave}, of the 10 best %scores).
   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} >=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.

6. Rules for repeating the course

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

6.2. Repeaters can apply for a Cell Biology exam course in the third semester if they have taken at least one exam in the previous exam period and in that exam have passed the minimum

requirements (Part A), and have scored at least 35% on Part B). 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: multidrog resistance

6th week:
Practical: Membrane transport: multidrog resistance

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

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

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

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

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

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

13th week:
Practical: Remedial lab

14th week:
Practical: Remedial lab

Requirements

Department: Department of Biophysics and Cell Biology, Cell Biology Division
Recommended semester:1st year 2nd semester.
Semester for the regular course:1st.
Prerequisites of the course: No prerequisites.
Teaching staff: Dr. Katalin Goda and 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.

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

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:

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 ≥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. Hypopysis and epiphysis.
Seminar: Histology: **a**. Lymphatic tissues II. 1. Spleen (HE stain) 2. Palatine tonsil (HE stain) 3. Lingual tonsil (HE stain) **b.** The skin 1. Fingertip (HE stain) 2. Skin (HE stain) 3. Mammary gland (HE stain)

5th week:
Lecture: Thyroid gland, parathyroid gland, suprarenal gland. The APUD system. Heart I. Heart II.
Seminar: Histology: **a.** Endocrine organs I. 1. Hypophysis (HE stain) 2. Hypophysis (Azan stain) 3. Epiphysis (HE stain) **b**. Endocrine organs II. 1. Thyroid gland (HE stain) 2. Parathyroid gland (HE stain) 3. Suprarenal gland (HE stain) 4. Demonstration: Thyroid gland: parafollicular cells (C cells, silver impregnation, immunohistochemistry)

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

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

Lung (HE stain) 4. Lung (The vascular system filled with drawing ink+HE)
Self Control Test

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

9th week:
Lecture: Histology of the stomach and the intestines. Pancreas. Liver I. Liver II. Portal system. Peritoneum. Lesser sac of the peritoneum.
Seminar: Histology: **a**. Digestive system III. 1. Colon (HE stain) 2. Demonstration: Colon (GEP cells, immunohistochemical reaction) 3. Appendix (HE stain) 4. Rectum (HE stain) **b**. Digestive system IV. 1. Pancreas (HE stain) 2. Demonstration: Pancreas (GEP cells: silver impregnation and immunohistochemical reaction) 3. Liver from pig (HE stain) 4. Liver from pig (Azan stain) 5. Human liver (HE stain) 6. Liver from rat (Trypan blue vital stain + Nuclear fast red stain) 7. Gall bladder (HE)

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

11th week:
Lecture: Structure of the kidneys and urinary system. Development of the urinary system. Topographical anatomy of the wall of the pelvis and perineal region. Male genital organs: testis and epididymis.
Seminar: Histology: **a.** Urogenital system II. 1. Kidney - tangential section (HE stain) 2. Kidney (Vascular infiltration with drawing ink + HE stain) **b**. Uogenital system III. 1. Ureter (HE stain) 2. Urinary bladder (HE stain) 3. Urethra masculina (HE stain) 4. Cross section of an embryonic penis (HE stain) 5. Demonstration: Penis (HE stain)

12th week:
Lecture: Ductus deferens, spermatic cord, seminal vesicle, prostate, scrotum. Penis. Mechanism of erection. Female genital organs: the ovary. Anatomy of the uterine tube and the uterus. Broad ligament. Vagina.
Seminar: Histology: **a**. Urogenital system IV. 1. Testis and epididymis (HE stain) 2. Spermatic cord (HE stain) 3. Seminal vesicle (HE stain) 4. Prostate (HE stain) 5. Demonstration: Prostate (Goldner's stain) **b**. Urogenital system V 1. Vagina (HE stain) 2. Ovary (HE stain) 3. Ovary with corpus luteum (HE stain).

13th week:
Lecture: Attachment and peritoneal relations of the uterus. Female external genital organs. Structure of the uterus and uterine tube. Menstrual cycle and its endocrine regulation. Implantation. The pregnant uterus. Placenta I.
Seminar: Histology: **a**. Urogenital system VI. 1. Uterine tube (HE stain) 2. Uterus - proliferative stage (HE stain) 3. Uterus - secretory stage (HE stain) Demonstration: Uterine tube with peg-shaped cells (HE stain) **b**. Urogenital system VII. 1. Pregnant uterus (HE stain) 2. Placenta (HE stain)

14th week:
Lecture: Placenta II. Fetal circulation. Development of the blood vessels. Development of the genital organs. Subdivision of the cloaca. Sexual differentiation. Sexual anomalies of genetic and hormonal origin.
Seminar: Histology: **a**. Consultation - Urogenital system **b.** SELF CONTROL - Urogenital system
Self Control Test

Requirements

Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the Faculty of Medicine, University of Debrecen are valid.
The 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 and 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”.
26 – 30 points= 2 Histology Bonuses
21 – 25 points= 1 Histology Bonus
0 – 20 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 exam. The topic(s) not asked will be chosen randomly: the student will pick (a) number(s) between 1 and 4. 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.

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 exam. The slide(s) not asked will be chosen randomly: the student picks (a) number(s) between 1 and 3. 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 results of Part 1 and Part 2 (9 marks) are evaluated together, thus on the "B" and "C" examinations the student will have to redo all the topics again.

Calculation of the mark for the final examination:
The mark of the final examination is the average of all the marks earned during the exam (rounded up from x.5 to the nearest integer).
The topics not asked because of Bonuses will not be part of the calculation.

Example 1 - (no Anatomy or Histology Bonuses)
Final mark = (a1+a2+a3+a4+h1+h2+h3+e1+e2)/9

Example 2 - (2 Anatomy Bonuses and 2 Histology Bonuses)
Final mark = (a1+a2+h1+e1+e2)/5

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

3rd week:
Practical: Anatomy: Topographical anatomy of the head and the neck: V.-VI.
a. Head: Retromandibular fossa. At the side of the removed parotid gland dissect the alveolar nerve and artery from the mandibular canal in situ without removing the half of the mandible. Cut out the masseter, the external and internal pterygoid muscles by careful preparation of the structures between the two pterygoid muscles. Preparation of the inferior alveolar nerve, lingual nerve, chorda tympani, maxillary artery, auriculotemporal nerve, middle meningeal artery, stylohyoid, styloglossus, stylopharyngeus muscles, glossopharyngeal nerve. Remove the lateral plate of the pterygoid process of the sphenoid bone. Find the muscles of the soft palate. **b**. Dissection of the nucheal region from the external occipital protuberance to the 7th thoracic vertebra. Occipital artery, muscles of the nuchal region from layer to layer. Identify the suboccipital triangle and its elements.Remove all muscles attached to the occipital bone. Make visible the posterior arch of the atlas and exarticulate the atlantooccipital joint. Cut through the alar ligaments and the apical ligament. Bend the head forward. The head remains connected to the body only through the pharynx and esophagus. In the other cadaver, structures related to the pharynx are dissected.

4th week:
Practical: Anatomy: Topographical anatomy of the head and the neck VII.-VIII.
a. Open the posterior wall of the pharynx and investigate the related structures. Study the facial isthmus. Dissection of the larynx. **b**. Demonstration of the median section of the head and neck. Conclusion of the dissection of the pharynx and larynx. Demonstration of the pharynx, larynx, tongue, palatine and lingual tonsil.

5th week:
Practical: Anatomy: Repetition of the topographic anatomy of the head and the neck. Dissection of the thoracic cavity I.
a. Repetition of the topographic anatomy of the head and neck. **b.** Surface projections of the thoracic organs. On the anterior thoracic wall show the following landmarks, projection lines of the heart and its orifices, the auscultation areas of the cardiac valves, margins of the cardiovascular shadow, projections of the lungs, pleurae and pleural recesses. Presentation of radiographs.

6th week:
Practical: Anatomy: Dissection of the thoracic cavity II-III. **a**. Structure of the thoracic wall. Topography of the intercostal spaces. Lymphatic drainage of the breast. After removing the pectoralis major muscle, dissect the intercostal

branches of the internal thoracic artery and the intercostal muscles. Opening of the thoracic cavity: exarticulate the sternoclavicular joint and cut the ribs along the anterior axillary fold. Compare the surface projection lines on the body and in youratlaseswith the in situ positions of the thoracic organs. Mediastinum and its divisions. **b**. Study of the heart on isolated preparations. Size and position of the heart. External anatomy of the heart. Preparation of arteries and veins of the heart. Internal anatomy of the atria and the ventricles of the heart. Types and functions of the heart valves. Layers of the heart wall. The conducting system. Functional aspects of the circulatory system. Pulmonary and systemic circulation.

7th week:
Practical: Anatomy: Dissection of the thoracic cavity IV-V.
a. In situ dissection of the heart, its vessels and chambers. Topography of the heart and pericardium and its sinuses. Open the pericardium between the superior and inferior vena cava and near the diaphragm along an L shaped line. Demonstration of the excised heart. Dissect the coronary arteries, the coronary sinus, the small cardiac vein, the great cardiac vein, the middle cardiac vein. Open a window on the anterior surface of the right auricle and turn backward. Remove and wash the coagulated blood to make the structures of the right atrium and the right atrioventricular orifice visible. Then cut a window on the anterior surface of the right ventricle starting from the conus, and turn the flap caudally while preserving the moderator band. Investigate the structures of the right ventricle including the tricuspid valve. Make a hole on the left ventricle by cutting out a piece of its wall, and identify its structures through the opening. The semilunar valves are studied at the aortic and pulmonary orifices after making window-like holes on their anterior walls. Presentation of radiographs. **b**. Study the pleura and its recesses. Remove the lungs and inspect the surfaces. Discuss schematic drawings of atlases of the medial surfaces of the lungs. Dissect bronchopulmonary segments (in one of the lungs) and bronchial arborization (in lung). Structures of the posterior mediastinum.

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

9th week:
Practical: Anatomy: Dissection of the abdominal cavity II-III.
a. Dissection of the median abdominal and the inguinal regions. Structure of the abdominal wall, layers of the abdominal wall. Muscles of the abdominal wall, rectus sheath, thoracolumbar fascia. Structure of the posterior abdominal wall. Opening of the abdominal cavity. Inspection and identification of the abdominal organs..**b**. Dissection of the lesser omentum and branches of the celiac trunk. Dissection of the blood vessels of the small and large intestines. Memorise the position of the abdominal viscera. Presentation of radiographs.

10th week:
Practical: Anatomy: Dissection of the abdominal cavity IV-V.
a. Dissection of the blood vessels. Discussion of the abdominal lymphatic system. Removing the intestines from the duodeno-jejunal flexure to the sigmoid colon-rectal border (only from one cadaver). Cut and demonstrate the inner surface of different parts of the intestine (including the cecum). In the cadaver from which intestines were removed dissect the structures of the retroperitoneal region. **b**. Topography and relations of the stomach, duodenum, pancreas and spleen. Liver: inspect and make a drawing of the visceral (inferior) surface. Topography and sheaths of the kidney. Layers of the retroperitoneal space.

11th week:
Practical: Anatomy: Dissection of the abdominal cavity VI-VII.
a. Paired visceral branches of the abdominal aorta. Kidneys, suprarenal glands. Dissection of the kidney, demarcate a lobe of the kidney. **b**. Dissection of the retroperitoneal space. Diaphragm. Openings of the diaphragm and its piercing structures. Lumbar plexus. Parietal branches of the abdominal aorta.

12th week:
Practical: Anatomy: True pelvis and perineal region I-II.
a. Topography of the organs in the true pelvis. External genital organs - demonstration. Dissection of the branches of the internal iliac artery. **b**. Dissection of the perineal region. Structures of the anal region. Ischiorectal fossa. (Removing of the lower limbs from one of the cadavers).

13th week:
Practical: Anatomy: True pelvis and perineal region III - IV. **a**. Dissection of the urogenital region and external genital organs. Nerves and blood vessels on the dorsal surface of the penis. Preparation of the roots of penis/clitoris. Preparation of the corpora cavernosa and corpus spongiosum penis. Layers of the scrotum. Preparation of the pelvis for median section. **b**. Halving of the pelvis in the median plane. Dissection of the organs of the true pelvis from the lateral aspect. Branches of the internal iliac artery. Make schematic drawings of the female and male pelvic organs.

14th week:
Practical:
Anatomy: True pelvis and perineal region V. End Semester Exam (ESE)
a. Male and female genital organs - demonstration of excised preparations. Placenta. Sacral plexus. **b.** ESE

Requirements

Requirements

Concerning attendance, the rules written in the Regulations Governing Admission, Education and Examinations of the Faculty of Medicine, University of Debrecen are valid. The presence in practices will be recorded. The head of the department may refuse to sign the subject if a student is absent more than three times from practices in the semester even if he/she has an acceptable reason. Compensation of practices is possible only on the same week at 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 and once in the exam period. Improvement of the ESE's mark is not allowed.

Details of the practical exam will be published on the e-learning site of the department.

Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY I. LECTURE**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Lecture: **42**
Seminar: **28**

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

2nd week:
Lecture: Main pathways of the carbohydrate metabolism, central role of glucose. Absorption and transport of monosaccharides. Carbohydrate metabolism in various tissues. Glycolytic pathway. Rapoport-Luebering shunt. Energy production of the glycolytic pathway. Non-physiological inhibitors of the glycolytic pathway. Shuttle pathways. Cori cycle. Glucose-alanine cycle. Gluconeogenesis. Substrates of the gluconeogenesis.

3rd week:
Lecture: Regulation of the glycolytic pathway in liver and muscle. Regulation of gluconeogenesis. Glycogen in liver and muscle. Degradation and synthesis of glycogen. Regulation of glycogen synthesis and degradation. Metabolism of galactose and fructose.
Practical:

4th week:
Lecture: Pentose phosphate pathway. Synthesis of disaccharides. Metabolism of glucuronic acid. Inherited diseases in the carbohydrate metabolism. Biochemistry of diabetes mellitus. Pyruvate dehydrogenase complex .

5th week:
Lecture: Organization of lipid structures. Mixed micelles in the digestive tract. Lipoproteins in blood plasma. Covalent interactions between proteins and lipids. Oxidation of fatty acids. Synthesis of fatty acids.

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

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

8th week:
Lecture: The mevalonate metabolic pathway. Synthesis of cholesterol Cholesterol transport in the body. The LDL receptor and its gene. Excretion of cholesterol. Biochemical explanation of elevated blood cholesterol levels.
Self Control Test

9th week:
Lecture: Comparison of the amino acid metabolism with the carbohydrate and lipid

metabolisms. Formation and utilisation of the intracellular amino acid pool. Nitrogen balance. Exogenous amino acid sources, digestion of proteins. Amino acid transports. Structure and function of glutathione. Endogenous amino acid sources: intracellular protein breakdown. Common reactions in the amino acid metabolism: fate of the nitrogen. Transaminations and deaminations. Enzymes containing pyridoxal phosphate cofactors, and their mechanism of action: stereoelectronic control. Formation and elimination of ammonia in the body. Nitrogen transport between the tissues.

10th week:
Lecture: The urea cycle and its regulation. Mitochondrial carbamoyl phosphate synthetase. Intracellular glutamine cycle. Decarboxylation and carboxylation reactions in the amino acid metabolism. C1 transfer and transmethylation, related enzyme and vitamin deficiencies. Monooxygenation and dioxygenation reactions. Fate of the carbon skeleton of amino acids: glucogenic and ketogenic amino acids. Degradation of amino acids in the pyruvate pathway. Transport function of alanine. Degradation and synthesis of cysteine. Formation and utilization of PAPS. Degradation and synthesis of serine and glycine. Pathways of threonine degradation. Degradation of amino acids in the - ketoglutarate pathway. Degradation of histidine, histidinemia.

11th week:
Lecture: Degradation and synthesis of proline. Degradation and synthesis ofarginine and ornithine, their precursor functions: NO, creatine, polyamines. Aspartate and asparagine degradation and synthesis in the oxaloacetate pathway. Degradation of amino acids in the succinyl-CoA pathway. The vitamine requirements and enzyme deficiencies in the propionyl CoA succinyl CoA conversion. Degradation of isoleucine and valine, related enzyme deficiencies. Comparison of leucine degradation with the degradation of isoleucine and valine. Degradation of lysine and tryptophane, their precursor functions. Carnitine synthesis. Degradation of phenylalanine and tyrosine, related enzyme deficiencies and precursor functions. Synthesis and degradation of cathecolamines.

12th week:
Lecture: Nucleotide pool. Digestion and absorption of nucleic acids. Sources of atoms in purine ring. De novo synthesis of purine nucleotides. Regulation of purine nucleotide synthesis. Salvage pathways for the purine bases. Degradation of purine nucleotides. Diseases associated with purine nucleotide metabolism.

13th week:
Lecture: De novo synthesis of pyrimidine nucleotides. Regulation of pyrimidine nucleotide synthesis. Salvage pathways for the pyrimidines. Degradation of pyrimidine nucleotides. Nucleoside and nucleotide kinases. Synthesis of deoxythymidilate. Nucleotide coenzyme synthesis (NAD,FAD,CoA). Antitumour and antiviral action of base and nucleoside analogues. Biochemistry of nutrition. Energy requirement. Basic metabolic rate. Energy content of the food. Energy storage and thermogenesis.
Self Control Test

14th week:
Lecture: Biochemical mechanism of obesity. Protein as N and energy source. N balance. Essential amino acids. Protein malnutrition. Vegetarianism. Clinical aspects of protein nutrition. Carbohydrates and lipids. Pathological mechanisms in obesity. Vitamins. Structure, biochemical functions. Relationship between the biochemical functions and the symptoms of deficiency. Essential inorganic elements of the food (metabolism, function, deficiency). Integrated metabolism.

Requirements

Requirements for signing the semester: attendance in 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. 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 and seminars (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). In case of unsuccessful written "C" exam, students will get oral questions, too.

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 elearning site of the Department (https://elearning.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 must be performed, if someone is absent due to any serious reason, the missing experiment has to be performed within the three-week practice period joining another group. There will also be a possibility after each three weeks period, on Monday afternoon, to do a make-up lab. Schedule of the practices will be posted on the elearning site of the Department (https://elearning.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 whole material of the practices on the 11th week. 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 the signature and at least a passing grade previously). Passing the course “Biochemistry I. Practical” is a required condition for obtaining the signature for “Biochemistry I. Lecture”. You can read more

detailed information about the practices on the elearning site of the Department (https://elearning.med.unideb.hu)

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.

The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

Testing, evaluation

In each Hungarian language course, students must sit for 2 written language tests and an oral exam. Students must appear at the lecture hall at least 15 minutes before the exam. If students are

late, they are not allowed to write the test.
A further minimum requirement is the knowledge of 200 words per semester divided into 10 word quizzes. There are five word quizzes before and another five after the midterm test. If a student fails or misses any word quizzes he / she cannot take the written test. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course. The results of the written tests and the oral exam are combined and averaged.
Based on the final score the grades are given as follows.

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

If the final score of the written tests is below 60, the student can take a written remedial exam once covering the whole semester's material.
Coursebook: See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**
Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

Department of Physiology

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

1st week:
Lecture:
Introductory remarks
Preparation for laboratory practices
Humoral regulation of cell function
Membrane transport mechanisms
Physiology of the body fluids. Liquor. Blood plasma.

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 Ca2+ 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.
In cases of more than four lecture absences the special advantage is withdrawn (see below).
Each student must attend on seminars with the group specified by the Education Office.
For continuous updates on all education-related maters, please check the elearning.med.unideb.hu web site (Department of Physiology menu item).

The Medical Physiology I lectures are listed at the 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 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.
- If one wishes to improve his/her former Physiology exam mark, it is possible to take improvement exam. Note that the mark of improvement exam depends on the actual actual performance, even if it is worse than the previous result!

Subject: **MEDICAL PHYSIOLOGY I. PRACTICAL**
Year, Semester: 2nd year/1st semester
Number of teaching hours:
Practical: **42**

1st week:
Practical: Introduction

2nd week:
Practical: 1. Investigation of the cardiovascular functions

3rd week:
Practical: Evaluation of ecg recordings – recognition of ecg alterations

4th week:
Practical: Determination of parameters characterising the respiratory functions

5th week:
Practical: Examination of the blood I.

6th week:
Practical: Computer aided acquisition and processing of biological signals

7th week:
Practical: Remedial lab

8th week:
Practical: Effects of electrolytes on the uterinal smooth muscle function

9th week:
Practical: Computer simulation of the frank-straling-mechanism

10th week:
Practical: Computer simulation of the humoral regulation of intestinal smooth muscle

11th week:
Practical: Investigation of the endothelial function on isolated arterial ring

12th week:
Practical: Computer simulation of the skeletal muscle function

13th week:
Practical: Remedial lab

14th week:
Practical: 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 maters, please check the 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 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 I are withdrawn!

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.

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.

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

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 senasation

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)

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

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.

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.

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

Requirements

In the frame of Neurobiology Lecture Course lectures and seminars of neurohistology and neurophysiology are held.
It is compulsory to attend seminars. Signature of the semester may be refused in case of more than one absence from neurophysiology seminars or more than two absences from neurohistology seminars.

For the lectures, the actual timetable and venue, as well as the lecture handouts can be found on the following webpage: https://elearning.med.unideb.hu.
Neurohistology seminars will be held in the Histology rooms of the Department of Anatomy. Neurophysiology seminars will be held on the 11th-14th weeks for General Medicine students, at the same time and same venue as the Physiology Seminars. It is compulsory to attend seminars. Rules of making up the neurohistology seminars are identical with the Anatomy Course I-II. Courses, whereas completion of neurophysiology seminars with a different group is not possible.
It is obligatory to attend the seminars in the group assigned by the Education Office.
Upon request, students are obliged to present personal ID prior to the practices.

There are no mid-semester exams in the course.

End-semester examination:

The semester is closed by an end-semester exam that consists of all materials of Neurobiology lectures, seminars and practicals. Registration to the exam is only possible with a successfully completed Neurobiology Practical exam.
The exam consists of a written test and an oral part.

For the written test, a total of 60 points and, for the oral exam, maximally 20 points (10+10) can be obtained.

Regarding the oral exam, the main emphasis is on recognizing and identifying macroscopic structures. The student chooses a single pre-combined complex topic which has two questions (questions with a list of related structures are available at: https://elearning.med.unideb.hu). The passing limit for each question is 6 points. Should the student fail on one of the questions, the oral exam is terminated and the other question will not be discussed.
Regarding the written test, all topics of the lectures, practicals and recognizing histological specimen will be subjected - the written test will be conducted using the Moodle system.

The final result of the exam is „fail" if either the written test or the oral exam does not reach the 60% passing limit (for the written test: 36 points, for the oral exam: 12 points). The final mark is calculated as the sum of points according to the following scheme:

0 – 59,9 %(0-47 points): fail (1)
60 – 69,9 % (48-55 points): pass (2)
70 – 79,9 % (56-63 points): satisfactory (3)
80 – 89,9 % (64-71 points): good (4)
90 – 100 % (72-80 points): excellent (5)

Provided that one of the two parts of the exam, i.e. either the written test or the oral exam, is NOT successful, at the remedial only the unsuccessful part needs to be completed.

Improvement of the mark is possible during the regular examination period by repeating both the written test and the oral exam while the previous mark will be erased. Both written and oral parts should be repeated in the improvement exam.

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'scut, basal ganglia, diencephalon, third ventricle

4th week:
Practical: Dissecting Room: Anatomy: Dissection of the brain – IV. Structures of the

brainstem, cerebellar peduncles. Coronal sections of the brain – I.

5th week:
Practical: Dissecting Room: Anatomy: Dissection of the brain – Part V. Fourth ventricle, rhomboid fossa, 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 potencial 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

Requirements

It is compulsory to attend the laboratory practices. Signature of the semester may be refused in case of more than 3 absences from all of the practices held in the dissection- and histology rooms of the Department of Anatomy and the practice hall of the Department of Physiology. Completion of all topic sheets in the exercise book is obligatory, that is verified by the signature of the teacher, is also a precondition of the signature.

For the practices, the venues are the dissection rooms and histology rooms of the Department of Anatomy and the Practice Halls of the Department of Physiology.
Rules of making up the practices taking place in the section room are identical with practices of Anatomy Course I-II.
Practices in the Department of Physiology are held on the 9th-14th weeks for General Medicine students. Completion of the practices in the Department of Physiology are verified by completion

of all topic sheets of the Exercise Book of Physiology and by signature of the practice teacher after each practice sheets. In case of lacking completed and signed Exercise Book, the end-semester signature can be refused.
Missed Neurobiology practices in the Department of Physiology must be made up in the frame of remedial practices. However, in the case of absolute necessity, one might try to join the practice of a different group; but before this happens, the student must get the permission of his/her lab teacher. There is absolutely no possibility to attend the practices of a different group without the permission of your own lab teacher. The actual timetable and venue of the practices can be found on the following webpage: https://elearning.med.unideb.hu.
It is obligatory to attend the practices in the group assigned by the Education Office.
Upon request, students are obliged to present personal ID prior to the practices.

End-semester examination:
The semester is closed by a practical exam that consists of all materials of Neurobiology practicals.

The exam consists of two parts, in which the neuroanatomical and neurophysiological knowledge of the student is tested. Both parts should be completed with at least pass, and the average of the two exams will be the final grade of the Practical Exam.

Regarding the neuroanatomy part, the main emphasis is on recognizing and identifying macroscopic structures. The first task is to identify 10 structures selected by the examiner from a minimal structure list (available for the students at: https://elearning.med.unideb.hu).
The final mark is calculated as the sum of points according to the following scheme:

10 identified structures: 5 (excellent)
9 identified structures: 4 (good)
8 identified structures: 3 (satisfactory)
7 identified structures: 2 (pass)
6 or less identified structures: 1 (fail)

Regarding the neurophysiology part, the student has to demonstrate the knowledge of practical materials of the Practical Hall of Department of Physiology. The student has to complete one randomly chosen simulation or diagnostic practice as it was achieved by students during the semester. As a precondition of attending the Closing Lab, the fully completed Exercise Book (with all the verified topics and signed front page) together with a photo ID must be presented during the Closing Lab. Students are expected to perform the given experiment on their own and must be familiar with theoretical background also.

In case of unsuccessful practical exam, the student can repeat the practical exam two times (on the 14th week and in the exam period at a time indicated by the Department of Physiology. There is no remedial exam in case of successful practical exam.

Besides the compulsory and recommended literature, lecture materials uploaded to https://elearning.med.unideb.hu also help students preparing for the Practical Exam

Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY II. LECTURE**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **48**
Seminar: **24**

1st week:
Lecture: Lecture: Gene expression I: Levels of eucariotic gene expression. The active chromatin. Regulation of transcription. Regulation at the mRNA level.

2nd week:
Lecture: Gene expression II: Translational regulation. Posttransational events. Gene therapy. Biochemistry of cell proliferation I: Mitotic cascade. M-phase kinase. Products and biochemical function of protooncogenes. Mechanism of oncogene formation.

3rd week:
Lecture: Biochemistry of cell proliferation II: Tumor suppressor genes and their biochemical function. Biochemical features of terminal differentiation. Biochemistry of programmed cell death.

4th week:
Lecture: Signal transduction I: Signal Term and levels of regulation. Significance and interrelationship between metabolic, cytokine, hormonal and neuronal regulation. Forms of external signals. Receptors and transducers. Systems increasing the sensitivity of regulation: allosteria, substrate cycle, interconversion cycle, cascades. Signalling pathways of nonpenetrating signals. Ionchannel receptors. Seven transmembrane domain receptors G proteins and GTP-ases. The adenylate cyclase and the phospholipase C signalling pathway. G proteins and GTP-ases. The adenylate cyclase and the phospholipase C signalling pathway. Control of enzyme activity. Other phospholipases. cGMP phosphodiesterase system. Signalling via one-hydrophobic domain proteins: the cGMP system. Coupling of tyrosin kinase receptors to the signalling pathways, raf, MAP kinases. Metabolic effects of insuline.

5th week:
Lecture: Signal transduction II: Cell death receptors. Signals acting via cytoplasmatic targets: the NO system. Coupling of signalling pathways to the regulation of genes and to the actin filament movement. Nuclear receptors. Signal crosstalks.
Iron and hem metabolism I: Iron transport, storage and distribution in the human body. Molecular regulation of the iron level in cells: stability of transferrin receptor and ferritin mRNA, IRE binding protein. Risk of the free iron and intracellular hemolysis.

6th week:
Lecture: Iron and hem 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. Enzymathic 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 bichemical 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 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 in 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). 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 elearning site (https://elearning.med.unideb.hu, login with your university network ID and password).

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 practice must be performed, if someone is absent due to any serious reason, the missing experiment has to be performed within the three-week practice period joining another group, after obtaining permissions from the education official of the department. There will also be a possibility after each three-week 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 elearning site of the Department (https://elearning.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 whole material of the practices on the 11th. 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 at least a passing grade previously). Passing the course "Biochemistry II. Practical" is a required condition for obtaining the signature for "Biochemistry II. Lecture". You can read more detailed information about the practices on the elearning site of the Department (https://elearning.med.unideb.hu).

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.

The teacher evaluates active participation in each class. Students are not supposed to share coursebooks in the classes therefore if they fail to bring the coursebook to the class for the second time the attendance is refused.

Testing, evaluation

In each Hungarian language course, students must sit for 2 written language tests and an oral test. 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 a student fails or misses any word quizzes he / she cannot take the written test. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can get bonus points (5-5%) by taking two extra quizzes containing 20 sentences each, before the midterm and end term tests. The sentences are taken from the units of the coursebook.

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

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

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

If the final score of the written tests is below 60, the student can take a written remedial exam once covering the whole semester's material.
Coursebook: See the website of the Department of Foreign Languages: **ilekt.med.unideb,hu.**
Audio files to the course book, oral exam topics and vocabulary minimum lists are also available on the website.

Department of Physiology

Subject: **MEDICAL PHYSIOLOGY II. LECTURE**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **37**
Seminar: **20**

1st week:
Lecture: Preparation for laboratory pract.
Homeostasis, principles of renal morphology and renal function
Quantitative description of renal function
Mechanism of glomerular filtration

2nd week:
Lecture:
Regulation of glomerular filtration
Tubular transport: proximal tubule
Tubular transport: loop of Henle and distal nephron
Urinary concentration and dilution, clinical correlates

3rd week:
Lecture:
Osmoregulation, water balance
Defense of body fluid volume, sodium balance
Acid-base balance
Acid-base disturbances, Calcium homeostasis I.

4th week:
Lecture: Calcium homeostasis II.; physiology of bone
Potassium balance, mycturition
Haemodialysis
General principles of endocrinology

5th week:
Lecture: Mechanisms of hormone action
Pituitary gland
Growth hormone
The thyroid gland I.

Self Control Test

6th week:
Lecture: The thyroid gland II.
Glucocorticoids I.
Glucocorticoids II.
The hormones of adrenal medulla

7th week:
Lecture:
The actions of catecholamine
The hormones of pancreatic islets I
The hormones of pancreatic islets II
Regulation of the function of pancreatic islets

8th week:
Lecture: Endocrine regulation of metabolism
Dianetes Mellitus
General principles in the regulation of gonadal functions
Male gonadal functions

9th week:
Lecture:
Female gonadal functions
Pregnancy, lactation
Stem cell
Sport physiology I.

10th week:
Lecture: Sport physiology II.

11th week:
Self Control Test

Requirements

1. Signature of the semester
Attendance of lectures 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 maters, please check the elearning.med.unideb.hu web site (Department of Physiology menu item).
The Medical Physiology II lectures are listed at the 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 web site (Department of Physiology menu item).
- If one wishes to improve his/her former Physiology exam mark, it is possible to take improvement exam. Note that the mark of improvement exam depends on the actual actual performance, even if it is worse than the previous result!

Depending on the average result of the self-controls of 2021/2022 academic year, the following special advantages are granted:
The average score of the five mid term SCTs (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 2021/2022 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 uterinal smooth muscle function

5th week:
Practical: Simulation of the renal transport mechanisms

6th week:
Practical: Computer simulation of the glucose tolerance test

7th week:
Practical: Remedial lab

8th week:
Practical: 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 maters, please check the 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 in the announced week 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 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 Behavioural Sciences

Subject: **MEDICAL ANTHROPOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Seminar: **15**

Requirements

The object of medical anthropology is the human being in the context of health and disease, in the healing processes and 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 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 the 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 study; a series of seminars organized bi-weekly in two-hour blocks.

Method:

Every student should present a short lecture (PowerPoint) on an issue from those that are listed below the titles of topics.

Topics:

1, Introduction I: technical and methodological issues of the course

2, Introduction II: medical anthropology as a part of medical humanities

3, Medicine and culture I.

- - What does culture-bound syndrome mean?
- - Is medicine (medical knowledge) international?
- - Is it possible in the field of medical knowledge a ‘point of view from nowhere’?
- - Can be reduced the aspects of medicine into biological sciences?
- - Is Western medicine racial and gender bias-free?

4, Medicine and culture II.

- - Are different types of ill-health naturally given or culturally constructed phenomena?
- - What are the differences between disease, illness, and sickness?
- - Do health and illness have the same meanings in different cultures?

- - Is it a place for personal aspects of ‘diseases’ in medicine?
- - Are mental disorders universal or local phenomena?

5, Traditional, natural and alternative medicine

- - What kinds of ‘Weltanschauung’ (image of the world) serve as backgrounds for different medical ideologies and systems?
- - How human beings are defined by ‘complementary and alternative’ (CAM) and modern medicine?
- - What is the attitude of modern medicine towards its predecessors?
- - Why is CAM so popular today?
- - How can culture influence placebo effects?

6, Body in Culture and Society

- - How is body-image influenced by cultural norms and values?
- - How does the body-mind problem appear in different cultures and historical periods?
- - What kind of body-images can be found in the culture of modern medicine?
- - Why is the female body so special in Western culture and medicine?
- - What are the characteristics of medicalization?

7, Pain, Suffering and Death

- - How does culture influence modes of pain and suffering?
- - How have traits of death and dying been changing in different periods of Western culture?
- - What are the cultural aspects of suicide?
- - What are the cultural aspects of abortion?
- - What are the cultural aspects of euthanasia?

8, Consultation

- Discussing the series of slides to the exam

8, Final test and essay

Requirements for the final grade:

A presentation on a chosen issue + exam.

Course books:

Cecil G. Helman: Culture, Health and Illness, Fifth Edition, Hodder Arnold, London, 2007. Chapters: 2; 4; 5; 6; 7; 9; 10; 11.

Michael Winkelman: Culture and Health Applying Medical Anthropology, Jossey Bass, San Francisco, 2009. Chapter 2; 5; 6;

Reading Books:

Roy Porter: Blood and Guts. A Short History of Medicine, Allen Lane, The Penguin Press, 2002.

Medical Anthropology, A course reader (manuscript) ed. Péter Molnár – Attila Bánfalvi, Debrecen, 1998.

Medical Knowledge: Doubt and Certainty, ed. C. Seale, S. Pattison, B. Davey, Open University Press, 2000.

Margaret Lock, Vinh-Kim Nguyen: An Anthropology of Biomedicine, Wiley-Blackwell, 2010.

Michael Winkelman: Culture and Health, Jossey-Bass, 2009.

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 civilization 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/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.

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 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 a student fails or misses any word quizzes he / she cannot take the midterm and final 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.

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

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

Department of Immunology

Subject: **IMMUNOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **45**
Seminar: **22**
Practical: **6**

1st week:
Lecture: Elements of the immune system and their role in defense against pathogens. Components and cells of the innate response. Characteristics and function of the innate immune response. The structure of lymphoid tissues and organs.
Seminar: Elements of the immune system and their role in defense against pathogens. The structure of lymphoid tissues and organs.

2nd week:
Lecture: Processing and presentation of antigens. Structure and function of proteins encoded by the major histocompatibility (MHC) gene complex. 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: Processing and presentation of antigens. Structure and function of proteins encoded by the major histocompatibility (MHC) gene complex. 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 immunresponse.
Self Control Test

6th week:
Lecture: Effector functions of helper T-cells. Activation and functions 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 functions of regulatory T-cells. The development of immunological memory. Monoclonal antibodies. Vaccination.
Seminar: Effector functions of helper T-cells.

Activation and functions 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 functions 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. Congenital immunodeficiencies II. 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. Transplantation.
Self Control Test

13th week:
Practical: The utility of flow cytometry in diagnosis, in clinical- and basic medical research. 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 tests (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 8-12, 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).
Lecture materials and other information concerning education can be found on our website at www.elearning.med.unideb.hu.

Department of Internal Medicine

Subject: **PROPEDEUTICS OF INTERNAL MEDICINE (INTERNAL MEDICINE I.)**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **28**
Practical: **28**

1st week:
Lecture: 1. Introduction. The subject of Internal Medicine. The medical ethic. Relationship between doctor and patients. Medical secret, information, attitude of doctors. Diagnosis: definition, importance, types.
2.Principles of history taking: Family history, habits, provoking factors, previous illnesses. Medical documentation. Present complains
Practical: *Introduction of the department. Location, functions, profile and system. Presentation of history taking*

2nd week:
Lecture: 1. Physical examination. Inspection, palpation, percussion, auscultation. General symptoms. Different types of fever. Blood pressure and body weight measurement.
2. Examination of the respiratory system: percussion, puncture of the chest. Pectoral fremitus, bronchophony
Practical: *Presentation of history taking. Measures of heat, and weight. Types of fevers.*

3rd week:
Lecture: 1.Examination of the respiratory system: History, cough, dyspnea, hemoptoe, breathing types.
2.Principles of physical examination of the chest. Differential diagnosis of chest pain.

Practical: *Taking case history. Inspection. Physical examination of the chest*

4th week:
Lecture: 1. Auscultation of the chest
2. X-ray examination of the chest.
Practical: *Physical examination of the lung.*

5th week:
Lecture: 1. Lung syndromes. Pneumonia, pleuritis, PTX. Mediastinal tumour.
2. Bronchitis, asthma, emphysema.
Practical: *Physical examination of the lung.*

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. Abdominalpain, 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.Hematologicanamnesis, diagnostics.
2.Theexamination ofendocrine 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 85%).
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*.

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).

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 AB0 and Rh blood groups

13th week:
Lecture: 24.Laboratory diagnostics of central nervous system diseases. Laboratory investigation of the cerebrospinal fluid.
25. Clinical biochemistry at the extremes of ages.
Practical: Detection of irregular antibodies, antibody screening, compatibility testing.

14th week:
Lecture:
26. Clinical biochemistry at the extremes of ages
27. Therapeutic drug monitoring I-II.
Practical: Immunoassay
Self Control Test

Requirements

Participation on practices: Attendance of practices is obligatory. Altogether one absence in the first semester and two absences in the second semester are permitted. In case of more absences, the practices should be made up by attending the practices with another group on 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 more practices than allowed in a semester. Assessment:
At the end of the first and second semester there is a written examination. There will be 2 written tests (SCTs) during the first semester. The students can get an offered grade at the end of the first semester based on the results of the SCTs. The materials of both semesters are required for the written test at the end of the second semester. During the second semester there will be 3 SCTs. Bonus percentage will be given on the basis of the results of the SCTs, which will be added to the result of the final exam. The materials of Clinical Biochemistry subject are uploaded on the e-learning website (www.elearning.med.unideb.hu)
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.Sterilization and disinfection
4.Principles of antimicrobial chemotherapy
Practical: Visualizing bacteria. Examination of unstained and stained specimens

3rd week:
Lecture: 5.Antimicrobial drugs for systemic administration
6. Principles and practice of antibiotic use in healthcare
Practical: Culture techniques. Anaerobic culture

4th week:
Lecture: 7. Bacterial pathogenesis
8.Antibacterial immunity
Practical: Biochemical activities of bacteria. Sterilization and disinfection

5th week:
Lecture: 9.Active and passive immunization. Hypersensitivity
10. Staphylococci
Practical: Determining the sensitivity of bacteria to antibiotics

6th week:
Lecture: 11.Streptococci
12. Mycobacterium genus
Practical: Serological reactions

7th week:
Lecture: 13.Causative agents of respiratory tract infections
14. Enterobacteriaceae I
Practical: 1st WRITTEN EXAMINATION (General Bacteriology)
Self Control Test

8th week:
Lecture: 15. Enterobacteriaceae II
16.Vibrio, Campylobacter, Helicobacter
Practical: Wound, skin and soft tissue infections caused by bacteria

9th week:
Lecture: 17. Pseudomonas and other non-fermentative Gram negative bacilli
18.Neisseria, Legionella, Brucella
Practical: Bacterial respiratory tract diseases

10th week:
Lecture: 19. Clostridia
20. Non-Clostridial anaerobic infections
Practical: Agents of bacterial intestinal infections and food poisoning

11th week:
Lecture: 21. Treponema
22. Borrelia, Leptospira
Practical: Urinary tract infections caused by bacteria

12th week:
Lecture: 23.Chlamydia and Mycoplasma
24. Rickettsia
Practical: 2nd WRITTEN EXAMINATION(Bacteriology with the

exception of Spirochaetaceae, Chlamydiae, Rickettsiae and Mycoplasms)

13th week:
Lecture: 25.Mycology I
26.Mycology II
Practical: Bacterial sexually transmitted diseases (STD)

14th week:
Lecture: 27.The human microbiom
28. 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).

Department 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: **5**
Practical: **23**

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.
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, antisepsis. Operating room environment. Preparation for operation personnel. Hand and arm disinfection (Scrubbing). Gowning. Gloving. Isolation. Sterilization techniques.
Practical: Scrubbing, gowning and gloving. Wound closure with different suturing techniques on biopreparate model.

5th week:
Lecture: Tracheostomy, conicotomy.
Practical: Conicotomy on phantom model. Scrubbing. Practicing wound closure with

different suturing techniques on biopreparate model.

6th week:
Lecture: Injection techniques. Blood sampling methods.
Practical: Blood sampling, intramuscular and intravenous injection on phantom models. Practising vein preparation, cannulation on phantom model, preparation of infusion set.
Self Control Test

7th week:
Lecture: Laparotomy.
Practical: Laparotomy on surgical training models. Scrubbing. Practicing wound closure with different suturing techniques on biopreparate model.

8th week:
Lecture: Basic principles of intestinal surgery.
Practical: Scrubbing. End-to-end one-layer intestinal anastomosis on small bowel biopreparate model.

9th week:
Lecture: Basic principles of vascular surgery.
Practical: Scrubbing. Vascular suturing techniques on aorta biopreparate model.

10th week:
Lecture: Surgery of the parenchymal organs.
Practical: Scrubbing. Parenchymal stitches on spleen biopreparate model. Practicing wound closure with different suturing techniques on biopreparate model.

11th week:
Lecture: Bioplasts and tissue adhesives. Drains, punctures (thoracal, abdominal).
Practical: Practising vein preparation, cannulation on phantom model and 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.
Practical: Catheterization of the urinary bladder on phantom model. Practicing blood sampling, injection techniques and vein preparation, cannulation on phantom models, preparation of infusion set.
Self Control Test

13th week:
Lecture: Insight into laparoscopic surgery and advanced technology. Basics of microsurgery.
Practical: Scrubbing. Practicing wound closure with different suturing techniques on biomodels.

14th week:
Lecture: Repeat all practices. Preparation for the practical exam.
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 week 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.surgres.unideb.hu
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.

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 leg3. Fat necrosis in the pancreas4. 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 liver6. Fatty change in the liver (lipid staining) 7. Atheromatous plaque 8. Cholesterolosis in the gallbladder 9. Atrophia brunea cordis

4th week:
Lecture: - Haemorrhage. Thrombosis. Embolism. DIC. - Morphologic patterns of the acute inflammatory response.
Practical: 10. Simple endometrial hyperplasia 11. Atrophia endometrii et myometrii 12. Nodular hyperplasia in the prostate 13. Bile stasis in the liver due to extrahepatic bile duct obstruction

5th week:
Lecture: - The role of macrophages in inflammation. Granulomatous inflammation. Amyloidosis
-Tissue regeneration. Reparation and wound healing. Calcification.
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. - Charasteristics of benign and malignant tumors. Differentiation and anaplasia.
Practical: 18. Pulmonary edema 19. Nutmeg liver 20. Appendicitis acuta suppurativa 21. Meningitis purulenta

7th week:
Lecture: - Charasterictics of tumor cell populations (clonality, heterogenity and progression). - Tumor dignity. Proliferation. Grading and staging.
Practical: 22. Bronchopneumonia with lung abscess 23. Septic abscesses in the myocrdiumban due to systemic fungal infection (PAS staining) 24. Chronic non-specific salpingitis 25. Foreign body granuloma

8th week:
Lecture: - Prognostic and predictive tumor markers. - Mechanisms of local and distant tumor spread. Angiogenesis.
Practical: 26. Keratoachantoma 27. Condyloma 28. Bowen's disease 29. Invasive cervical cancer

9th week:
Lecture: - The biology of tumor growth. Heredity in cancer. - Opportunistic infections. Systemic effects of neoplasia.

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: - Mono- and polygenic dysorders. - Immunodeficiencies. Tuberculosis.
Practical: 35. Allergic vasculitis 36. Polyarteritis nodosa 37. End stage lesion in Burger's disease 38. Gouty tophus

11th week:
Lecture: - Humoral and cellular immunopathological mechanisms. - The pathology of transplantation. Autoimmunity.
Practical: 39. Polymiositis 40. SLE lymphadenopathy 41. Chronic synovitis (Rheumatoid arthritis) 42. Rheumatoid nodule (Rheumatoid arthritis)

12th week:
Lecture: - Systemic autoimmune diseases (SLE, Sjögren, RA, SS).- Vasculitis.
Practical: 43. Gaucher's disease44. Toxoplasma lymphadenitis45. Chronic lyphocytic leukemia (CLL)46. Follicular lymphoma (FL)

13th week:
Lecture: - Pathology of the lymphatic system. - Malignant lymphomas, lymphoid leukemias.
Practical: 47. Diffuse large B-cell lymphoma (DLBCL) 48. Gastric lymphoma (MALT type) 49. Hodgkin's disease (HL) 50. Myelofibrosis

14th week:
Lecture: - AML. Chronic myeloproliferative disorders. - Myelodysplasia. Anaemias. Pigments.
Practical: Repeating practice

Requirements

Pathology I-II.

Learning stuff:
Textbook: Robbins' Basic Pathology, 10th Edition (Elsevier)
Lectures: PPT slides of all lectures (uploaded for the actual week)
Practicals (weekly packages):
- **histopath slides**
- **macro preps**
- **topic-wise supporting content**

Test bank: continously available from the e-learning site
Downloadable material: Department of Pathology

Validation of Semester:

- Histopathology and macro pathology (autopsy) classes are compulsory.
- Participation should be warranted electronically right before the class using the barcode based mobile approach.
- Missing of two practical classes (histo and macro pathology together) is tolerable.
- Intracurricular replacement of histo and/or macro pathology classes is possible on the same week.

Examination:
1st semester (Pathology 1): **End of Semester Examination** (ESE)
2nd semester (Pathology 2): **Final exam** (FE).

The Exam consists of: online test, practical exam and oral test.

Written and practical exams (proposed timing):

Pathology theory test (week 13):
- The test bank of the written pathology test can be found on the departmental E-learning website
- 85% is to be reached for pass.
- In the 2nd semester the questions comes from the 1st and the 2nd semester

Histopathology exam (computerized - week 14):
- The computerized histopathology exam consisted of 6 microscopic slides with related questions.
- Digital slides and learning material public on the E-learning and http://histopractice.med.unideb.hu/casecenter site.
- 85% correct answers are required for pass.
- In the 2nd semester exam slides come from the 1st and 2nd semester.

Macro practical exam (autopsy room - week 14):
- This practical exam takes place in the autopsy room.
- Oral presentation and interpretation of macro preparations is expected.
- 1-5 grades. Grade 2 (pass) is required for the successful exam.

Pass of all 3 exams are required for entry to the ESE and FE.
Any failed test is to be repeated on the exam day before starting the oral part

Oral exam:
Oral presentation and discussion of topics chosen from the topic list.
ESE: Two randomly chosen 1st semester topics to be presented.

FE: Three randomly chosen topics (one from the 1st semester, and two from the 2nd semester).

The knowledge of students is judged on the five-grade evaluation scale (1-5 grades).

During the oral exam fail on any (possible) substation (written, practical, oral) means termination of the chance. The exam must be repeated from the part that failed.

During improvement exam only the oral exam topics must be repeated (the student can get worse grade than the previous one or possibly can fail).

For further information: http://pathol.med.unideb.hu

https://elearning.med.unideb.hu

Department of Public Health and Epidemiology

Subject: **BASIC ONCOLOGY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **13**

1st week:
Lecture: Tumor initiation and progression

2nd week:
Lecture: The effect of lifestyle and social factors on tumorigenesis and tumor progression

3rd week:
Lecture: Role of the radioactive and UV radiations in the malignant transformation

4th week:
Lecture: The effect of nutrition on tumorigenesis

5th week:
Lecture: Role of viruses in the malignant transformation. I. Carcinogenic DNA viruses.

6th week:
Lecture: Role of viruses in the malignant transformation. II. Carcinogenic RNA viruses.

7th week:
Lecture: Chemical carcinogenesis. Carcinogenic chemicals in the environment

8th week:
Lecture: Tumor immunology in clinical practice

9th week:
Lecture: Molecular biological techniques in cancer diagnosis and to search for alterations in the cancer genome

10th week:
Lecture: Cancer stem cells

11th week:
Lecture: Epidemiology of malignant diseases

12th week:
Lecture: Cancer screening. Cancer registries

13th week:
Lecture: Prevention strategies in cancer

Requirements

Conditions of signing the Lecture book at the end of the semester.
Although attendance at lectures is not compulsory, it is highly recommended, since the material covered in the lectures will be examined. The department will refuse to sign the Lecture book if the student fails the test. If the student fails the written test, they can retake it on the date prearranged with the department.

One of the main objective is to provide sufficient theoretical background to the basic principles of carcinogenesis, cellular and molecular biology of cancer, the effect of lifestyle, social factors and nutrition on tumorigenesis. In order to highlight the importance of the various environmental factors in the development and progression of cancer, detailed information is given in the following areas: the health effect of various chemicals and occupational exposures, health hazard of ionizing and nonionizing radiation and the role of viruses in malignant transformation. The genetic background of various cancers will be discussed based on molecular epidemiological data. The course provides sufficient background to pathobiochemical alterations associated with tumor growth and tumor metastasis, characteristics of benign and malignant tumors and malignant cell populations. The course also aims to give up-to-date information on cancer epidemiology, the major issues in screening programs and the benefit and role of screening tests and prevention strategies.

Department of Behavioural Sciences

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-psicho-social model.

Seminar: The role of psychology in medical practice.

2nd week:
Lecture: Seeking professional help (first encounter, medical history, diagnostic procedure). Doctor-patient interaction, compliance, the "difficult patient".
Seminar: Special problems of medical students and doctors.

3rd week:
Lecture: Health beliefs, models of health, health behaviours, illness cognitions. Models of illness. Health risk behaviours.
Seminar: Phases of doctor-patient consultation.

4th week:
Lecture: Adverse childhood experiences and adult health (ACE).
Seminar: Breaking bad news.

5th week:
Lecture: Pain - psychological and sociolcultural factors.
Seminar: Stress management, time management, relaxation.

6th week:
Lecture: Chronic diseases, psychological preparation for surgery, intensive care unit, hospitalization.

7th week:
Lecture: Stress and coping (vulnerabiliy, protective factors). Basics of psychology.

8th week:
Lecture: Crisis, presuicidal syndrome, burnout.

9th week:
Lecture: Somatic symptom and related disorders

10th week:
Lecture: Placebos and the interrelationship among beliefs, behaviour and health.

Requirements

Evaluation: third year students should pass "End of Semester Examination" (ESE) at the end of the semester. The Department of Behavioural Sciences will adhere to the requirements of the General Academic Regulations and Rules of Examinations. The student must be present on the examination at the designated time. (He/she must explain the reason for any absence from the examination to the Departmental Adviser within 1 days of the day of examination.)
The final mark is the average of the seminar and the lecture results. Both should be better than fail to pass the ESE

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.

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 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 a student fails or misses any word quizzes he / she cannot take the midterm and endterm exams. They also have to take a vocabulary exam that includes all 100 words before the midterm and end term exams. A word

quiz can be postponed by a week and students can take it only with their own teacher.

The oral exam consists of a role-play from a list of situations covered in the coursebook. If students fail the oral exam, they fail the whole course.
The grades are given as follows.

fail (1)
pass (2)
satisfactory (3)
good (4)
excellent (5)

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

Department of Internal Medicine

Subject: **INTERNAL MEDICINE II. (IMMUNOLOGY AND RHEUMATOLOGY)**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **27**
Practical: **18**

1st week:
Lecture: 1. General characteristics of systemic autoimmune diseases, undifferentiated connective tissue disease, Raynaud's syndrome.
2. Systemic lupus erythematosus. (SLE)
3. Antiphospholipid syndrome. Plasmapheresis
Practical: UCTD.

2nd week:
Lecture: 4. Systemic sclerosis.
5. Organspecific autoimmune diseases.
6. Mixed Connective tissue disease (MCTD).
Practical: SLE, APS.

3rd week:
Lecture: 7. Adult immunodeficiencies, immunity and pregnancy
8. Immunomodulation in the treatment of autoimmune diseases.
9. Laboratory diagnostics of autoimmune, allergic diseases and immunodeficiencies.
Practical: PSS and Raynaud's syndrome. MCTD.

4th week:
Lecture: 10. Idiopathic inflammatory myopathies.
11. Allergic diseases and coeliac disease.
12. Sjögren's syndrome, secondary vasculitides.
Practical: Polymyositis and dermatomyositis

5th week:
Lecture: 13. Systemic vasculitides.
14. Early arthritis, rheumatoid arthritis, special forms (Felty, Caplan syndrome).
15. Tumor immunology.
Practical: Sjögren´s syndrome and vasculitis.

6th week:
Lecture: 16. .
17. Juvenile idiopathic arthritis, adult onset Still's syndrome, polymyalgia rheumatica.
18. Spondyloarthritides.
Practical: Presentation of case with RA and other types of arthritis.

7th week:
Lecture: 19. Crystal deposition diseases.

20. Infection and arthritides
21. Osteoporosis. Metabolic bone diseases.
Practical: Presentation of a case with SpA and psoriatic arthritis.

8th week:
Lecture: 22. Soft tissue rheumatism, compression syndromes.
23. Osteoarthritis, spondylosis. Low back pain.
24. DMARD therapy in inflammatory arthritides, pain management.
Practical: Presentation of a case with osteoarthritis, differential diagnosis of low back pain

9th week:
Lecture: 25. Shoulder regional syndrome, femur head necrosis.
26. Differential diagnosis of inflammatory rheumatic and systemic autoimmune diseases.
27. Physiotherapy, balneotherapy.
Practical: Presentation of a case with gout, osteoporosis and other cases with rheumatological diseases.

Requirements

Conditions of signing the Lecture book:

The student is required to attend the practices. Should they miss a practice, however, they will be obliged to provide a well-documented reason for it. Missed practices should be made up for at a later date, to be discussed with the tutor. The student is expected to be able to communicate with the patient in Hungarian, including history taking. At the end of the semester the student is required to sit for the end of semester examination (ESE). 1st part is written (minimum test, ≥85%), 2nd part is practical exam; 3rd part is oral exam (two topics).

Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY II.**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **42**
Practical: **28**

1st week:
Lecture: 1. Coagulopathies, (general introduction), haemophilias .
2. von Willebrand disease
3. Platelet function disorders.
Practical: Laboratory informatics

2nd week:
Lecture: 4. Inherited thrombophilias.
5. Acquired thrombophilias
6. Prethrombotic state, thromboembolias, consumption coagulopathies
Practical: Laboratory diagnostics of coagulopathias

3rd week:
Lecture: 7. Laboratory diagnosis of autoimmune diseases
8. Disorders of sodium and water metabolism I.
9. Disorders of sodium and water metabolism II.
Practical: Laboratory diagnostics of Thrombophilia. Laboratory monitoring of anticoagulant therapy

4th week:
Lecture:
10. Disorders of potassium metabolism
11. Disturbances of the acid-base balance
12. Laboratory diagnostics of renal disorders

Practical: Laboratory diagnostics of platelet

function disorders. Laboratory monitoring of antiplatelet therapy.

5th week:
Lecture:
13. Pathobiochemistry of the renal function I.
14. Pathobiochemistry of the renal function II.
15. Hypoglycaemias
Practical: Laboratory diagnostics of renal disorders.

6th week:
Lecture:
16. Pathogenesis and pathomechanism of diabetes mellitus
17. Pathobiochemistry and clinical biochemistry of the acute complications of diabetes mellitus
18. Laboratory diagnostics of diabetes mellitus
Practical: Examination of urine sediment
Self Control Test

7th week:
Lecture:
19. Disorders of lipid metabolism
20. Laboratory diagnostics of hyperlipidemia
21. Risk factors of atherosclerosis
Practical: Basic laboratory methods in metabolic diseases

8th week:
Lecture:
22. Laboratory diagnostics of acute coronary syndrome I.
23. Laboratory diagnostics of acute coronary syndrome II.
24. Laboratory diagnostics of hyperuricaemia and gout
Practical: Case presentation

9th week:
Lecture:
25. Pathobiochemistry of liver disorders
26. Laboratory diagnostics of liver disorders. Pathobiochemsitry of acute hepatic disorders
27. Pathobiochemistry and laboratory diagnostics of cholestasis and cirrhosis
Practical: Laboratory investigation of cerebrospinal fluid and other body fluids.

10th week:
Lecture:
28. Pathobiochemistry and laboratory diagnosis of autoimmune liver diseases
29. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract I.
30.Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract II.
Practical: Separation techniques.
Self Control Test

11th week:
Lecture: 31. Laboratory diagnostics of acute pancreatitis.
32. Clinical biochemistry of hypothalamus and hypophysis.
33. Pathobiochemistry of thyroid disorders.
Practical: Laboratory diagnostics of myocardial infarction, POCT

12th week:
Lecture:
34. Laboratory diagnostics of thyroid functions.
35. Clinical chemistry of parathyroid disorders. Disorders of calcium, phosphate and magnesium metabolism
36. Pathobiochemistry and laboratory diagnostics of adrenal cortex disorders
Practical: Laboratory evaluation of autoimmune diseases.

13th week:
Lecture:
37. Pathobiochemistry and laboratory diagnostics of adrenal medulla disorders
38. Clinical biochemistry of gonadal functions
39. Laboratory diagnostics of bone disorders
Practical: Laboratory evaluation of liver and pancreas function
Self Control Test

14th week:
Lecture:
40. Laboratory diagnostics of muscle disorders
41. Demonstration of practical pictures
42. Summary of laboratory methods
Practical: Laboratory evaluation of liver and pancreas function - case presentation.

Requirements

Participation on practices: Attendance of practices is obligatory. Altogether one absence in the first semester and two absences in the second semester are permitted. In case of more absences, the practices should be made up by attending the practices with another group on 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 more practices than allowed in a semester. Assessment:

At the end of the first and second semester there is a written examination. There will be 2 written tests (SCTs) during the first semester. The students can get an offered grade at the end of the first semester based on the results of the SCTs. The materials of both semesters are required for the written test at the end of the second semester. During the second semester there will be 3 SCTs. Bonus percentage will be given on the basis of the results of the SCTs, which will be added to the result of the final exam. The materials of Clinical Biochemistry subject are uploaded on the e-learning website (www.elearning.med.unideb.hu)
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 I
2. Protozoa II
Practical: Bacterial zoonotic infections

2nd week:
Lecture: 3. Flatworms
4. Roundworms
Practical: Anaerobic infections

3rd week:
Lecture: 5. The structure and classification of viruses
6. The replication of viruses
Practical: Infections of sterile body sites (sepsis, bacteriemia, endocarditis, osteomyelitis)

4th week:
Lecture: 7. The pathogenesis of viral diseases. Host defenses in viral infections
8. Prevention and treatment of viral diseases
Practical: Diagnosis of mycotic infections

5th week:
Lecture: 9. Orthomyxoviruses
10. Paramyxoviruses, Coronaviruses, Rubella virus
Practical: 3rd WRITTEN EXAMINATION (Clinical Bacteriology and Mycology)

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 Roboviruses
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)

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. In the 2nd semester, two tests are to be written by the students. 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: - Soft tissue tumors. - Non-neoplastic lesions of the bones. Pathology of the joints. - Bone tumors.
Practical: Introduction

2nd week:
Lecture: - Diabetes mellitus.- Arteriosclerosis. Hypertension and hypertensive vascular disease. - Acute myocardial infarction.
Practical: 51. Lipoma
52. Embryonal rhabdomyosarcoma
53.Acute osteomyelitis

54. Chondroma

3rd week:
Lecture: - Myocarditis. Cardiomyopathies. - Diseases of the endocardium and the cardiac valves. - Congenital heart diseases. Venous and lymphatic vessel disorders.
Practical: 55 Osteosarcoma
56 Nephropathia diabetica
57. IRDS
58. Bronchial asthma

4th week:
Lecture: - ARDS. Pneumonia. Pulmonary embolisms. - Chronic obstructive pulmonary diseases. - Interstitial lung disease.
Practical: 59. Boeck's sarcoidosis
60. Bronchial squamous carcinoma
61. Intrabronchial carcinoid tumor
62. Small cell carcinoma

5th week:
Lecture: - Tumors of the lung and pleura. - Benign, preneoplastic and neoplastic lesions in the oral cavity. Diseases of hte salivary glands. - Esophageal diseases. Gastritis. Gastroduodenal ulcers.
Practical: 63. a and b Barrett's esophagus (a; HE + b; PAS-AB
64. Ulcus pepticum ventriculi
65. Crohn's disease
66. Ulcerative colitis

6th week:
Lecture: - Maldevelopment of intestine. Megacolon. Circulatory intestinal lesions. - Enteritis, enterocolitis. Malabsorption. Inflammatory bowel diseases. - Colorectal cancer.
Practical: 67. High grade adenoma in the colon
68. Malignant transformation of adenoma
69. Mucinous adenocarcinoma
70. Liver cirrhosis with HCC

7th week:
Lecture: - Intra- and extrahepatic biliary tract diseases. - Viral hepatitis. Drug induced liver diseases. Acute and chronic liver failure. - Liver cirrhosis.
Practical: 71. Crescentic glomerulonephritis
72. Acute pyelonephritis
73. Clear cell kidney carcinoma
74. Carcinoma transitiocellulare vesicae urinariae

8th week:
Lecture: - Tumors and circulatory disorders of the liver. Inherited metabolic liver diseases. - The pathology of the pancreas and appendix. - Glomerular diseases.
Practical: 75. Prostatic adenocarcinoma
76. Pure seminoma
77. Embryonal carcinoma with choriocarcinoma
78. Fibroadenoma

9th week:
Lecture: - Diseases affecting tubuli and interstitium. Kidney stones. Hydronephrosis. - Cystic diseases and tumors of the kidney. - Pathology of the urinary tract.
Practical: 79. Invasive ductal carcinoma with DCIS
80. Invasive lobular carcinoma
81. Adenocarcinoma of the endometrium
82. Perineal endometriosis

10th week:
Lecture: - Hyperplasia and carcinoma of the prostate. - Testicular tumors. - Non-neoplastic and preneoplastic conditions of the breast.
Practical: 83. Cystadenocarcinoma papillare serosum ovarii
84. Tubal abortion
85. Carcinoma basocellulare
86. Compound naevus

11th week:
Lecture: - Breast cancer. - Uterine tumors. - Tumors of the ovarium.
Practical: 87. Superficial spreading malignant melanoma
88. Malignant melanoma in the eye
89. Hashimoto's thyreoiditis
90. Graves disease

12th week:
Lecture: - Pathology of the pregnancy. Pathomorphological aspects of the most frequent

diseases of the newborn. - Melanocytic and epithelial skin tumors. - Pathology of the thyroid and parathyroid.
Practical: 91. Papillary carcinoma of the thyroid
92. Follicular carcinoma of the thyroid
93. Retinoblastoma
94. a and b Alzheimer's disease (a; HE + b; tau)

13th week:
Lecture: - The pathology of the adrenals. - Ophtalmic pathology. Cerebrovascular diseases. - Stroke.
Practical: 95. a and b Parkinson's disease (a; HE + b; alpha-synuclein)
96. Schwannoma
97. Meningioma
98. Glioblastoma

14th week:
Lecture: - Neurodegenerative diseases. Dementias. - Infective diseases of the CNS. - Tumors of the CNS.
Practical: Repeating practice

Requirements

Pathology I-II.

Learning stuff:
Textbook: Robbins' Basic Pathology, 10th Edition (Elsevier)
Lectures: PPT slides of all lectures (uploaded for the actual week)
Practicals (weekly packages):
- **histopath slides**
- **macro preps**
- **topic-wise supporting content**

Test bank: continuously available from the e-learning site
Downloadable material: https://elearning.med.unideb.hu Department of Pathology

Validation of Semester:
- Histopathology and macro pathology (autopsy) classes are compulsory.
- Participation should be warranted electronically right before the class using the barcode based mobile approach.
- Missing of two practical classes (histo and macro pathology together) is tolerable.
- Intracurricular replacement of histo and/or macro pathology classes is possible on the same week.

Examination:
1st semester (Pathology 1): **End of Semester Examination** (ESE)
2nd semester (Pathology 2): **Final exam** (FE).

The Exam consists of: online test, practical exam and oral test.

Written and practical exams (proposed timing):

Pathology theory test (week 13):
- The test bank of the written pathology test can be found on the departmental E-learning website
- 85% is to be reached for pass.
- In the 2nd semester the questions comes from the 1st and the 2nd semester

Histopathology exam (computerized - week 14):
- The computerized histopathology exam consisted of 6 microscopic slides with related questions.

- Digital slides and learning material public on the E-learning and http://histopractice.med.unideb.hu/casecenter site.
- 85% correct answers are required for pass.
- In the 2nd semester exam slides come from the 1st and 2nd semester.

Macro practical exam (autopsy room - week 14):
- This practical exam takes place in the autopsy room.
- Oral presentation and interpretation of macro preparations is expected.
- 1-5 grades. Grade 2 (pass) is required for the successful exam.

Pass of all 3 exams are required for entry to the ESE and FE.
Any failed test is to be repeated on the exam day before starting the oral part

Oral exam:
Oral presentation and discussion of topics chosen from the topic list.
ESE: Two randomly chosen 1st semester topics to be presented.

FE: Three randomly chosen topics (one from the 1st semester, and two from the 2nd semester).

The knowledge of students is judged on the five-grade evaluation scale (1-5 grades).

During the oral exam fail on any (possible) substation (written, practical, oral) means termination of the chance. The exam must be repeated from the part that failed.

During improvement exam only the oral exam topics must be repeated (the student can get worse grade than the previous one or possibly can fail).

For further information: http://pathol.med.unideb.hu

https://elearning.med.unideb.hu

Division of Clinical Physiology

Subject: **CLINICAL PHYSIOLOGY**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **14**
Seminar: **28**

1st week:
Lecture: Introduction, cellular and molecular factors of pathologic cardiac excitability.
Seminar: The basics of ECG.

2nd week:
Lecture: Pathologic contractile function of the heart (contractile proteins, intracellular Ca2+-homeostasis and cardiac pumping).
Seminar: ECG diagnosis of arrhythmias I.

3rd week:
Lecture: Myocardial ischemia, myocardial infarction and new ischemic syndromes (hibernation, preconditioning, stunning).
Seminar: ECG diagnosis of arrhythmias II.

4th week:
Lecture: Cardiac hypertrophy and failure.
Seminar: Differential diagnostics or arrhytmias, evaluation of ECG recordings.

5th week:
Lecture: Heart failure (molecular pathophysiology).
Seminar: Conduction disorders, ECG sings of volume and pressure overload.

6th week:
Lecture: Endothelium, smooth muscle, vessels.
Seminar: Angina pectoris, myocardial infarction.

7th week:
Lecture: Hypertension.
Seminar: Exercise stress test ECG, Holter ECG.

8th week:
Lecture: New translational perspectives in cardiovascular medicine.
Seminar: Electronic pacemakers, mechanisms of arrhythmias.

9th week:
Lecture: Stem cells in cardiovascular medicine.
Seminar: ECG signs of electrolyte disorders, differential diagnostics, practicing.
Self Control Test (Bonus points for the exam can be collected during the written mid-semester clinical physiology test during the 9th week.)

10th week:
Lecture: Cellular and molecular elements of the respiratory system with clinical significance.
Seminar: Evaluation of ECG recordings (oral ECG exam).

11th week:
Lecture: Clinical physiology of the respiratory system.
Seminar: Echocardiography I., standard views, normal values.

12th week:
Lecture: Clinical physiology of nutrition and metabolism.
Seminar: Echocardiography II., consequences of myocardial infarction, stress echocardiography, TEE.

13th week:
Lecture: Clinical physiology of the nervous system I.
Seminar: Respiratory function tests.

14th week:
Lecture: Clinical physiology of the nervous system II.
Seminar: Cardiac catheterisation.
Self Control Test (Result of the 9th and 14th weeks tests will form the basis for a recommended final mark.)

Requirements

Students are expected to attend lectures and obliged to attend seminars. The Department may refuse the acknowledgment of the semester from this subject if a student is absent for more than two seminars. Seminar attendance is recorded electronically during the first 5 minutes of the seminars, thereby late arrivals by 6 or more minutes result in seminar absences. A successful oral ECG test (during the 10thweek of the second semester) is also a prerequisite for Clinical Physiology.

Third year students are invited to participate in two written tests ("Assessment of the work" (AW)) during the 9th and 14th weeks organized by the Division of Clinical Physiology. Single choice test questions (single right or single false answers should be chosen from five possibilities) will be asked to assess students' proficiency. Bonus points can be collected for the 9th week written exam to be included into the result of the pre-final (14th week exam) and final tests (during examination period). 20 questions covering the materials of lectures and seminars between 1-9 weeks will be asked on the 9th week written self control.

Students reaching higher than passing limits will be offered by a recommended grade following the

14th week self control. This pre-final exam will contain 50 questions where the entire curriculum of Clinical Physiology will be included. The Division cannot ensure opportunities for the inspection of the corrections of the above self controls on a personal basis, nevertheless test questions can be discussed after the tests during independent events organized for all students at the same time. Students are expected to arrange this event where a minimum of 40 students should participate and to contact the academic advisor for technical support.

If a final grade cannot be recommended, written exams will be performed during the examination period. First exams and first repeated exams are in written, while the second repeated exam is in an oral. In addition students can register for an oral improvement provided they exceeded the passing limit of any written tests. There is not a special topic list for oral improvement exam, oral ECG analysis and all the materials of seminars and lectures are asked.

For more information, please visit: klinfiz.unideb.hu. Login requires NEPTUN code and its password.

CHAPTER 17
ACADEMIC PROGRAM FOR THE 4TH YEAR

Department of Behavioural Sciences

Subject: **BIOETHICS**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Seminar: **10**

1st week:
Lecture: General Ethics Introduction – philosophical and conceptual overview
Seminar: Casuistry as a Means of Analysis – 1st case analysis

2nd week:
Lecture: Modern Medical Ethics – its evolution, character-traits and relation to its predecessors.
Seminar: Questions of Patient Rights and Justice – 2nd case analysis

3rd week:
Lecture: Patient Rights – their history, importance and challenges in the modern healthcare systems
Seminar: End of Life Decision, Questions re. Comatose and Vegetative patients – 3rd case analysis

4th week:
Lecture: End of Life Decisions – withholding and –drawing treatments, futility, triage
Seminar: Challenges of Research Ethics – 4th case analysis

5th week:
Lecture: Fundamental Ethical Questions of Human Trials and Research Integrity
Seminar: Ethical Questions of Reproduction – abortion, eugenics, and the sociopolitical aspects of bioethics

6th week:
Seminar: Confidentiality and datamanagement in clinical practice.

7th week:
Seminar: Informed consent in practice.

8th week:
Seminar: Ethics of en-of-life decisions.

9th week:
Seminar: Clinical trials and non-interventional research.

10th week:
Seminar: Distributive justice in the clinic.

Requirements

Grade: Colloquium

Requirement of the signature: taking part in the seminars, one absence allowed
Compulsory readings:
Gregory E. Pence - Medical Ethics -Accounts of Ground-Breaking Cases McGraw-Hill Education, 2016
Guidry-Grimes, Laura, Veatch, Robert - The Basics of Bioethics – Routledge, 2019

About the course:

The course outlines and explores the basics of modern bioethics. It helps students orienting in the diverse questions of contemporary bioethics – ranging from its ethical foundations, theories and argumentation, through patient rights and the questions of autonomy, to the end of life decisions and research ethics issues.

On top of laying down the theoretical and conceptual grounds of the subject matter, the course aims to map the national and international legal frameworks and policy environment. Besides, the course's purpose is to train those competences which enables the students to interpret and critically reflect upon the actual laws through general and professional ethical norms, by means of developing their rhetorical, logical and philosophical skills.

Department of Obstetrics and Gynecology

Subject: **OBSTETRICS AND GYNECOLOGY I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **20**

1st week:
Lecture: Fundamentals of obstetrics and gynaecology. History and examination. Menstrual cycle
Practical: Introduction of the Department of Obstetrics and Gynecology. Gynaecologic and obstetric examination, cervical cancer screening. History taking in pregnancy. Menstrual cycle. Miscarriage, abortion, definitions.

2nd week:
Lecture: Physiological pregnancy: from the implantation to the delivery room
Practical:
Preconceptional care. Physiologic changes in pregnancy. Antenatal care. Role of the GP and the obstetrician. Importance of ultrasound examination. Fetal surveillance. Cardiotocography. Fetal compromise during labour. Meconium stained amniotic fluid

3rd week:
Lecture: Antenatal care. Fetal surveillance during pregnancy.
Practical:
Normal labour. Initiation of labour. Stages of labour. Preparation for labour. Alternative concepts of management. Protocols of the management of labour. Family and baby friendly practices. Legal aspects of labour, rights and decision making. Induction of labour: conditions, indications and methods

4th week:
Lecture: Normal labour. Intrapartum monitoring of the fetus.
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. Gynaecologic and obstetric examination, cervical cancer screening.

5th week:
Lecture: Family and baby friendly approach in obstetrics. Planned delivery, induction of 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. Gynaecologic and obstetric examination, cervical cancer screening.

6th week:
Lecture: Abnormal labour
Practical:
Identifying risk factors for preterm birth. Physical examination of the pregnant woman. Normal and abnormal uterine activity in labour. Premature and pre-labour rupture of memebranes. Postmaturity. Malpresentation and malposition. Abnormalities of the birth canal. Cephalopelvic disproportion.

7th week:
Lecture: Abnormal pregnancy. Medical disorders in pregnancy. Fetal abnormalities.
Practical:
Medical disorders in pregnancy by organ systems.Infectious diseases in pregnancy. Pre-existing and acquired diseases in pregnancy.

8th week:
Lecture: Haemorrhagic complications. Miscarriage. Preterm labour. Perinatal mortality
Practical: Placenta previa, abruption. Postpartum haemorrhage. Coagulation disorders, obstetric shock. Prematurity, causes, prevention, delivery. Perinatal mortality. Miscarriage and abortion, types and course.
Legal aspects of termination of pregnancy.

9th week:
Lecture: Intrauterine growth restriction. Multiple prengnancy. Hypertensive disorders in pregnancy
Practical:
IUGR. Abnormalities of the placenta, amniotic cord and amniotic fluid. Multiple pregnancy (physiology and special aspects of antenatal care and delivery) Pregnancy induced hypertension, chronic hypertension, preeclampsia, HELLP syndrome.

10th week:
Lecture: Caesarean section and instrumental vaginal delivery. Ectoipic pregnancy. Physiological and abnormal puerperium.
Practical:
Early pregnancy complications, use of ultrasound in the diagnosis.
Indications of caesarean section. Vacuum extraction. Ectopic pregnancy: types, diagnosis and management. Recognizing abnormal course of puerperium.

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.

Practices are focusing on deepening of knowledge of lecture material, emphasizing practical aspects, demonstrating how these principles work in our important units, e.g. labour ward. Hands-on training will be mainly during the block practices (5x6 hours). 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. Teaching material available on the eLearning site is also part of the exam. An online mid-semester self-control test will be conducted, the exact time and topic will be communicated during the semester. Students performing better than 70 % will have only 1 title to answer at the ESE. Questions from a pre-published list of minimals will also be asked at the exam.

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:
1. Osteoarthritis of the hip. Aseptic necrosis of the femoral head. Replacement of the hip joint.
2. 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.

2nd week:
Lecture:
1. Postural kyphosis. Scoliosis and its treatment.
2. 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.

3rd week:
Lecture:
1. Bone tumor and tumor like lesions
2. Bone infection. Acute and chronic osteomyelitis. Suppurative arthritis.

Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the hip. X-ray pictures evaluation. Introduction of the orthopaedic hip implants to the students.

4th week:
Lecture:
1. Functional anatomy of the foot. Congenital deformities and diseases of the foot.
2. Perthes' disease, transient synovitis of the hip joint. Slipped capital femoral epiphysis. Coxa vara.

Practical: Basic principles of examination

methods in pediatric orthopaedic surgery. Pediatric orthopaedic case-discussions. X-ray pictures evaluation.

5th week:
Lecture:
1. Frequency, pathology, diagnosis and treatment of developmental/congenital dysplasia/dislocation of the hip (DDH, CDH).
2. Diseases of the neck and upper extremities.
   Practical: Examination of patients by students and discussion. The use of hip ultrasonography in pediatric patients.

6th week:
Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the knee. X-ray pictures evaluation. Introduction of the orthopaedic knee implants to the students.

7th week:
Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the knee. Operative and conservative treatment methods. Knee arthroscopy.

8th week:
Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the spine. X-ray pictures evaluation. Operative and conservative treatment methods.

9th week:
Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the shoulder. Operative and conservative treatment methods.

10th week:
Practical: Basic principles of examination methods in orthopaedic surgery. Methods of physical examinations of the foot. X-ray pictures evaluation. Case-discussions.

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 elearning site of the University. 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, Physiology
Attendance at lectures is highly recommended, since the topics in examination cover the lectured topics. Attendance register will be performed regularly. Attendance at seminars is compulsory. The Department will refuse to sign the semester if he/she is absent from more than 2 seminars/semester. Two control tests during the semester will be performed, which is obligatory.
At the end of the 1st semester the students are required to take the End of Semester Examination (written and oral), based on the material taught in the semester. Three questions should be answered in detail. To know the groups of drugs with examples in all of the chapters in pharmacology is compulsory. If one question is remained properly unanswered from the three titles the student is not

allowed to pass. If lethal dose, not proper or ineffective treatment is discussed the student have to be failed.
Dress code for exams: Informal (www.dresscodeguide.com; www.dresscode.hu). Display religious affiliation is allowed (cross, abaya, burqa (niqab), chador, hijab, sartorial hijab, turban, yarmulke etc.), but it cannot generate fear. Wedding ring, sindoor, snoods are allowed as well. For more details visit our website: pharmacology.med.unideb.hu

Department of Public Health and Epidemiology

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. Climate change and human health
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 toxicology12. Health effects of noise
Seminar: 5. Chemical safety 6. Toxicological aspects of alcohol consumption

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, and 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 epidemiology22.Epidemiological investigations,
Seminar: 11. Basic biostatistics 12.Using research results in clinical practice I

7th week:
Lecture: 23. Frequency measures in epidemiology 24. Study design
Seminar: 13. Types of epidemiological studies14. Validity of epidemiological studies

8th week:
Lecture: 25. Analyses based on aggregate statistics 26. Conclusions of the epidemiological studies
Seminar: 15. Using research results in clinical practice II 16. Using epidemiological measures in practice (DEALE method)

9th week:
Lecture: 27. Preventive strategies 28.

Randomized controlled trials
Seminar: 17. Preventive strategies 18. Critical evaluation of the epidemiological literature

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

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: Lecture1: Diseases of the esophagus
Lecture 2: Plastic surgery operations of the trunk and extremities (Zoltán Péter, M.D.)
Practical: Thoracic surgery practice week

5th week:
Lecture: Lecture 1: Benign gastric lesions. Gastric cancer
Lecture 2: Plastic surgery operations in the head and neck region. (Attila Szűcs M.D., PhD)

Practical: Gastroenterologic surgery practice week

6th week:
Lecture: Hernia surgery

7th week:
Lecture: Diseases of the biliary tract and gall bladder

8th week:
Lecture: Hepatic surgery

9th week:
Lecture: Pancreatitis, pancreas malignancies

10th week:
Lecture: Diseases of the spleen. Laparoscopy in surgery

Requirements

There are 10 surgery lectures during the semester and 2 extra lectures on plastic surgery (organized by the Department of Dermatology)
During the first semester the first half of the year has to complete 5x2 hours of practice.
If missing a practice, you have to make it up with another group during the same week. The Head of the Department may refuse to sign the electronic Lecture Book if a student was absent from more than one practice during the semester without an acceptable reason.
Examination: written test covering the topics of the first semester.

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: delyed union and non-union. Posttraumatic arthritis. 2. Injuries in childhood. Injuries specific to growing bone and their treatment principles. Characteristic childhood injuries. 3. Injuries of thoracic cage. Pneumathorax, hemothorax. Cardiac injuries. Closed and open injuries of the abdomen. Diagnosis and operative treatment of abdominal organ injuries. Diaphragmatic ruprture. 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 calssification. Minimal invasive therapy: osteosynthesis using cannulated screws. Indication for the use of hip replacement. 3. Diagnosis, classification and treatment of per- and subtrochanteric femur fractures. Treatment of femur diaphysis fractures.

5th week:
Lecture: 1-2. Common fractures of the upper limb - treatment of fractures of the proximal humerus and wrist. 3. Diagnosis, classification and basic principles of treatment of crural and ankle fractures. Pilon fractures.

6th week:
Practical: Physical examination of the trauma patient. Anemnesis. General physical examination. Functional examination of the extremities (neutral 0 method). Examination of circulation and inveration. Imaging in the trauma treatment. Basic principle of x-ray examinations. Special investigations (CT, MRI, DSA, Color-Doppler, ultrasound). How to ask for imaging. Evaluation of X-rays.

7th week:
Practical: The basic principle of wound treatment. Sutures, knot tying, suture removal. Bandage. Tetanus and Lyssa profilaxis.

8th week:
Practical: Types of conservative fracture treatment. Roles of application of plasters. Soft bandages, braces, orthesises. Traction treatment.

9th week:
Practical: Operative fracture treatment. Implantations. Metallosis, corrosion, metal allergy. Types of osteosynthesises. Diagnostic and operative arthroscopy. Basic principles of osteosynthesises.

10th week:
Practical: Treatment of seriously injured patients. ATLS (Advanced Trauma Life Support). Resuscitation.

Requirements

The lectures will take place in the Auguszta big lecture hall. We strongly advise to participate on the lectures, because the official textbook include not all the diagnostic and therapeutic knowledge. The practices will take place two hours a week at the Department of Trauma and Hand Surgery (4031 Debrecen, Bartók B. u. 2-26). Participation on the practices is obligatory. In one semester one absent is acceptable, but the student has to come to the trauma duty to compensate it (confirmed and signed by the chief of the trauma duty). In case of not justified absent the lecture book will not signed, and the student can not go to the exam. Sign of the lecture book will take place the week before the exam period, at the secretariat of the Department of Trauma and Hand Surgery.

After finishing Traumatology I. course and practices, during the educational period there will be written test with 30 questions. The students, who have good results of the test, will receive discount on the oral exam.

Type of the exam:
emphasised mode oral exam (Kollokvium). Registration to the exam should be done the day before the exam till 12.00 hour on the internet Neptun program.
The oral exam consists of three questions.

Division of Cardiology

Subject: **INTERNAL MEDICINE III. (CARDIOLOGY, ANGIOLOGY)**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

1st week:
Lecture: 1. Epidemiology of cardiovascular diseases. Milestones in cardiology.
2. Pathomechanism of atherosclerotic diseases. Risk factors and prevention.
Practical: Coronary Heart Disease: stable coronary artery disease, unstable angina, STEMI, NSTEMI management.

2nd week:
Lecture: 3. Acute coronary syndrome management.
4. Stable coronary artery disease. Non-invasive and invasive imaging modalities for evaluating coronary artery stenos and their complications.
Practical: Congenital and acquired heart disease. Heart murmurs, diagnosis and therapy, surgical indications.

3rd week:
Lecture: 5. Coronary artery bypass graft surgery. Surgical management of the complications of acute myocardial infarction.
6. Peripheral arterial disease: symptoms, diagnosis and therapy.
Practical: Examination of heart failure patients. Arrhythmias.

4th week:
Lecture: 7. Aortic aneurysm: diagnosis, therapy. Vasculitis, disorders of microcirculation.
8. Symptoms, types, diagnosis and therapy of hypertension.
Practical: Hypertension and 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, bicuspidal aortic valve).

10th week:
Lecture: 19. Surgical and interventional management of valvular heart disease (valvular surgery, TAVI). Postoperative pharmacological therapy.
20. Cardiac rehabilitation after myocardial infarction, percutaneous and surgical interventions.

11th week:
Practical: Block practice

12th week:
Practical: Block practice

13th week:
Practical: Block practice

14th week:
Practical: Block practice

Requirements

Participation in practices is obligatory.
Type of exam: minimum test, practical exam, oral exam.
Signature of lecture book: take part in all practices. Application for subject.

Division of Radiology and Imaging Science

Subject: **RADIOLOGY AND NUCLEAR MEDICINE I.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **30**

1st week:
Lecture: Principles of Radiological Techniques. Contrast media in Radiology.
Practical: Contrast media in Radiology. Chest Radiology.

2nd week:
Lecture: Chest Radiology. Cardiovascular Radiology.
Practical: Cardiovascular Radiology.

3rd week:
Lecture: Gastrointestinal and abdominal radiology.
Practical: Gastrointestinal radiology I. (esophagus, stomach)

4th week:
Lecture: Urogenital Radiology. Gynecological and Obstetric Radiology.
Practical: Gastrointestinal Radiology II. (liver, spleen, gall, pancreas)

5th week:
Lecture: Breast imaging. Interventional radiology.
Practical: Urogenital Radiology. Breast imaging. Gynecological and Obstetric Radiology.

6th week:
Lecture: Neuroradiology - brain, spine.
Practical: Neuroradiology - brain.

7th week:
Lecture: Head and neck imaging.
Practical: Neuroradiology - spine.

8th week:
Lecture: Musculosceletal radiology.
Practical: Musculosceletal radiology.

9th week:
Lecture: Paediatric imaging.
Practical: Paediatric imaging.

10th week:
Lecture: Emergency radiology.
Practical: Emergency radiology.

Requirements

The aim of the course is to teach students the basis of how the different medical imaging modalities work with respect to clinical application. 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 examination.
Local anaesthesia in the oral cavity.
2. practice: Simple tooth extraction and possible complications.

Instruments of the tooth extraction. Basics of 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 maxillary sinus and salivary glands.
2. Practice Orthognathic surgery. Microsurgery and reconstructive 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. Root canal treatment procedure.
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 tempomandibular joints
10.Lecture: Orthodontics.

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 practical occasions can be max. 1.
All absences need to be certified.
The exam is ESE, an electronical test via exam.unideb.hu (moodle).
Max. 30 students can be examined on an exam date.

Department of Behavioural Sciences

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 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, breavement.

Practical: Communication with angry or aggressive patients.

10th week:
Lecture: The doctor as human being. Hierarchy in medical institutes. Chronic stress, occupational risks, burnout, vicarious traumatization, resilience, self-care.

Practical: Discussion of experiences of the patient/motivational interviews. Closing the course.

Requirements

Course organizer: Karolina Kósa MD PhD
Academic Advisors: Zia Fekete MA, Márta Fűzi MD
E-mail: behav.med@med.unideb.hu
Please use this email for all correspondence related to the course.
University of Debrecen, Faculty of Public Health
Institute of Behavioural Sciences

DESCRIPTION OF THE COURSE

The purpose of the course is to acquaint students with the practical application of the concepts and models of behavioural medicine in medical situations, including the bio-psycho-social perspective in different somatic diseases, in order to help students enlarge and integrate their knowledge of psychosocial and behavioural factors of diseases into the prevention, etiology, diagnosis, treatment and rehabilitation of somatic diseases. Students will obtain experience with certain methods of behaviour change, and they will observe and practice techniques of medical communication in concrete situations.

Number of teaching hours: 20
Practice: 10 hours- attendance of practice is compulsory; no possibility for swapping groups
Lecture: 10 hours – attendance is recommended; active attendance can substitute the test offered in the examination period. See below the explanation of active attendance.
Course material is available here: https://elearning.med.unideb.hu
Please search for “Behavioral Medicine”.
Search function: “Kurzusok keresése” at the bottom of the page.

TOPICS OF THE PRACTICES

1. Introduction. Assessing prior knowledge, expectations. Students’ career paths to date and actual stress sources. The role of psychology in the medical care. Requirements
2. Behaviour Change: the Prochaska-DiClemente (or Stages of Change) model and the motivational interviewing technique
3. Communication with somatising patient

4. Communication with angry or aggressive patients
5. Discussion of experiences of the patient/motivational interviews. Closing the course

REQUIREMENTS FOR THE PRACTICES

- Attendance of each practice is mandatory. Max. 1 absence is accepted (with or without justification). There is no possibility for make-up, no group swapping.
- Preparation & writing of a patient interview or motivational interview. Requirements for content and format of the interview can be viewed on this webpage: https://elearning.med.unideb.hu – Behavioral Medicine
- Deadline for submitting the essay in printed and electronic form to the practice instructor: last practice in week 10.
- Performance evaluation of practice: the practice instructor evaluates and marks the essay.

TOPICS OF THE LECTURES

1. Lecture Introduction. The topics of behavioural medicine. The mind-body problem in medicine. Psychological aspects of somatic diseases: cardiovascular and respiratory diseases.
2. Lecture Social processes in medicine. Hierarchy and emotions. Rapport, health literacy, adherence. Communication with older patients.
3. Lecture Psychological aspects of somatic diseases: gastrointestinal diseases, eating disorders, obesity
4. Lecture Potential difficulties in the doctor-patient relationship. Dying, death, bereavement.
5. Lecture The doctor as human being. Hierarchy in medical institutes. Chronic stress, occupational risks, burnout, vicarious traumatization, resilience, self-care.

REQUIREMENTS FOR THE LECTURES

- Attendance of the lectures is recommended.
- During all lectures, altogether 24 questions will be shown. Questions can be answered from the topics of the lectures and from the key terms given below (in part covered by previous subjects completed as pre-requisites for Behavioural Medicine).
- Active attendance of lectures enables students to complete the written test by the last lecture at week 10 provided that at least 14 answers will be correct out of 24 questions answered.
- Questions during the lectures can be answered by those students who registered for the course and are present at the lectures using their own smart devices via the distance learning website of the University: https://elearning.med.unideb.hu
- In order to receive a recommended grade for the written test exam, at least 14 questions must be correctly answered out of the 24 questions posed during the lectures.
- In order to be an active attendant of the lectures, please

1. attend the lectures,
2. enter the distance learning website of the University: https://elearning.med.unideb.hu using your Neptun code BEFORE THE FIRST LECTURE
3. bring an internet-connecting smart device (phone, laptop, tablet) to all lectures through which you will answer the questions,
4. keep in mind that not entering the website prior to the first lecture, or lack of smart device, or non-functioning device during the lectures will not be accepted as justification for complaints or excuse from answering the questions. The Institute of Behavioural Sciences does not take responsibility for the operation of the students' smart devices, cannot provide smart devices for answering the test questions during lectures, and does not offer alternative options for answering questions.

FINAL GRADE

- The final grade will be the mathematical average of the grade for the written test exam and the grade for the essay if both grades are at least "pass".
- If either the test or the essay is graded as 'fail', the test must be re-taken, the essay must be re-written.
- The topics of the written test will be based on the content of the lectures, the ley terms specified below, the compulsory readings, and the topics of the subjects required as pre-requisites for Behavioural Medicine.
- The written test with questions based on the content of lectures can be taken – after entering the distance learning website (elearning.med.unideb.hu) – at the following dates and times. The use of the students' own devices will not be allowed at the following occasions; all students must use the computers in the Room:
- week 12: 29 April, 17:00 Location: TEOK Building, Ground floor, Room 107.
- o week 14: 15 May, 17:00 Location: TEOK Building, Ground floor, Room 107.
- o Further dates for taking the test will be provided in the examination period.

In case of missing or failing the A chance test, the B chance test can be taken. In case of missing or failing the B chance test, an oral examination will be conducted at a specified time and location to be announced later.

KEY TERMS FOR THE WRITTEN EXAM

• basic terms: mental functions, cognitive systems, sensorimotor systems, affective systems, affective functions, social processes, disorder vs disease
• memory: working memory, long-term memory, explicit memory, implicit memory, declarative memory, procedural memory, episodic memory, executive functions
• metacognition, cognitive control, mental representation
• cognitive distortion, cognitive dissonance, cognitive bias, availability bias, attribution error, anchoring, framing, confirmation bias, self-serving bias
• fear, anxiety, threat, acute threat, potential threat, sustained threat, loss
• somatization, denial, acting out, idealization, rationalization
• trauma, crisis, acute stress, chronic stress, somatic and psychological symptoms of stress
• communication: congruent, incongruent, verbal, non-verbal, metacommunication, communication channels, agency, self-knowledge, mental state, affiliation, attachment
• rapport, adherence, non-adherence, compliance, non-compliance, health literacy, assessment of health literacy, placebo, nocebo
• drug habituation, drug addiction, behavioural addiction, substance dependence, tolerance, withdrawal
• stages of dying, bereavement, grief response, normal grief, pathological grief, complicated grief, euthanasia, passive euthanasia, active euthanasia, assisted suicide
• internalizing and externalizing disorders, organic, functional, somatic, somatoform, psychogenic, psychosomatic disorders
• factitious disorder, somatic symptom disorder, somatoform disorder, conversion disorder, malingering

COMPULSORY READINGS

All compulsory readings are accessible in pdf.

- lecture materials available here: https://elearning.med.unideb.hu – ÁOK GenMed Behavioural Medicine
- Cardiovascular and respiratory. In: Ayers, S. & de Visser, R. (2011). Psychology for Medicine. SAGE Publications Ltd, London, 269-293.
- Gastrointestinal. In: Ayers, S. & de Visser, R. (2011). Psychology for Medicine. SAGE Publications Ltd, London, 294-324.
- Callahan et al. (2008) Dementia and Late-Life Depression. In Boyer&Paharia (eds) Comprehensive handbook of clinical health psychology. John Wiley&Sons, Hoboken, New Jersey, 263-277.
- Death and dying. In: Ayers, S. & de Visser, R. (2011). Psychology for Medicine. SAGE Publications Ltd, London, 129-142.
- Bereavement. In: Alder et al. (eds) (2009) Psychology and Sociology Applied to Medicine. An Illustrated Colour Text. Churchill Livingstone, 18-19.
- Zimmerman et al. (2000) A 'Stages of Change' Approach to Helping Patients Change Behavior. American Family Physician, 61(5):1409-1416. http://www.aafp.org/afp/2000/0301/p1409.html#
- Motivational Interviewing: https://www.umass.edu/studentlife/sites/default/files/documents/pdf/Motivational_Interviewing_Definition_Principles_Approach.pdf
- Sobell&Sobell (2008) Motivational Interviewing Strategies and Techniques: Rationales and Examples. Online document
- Pilling, J. (2011) Medical Communication. Budapest, Medicina. The following chapters:
- Prevention and management of violence
- Communication with older patients
- Communication with somatising patients

RECOMMENDED READINGS

Pilling, J. (2011) Medical Communication. Budapest, Medicina
Alder et al. (eds) (2009) Psychology and Sociology Applied to Medicine. An Illustrated Colour Text. Churchill Livingstone.
Ayers, S. & de Visser, R. (2011) Psychology for Medicine. SAGE Publications Ltd, London.
Boyer & Paharia (eds) (2008) Comprehensive handbook of clinical health psychology. Wiley&Sons, Hoboken, New Jersey
Haas (ed) (2004) Handbook of Primary Care Psychology. Oxford, New York, Oxford University Press
Baile, W. F. The Complete Guide to Communication Skills in Clinical Practice. MDAnderson.
• Breaking Bad News
• Addressing Emotions
• Discussing Medical Errors
• Cultural Competence

- Challenging Emotional Conversations with Patients & Families
- Effective Communication in Supervision

https://www.mdanderson.org/content/dam/mdanderson/documents/education-training/icare/pocketguide-texttabscombined-oct2014final.pdf

Department of Internal Medicine

Subject: **INTERNAL MEDICINE IV. (ENDOCRINOLOGY, NEPHROLOGY)**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

1st week:
Lecture: 1. Diagnostic approach to thyroid diseases. Iodine metabolism. Iodine deficiency. 2. Hyperthyroidism, signs and symptoms. Graves'disease. Graves' ophthalmopathy. Toxic adenoma. Thyroid storm.

2nd week:
Lecture: 1. The thyroid nodule. Thyroid cancer. Multiple endocrine neoplasia, carcionoid syndrome. Hypoglycemic disorders.2. Hypothyroidism. Thyroiditis.

3rd week:
Lecture: 1. Adrenal insufficiency, adrenal crisis. Cushing's disease and Cushing's syndrome. 2. Hyper- and hypoparathyroidism. Hypercalcemic states.

4th week:
Lecture: 1. Mineralocorticoid excess. Congentianl adrenal hyperplasia. Pheochromocytoma. 2. Diseases of the anterior pituitary. Hypo- and hyperfunction. Posterior pituitary, diabetes insipidus, SIADH

5th week:
Lecture: 1. Hyper and hypoparathyroidism. Hypercalcemic states. 2. Case presentation

6th week:
Lecture: 1. Chronic kidney disease - definition, significance, classification, causes and screening. Referral to a nephrology clinic, emergency states. 2. Accelerated vascular calcification, anaemia and disorders of the Ca-P metabolism in kidney disease.
Practical: Endocrinology I. History taking, physical examination and diagnostic procedures in patients with endocrine diseases.

7th week:
Lecture: 1. Primary glomerulonephritis. 2. Acute and chronic tubulointerstitial nephritis. Pregnancy and the kidney. Urinary tract infection, renal stones.
Practical: Endocrinology II. Case presentation of patients with the most common endocrine diseases (Graves' diseases, acromegaly, Cushing's disease)

8th week:
Lecture: 1. Systemic diseases (diabetes, lupus, vasculitis, myeloma) associated with glomerulopathy. 2. Vascular and hypertensive kidney damage.
Practical: Nephrology I. History taking, physical examination and diagnostic procedures in patients with kidney diseases.

9th week:
Lecture: 1. Acute renal failure - presentation, diagnosis, differential diagnosis, prevention. 2. Renal replacement therapy (hemodialysis, peritoneal dialysis.
Practical: Nephrology II. Case presentation of

patients with the most common acute chronic kidney diseases (diabetes, hypertension, vascular kidney disease), differential diagnosis.

10th week:
Lecture: 1. Kidney transplantation, recipient and donor compatibility, immunosuppression. 2. Case presentation.
Practical: Renal replacement therapy. Presentation of the Division of Nephrology and the Extracorporeal Life Support Center

11th week:
Practical: Block practice

12th week:
Practical: Block practice

13th week:
Practical: Block practice

14th week:
Practical: Block practice

Requirements

Requirements for accepting the semester: Practices are compulsory, therefore nobody should be absent from any practice unless due to well-documented reasons. Missed practices should be repeated preferably the same week, confirmation of attendance should be presented to the tutor. Everyone must be able to communicate with the patients using basic Hungarian during history taking and physical examination. The official material of examinations includes the lecture and practice materials and the suggested readings.

Examination procedure:
1. Written test (minimum questions), pass limit 90%
2. Practical (bedside) examination
3. Theoretical examination

All the exam materials (minimum questions and answers, exam topics, lecture topics) can be downloaded from:

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: Abnormal uterine bleeding.
Practical: Primary and secondary amenorrhoea. Oligomenorrhoea, PCOS. Heavy menstrual bleeding, abnormal menstrual cycle. Dysmenorrhoea, PMS

2nd week:
Lecture: Sterility and infertility. Contraception.
Practical: Investigations and management of infertility. Medical treatment and assisted reproduction techniques. Family planning, contraception.

3rd week:
Lecture: Benign gynaecological conditions. Endometriosis
Practical: Congenital defects of the genitals, disturbances of sexual differentiation. Normal and abnormal puberty.

4th week:
Lecture: Precancerous lesions in gynecology. Gynaecological oncology. Medical and surgical management of gynecological malignancies.
Practical: Inflammatory diseases in gynecology. Family planning, contraception. Oncocytologic classifications (Papanicolau, Bethesda). Precancerous lesions in gynecology: screening, diagnosis and treatment.

5th week:
Lecture: Operative gynaecology for benign conditions: laparotomy, laparoscopy and hysteroscopy
Practical: Benign tumors of the vulva, vagina, cervix, corpus and ovaries. Endometriosis: pathophysiology, diagnosis and treatment.

6th week:
Practical: Precancerous lesions in gynecology: screening, diagnosis and treatment. Inflammatory diseases in gynecology.

7th week:
Practical: Menopause. Urogynecology. Uterovaginal prolapse. Pediatric and adolescent gynecology.

8th week:
Practical: Gynecological ultrasound. Diagnosis and treatment of benign gynecological tumors.

9th week:
Practical: Principles of gynecological oncology. Cervical screening. Medical treatment of gynaecological malignancies.

10th week:
Practical: Anatomy of the female pelvis. Surgery of gynaecological malignancies.

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.

Practices are focusing on deepening of knowledge of lecture material, emphasizing practical aspects, demonstrating how these principles work in our gynecological wards and outpatients. Hands-on training will be mainly during the block practices (5x6 hours). 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. Teaching material available on the eLearning site is also part of the exam. An online mid-semester self-control test will be conducted, the exact time and topic will be communicated during the semester. Students performing better than 70 % will have only 1 title to answer at the ESE. Questions from a pre-published list of minimals will also be asked at the exam.

Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOLOGY II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **50**
Seminar: **20**

1st week:
Lecture: Antiepileptics
Sedatohypnotics
Alcohols
Antipsychotics and lithium
Antidepressants
Seminar: Repetition of the pharmacology of the autonomic drugs and the prescription writing.

2nd week:
Lecture: Antiparkinsonian agents
Pharmacotherapy of other neurodegenerative diseases
Opioid analgesics and antagonists-I
Opioid analgesics and antagonists-II
Drug of abuse
Seminar: Pharmacology of the cardiovascular drugs. CNS pharmacology I: Antiepileptics and sedatohypnotics.

3rd week:
Lecture: General anaesthetics
Local anaesthetics
Peripheral and central muscle relaxants
Serotonin, agonits and antagonists, the ergot alkaloids and the therapy of migraine
Histamine and antihistaminic drugs
Seminar: Pharmacology of the gastrointestinal drugs. CNS pharmacology II: Antidepressants. Antiparkinsonian agents.

4th week:
Lecture: Non-steroidal antiinflammatory drugs I
Non-steroidal antiinflammatory drugs II
Pharmacotherapy of rheumatoid arthritis and gout
Hypothalamic and hypophyseal pharmacology
Thyroid and antithyroid drugs. Parathyroid hormon
Seminar: CNS pharmacology III: Antipsychotics, Other neurodegenerative disorders, opioids. Muscle relaxants and the pharmacology of anesthesia.

5th week:
Lecture: Adrenocorticosteroids and adrenocortical antagonists
Pancreatic hormones and antidiabetic drugs-I
Pancreatic hormones and antidiabetic drugs-II
The gonadal hormones and inhibitors-I
The gonadal hormones and inhibitors-II
Seminar: Serotonin, histamine, NSAIDs Pharmacological treatment of RA and gout.

6th week:
Lecture: Drugs and pregnancy
Pharmacology of doping
Agents that affect bone mineral homeostasis
Basic principles of antimicrobial chemotherapy
β-lactam antibiotics and other cell wall synthesis
Seminar: Endocrine pharmacology especially treatment of diabetes.

7th week:
Lecture: Protein synthesis inhibitors
Sulfonamides, trimethoprim and (fluoro)quinolones, metronidazole and urinary antiseptics

Antimycobacterial drugs
Other and novel antibacterial drugs
Antiseptics and disinfectants
Seminar: Antibacterial chemotherapy

8th week:
Lecture: Antiviral chemotherapy and prophylaxis I
Antiviral chemotherapy and prophylaxis II
Antiparasitic chemotherapy: basic principles. Antiprotozoal drugs
Antiparasitic chemotherapy: Antihelminthic drugs. Disinfectants, antiseptics and sterilants
Antifungal agents
Seminar: Antihelmintic and antiprotozoal agents. Disinfectants, antiseptics and sterilants

9th week:
Lecture: Cancer chemotherapy-I
Cancer chemotherapy-II
Cancer chemotherapy-III
Immunopharmacology-I
Immunopharmacology-II
Seminar: Antifungal and antiviral agents. Pharmacological management of neoplastic diseases.
Self Control Test (Test from the topics of the first 8 weeks.)

10th week:
Lecture: Toxicology-I Introduction to toxicology
Toxicology-II Treatment of intoxicated patient
Ocular and dermatological pharmacology
Pharmacology of radiological contrast media
Preclinical and clinical drug development
Seminar: Immunopharmacology. Toxicology. Drug development

Requirements

Prerequisites: Pharmacology I

Attendance at lectures is highly recommended, since the topics in examination cover the 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 can 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 and elearning.med.unideb.hu.
In case of declared emergency state the teaching activity will be changed according to the followings:
1. Teaching materials, webinar conference logins, other education related documents are distributed by the official e-learning website of the Medical Faculty (elearning.med.unideb.hu).
2. Lecture slides are uploaded at least in pdf format or in narrated file (e.g. ppsx). Interactive webinar conferences (web lectures) are organized, if proper decision comes into power.
3. Seminars are online and the conference program is the external part of the Moodle system.
4. Seminars are organized for each educational group by the original seminar leader. Joining the seminar is possible and required through the Moodle e-learning system.
5. Participation in seminars is compulsory, only 2x2 hours unjustified absences per semester are allowed and the attendance is automatically registered by the Moodle system. To help the understanding of the presented material, online tests can be organized (polling). These results WILL NOT BE evaluated as a mark, but the discussion can be based on the distribution of the answers.
6. The possibility is open and highly recommended for all of the students to participate in more

than one seminar session (2 hours) per week. The upper limit of students to join is 200 persons.
7. Regularly, practice tests are set up in the e-learning system. These result NO mark. Several attempts are allowed, the only goal is to reach better results than 90%.
8. After the withdrawal of emergency state, the original regulations come into power again.

Department of Public Health and Epidemiology

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. Characteristics of infectious diseases, steps of outbreak investigation 2. Epidemiology of sexually transmitted diseases 3. Epidemiology and control of zoonoses;
Seminar: 1. Introduction to the epidemiology and surveillance of communicable diseases;;Dynamics of infection; 2. Using Epiinfo in outbreak investigation

2nd week:
Lecture: 4., Epidemiology of nosocomial diseases 5. Epidemiology of gastrointestinal infections 6. Vaccines and immunization
Seminar: 3. Outbreak investigation of hepatitis B virus infection in clinical setting; 4. Nosocomial infections: surveillance and prevention

3rd week:
Lecture: 7. Epidemiology of hepatitis 8. Re-emerging infections. 9 Epidemiology of HIV/AIDS
Seminar: 5. Concept and methods of health monitoring; 6. Control of nosocomial infections

4th week:
Lecture: 10. Prion diseases: facts and theories in preventive medicine 11. Epidemiology and control of airborne infections 12. Introduction to the epidemiology of non-communicable diseases
Seminar: 7. Nosology (filling a death certificate); 8. Public health databases I

5th week:
Lecture: 13. Epidemiology of chronic respiratory diseases; 14. Epidemiology and control of metabolic diseases 15. Epidemiology and control of chronic gastrointestinal diseases
Seminar: 9. Priority setting in health care 10. Public health databases II.

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 analysis16. 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 (practice)	**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 semesters. Student participation is recorded electronically in lectures. At the beginning and 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.

(((a+b)/2)+c+d+e)/4

a -database handling exam
b -oral practical exam
c -grade from environmental health
d - grade from epidemiology
e - grade from health promotion and health policy

-if the student's calculated average is between x.25 ≤ and ≥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

Department of Pulmonology

Subject: **PULMONOLOGY**
Year, Semester: 4th year/2nd semester**,** 4th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

6th week:
Lecture: Respiratory symptoms and signs. Commonly used therapy in pulmonology. Lung function tests, blood gas analysis. Laboratory examinations in pulmonary disease.
Practical: Anamnesis, physical history and exam

7th week:
Lecture: COPD, Asthma bronchiale
Practical: Bronchoscopy. Lung cancer (diagnosis and therapy)

8th week:
Lecture: Lung cancer symptoms, signs, diagnosis, therapy. Chronic respiratory failure.
Practical: Lung function test, blood gas analysis.

9th week:
Lecture: Pneumonia. Tuberculosis. Pleural disorders.
Practical: Asthma bronchiale. COPD. Patient examinations.

10th week:
Lecture: Interstitional lung disease. Sarcoidosis. Pulmonary embolism, cor pulmonale, pulmonary hypertension.Collection of chest X-ray for the exam.
Practical: Chest X-rays for the exam.

Requirements

The rules written in the statue of the Organization and Operation of Medical University of Debrecen will be applied. The student is obliged to attend the practices.
In case of absence the student must compensate on the same week with another student's group or should ask the tutor.
If a student is absent more than twice from practices in a semester, he/she will not get signature. The final examination will consist of a practical (X-ray examination) and az oral part, two questions from the topics. The topics will be given in the first lecture of the semester.
Lectures are the guidelines for the examination.

Department of Surgery

Subject: **SURGERY II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**

1st week:
Lecture: Inflammatory Bowel Diseases
Practical: Vascular surgery practice week

2nd week:
Lecture: Acute abdomen, surgical emergencies
Practical: Breast-endocrine surgery practice week

3rd week:
Lecture: Surgery for morbid obesity
Practical: General surgery, TRP practice week

4th week:
Lecture: Bowel obstruction. Proctology
Practical: Thoracic surgery practice week

5th week:
Lecture: Surgical treatment of colorectal cancer
Practical: Gastroenterologic surgery practice week

6th week:
Lecture: Endocrine surgery

7th week:
Lecture: Benign breast lesions. Breast cancer

8th week:
Lecture: Vascular surgery (arterial and venous diseases)

9th week:
Lecture: Thoracic surgery

10th week:
Lecture: Transplantation surgery

Requirements

There are 10 surgery lectures during the semester.
During the second semester the second half of the year has to complete 5x2 hours of practice. If missing a practice, you have to make it up with another group during the same week. The Head of the Department may refuse to sign the electronic Lecture Book if a student was absent from more than one practice during the semester without an acceptable reason.
Examination: written test covering the topics of both semesters.
Special regulations relating to the state of emergency during the Second Semester, Year 2019/2020

Surgery II course is held in the form of e-learning. Lecture materials with voice-over are uploaded to the e-learning portal (elearning.med.unideb.hu).
Online Webex seminars are held on certain days in various topics.
The semester is accepted if the student participates in at least two of these web seminars.
Previous lecture bonus points are not applicable for the End-Semester Exam.

Department of Urology

Subject: **UROLOGY**
Year, Semester: 4th year/2nd semester**,** 4th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **16**

1st week:
Lecture: Tumors of the urinary bladder.
Practical: Introduction to urological clinical practice, describing the place of urology among all fields of medicine. Visiting the wards and operating theatres.

2nd week:
Lecture: Disorders of the testis, scrotum and spermatic cord. Penile cancer.
Practical: Clinical investigation of genitourinary tract, urological laboratory and imaging examinations. Uro-radiological case presentations.

3rd week:
Lecture: Tumors of the prostate.
Practical: Differential diagnosis and treatment of the obstruction of the urine collecting system: transurethral and suprepubic bladder catheter, uretercatheter, DJ stent, nephrostomy tube. Video demonstration of catheter insertion.

4th week:
Lecture: Female urology. Urodynamic study.
Practical: Endoscopy and laparoscopy in urology: indications, methods, benefits, disadvantages, complications. Demonstration of the special instruments.

5th week:
Lecture: Injuries to the genitourinary tract, emergency diagnosis. Male infertility. Male sexual problems.
Practical: BPH and prostate cancer: diagnosis, treatment and follow up. Defining differences between the two diseases. Touching prostate on probe.

6th week:
Lecture: Tumors of the kidney.
Practical: Differential diagnosis of scrotal disorders: varicocele, hydrocele, retention of the testicle, tescticular atrophy, epididymitis, orchitis, trauma, torsion, testicular cancer, inguinal hernia, oedema. Case presentations at the ward.

7th week:
Lecture: Tumors of the testis.
Practical: Urological infections, prevention. When to treat bacteruria. Nosocomical infections. Urine analysis at our laboratory.

8th week:
Lecture: BPH. Retention urine. Clinical assessment and treatment.
Practical: Urinary stone disease: etiology, diagnosis, treatment. Discussing the problematic titles of urology.

9th week:
Lecture: Nonspecific infections. Specific infection. Pediatric urology. Congential anomalies.

10th week:
Lecture: Urinary tract stones. Surgical and non surgical treatment. Radiomorphologic investigation in urology.

Requirements

Exam: oral type, the student has to pull 2 topics (1 cancer and 1 general).
Students have to attend all (8) urological practices during the semester. In case of absence the student must compensate for the missing practice (either with joining another group or asking the

supervisor about his duty).
Student hase to subscribe all of the attendance register of eight practices. This need for student can register to the exam.
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: Disorders with non-Mendelian inheritance. Genetics of multifactorial diseases.

10th week:
Lecture: Genetics of infertility. Case presentations, interpretation of test results.

Requirements

Evaluation: Students take written exam during the examination period.

Division of Radiology and Imaging Science

Subject: **RADIOLOGY AND NUCLEAR MEDICINE II.**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

1st week:
Lecture: Principles of radionuclide imaging. Radiobiology and radioprotection.
Practical: Nuclear Medical investigations procedures, demonstrated on bone scintigraphy.Visit to Nuclear Medicine Department. Tools for radiation protection.

2nd week:
Lecture: Isotope diagnostics inendocrinology. Radioiodine therapy of hypertherosis. Radionuclide imaging of the heart and lung.
Practical: Thyroid and other endocrine studies. Radioisotope imaging of the heart.

3rd week:
Lecture: Radionuclide imaging of the kidney function and the gastrointestinal tract.
Practical: Dynamic studies: kidney, hepatobiliary, esophageal, gastric.

4th week:
Lecture: Nuclear medicine in oncology; cell labeling. Radioisotope therapy.
Practical: Nuclear oncology. Inflammation & infection.

5th week:
Lecture: Basics of radiation therapy.
Practical: Brain SPECT and PET. Lung function.

9th week:
Lecture: The spine and the spinal cord
Practical: The diseases of the spine and the spinal cord

Requirements

Chance "A" is a written exam with offered term mark. if not accepted, the term mark will be the average of the written and oral parts. Chance "B" and "C" are oral.
One absence is allowed.Electronic materials:
http://elearning.med.unideb.hu/ ingroup "Izotópdiagnosztika/Nuclear Medicine" see " Nuclear Medicine

CHAPTER 18
ACADEMIC PROGRAM FOR THE 5TH YEAR

Affiliated Department of Infectology

Subject: **INFECTOLOGY**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **15**
Practical: **20**

1st week:
Lecture:
Challenges in Infectious Diseases. Coronavirus infections., COVID-19
Practical: Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

2nd week:
Lecture: Antibiotics - Practical antimicrobial therapy
Practical: Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases
Kenezy Gyula University Hospital, Infectology

3rd week:
Lecture: Infection control in hospital settings. Multiresistant pathogens, noscomial infections
Practical:
Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major classes of infectious diseases
Kenezy Gyula University Hospital, Infectology

4th week:
Lecture: 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 Behavioural Sciences

Subject: **BEHAVIOURAL SCIENCES FINAL EXAM**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester

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://aok.unideb.hu/sites/default/files/upload_documents/topics_behav_sci_final_exam.pdf

Compulsory readings for the final exam:

MEDICAL PSYCHOLOGY, AND BEHAVIOURAL MEDICINE

Csabai, M. and Molnar, P.: Health, Illness and Care. A textbook of medical psychology. Springer, Budapest, 2000.

Material of the lectures

BIOETHICS

Handouts and background readings: in e-formats that were given during the seminars. Jay E. Kantor: Medical Ethics for Physicians-in-Training. Plenum, NY & London, 1989.

MEDICAL SOCIOLOGY

Anne-Marie Barry and Chris Yuill. Understanding Health. A Sociological Introduction. SAGE Publications. London-Thousand Oaks-New Delphi. 2002.

MEDICAL ANTHROPOLOGY

Chapters from the following textbook: Cecil G. Helman: Culture, Health and Illness, Fifth Edition, Hodder Arnold, London, 2007. (different editions are available)

- The body: cultural definitions of anatomy and physiology
- Doctor-patient interaction
- Gender and reproduction
- Pain and culture
- Culture and pharmacology: drugs, alcohol and tobacco
- Cross-cultural psychiatry

(Titles of chapters can slightly differ in different editions.) + Handouts

Academic Advisor:
Karolina Kósa M.D., M.Sc., Ph.D.
email: kosa.karolina@med.unideb.hu
Further information is available:
Gergő Somogyi
email: somogyi.gergo@med.unideb.hu

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:** Syphilis, gonorrhoea, other sexually transmitted diseases. Naevi. Malignant melanoma.

Practical: Primary and secondary lesions, dermatological anamnesis and status. Patient examination.

2nd week:
Lecture: Primary and secondary lesions
Seminar: Skin tumors originating from non-pigment cells.
Eczemas.
Practical: STD laboratory testing. Patient examination.

3rd week:
Lecture: Cutaneus autoimmune disorders.
Seminar: Urticaria, anaphylaxis.
Drug allergy.
Practical: Test: STI, primary + secondary lesions.
Allergological skin tests. Patient examination.
Self Control Test

4th week:
Lecture: Vasculitis
Seminar: Bacterial infections.
Viral and parasitic dermatoses.
Practical: Phototheapy, cosmetology. Patient examination.

5th week:
Lecture: Cutaneous tumors: benign skin tumors; mycosis fungoides, Kaposi-sarcoma.
Seminar: Psoriasis and other papulosquamous disorders.
Thermic injuries (Burn and frostbite)
Practical: Dermatoscopy. Burn. Patient examination.

6th week:
Lecture: AIDS.
Mycotic infections.
Practical: Test: skin tumors + burn. Patient examination.
Self Control Test

7th week:
Lecture: Chronic venious insufficiency. Leg ulcer.
Seborrhoea, acne rosacea, perioral dermatitis.
Practical: Mycological examination, introduction to topical therapy. Patient examination.

8th week:
Lecture: Topical therapy in dermatology. Photodermatoses. Photo(chemo) therapy.
Practical: Test: inflammatory skin diseases. Patient examination.
Self Control Test

9th week:
Lecture: Dermatosurgery, histology.
Hair and nail diseases.
Practical: Test: skin infections. Patient examination.
Self Control Test

10th week:
Lecture: Systematic therapy in dermatology.
The skin and internal diseases.
Practical: Consultation, presentation of clinical photos. 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

In accordance with and in addition to the concerning general regulations of the University Medical School of Debrecen, Debrecen, Hungary, the Department of Dermatology requires the followings from the 5th year medical students

According to the University's Study and Examination Regulations, it is required to participate on all practical classes and seminars, and participation of at least 30% of lectures (indicated in the beginning of the semester) is mandatory, while participation in the other lectures is strongly recommended. The material given on the lectures, seminars and practical classes, and literature that was recommended during the classes is asked during the exam.

Make up for practical classes and seminars:
* In case of absence, there is a possibility to make up the practical class with another group (the class with the same topic). Prior to compensation class, the consultation with the group tutor or the educational supervisor is required. The group tutor or the educational supervisor will determine the date of the make-up class to avoid the large group education.
* In the case of a seminar, the absence can be made up by attending a recommended, non-mandatory lecture. It is necessary to request a certificate/ signature of attendance from the lecturer which must be presented to educational supervisor or to your group tutor.
* During the semester, the number of uncompensated absences may not exceed 1 occasion (2 hours for practice, 1 hour for seminar). The number of compensated absences may be maximum two occasions (4 hours for practice, 2 hours for seminar).
* At one time maximum 3 students can make up the class in a given group.
* The student will not receive a signature in case of two unvalidated absences (2 times = 4 hours in case of practice, 2 times = 2 hours in case of seminar).

If someone wants to change groups during the semester, a written request mentioning the reason of the group change to the educational office and to the department's educational supervisor must be submitted. If someone changes groups arbitrarily without permission, the semester cannot be accepted even though the student has participated in all the practical classes. The group change is possible within actual semester (within groups 1-5 or 6-10). To change the group from current semester to another (eg from group 2 to group 8), the dean's permission is required.

The aim of our practical classes is to practice patients' medical history taking, physical examination at bedside. During the practical classes students with tutors demonstrate different diseases, perform patient examinations, anamnesis taking, and status description.

At the beginning of each practice, thematic material is discussed on the topic of dermatological diagnostics and topical treatments.

We expect our students to behave appropriately, to respect the patients' rights. Patients' data and examination results must be treated confidentially. Removal of patients' medical documents (outpatient and inpatient medical reports, final reports) from the wards, taking pictures or making

photocopies of the medical documentation is strictly forbidden. The rules of medical confidentiality also apply to medical students, their violations can have legal consequences.

Midsemester tests:
- There are four tests during the semester (2 oral, 2 written), that will take place during practicals.
- The assessment tests are obligatory, in case of absence, it has to be discussed with the group supervisor to perform the test at the following practical hour.
- Test compensation/improvement can be done at week 10.
- During the exam in addition to the knowledge of the recommended literature, we also take into account material taught during the lectures, seminars and practical classes.

Parts of the exam (colloquium):
1. The written test (10 minimum questions, which are available at the website of the department). To pass, it is required to get 6 points out of 10. If the student scores less than 6 points, the exam cannot be continued and the mark is FAIL.
2. The oral exam consists of two parts: theoretical and practical questions.
3. A photo with skin lesions is presented to the student as the part of the practical exam. Based on the seen clinical picture, we will ask the student to describe the skin symptoms and set up a differential diagnosis.

Completion of all three parts of the exam gives the final mark, which will also include the average mark of the midsemester tests.

Department of Emergency Medicine

Subject: **EMERGENCY MEDICINE**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **20**
Practical: **20**

1st week:
Lecture: General approach for emergency care, urgency levels, transportation trauma, etc. Rescue techniques in catastrophe situations.
Practical: Initial assessment and treatment with the airway, breathing, circulation, disability, exposure, approach in emergency medicine. Practical approach for emergency medicine. Prehospital Management. Airway management. Symptoms of airway obstruction.

2nd week:
Lecture: Cardiac arrest, levels of cardiopulmonary resuscitation, basic life support, professional basic life support, advanced life support, post resuscitation care.
Practical: BLS.

3rd week:
Lecture: Cardiac rhythm disturbances. Hypertensive emergencies. Syncope, endocrine, metabolic and acid-base emergencies.
Practical: Safe defibrillation. AEDs, manual defibrillators.

4th week:
Lecture: Chest pain, acute coronary syndromes, pulmonary embolism, aortic dissection.
Practical: Indications and limitations of maintaining peripheral veins. Vein puncture. Intraosseous access. Central vein catheterization. Gastric lavage, delivery in the field.

5th week:
Lecture: Shock. Acute severe allergic reactions, anaphylaxis. Respiratory failure.
Practical: CPR practice/ ALS.

6th week:
Lecture: Pediatric emergencies cardiac arrest in childhood, acute circulatory and respiratory failure, seizures, etc.
Practical: Pediatric CPR.

7th week:
Lecture: Poisoning psychiatric emergencies.
Practical: Complex rapid trauma survey.

8th week:
Lecture: Abdominal pain. Gastrointestinal bleeding. Vomiting and diarrhea. Obstetric and gynecologic emergencies.
Practical: Complex treatment of critical patients.

9th week:
Lecture: Stroke, headache, subarachnoid hemorrhage, convulsions, altered mental status, coma.
Practical: Complex case situation.

10th week:
Lecture: Abdominal pain. Gastrointestinal tract bleeding. Vomiting and diarrhea. Obstetric and gynecologic emergencies. Pediatric emergencies -cardiac arrest in childhood, acute circulatory and respiratory failure, seizures, etc.
Practical: Consultation.

Requirements

Requirements for signing the lecture book:

For obtaining the signature at the end of the semester you are required to attend all practicals. In case of absence you have to do the practical at a chosen time, written excuse is not accepted. Concerning the supplementary practical you have to contact your physician responsible for the practical. Facilities for maximum 2 (two) complementary practicals are available at the Simulation Center in Debrecen. If somebody will have more than 2 missed practices will get no signature. Evaluation: students write a test every week reading previous week lectures topic. The final examination consists of an oral and a practical part. Students can go for the oral exam only if they pass the practical exam. You can register for the exam before the beginning of the examination period. In case you fail to register for the exam we consider it as a failed one. "A" and "B" exam chances are assured.

The subject Emergency medicine (AOOXY03T9) includes course material equivalent to 0.5 credits according to the electronic, Moodle-based teaching program entitled “Basic Life Support module (BLS)” and course material equivalent to 2.0 credits according to the electronic, Moodle-based teaching program entitled “Advanced Life Support module (ALS)”

Department of Family and Occupational Medicine

Subject: **FAMILY MEDICINE**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Seminar: **10**

1st week:
Seminar: 1. Primary health care. General practice/family medicine.

2nd week:
Seminar: 2. Doctor-patient consultation in general practice/family medicine. Diagnosis and treatment in primary care.

3rd week:
Seminar: 3. Working with families in primary health care.

4th week:
Seminar: 4. Prevention in primary care.

5th week:
Seminar: 5. Quality in general practice: Medical audit, practice guidelines in general practice.

Requirements

Requirements for signing the lecture book: The grade is calculated according to the result of the written exam and activity during the seminars.

Department of Forensic Medicine

Subject: **FORENSIC MEDICINE I.**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

1st week:
Lecture: Introduction to Forensic Medicine.
Practical: Getting to know the Department of Forensic Medicine.
Practices between 1st - 11th week: Usual and special autopsy techniques, external examination of dead person autopsy cases and case studies on the above mentioned topics.

2nd week:
Lecture: Forensic autopsies.

3rd week:
Lecture: Time of death. Postmortem changes after death I.

4th week:
Lecture: Postmortem changes after death II.

5th week:
Lecture: Types of injuries and wounds I.

6th week:
Lecture: Types of injuries and wounds II. Vital injuries.

7th week:
Lecture: Traffic accident victims.

8th week:
Lecture: Craniocerebral trauma. Electrical injuries.

9th week:
Lecture: Firearm injuries. Effects of heat and cold. Fire deaths.

10th week:
Lecture: Death due to asphyxia I-II.

11th week:
Lecture: Physical and biological trace evidences.

Department of Internal Medicine

Subject: **INTERNAL MEDICINE V. (GASTROENTEROLOGY)**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

1st week:
Lecture: 1. Gastrooesophageal reflux disease 2. Gastritis, H. pylori infection, Peptic ulcer disease.

2nd week:
Lecture: 1. Neoplasms of the esophagus, stomach and small intestine. 2. Malabsorption, celiac disease, lactose intolerance.

3rd week:
Lecture: 1. Inflammatory bowel disease (Crohn's disease. Ulcerative colitis) 2. 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: patomechanism, 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. Electrolite 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 85%
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. Csépány 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. Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday, Wednesday, Friday 13:00-14:00
Material for students: available at https://elearning.med.unideb.hu/

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. Practical exam will be performed at the leader of the group after the last practice.
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 I.**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **10**

1st week:
Lecture: Introduction to pediatrics. (Epidemiology, physical examination). Lecturer: Tamás Szabó M.D., Ph.D.
Cardiopulmonary adaptation. Pediatric emergencies in the delivery room, Birth injures. Lecturer: György Balla M.D., Ph.D., D.Sc.

2nd week:
Lecture: Rare disease manifested in infancy and childhood. Lecturer: Katalin Szakszon M.D., Ph.D.
Respiratory problems in newborns (differential diagnostic approach.) Lecturer: Tamás Kovács M.D.

3rd week:
Lecture: Solid tumors in childhood. Lecturer: István Szegedi M.D., Ph.D.
Diseases of central nervous system in newborns. Leturer: Andrea Nagy M.D.

4th week:
Lecture: Techniques of natural and artificial feeding. Special formulas. Vomiting in Neonates anf infants. Lecturer: Timea Rózsa M.D.
Childhood psychological diseases. Lecturer: Beáta Nagy M.D., Ph.D.

5th week:
Lecture: Congenital and aquired diseases of the gastrointestinal tract requiring surgical intervention in neonates and young infants.

Lecturer: László Sasi Szabó M.D.
Seizures in infants and newborns. Hypoxic damage, Periventricular leukomalatia. Habilitation. Lecturer: Mónika Bessenyei MD.

6th week:
Lecture: Charasteristics of gastrooesophageal reflux in infants and children. Treatment of malnutrition. Diagnosis of Eosinophil diseases, bloody stools. Lecturer: Orsolya Kadenczki M.D.
Cardiac emergencies in newborns and infants. Lecturer: Gábor Mogyorósy M.D., Ph.D.

7th week:
Lecture: Neonatal charasteristics of renal function, urinary tract disorders. Lecturer: Tamás Szabó M.D., Ph.D.

8th week:
Lecture: Fluid and electrolyte balance. Acid-base balance disorders: acidosis, alkalosis. Lecturer: Tamás Kovács M.D.
Immunodeficiencies and autoimmune diseases in childhood. Lecturer: Rita Káposzta M.D., Ph.D.

9th week:
Lecture: Intrauterine and neonatal infections. Lecturer: Gergely Balázs M.D.
Failure to thrive in children (GOR) Lecturer: Éva Nemes M.D. Ph.D.

10th week:
Lecture: Special problems of prematurity (RDS, ROP, NEC, DAP, BPD). Lecturer: Balázs-Kovács Pászthy M.D.
Diseases associated with lower and upper respiratory obstruction (differential diagnosis). Lecturer: Zsolt Bene 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.

The students should participate in two weeks Block practice either in the first or the second semester.

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

Conditions to accept the semester: The student is required to participate the practicals, only one absence can be made up by joining to other group.
Exam: Every student has to write a case report to obtain the practical grade.

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: Airway management - basic

2nd week:
Lecture: Respiratory insufficiencies: definition, causes, types and basic guidelines of treatment
Practical:
Airway management - advanced

3rd week:
Lecture: Oxygen therapy and artificial ventilation
Practical: Monitoring ventilation, O2 therapy and mechanical ventilation

4th week:
Lecture: The treatment of the acid-base disturbances
Practical: Hemodynamic monitoring and support

5th week:
Lecture: Sepsis and multiple organ failure
Practical: Advanced Life Support

6th week:
Lecture: Brain death and donor conditioning
Practical: Nutrition therapy

7th week:
Lecture: General (intravenous and inhalational) anesthesia
Practical: General anesthesia. Regional anesthesia and pain therapy

8th week:
Lecture: Intensive treatment of the hemodynamically unstable critically ill
Practical: Anesthesiological risk, premedication, OR and PACU

9th week:
Lecture: Life-threatening disturbances of fluid-electrolite balance. Guidelines of volume therapy
Practical: Workload at the ICU. Transport of the critically ill

10th week:
Lecture: Regional anesthesia
Practical: The diagnostic steps and treatment of acid-base disturbances

Requirements

On weeks 1-5 practicals are held at he Simulation Center of the Medical Faculty (Ophthalmology Clinic Building), whereas between 6th-10th week at the working place of the tutor. Conditions of signing the Lecture book: The student is required to attend the practicals, absences are to be compensated during the duties of the tutor. Exam: The prerequisite of entering the exam is to show the signed attendance sheet of the practicals. The exam is oral only. Every student has to answer two oral questions. In case of uncertainty, the examiner might ask other questions related to other topics in order to make sure his decision on the mark.
Depending on the actual COVID epidemiological situation, the program may change accordingly.

Department of Clinical Oncology

Subject: **CLINICAL ONCOLOGY**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **20**
Seminar: **7**

1st week:
Lecture: Molecular classification of tumors and basics of targeted therapy
Seminar: Emergency conditions in oncology

2nd week:
Lecture: Systemic therapeutic options in oncology
Seminar: Surgical aspects in oncology

3rd week:
Lecture: The role of prevention and screening in oncology

4th week:
Lecture: Supportive and palliative treatment in cancer patients

5th week:
Lecture: Treatment of colorectal cancer by stage

6th week:
Lecture: Basics of radiotherapy
Treatment of oesphageal and gastric cancer
Rare tumors
Seminar: Complex treatment of skin tumors

7th week:
Lecture: Treatment of testicular, prostate tumors
Psychooncology
Diagnosis and current treatment of breast cancer
Seminar: Treatment of biliary tract tumors, hepatocellular carcinoma andnpancreatic cancer

8th week:
Lecture: Treatment of renal cancer
Treatment of vesical tumors
Complex treatment of skin tumors
Seminar: Complex treatment of soft tissue tumors and osseal sarcoma

9th week:
Lecture: Dermatologic side effects of chemotherapy and targeteg therapy
Cpmplex treatment of lung cancer
Treatment of head and neck cancer
Seminar: Treatment of head and neck cancer

10th week:
Lecture: Imaging techniques in oncology
The role of translational research in oncology; biomarkers
Case presentations gastrointestinal tumors
Seminar: Case presentations - interesting cases

Requirements

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 VI. (HAEMATOLOGY, HAEMOSTASEOLOGY)**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **15**
Practical: **10**

1st week:
Lecture: 1. Haemopoiesis. Basic principles, normal values, aplastic anaemia, agranulocytosis. 2. Non-Hodgkin lymphomas I - classification, diagnostics
Practical: Bone marrow failure: aplasia, agranulocytosis, neutropenia, deficiency anaemias

2nd week:
Lecture: 1. Non-Hodgkin lymphomas II - treatment. 2. Hodgkin's lymphoma
Practical: Leukocytosis. Benignant and malignant haematologic disorders with special focus on AML, ALL, CLL and CML.

3rd week:
Lecture: 1. Acute leukaemias. 2. Chronic myeloproliferative disorders: PV, ET, MF
Practical: Lymphoma patients. Hodgkin-, and Non-Hodgkin Lymphomas.

4th week:
Lecture: 1. Hemolytic anaemias 2. Differential diagnosis of anaemia. Iron deficiency. Megaloblastic anaemia. Myelodysplastic syndrome
Practical: Thrombophilia, thromboembolism. Clinical signs, diagnosis, therapy.

5th week:
Lecture: 1. Chronic myelogenous leukaemia. 2. Chronic lymphocytic leukaemia. Multiple myeloma. Waldenström macroglobulinaemia.
Practical: Bleeding tendency (ITP, TTP, DIC, HIT, haemophilia, Willebrand-disease). A practical approach.Diagnosis, therapy

6th week:
Lecture: Hemopoietic stem cell transplantation

7th week:
Lecture: Inherited and acquired thrombophilias. Antithrombotic therapy induced bleeding

8th week:
Lecture: Inherited and acquired thrombophilias. Antithrombotic therapy induced bleeding.

9th week:
Lecture: Thrombocytopenias (ITP, DIC, TTP, HIT).

10th week:
Lecture: Coagulopathies (haemophilia, von Willebrand disease). Platelet disorders.

Requirements

Attending the lectures is not compulsory; however, it is highly recommended.

Participation at the practical lessons is compulsory. Since topics of the practices are very strict and only five haematological practices are available, no supplementary or „replacement" practices (e.g. weekends, other days, etc.) can be accepted! N.B. The importance of practical skill (physical and laboratory examination) will be in focus. The guide given above might be a matter of change according to the actually available patients.
Students are strongly recommended to prepare for the seminars since those will be interactive!

Examination:

A. Written test, the minimum questions can be downloaded from the following website: , under the tag "*Education"*.
B. Oral examination: practical questions and 2 titles.
Exam entrance only with signed Lecture Book.

Leader of Block Practice: G. Pfliegler MD Deputy leader: P. Batár MD PROGRAM -Working hours: 7:45 am – 13:45 pm, from Monday to Friday -Each day 5 students from 4th year and 3 students from 5th year should attend Morning discussion at 8:15 am., Rak Library (2nd floor of the old wing of 2nd Dept. Med.) -Students participate in the everyday practice of their tutor's ward. Beside this they attend visits, outpatient services, laboratories (endoscopy, haemostasis,

haematology). -They have to attend one shift (8 am – 2 pm – 8 pm) at the Emergency Outpatient Service (1st Department of Internal Medicine), as well as one afternoon duty at the 2nd Department of Internal Medicine (2-10 pm). -Names of Tutors see below! -Exact dates with the names for Emergency Ward see below, afternoon duties in the 2nd Department of Internal Medicine will be made ready by the students for the second day of block practice. -One day leave with good reasons is allowed but has to be replaced by an additional working shift. Detailed program Location: Rak Library (2nd floor) Working hours 7:45 am – 13:45 pm Consultations, case presentations: 12 o'clock 1st Day (Monday): opening discussion 9 o'clock. Hematology/hemostaseology/rare diseases consultations 3rd day, Wednesday: consultation (Dr. Pfliegler) 4th day, Thursday: consultation (Prof. Z. Boda) 9th day, Tuesday: consultation (Prof. A. Kiss.) 11th day, Thursday: consultation (Prof. M. Udvardy) Closing session: the last day of practice (Prof. Boda – Dr. Batár)
THE PARTICIPATION ON CONSULTATIONS OF THE APPROPRIATE YEAR IS MANDATORY (i.e. HEMATOLOGY-HEMOSTASIS-RARE DISEASES FOR 5th YEAR, ENDOCRINOLOGY-NEPHROLOGY FOR 4th YEAR) but STUDENTS ARE ALSOENCOURAGED TO PARTICIPATE AT EACH CONSULTATION, i.e. 4th YEAR STUDENTS ON 5th YEAR CONSULTATIONS AND VICE VERSA.
Each day's attendance must be signed by the tutor! At the end of the block practice the tutors handle the signed sheets to the Block Leader, who is entitled to present them to the Education Office! It is mandatory for students to bring -Labcoat -Stethoscope -Pencil or pen, notepad

Department of Neurology

Subject: **NEUROLOGY II.**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **10**
Practical: **10**

1st week:
Lecture: CNS complications of internal medicine diseases

2nd week:
Lecture: Infectious diseases of CNS

3rd week:
Lecture: Bedside diagnosis of disturbances of consciousness

4th week:
Lecture: Emergency in neurology

5th week:
Lecture: Dementias

6th week:
Lecture: Sleep disturbances

7th week:
Lecture: Neuromuscular diseases

8th week:
Lecture: Mono- and polyneuropathies

9th week:
Lecture: Lobar syndromes

10th week:
Lecture: Questions and answers

Requirements

Consulting hours for Educational Advisor: Monday, Thursday 13:00 - 14:00.
Educational Advisor: Dr. Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday, Wednesday, Friday 13:00-14:00
Material for student: available at https://elearning.med.unideb.hu/

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.
4. 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: Anatomy of the eye and its appendages. Diseases of the eyelid, plastic surgery in ophthalmology.
Neuro-ophthalmology and diseases of the orbit
Practical: Patient history, outer examination, eyelid eversion

2nd week:
Lecture: Cornea and its diseases, refractive surgery
Cataract
Practical: Visual acuity, corrective lenses

3rd week:
Lecture: Glaucoma
Retinal diseases and intraocular tumors
Practical: Slit lamp examination, ophthalmoscopy, intraocular pressure measurement, visual field

4th week:
Lecture: Uveitis and retina surgery
Pediatric ophthalmology
Practical: Red eye, ocular trauma

5th week:
Lecture: Eye trauma and ocular emergencies, red eye
Ocular manifestations of systemic diseases
Practical: Acute visual loss

6th week:
Practical: Chronic visual loss

7th week:
Practical: Ocular motility disorders, diplopia, when it is necessary to refer a patient to ophthalmology

8th week:
Practical: Pictures

9th week:
Practical: Patient examination

10th week:
Practical: Patient examination

Requirements

Participation at the practicals is compulsory. Missed practicals can be replaced by attending practical with another group in the same week or in other time contact with the practical leader. The head of the Department may refuse signing of the Lecture book in cases of one or more missed practicals until replacement is done. The list of lectures (subject, date, lecturer) is on https://elearning.med.unideb.hu website. Attendance on lectures is recommended as pictures of the most important eye diseases are shown during lectures.
A written exam is organised on the last week of the semester. Participation on the written exam is not compulsory. If the grade offered is accepted, it should be indicated in the Neptun system within

5 working days. In case of acceptance the students do not have to take the final oral exam. In any other conditions students are required to take the oral exam (FE), which consists of a practical and a theoretical part. In the practical exam 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: https://elearning.med.unideb.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. If the chosen date has already been full, it is not possible to get extra places, so please choose another day.
Still have any question, you can write an e-mail: szemklinika@med.unideb.hu

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. Acut supparative otitis media
2. Treatment and complications of the otitis media
Practical:
General information.
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).

2nd week:
Lecture: 3. The cochlea and sound perception.
4. Audiological examination. Rehabilitation of the hearing loss
Practical: Physiology of hearing-practice in audiometry (whispering speech, conversational speech, examination s with tuning-fork, treshold audiometry, objective audiometry and special tests). Audiometrical methods in practice.

3rd week:
Lecture: 5. The vestibular system
6. Disorders of the nose and paranasal sinus. Tumors of the nose and paranasal sinuses
Practical: Symptomatology of ear diseases, Investigation of functioning of auditory tube (Valsalva's experiment, Polizter's test, tympanometry). Exposition and demonstration of ear operations, tympanoplasty, a antrotomy, mastoidectomy, the essence of radical ear operation. (operating theatre, videoprogram).

4th week:
Lecture:
7. The pharynx (inflammatory disorders, neoplasm)
8. The larynx (inflammatory disorders)
Practical: Nose and paranasal sinus operations, (FESS) nasal endoscopy videoprogram). Demonstration of maxillary sinus punction. Control method of epistaxis. Anterior nasal packing and Belloque-tamponade.

5th week:
Lecture: 9. Benign et malignant disorders of the larynx and the hypopharynx
10. The salivatory glands. Differential diagnosis of neck masses
Practical:
Tonsillectomy, adenoidectomy. Indications of tonsillectomy and adenotomy. (operating theater) Diff. diagnosis of cervical masses. Cervical nodes, cervical trigones, deep neck abscess as a complication of acute tonsillitis.

6th **week:**
Practical: Malignant diseases of larynx. Presentation of larynx operations/video or operating theatre. Endoscopes in the oto-rhyno-laryngological practice.
Self Control Test

7th week:
Practical: Demonstration of microlaryngoscopy and oesophagoscopy. Laryngological connections of Laser surgery/video or operating theatre. Use of laryngoscope.

8th week:
Practical: Practice in the Center for Medical Simulation. Conicotomy, tracheotomy.

9th week:
Practical: Vestibular examinations. Evaluation of spontaneus vestibular symptoms. Incuded examinations. (Rotatorical examination of electrical rotatory chair, electrony stagmography, analysis of optokinetic and positional nystagmus). Demonstration of 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: Malignant disease in childhood.
Differential diagnosis of anaemia, deficiency and hemolytic anaemia.

3rd week:
Lecture: Fainting states and epilepsy.
Pediatric gastroenterology diseases.
Inflammatory bowel disease, gastrooesophageal reflux.

4th week:
Lecture: Endocrine problems in children.
Childhood acute and chronic renal failure.

5th week:
Lecture: Pediatric emergency childcare-

poisoning.
Differential diagnosis in respiratory diseases in childhood.

6th week:
Lecture: Exanthema in pediatric diseases.

7th week:
Lecture: Treatment for children with type 1 (insulin-dependent) diabetes mellitus.
Obesitas, type 2 diabetes.

8th week:
Lecture: Primary and secondary immune deficiencies in children.
Autoimmune syndromes.

9th week:
Lecture: Congenital and acquired malformations of the urinary tract.

Requirements

Requirements for signing the lecture book: Attendance of practices is mandatory. In case of more than one absence the signature of the lecture book will be refused except in case of documented serious disease or other reasonable cause to be discussed with the senior lecturer in charge for the 5th year English curriculum. Absences should be made up, compensation will be arranged individually by the senior tutors of the groups.
Exam: Obtaining signature of the lecture book. Prearranged exam appointment strictly within the exam period as given by the Department of Education (to be obtained from the secretary of the Department, students are kindly requested to come to do the exam in a group of 5-15 students in an exam day; changes in the exam schedule should be made at least 24 hours -1 working day - prior to the scheduled exam). Type of examination: AW5 - oral exam, two titles. After the last lecture there is an option to do a test exam. If the result of the test exam is accepted by the student, the oral exam can be omitted.

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

Conditions to accept the semester: The student is required to participate the practice, only one absence can be made up by joining to other group.
Exam: Oral exam has to be taken to obtain the grade. Two titles, one theoretical and one practical topic have to be answered.

CHAPTER 19
ACADEMIC PROGRAM FOR THE 6TH YEAR

Internal Medicine	10 weeks
Pediatrics	7 weeks
Surgery	5 weeks
Neurology	4 weeks
Psychiatry	4 weeks
Obstetrics and Gynecology	5 weeks

Subject: **INTERNAL MEDICINE**
Requirements of the internship in Internal Medicine
Duration:**10 weeks**
Working hours**: 8 a.m. to 2 p.m.**
Working regulations: Students are entitled to work under the supervision of their tutors. The time schedule enables them to spend app. - 2 weeks in each special ward (e.g. hematology, outpatient service, gastroenterology, general medical, etc.) where they have to participate in the everyday clinical work - similarly to the residents. They will also get opportunities to become familiar with the laboratories (hematology, gastroenterology, hemostasis, clinical chemistry).
Duties: each week one duty (2 p.m. - 10 p.m.) is required.
Organized consultations: on special topics are also available.
Examination: consists of a practical, and an oral (two titles) part.
Notice: only those with a successful written and practical examination have the right to enter the oral part. In case of a failed exam the student must spend an additional practical period (5 weeks) plus 1 week preparation period according to the rules.

Subject: **NEUROLOGY**
REQUIREMENTS OF THE NEUROLOGY INTERNSHIP
Duration of the rotation is **4 weeks**.
Consulting hours for Educational Advisor: Monday, Thursday, 13:00 - 14:00.
Educational Advisor: Dr. Csépány Tünde Cecília, deputy: Dr. Csapó Krisztina
Office hours at Secretary: Monday, 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

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 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 Travlers, 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 catalogues).

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

The aim of the course: The aim of this course is to acquire a basic theoretical and practical knowledge on library search systems and databases for an effective learning-research activity.
Course description: The purpose of this course is to introduce students to the short history of the DEENK, its structure and regulations, and to present its services via the library's own website. Students will learn about the structure of the website, and get an overview of the most important menu items. Students will also become familiar with the use of traditional and electronic library systems and services, databases, and the online catalogue. PubMed: Students will learn about its structure, its role in scientific research activities, and the most important search methods and possibilities in online resources, health websites, and online journals.

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 immundefects

6th week:
Lecture: Cancer I.

7th week:
Lecture: Cancer II.

8th week:
Lecture: Cancer II.

9th week:
Lecture: Osteoporosis

10th week:
Lecture: Immunedeficiencies

Requirements

Course content: topics presented at the lectures (available at the elearning site of the Department of Biochemistry and Molecular Biology,**)** Follow the link: Educational materials- Elective courses

Attendance: Students are expected and required to attend all lectures of this course. No more than one unexcused absence is permitted. Students will fail the course on their second unexcused absence. Legitimate excuses should be presented in writing to the course administrator by the specified date.

Grading policy: The final grade will be based on the final oral exam at the end of the semester. Students have to select one topic from the full list of course topics for their oral exam, and can sign up for the topic at the link below. The final sign-up sheet will be posted on the department web-site at the beginning of the exam period. **It will be your responsibility to contact the lecturer for the assignment, and for the date of the oral examination.** The course lecturers will assign scientific publications to the students based on the sign-up sheet. For the oral exam students are expected to prepare a short Powerpoint presentation (4-5 slides) based on the publication, and discuss the publication with the lecturer.

Please follow the **announcements** of the course administrator about exam dates or changes in the schedule on the bulletin board (LSB downstairs, 1corridor), and on the department

Department of Clinical Oncology

Subject: **MOLECULAR ONCOLOGY AND CANCER PREVENTION**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **13**
Seminar: **2**

1st week:
Lecture: Transformation; Carcinogenesis
Tumorigenesis; The modeling of tumorigenesis
Molecular classification of cancers; Targeted therapy, personalized medicine

2nd week:
Lecture: The genetics of cancer / hereditary and acquired genetic changes / High vs. low penetrance genes / TCGA
Tumor heterogeneity and cancer stem cells
Tumor microenvironment / The role of inflammation in cancer formation and maintenance

3rd week:
Lecture: The rationale and strategies of cancer prevention
Seminar: Summary and discussion of the curriculum

4th week:
Lecture: Oncogenes as therapeutic target; NRs / RTKs as therapeutic and preventive targets
Tumor suppressors / DNA repair / synthetic lethality; Morphogenic tumor suppressor pathways
Metabolic alterations in cancer / The Warburg effect; Energy substrate sensors / AMPK, S6K, mTOR / IDH

5th week:
Lecture: Cancer risk factors and risk assessment; Biomarkers as surrogate endpoints
Proof of Concept - Clinical trials; Quantitation of treatment effect size
Cancer drug development / Design; Molecular screening / Drug repurposing

6th week:
Lecture: The theory and practice of immune therapy and cell therapy in oncology
Seminar: Summary and discussion of the curriculum

Requirements

Students are required to attend at least two thirds of the lectures. Expected for the successful completion of the course is the ability to apply cellular and molecular level knowledge of malignant disregulation to current treatment options in oncology and targeted therapy. Understanding the rationale and current status of cancer prevention is also emphasized. Course performance is evaluated in oral exams based on the topics listed, and includes the interpretation of a graph from a research paper.

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.

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 a student fails 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 a

student does not have at least 8 successful word quizzes, he / she has to take a vocabulary exam that includes all 300 words. A word quiz can be postponed by a week and students can take it only with their own teacher. Students can obtain bonus points (5-5%) by taking all the word quizzes successfully.

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

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

If the final score is below 60, the student can take a remedial exam once covering the whole semester's material.

Coursebook: See the website of the Department of Foreign Languages: **ilekt.med.unideb.hu.** Minimum vocabulary lists and further details are also available on the website.

Department of Human Genetics

Subject: **MEDICAL GENOMICS**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Lecture: **12**
Practical: **2**

11th week:
Lecture: 1. Introduction: genomics before and after the Human Genome Project
2. Traditional Sanger sequencing and next-generation sequencing methods
3. Bioinformatics and Genome Analysis, genomics and BIG DATA

12th week:
Lecture: 4. Major achievements of genome sequencing projects and future perspectives
5. Human genetic variations
6. Cell-free nucleic acids: characteristics and applications

13th week:
Lecture: 7. The genetics of cancer
8. Drug development and Pharmacogenomics
9. Clinical Laboratory Genetics: diagnostic gene/genome sequencing

14th week:
Lecture: 10. Invasive and non-invasive approaches for prenatal diagnosis
11. Importance of biomarkers in disease diagnosis, multivariate diagnostics. Biobanks.
12. Genome-wide association studies (GWAS) in complex genetic diseases. Personalized genome analysis, examples.
Practical: Expression and comprehensive genomics. GWAS.

Requirements

Minimum requirements of the signature:
- Electronic registration through Neptun.
- Active participation on Medical genomics practical(s)/seminar(s) – proved with signed

attendance-sheets.
- Those, who do not meet these requirements, cannot take the examination.

It is highly recommended to attend the Medical genomics lectures (but it is not the prerequisite of the signature).
- We give assignments at the end of the lectures in connection with the actual topic (altogether 12), and students may answer them for an offered grade. Grades: satisfactory (3): 50.00-64.99%, good (4): 65.00-74.99%, excellent (5): 75.00-100%. If the student rejects the offered grade, bonuses are given to him/her (max. 10).
- 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). 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/practicals will be held the same time as the Medical Genetics seminars/practicals.)

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

Department of Internal Medicine

Subject: **GERIATRIC MEDICINE**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **20**

1st week:
Lecture: Gerontology and Geriatrics. Aging in general. Communication with the elderly patient History-taking in the Elderly.

Self Control Test

2nd week:
Lecture: Physiological and patho-physiological

changes in the elderly. Pain medication in the elderly.
Self Control Test

3rd week:
Lecture: Age-related physiological changes in the heart. Circulatory disorders in the elderly.
Self Control Test

4th week:
Lecture: The most common respiratory diseases in the Elderly.
Self Control Test

5th week:
Lecture: Sarcopenia and immobilization in the Elderly.
Self Control Test

6th week:
Lecture: Changes of renal functions in the elderly.
Self Control Test

7th week:
Lecture: Endocrine changes with aging, endocrine diseases in the elderly. Metabolic changes and diseases in the elderly.
Self Control Test

8th week:
Lecture: Acute and chronic gastrointestinal disorders in the elderly.
Self Control Test

9th week:
Lecture: Depression, dementia in the elderly. Neuropatologic alterations.
Self Control Test

10th week:
Lecture: Diseases of the locomotor system in the elderly.
Self Control Test

Subject: **RARE DISEASES**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **10**

1st week:
Lecture: Rare disorders: introduction. (G. Pfliegler)Rare diseases: organizations Hungarian and international approach (J. Sándor)

2nd week:
Lecture: Molecular genetics in rare diseases (I. Balogh)Rare bleeding disorders - genotype, phenotype, laboratory and molecular genetics (Zs. Bereczki)

3rd week:
Lecture: Genetic disorders (É. Oláh) Manifestations of rare diseases in the eye (V. Nagy)

4th week:
Lecture: The role of biochemical laboratory in the diagnosis of rare disorders. (J. Kappelmayer) Lysosomal diseases and immunodeficiency (L. Maródi)

5th week:
Lecture: Orphan drugs. (G. Blaskó)Case presentations (E. Kovács, K. Urbán)Closing remarks (G.Pfliegler)Conditions for acceptance: test

Subject: **TRAVEL MEDICINE FOR MEDICAL SCHOLARS**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **30**

Requirements

1. Positioning travel medicine among the medical disciplines. Travel medicine in Hungary - first in Europe
2. Health status of the traveler. Risk factors of the traveler. Definition and analysis of the travel types. Prevention possibilities.
3. Classification of the travel related medical problems. Travel induced diseases: deep vein thrombosis,jet-lag, motion sickness, travel psychosis
4. Travel related medical problems: environmental hazards, traffic accidents, safety measurements, crime prevention
5. Vaccination-preventable and non-preventable infectious diseases. Traveler's diarrhoea. Safe food and drink.
6. Technique of the vaccination, contraindications, side effects
7. Pretravel advices for the immunocompromised traveler. Treatment abroad
8. Sexually transmitted diseases, morbidity, prevention. Post exposure prorhylaxis of AIDS
9. Dermataological problems during the trip and after returning
10. Modalities and timing of the repatriation. Indication and contraindications of the repatriation. MEDIF. Fit-to-fly formula
11. Malariaprevention, different types of malaria, high risk areas, malaria as an emergency
12. Travelers with special needs: VFR. Migration problems
13. Diabetic traveler, patient with heart disease, preparing COPD patient for travel
14. Cabin environment, preparing patient for the air travel. Fear of flying.

Department of Laboratory Medicine

Subject: **EPIDEMIOLOGY, PATHOPHYSIOLOGY, DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **11**
Seminar: **2**
Practical: **2**

1st week:
Lecture: Definition and epidemiology of osteoporosis

2nd week:
Lecture: Pathophysiology of osteoporosis I

3rd week:
Lecture: Pathophysiology of osteoporosis II

4th week:
Lecture: Diagnosis of osteoporosis

5th week:
Lecture: Treatment of osteoporosis

6th week:
Lecture: Case-study and literature reviews

7th week:
Lecture: BMD measurement and Bone turnover marker measurement
Practical: BMD measurement and Bone turnover marker measurement

8th week:
Lecture: Summary and MCQ test
Self Control Test

Requirements

To get the latest and updated information on the complex condition of osteoporosis

Subject: **PROBLEM BASED LEARNING IN COMPLEX PATHOLOGY**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **30**

1st week:
Lecture: Introduction

2nd week:
Lecture: Problem based evaluation of myeloproliferative disorders.

3rd week:
Lecture: Problem based evaluation of anemias.

4th week:
Lecture: Clinical case

5th week:
Lecture: Problem based evaluation of malignancy and tumor immunology.

6th week:
Lecture: Problem based evaluation of kidney diseases.

7th week:
Lecture: Problem based evaluation of diabetes mellitus.

8th week:
Lecture: Problem based evaluation of acute coronary syndrome.

9th week:
Lecture: Problem based evaluation in gastrointestinal disorders

10th week:
Lecture: Problem based evaluation in autoimmunity and hypersensitivity reactions.

Requirements

Entrance conditions: at least 10 students.
Only in 2nd semester.

Department of Medical Chemistry

Subject: **ADVANCED STUDENTS' SCIENTIFIC ACTIVITY**
Year, Semester: 2nd year/2nd semester**,** 2nd year/1st semester
Number of teaching hours:
Lecture: **10**

Requirements

Introduction to students' scientific activities, formerly presented lecture(s) at the students' scientific conference(s) and/or accepted thesis.

Subject: **UNDERSTANDING MEDICAL PROBLEMS THROUGH EXPERIMENTS**
Year, Semester: 1st year/2nd semester
Number of teaching hours:
Practical: **30**

1st week:
Practical: How to make fat and how to get rid of it?(Adipocyte differentiation. Lipid and energy metabolism.)

2nd week:
Practical: What cells "inhale" and "exhale"? What a seahorse can teach us about mitochondrial function and dysfunction? (Measuring the effects of metabolic drugs on oxygen consumption and glycolytic rate.)

3rd week:
Practical: Let's make bones!(Phosphate-induced mineralization in osteoblast cultures. Role of Vitamin C.)

4th week:
Practical: How to kill tumor cells?(Cellular effects of different classes of anticancer drugs on cancer cell lines.)

5th week:
Practical: A smoking gun.(How cigarette smoking causes lung injury?)

6th week:
Practical: Beware of the Sun!(Effects of UV radiation on skin cells.)

7th week:
Practical: A radical idea.(Generating and eliminating free radicals by the cells.)

8th week:
Practical: About fruits and vegetables.(Testing the antioxidant effects of various fruits and vegetables.)

9th week:
Practical: Can the exhaust fumes of your car lower your blood pressure?(Cell biology of nitric oxide and peroxynitrite.)

10th week:
Practical: Show me your breath, I tell you who you are!(Measurements from exhaled breath concentrate.)

11th week:
Practical: Will your pain killer kill your liver? (Liver toxicity of acetaminophen.)

12th week:
Practical: Immunosuppression in action.(How does cyclosporine work?)

13th week:
Practical: You are what you eat!(Evaluation of the effects of lipid-rich diet by histology and

biochemical essays.)

14th week:
Practical: Filling and emptying glycogen stores. (Determination of the glycogen stores in various alimentary conditions.)

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: β-lactam antibiotics.

4th week:
Lecture: Non-β-lactam antibiotics.

5th week:
Seminar: Measurement of antimicrobial activity.

6th week:
Lecture: History, mechanisms and spread of antibiotic resistance.

7th week:
Lecture: Antibiotic usage, antibiotic stewardship.

8th week:
Lecture: Risks caused by antibiotic use.

9th week:
Lecture: Antiviral agents.

10th week:
Lecture: Antifungal agents, antifungal resistance.

11th week:
Lecture: Chemotherapy against protozoal pathogens and helminths.

12th week:
Seminar: Presentation of project works

13th week:
Seminar: Presentation of project works.

14th week:
Seminar: Interactive case studies.

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, haemangio-blastoma.

3rd week:
Lecture: 3. Intracranial tumors II. Pituitary adenoma, craniopharyngioma, epidermoid/dermoid cysts, colloid cyst, germinoma, teratoma, lipoma, primary malignant lymphoma, metastatic tumours. Causes and management of hydrocephalus (obstructive,

communicating, congenital, acquired).

4th week:
Lecture: 4. Spinal space-occupying lesions (tumors, disc prolapse and spondylosis). Tumours of peripheral nervous system.

5th week:
Lecture: 5. Neurotraumatology. Head, spinal and peripheral nerve injuries.

6th week:
Lecture: 6. Cerebrovascular diseases requiring neurosurgical treatment. Inflammatory processes, brain abscess.

7th week:
Practical: 1. Diagnosis and treatment of intracranial space occupying lesions (except hematomas). Neurosurgical aspects of hydrocephalus and intracranial developmental anomalies. Shunt operations.

8th week:
Practical: 2. Neurosurgical aspects of vascular diseases. Causes and outcome of subarachnoid haemorrhage. Cerebral aneurysm, angioma and fistula, their surgical management.

9th week:
Practical: 3. Craniocerebral and spinal trauma, diagnosis and neurosurgical treatment. Management of unconscious neurosurgical patients. Brain herniations.

10th week:
Practical: 4. Degenerative and space occupying spinal lesions. Their diagnosis and surgical treatment. Operability of spinal developmental anomalies.

Requirements

The fundamentals of neurological surgery can be found in the textbook. The convincing knowledge of this material and the active participation of each practical lesson are the condition of a successful examination. The six lectures will complete the textbook with new data and stress the importance of the symptomatology and diagnostic possibilities of the more frequent neurosurgical diseases, mainly from practical points of view. These will facilitate the understanding of the textbook and the theses of the examination as well. The task of the practicum is the collection of personal practical experience of the neurosurgical diseases at bedside.
The active participation in all practicum is obligatory. No more than two misses of lectures and one miss of seminars and accepted written test exam are needed to get the credit.

Department of Obstetrics and Gynecology

Subject: **RECENT ADVANCES OF INFERTILITY MANAGEMENT AND GYNAECOLOGICAL ONCOLOGY**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Lecture: **20**

Requirements

Aim: To provide supplemental knowledge of modern human reproductive technology in five lectures. Lectures 6-16 are devoted to transmitting structured knowledge of gynaecological cancer management in sequence of their localisation and public health importance. The course is primarily aimed at providing graduate level audiovisual information that could not be fitted into the restricted schedule of regular lectures of semester II. in year IV. curriculum.

Topics:
Pathophysiology of reproductive failure
Infertility work-up, practical approach
Assisted reproduction. Homologous and heterologous insemination
In vitro fertilisation. Embryo transfer Legal and ethical issues of in vitro fertilisation
Ovarian cancer epidemiology and diagnostics
Ovarian cancer chemotherapy
Ovarian cancer surgical treatment
Endometrial cancer epidemiology and diagnostics
Endometrial cancer therapy
Cervical cancer prevention and screening
Cervical cancer diagnostics and therapy
Vaginal and vulval cancer epidemiology and diagnostics
Vaginal and vulval cancer treatment
Trophoblast tumours
Lecturer: Prof. Póka, Róbert, M.D., Dr. habil., Ph.D.

Subject: **REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY**
Year, Semester: 4th year/2nd semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **15**

1st week:
Lecture: 1. Introduction (Jakab, Attila M.D., Ph.D.) Reproductive Physiology (Lecturer: Deli, Tamás M.D., Ph.D.): Molecular Biology and Biochemistry for Reproductive Endocrinology. Ovarian and Uterine Embryology, Development and Reproductive Function. Neuroendocrinology. Regulation of the Menstrual Cycle. Sperm and Egg Transport, Fertilization, and Implantation.

2nd week:
Lecture: 2. Clinical Reproductive Endocrinology (Lecturer: Deli, Tamás 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 plannig. 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: Török, Péter M.D., Ph.D.) Uterine and tubal infertility. Endometriosis. Minimally invasive procedures. Ovulation induction. Assisted reproductive tecthniques (ART).

9th week:
Lecture: 9. Menopause (Lecturer: Jakab, Attila M.D., Ph.D): Epidemiological issues of the menopuase. Physiology of the menopausal transition. Postmenopausal Hormone Replacement Therapy (HRT). Postmenpausal abnormal bleeding. Cardiovascular changes and osteoporosis in the menopause. HRT in reproductive cancer patients.

10th week:
Lecture: 10. Reproductive Andrology (Lecturer: Benyó, Mátyás M.D.): Regulation of testicular function. Aging male. Male infertility. Semen analysis. Sperm function tests. Sperm preparation methods for assisted reproduction. Surgical treatment for male infertility. Sperm cryopereservation. Closing test (Jakab, Attila M.D., Ph.D.)

Requirements

Reproductive Endocrinology covers the physiology and pathophysiology of the female reproductive system, from puberty through the reproductive ages, until and beyond the menopause. Over the decades, advances of genetics, molecular biology and clinical epidemiology resulted in rapidly growing information and therapeutical 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.
Closing test: multiple choice questions, MCQ

Department of Oncoradiology

Subject: **RADIOTHERAPY IN THE CLINICAL PRACTICE**
Year, Semester: 4th year/2nd semester
Number of teaching hours:
Seminar: **18**

1st week:
Seminar: - Basics of radiotherpay
- Indications, role of radiotherapy in complex oncology, special technics

2nd week:
Seminar: - Equipments of teletherapy I. and II.

3rd week:
Seminar: - Radiotherapy of head neck cancers, GI tumors.

4th week:
Seminar: - Radiotherapy of breast cancer,

prostate cancer

5th week:
Seminar: - Special techniques of teletherapy

- Physical aspects of Brachytherapy

6th week:
Seminar: - Isotope therapy

7th week:
Seminar: - Clinical aspects of Brachytherapy

8th week:
Seminar: - Eye plaque brachytherapy

9th week:
Seminar: - Radiotherapy of lung cancers, CNS cancers

10th week:
Seminar: - Test

Requirements

The goal is to get to know the process and clinical considerations of radiotherapy (indications, contraindications, equipments).
Requirement for signature:
- Only 1 recorded absence.
Exam:
- Written test exam
Grading:
- 60%< pass
- 70%< satisfactory
- 80%< good
- 90%< excellent

Department of Operative Techniques and Surgical Research

Subject: **ADVANCED SURGICAL OPERATIVE TECHNIQUES**
Year, Semester: 5th year/2nd semester**,** 5th year/1st semester
Number of teaching hours:
Lecture: **4**
Practical: **20**

1st week:
Lecture: Scrubbing and behaviourial rules in the Operating Theatre. Main principles of surgical hemostasis. Basic surgical techniques of laparotomies, intestinal anastomoses, management of splenic injury, resection of the spleen and cholecystectomy. Operative techniques of preparation and cannulation of the external jugular vein, arteriotomy and closure of arteries, conicotomy and tracheostomy.

2nd week:
Practical: Overviewing basic surgical techniques on models prior to the living operations.

3rd week:
Practical: Paramedian laparotomy, one layer end-to-end jejuno-jejunostomy. Preparation and cannulation of the external jugular vein.

4th week:
Practical: Paramedian laparotomy, spleen stitches, resection of the spleen, cholecystectomy. Preparation and cannulation of the external jugular vein. Preparation, arteriotomy and suturing of the common carotid artery and femoral artery. Conicotomy and

tracheostomy.

5th week:
Practical: Paramedian laparotomy, spleen stitches, resection of the spleen. Preparation and cannulation of the external jugular vein. Preparation, arteriotomy and suturing of the common carotid artery and femoral artery. Conicotomy and tracheostomy.

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 biopreparate model and/or phantom model in closed pelvi-box and MATT

trainer.

6th week:
Practical: Cholecystectomy on isolated porcine liver-gallbladder biopreparate model and/or phantom model in closed pelvi-box and MATT trainer.
Self Control Test

Requirements

Prerequisite: Basic Surgical Techniques, Surgical Operative Techniques, Surgery II.
Aim of the course: Students have to learn the laparoscopic equipment and instruments and to perform basic laparoscopic interventions working in open and closed pelvi-trainer, MATT (Minimal Access Therapy Technique) trainer on surgical training models, phantom models and biopreparate model.
Course description: History and basic principles of endoscopic surgery. The use laparoscopic equipment and instruments. Intracorporeal knotting technique in open and closed pelvi-trainer on phantom models and biopreparate models.
Cholecystectomy in closed pelvi-trainer and MATT-trainer on liver-gallbladder phantom model and biopreparate model.

Subject: **BASIC MICROSURGICAL TRAINING. INTRODUCTION TO MICROSURGERY**
Year, Semester: 4th year/1st semester**,** 4th year/2nd semester
Number of teaching hours:
Lecture: **2**
Practical: **10**

1st week:
Lecture: General principles of microsurgery. Operating microscopes. Microsurgical instruments (scissors, forceps, needle-holders, approximating vessel clamps). Microsurgical suture materials and needles. Clinical and experimental application of microsurgery.

2nd week:
Practical: Adaptation to the operating microscope at various magnifications - harmony between eyes and hands. Scraping letters by letters from a newspaper with the tip of an injection needle with left and right hand at various magnifications - establishing the coordination between the hands.

3rd week:
Practical: Fiber removal and reposition with microsurgical forceps on a dry and wet gauze model, from different directions, at various magnifications. Preparation of "free flap" on a 4-layer gauze model for practicing the perception of depth.

4th week:
Practical: Practicing microsurgical suturing and knotting techniques by closing incisions made from different directions on rubber glove pieces. Presentation of the Microsurgical Museum.

5th week:
Practical: Arterial anastomosis: end-to-end vascular anastomosis on the femoral artery of a chicken thigh's biopreparate model.
Self Control Test

Requirements

Prerequisite: Basic Surgical Techniques, Surgical Operative Techniques

Aim of the course: To learn how to use microscope and microsurgical instruments and to perform different microsurgical interventions.
Course description: Students learn how to use microscope and microsurgical instruments, suture materials and needles. Basic interventions under the microscope by different magnifications to make harmony between eyes and hands. Knotting technique on training pads and performing end-to-end vascular anastomosis on femoral artery biopreparate model (chicken thigh).
Exam: AW5

Subject: **HISTORY OF MEDICINE**
Year, Semester: 1st year/1st semester**,** 1st year/2nd semester**,** 2nd year/1st semester**,** 2nd year/2nd semester**,** 3rd year/2nd semester**,** 3rd year/1st semester**,** 4th year/1st semester**,** 4th year/2nd semester**,** 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **26**

1st week:
Lecture: Introduction. Sources and methods of history of medicine. Paleomedicine, prehistoric medicine.

2nd week:
Lecture: Medicine of the ancient river valley civilizations: China, India, Mesopotamia.

3rd week:
Lecture: Medicine in the ancient Egypt.

4th week:
Lecture: Ancient Greek medicine. Asclepions. Hippocrates. Concept and doctrines. Corpus Hippocraticum. The Oath.

5th week:
Lecture: Medicine in the Roman Empire. Aesculapius. Encyclopedians: Terentius Varro, Plinius, Celsus. Soranos, Dioscorides. Galenus. Hygiene and public health. Valetudinaria.

6th week:
Lecture: Medieval medicine. Monastery medicine. Byzantine healers. The great compilators. Arabian medicine, Rhases, Avicenna, Abulcasis.

7th week:
Lecture: Pandemics in history.

8th week:
Lecture: Scholastic medicine. The Renaissance. Leonardo da Vinci, Vesalius, Paracelsus.

9th week:
Lecture: Significant discoveries of the 17th - 20th centuries. Selections from the history of various medical disciplines I.

10th week:
Lecture: Significant discoveries of the 17th - 20th centuries. Selections from the history of various medical disciplines II.

11th week:
Lecture: Overviewing the history of medicine of the Middle East (since medieval ages), the American continent, Sub-Saharan Africa, South Asia (since 1500), the Far East and Australia.

12th week:
Lecture: Brief overview of the history of dentistry, pharmacy and public health.

13th week:
Lecture: History of the Hungarian Medical Education. History of the University of Debrecen and the Faculty of Medicine. Consultation.
For the participants organized visit to the Medical History Exhibition at the Kenézy Villa and the Sculpture Park will be available on demand.

Self Control Test

Requirements

Aim of the course:
History of medicine is more than just history of a branch of science. Development of medicine in various cultures and ages had been accompanied and/or led to a number of changes in attitudes and relationships of human and nature, religions and society, with numerous turning points, paradigm shifts, major discoveries and technological development. The aim of the course is to briefly present the history of the medicine, the development of medical thinking, decision-making, attitude and healing practice. Deepening in science history can also contribute to the appreciation of the value of the medical approach used in the everyday preventive, diagnostic and therapeutic practice of different medical disciplines. The lessons from paradigm changes may also enforce the open-mindedness, which is certainly still needed for a long time.

Exam: AW5 (written final test)

Subject: **SURGICAL ANATOMY - SELECTED CHAPTERS**
Year, Semester: 4th year/1st semester**,** 4th year/2nd semester**,** 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Lecture: **24**
Practical: **2**

1st week:
Lecture: Introduction. Regional anatomy – an overview, orientation, planes, projection of organs.

2nd week:
Lecture: Surgical anatomy of the head and neck region I.

3rd week:
Lecture: Surgical anatomy of the head and neck region II.

4th week:
Lecture: Axillary fossa. Femoral region.

5th week:
Lecture: Anatomy of the thorax and the abdominal wall.

6th week:
Lecture: Surgical anatomy of the thoracic cavity.

7th week:
Lecture: Anatomical aspects of gastrointestinal surgery I.

8th week:
Lecture: Anatomical aspects of gastrointestinal surgery II.

9th week:
Lecture: Surgical anatomy of the liver and biliary system.

10th week:
Lecture: Surgical anatomy of the pancreas and spleen.

11th week:
Lecture: Surgical anatomy of the kidney, urinary tracts and male genitalia.

12th week:
Lecture: Surgical anatomy of the female genital organs.

Self Control Test

13th week:
Lecture: Summary. Written test.

Requirements

Our course provides a detailed anatomical overview for students interested in operative medicine in the context of surgical interventions. The course involves a surgical anatomical review of different regions, a synopsis of clinically important and detailed anatomical relationships from a surgical perspective, presenting the surgical significance of anatomical variations and pathological differences. During the lectures, diagnostic images and intraoperative photos, videos, and a 3D interactive anatomical screen will help the demonstration.

Exam: AW5 (written final test)

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.

Practical: Presenting the Museum of Surgical Suture Materials and Museum of Surgical Staplers

3rd week:
Lecture: Surgical bioplasts, method of action, types and their clinical applications (video-demonstration).
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 surgical 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 (video-demonstration).
Surgical suture materials. Basic surgical techniques. Advanced knotting and suturing techniques,
pitfalls in suturing techniques (video-demonstration).
Practical: Practicing knotting techniques on knotting pads and different suturing techniques on surgical training model: simple interrupted stitch, Donati stitch, simple continuous suture line, suture removal–in team work.

2nd week:
Lecture: Scrubbing (video-demonstration). Possible mistakes in scrubbing (video-demonstration).Different suturing andknotting techniques on pig leg biomodels (video-demonstration).
Practical: Dry practice. Practicing how to put on surgical gloves correctly (two methods!). Practicing different suturing techniques and apodactylic technique on pig-leg biopreparate model in team work (simple interruptedstitch, Donati stitch, simple continuous suture, suture removal). Evaluation of the suture lines, discussion of pitfalls.

3rd week:
Lecture: Blood sampling andi. v. injection techniques. Different suturing and knotting techniques on pig-leg biomodels (video-demonstration).
Practical: Practicing blood sampling and intravenous injection techniques on models and on upper limb phantom models. Individual evaluation of different techniques, discussion of pitfalls. Practicing different suturing techniques and apodactylic technique on pig-leg biopreparate model in team work(simple interrupted stitch, Donati stitch, simple continuous suture line, suture removal). Evaluation of the suture lines, discussion of pitfalls.

4th week:
Lecture: Vein preparation on venous cutdown pad, cannulation, preparation of infusion set (video-demonstration). Urinary bladder catheters. Catheterization of the urinary bladder on phantom model (video-demonstration).

Practical: Dry practice. Catheterization of the urinary bladder on phantom model. Vein preparation and cannulation on a venous cutdown pad and connection to an infusion set. Individual evaluation of different techniques, discussion of pitfalls.
Self Control Test

Requirements

Prerequisite: Basic Surgical Techniques
Aim of the course: Evoking, deepening, extending and training of basic surgical knowledge acquired during the "Basic Surgical Techniques" subject, working on different surgical training models, phantom models in "dry" circumstances, then following surgical scrub, in the operating room, working on vein pad phantom model and different biopreparate models.
Course description: Revision of basic surgical techniques. Repeating and practicing basic life

saving methods - hemostasis, venous cutdown technique, conicotomy - and basic interventions - blood sampling and injection (i.m., i.v.) techniques, wound closure with different suturing techniques - on phantom models and biopreparate models.

Exam: AW5

Department of Ophthalmology

Subject: **REFRACTION, REFRACTIVE ERRORS, CORRECTIONS, REFRACTIVE SURGERY**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **5**

1st week:
Seminar: Refraction, refractive errors, corrections, refractive surgery.

2nd week:
Seminar: Refraction errors, keratometry, aberrometry, corneal topography.

3rd week:
Seminar: Prescription of Eyeglasses

4th week:
Seminar: Contact lenses

5th week:
Seminar: Refractive Surgery

Requirements

The attendance all the 5 seminars is compulsory. Missed seminars should be repeated by attending seminars on the next semester.
The knowledge of students is assessed on a five-grade scale (test). Registration to the course should be done o the Neptun system.

Department of Pathology

Subject: **FUNDAMENTAL CLINICAL NEUROSCIENCE**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **10**
Seminar: **10**
Practical: **10**

Requirements

Requirements: Attendance of lectures, seminars, practical sessions is compulsory - absences and their 'make-up' are regulated by the Educational office of the Medical Faculty. The exam questions are primarily based on the material presented at the Lectures. The Seminars and Practical sessions are supporting the learning and understanding of the topics.

Aims of the course: To teach the molecular and morphological aspects of clinical neurosciences and

to provide a solid basis for the clinical studies and medical practice. To refresh the relevant knowledge acquired at the pre-clinical studies (Anatomy, Physiology, Biochemistry) in a clinico-pathological context.
Curriculum: During the 6 weeks the topics will be covered in altogether 30 hours. Lectures will be supported by seminars & practicals with clinico-pathological discussions and demonstrations of neuropathological methods & techniques (including brain cut, microscopy).

week 1: Basic reactions in the nervous system;
week 2: cerebrovascular diseases; Trauma; Infectious and inflammatory diseases;
week 3: Dementias and movement disorders;
week 4: Brain tumours;
week 5: Metabolic and toxic disorders; Developmental disorders;
week 6: Demyelinating diseases; Neuromuscular diseases; Other neuro-psychiatric diseases.

Textbook: Robbins: Basic pathology (9th edition); selected research papers (to be specified)
Suggested reading: selected research papers (to be specified)
Exam: Written (Multiple Choice Questions test paper)

Department of Pharmacology and Pharmacotherapy

Subject: **PHARMACOTHERAPY**
Year, Semester: 5th year/1st semester
Number of teaching hours:
Lecture: **30**

1st week:
Lecture: Metabolic diseases I: Diabetes mellitus

2nd week:
Lecture: Metabolic diseases II: Hyperlipidaemias

3rd week:
Lecture: Diseases of the biliary truct and the pancreas

4th week:
Lecture: Pharmacotherapy of cardiac arrhythmias

5th week:
Lecture: Pharmacotherapy of hypertension

6th week:
Lecture: Myocardial infarction and unstable angina

7th week:
Lecture: Pharmacotherapy of ischaemic heart disease Angina pectoris, AMI

8th week:
Lecture: Pharmacotherapy of rheumatic diseases

9th week:
Lecture: Chronic obstructive airway disease

10th week:
Lecture: Cancer therapy

11th week:
Lecture: Test writing

Requirements

Pharmacology final exam.

Department of Physical Medicine and Rehabilitation

Subject: **PRINCIPLES OF PHYSICAL MEDICINE AND REHABILITATION**
Year, Semester: 5th year/2nd semester
Number of teaching hours:
Lecture: **16**

1st week:
Lecture: Theory of medical rehabilitation. Functional assessments of people with disabilities. - Zoltán Jenei M.D., Ph.D
Basic principles of therapy approaches in medical rehabilitation, measuring the effects of rehabilitation. - Zoltán Jenei M.D., Ph.D

2nd week:
Lecture: Intervention, treatments and service delivery in rehabilitation (inpatient, outpatient and community-based services). - Zsuzsanna Vekerdy-Nagy M.D, Ph.D
Special features of pediatric rehabilitation - Zsuzsanna Vekerdy-Nagy M.D, Ph.D

3rd week:
Lecture: Autonomy and compliance. Quality of Life - Adél Nagy M.D.
Living with disability: personal experiences - Betti Dézsi coordinator of 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. Musculosceletal rehabilitation. - Rita Szepesi M.D.

6th week:
Lecture: The role of physical therapy in medical rehabilitation - Ilona Balajti Mrs. Veres, PT
Orthetics and prothetics in rehabilitation - Andrea Jánossy Győrfiné PT

7th week:
Lecture: Objective measurement in medical rehabilitation - Zsófia Hőgye PT, Rehabilitation Expert, Ergotherapist
Medical assistive devices - Zsófia Hőgye PT, Rehabilitation Expert, Ergotherapist

8th week:
Lecture: Occupational therapy in medical rehabilitation - Boglárka Boldogfalvi PT
Importance of nutrition and dietetics in rehabilitation - Krisztina Sáfrány 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: Principles of Physical Medicine and Rehabilitation
Year, Semester: 5th year/2nd Semester
Information and Requirements regarding pandemic period:

All the lectures have been uploaded (16 x 45 min). In case of any questions, requirements please contact us: jenei.zoltan@med.unideb.hu
Students have to prepare for their exam by this curriculum.
Exam for 2 credit points: Written (Multiple Choice Questions test paper). We can give further information about the date of the exam depending on viral epidemiological arrangements and state.

Subject: **SOCIAL ACCEPTANCE OF PEOPLE WITH DISABILITIES**
Year, Semester: 3rd year/1st semester
Number of teaching hours:
Lecture: **20**
Practical: **2**

1st week:
Lecture: Problems of people with disabilities during their life Subtopics: a) Definitions (normality, abnormality, handicap, deficiency, disability, participation – the health concept in different cultures and societies). b) Different types of impairments, their characteristic features, possible treatments and rehabilitation (visual, auditive, movement, learning impairments, mental deficiencies, behavioural and communicational disturbances).- Zsuzsanna Vekerdy-Nagy M.D., Ph.D

2nd week:
Lecture: Social inclusion and its legal environment Subtopics: a) Politics of equal rights, equal treatment and antidiscrimination. b) Legal problems of limitations the rights of people with disabilities. - Angéla Molnár jurist
The world of people with disabilities from the point of view of parents and relatives Subtopics: a) Experiences and personal messages, advices to the experts. b) Short and long term life goals. c) Changes in life quality. - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc.

3rd week:
Lecture: How to approach to people with disabilities? Psychological considerations. Bernadett Bodor psychologist
Dietary problem of people with disabilities - Krisztina Sáfrány nutrician

4th week:
Lecture: The world of people with disabilities from "inside" – own experiences (lecturers: persons with disabilities) - Subtopics: a) Expectations towards ourselves and towards the environment b) Successes and/or failures of adaptation c) Attitudes d) Short and long term life goals e) Expectations in communication - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc.

5th week:
Lecture: Care nursing being with disabilities from the point of view of volunteers, therapist, caregivers and nurses Subtopics:
a) The most frequent problems arising during care and nursing, the "art of being there", avoiding burnout. - Zsófia Hőgye PT, ergotherapist, rehabilitation expert and Gabriella Nagy PT, rehabilitation expert
b) Communicational problems. - Edina Szabó Ph.D. speech therapist
c) Characteristics of rehabilitation care. - Julianna Illyés Kavaleczné social worker

6th week:
Lecture: Parent of children with disabilities - perspective of the PRM doctor. - Éva Szabó M.D.
Pedagogical aspects of disabilities, concepts of special needs, special educational requirements, deficiencies of partial abilities, questions of integration - inclusion. - Erzsébet Gortka-Rákó Ph.D.

7th week:
Lecture: Social aspects of disabilities, characteristic features of groups of people with

disabilities, homes of people with disabilities, segregated institutes, stigmatization, discrimination, employment, psychology. - Betti Dézsi informatician, special translator, coordinator of rehab.exp.Msc

8th week:
Lecture: Ferryman's Service. - Judit Miholecz psychologist
UN, WHO perspectives - on overview the role international organizations in disability issue. - Zsuzsanna Vekerdy-Nagy M.D., Ph.D.

Requirements

Intended learning outcomes:
To promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities and to promote respect for their inherent dignity.
Multidimensional introduction into the world of people with disabilities.
Target group: foreign and Hungarian students of medicine
Announced for students in year: 1st semester
no. of lessons: 20 x 45 min no. of practices: 2 x 45 min Credit points: 2
Practice: in small groups (min. 3, max. 6 students) during the academic year (summer included)

Department of Physiology

Subject: **MODERN TECHNIQUES ALLOWING THE INVESTIGATION OF PHYSIOLOGICAL PHENOMENA**
Year, Semester: 2nd year/2nd semester
Number of teaching hours:
Lecture: **24**

1st week:
Lecture: Application of electrophysiological techniques in the investigation of the electric activities of living cells.

2nd week:
Lecture: Methods allowing the monitoring of the intracellular Ca2+ concentration in living cells.

3rd week:
Lecture: Analysis, evaluation and interpretation of current recordings. Biostatistics.

4th week:
Lecture: Preparation of neurones for functional investigation. Possible advantages and disadvantages of the applicable methods.

5th week:
Lecture: Investigation of the signal transducing proteins at the levels of proteins, RNA or DNA (immunocytochemistry, immunohistochemistry, confocal microscopy, Western blot, quantitative [real-time] PCR).

6th week:
Lecture: Cell and tissue culture (primary cultures, cell lines, organ cultures).

7th week:
Lecture: Isolation and identification of contractile proteins by biochemical methods.

8th week:
Lecture: Measurements conducted on isolated ion channels: the bilayer technique.

9th week:
Lecture: tutorial

10th week:
Lecture: Final Assessment.

Requirements

1. Signature of the semester
Lecture attendance may be followed up by the Department. The lecture will not be delivered if 5 or fewer students show up. Nevertheless, the lecture material is going to be asked in the final assessment.
For continuous updates on all education-related maters, please check the 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 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 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 the student's 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 an applicant.
3.Special Rule: the applicant has to organize the chosen project and register at the tutor (NOT via NEPTUN) until the end of first academic week. Applications after the first week are not accepted.
4.Preconditions for the program: mark three (3) or better in Physiology I 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.
6.Two students works in team on one project, and prepare one mutual report, thus they get the same score at the end of the program regardless their contribution. The Journal Club and Lab Visit programs are carried out individually.
7.Evaluation of the students is based on the written report or the oral presentation using five grade score system (1-5). Grades are final, no make-up is allowed.
8.The list of offered programs is 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 [Ca2+]i

3rd week:
Lecture: [Ca2+]i dependent excitatory processes in the surface membrane of cardiac cells.

4th week:
Lecture: The structure of the skeletal muscle. Ionic channels underlying the excitability of the skeletal muscle. Molecular structure of ionic channels.

5th week:
Lecture: Changes in surface membrane function in inherited skeletal muscle disorders: degenerative forms (muscle dystrophies). Changes in surface membrane function in inherited skeletal muscle disorders: alterations in the muscle tone (myotonies).

6th week:
Lecture: The role of the surface membrane in the regulation of calcium homeostasis in neurons. Pathological conditions arising from abnormal calcium handling in neurons.

7th week:
Lecture: Changes in the membrane properties of the neurons under pathological conditions. Pathological conditions arising from the hyperexcitability of neurons.

8th week:
Lecture: The role of TRP channels in the regulation of biological processes of human skin cells. TRP-pathies.

9th week:
Lecture: The role of the endocannabinoid system in the transmembrane signaling of skin-derived cells. Is the human skin always "high"?

Requirements

1. Signature of the semester
Lecture attendance may be followed up by the Department. The lecture will not be delivered if 5 or fewer students show up. Nevertheless, the lecture material is going to be asked in the final assessment.
For continuous updates on all education-related maters, please check the 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 musculoskleletal system, treatment of sport injuries from the aspect of physical therapist (1 hour lecture, 1 hour practice)

5th week:
Lecture: Zsuzsa Gyurcsik: Rehabilitation inmusculoskeletal 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 Traumatology and Hand Surgery

Subject: **TRAUMATOLOGY II.**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **10**

6th week:
Lecture: 1. Periprotetic fractures of the femur. Treatment of fractures of the distal femur. 2. Patella and proximal tibial fractures.

7th week:
Lecture: 1. Injuries of the shoulder, humerus fractures. 2. Indication of limb replantation, techniques and expected results. Revascularization syndrome. Skin defects, skin replacement procedures.

8th week:
Lecture: 1. Classification and treatment of wrist fractures. Basic treatment principles of closed and open fractures of the hand. 2. Fractures of the talus and calcaneous. Subtalar dislocation. Fractures of tarsal bones and toes.

9th week:
Lecture: 1. Role of arthroscopy in the diagnosis and surgical treatment of joint injuries. Meniscus injuries, diagnosis and treatment injuries to knee ligaments. Haemarthrosis. Osteochrondritis dissecans. 2. Methods of ligament, bone and joint replacement. Use of metals and plastics in traumatology. Biological osteosynthesis.

10th week:
Lecture: 1. Fractures of the neck and head of radius. Olecranon fractures. Fractures of the forearm diaphysis. Monteggia and Galeazzi fractures. 2. Carpal instability, treatment of fractures of carpal bones. Tendon and nerve injuries of the hand. Treatment of severely injured hand.

Requirements

The lectures will take place in the Auguszta big lecture hall. We strongly advise to participate on the

lectures, because the official textbook doesn't include all the diagnostic and therapeutic knowledge. Sign of the lecture book will take place the week before the exam period, at the secretariat of the Department of Trauma and Hand Surgery.

Type of the exam: oral exam (AW5).

In case of the unsatisfactory mark, the student can repeat the exam with the certification of the Education Department.

Department of Urology

Subject: **FACTS AND RECENT ACHIEVEMENTS OF ANDROLOGY**
Year, Semester: 5th year/1st semester**,** 5th year/2nd semester
Number of teaching hours:
Seminar: **30**

Requirements

Course title: Facts and Recent Achievements of Andrology
Course type: required elective
ECTS credit: 2
Conditions: successful Urology exam
Type of exam: AW5
Lecturers:
Molnár, Zsuzsanna MD, PhD assistant lecturer
Drabik, Gyula MD, assistant lecturer
Murányi, Mihály MD, clinical specialist
Benyó, Mátyás MD, PhD assistant professor
(Coordinator: Benyó, Mátyás MD, benyomatyas@gmail.com)
Aims of the Course
The incidence of infertility is has increased in the last decade in the developed countries. About 15% of couples do not achieve pregnancy within one year and seek for medical treatment because of infertility. In 50% of involuntarily childless couples a male-infertility-associated factor is found together with abnormal semen parameters. The improving standard of living resulted in a focused attention on male fertility and sexual dysfunctions. Since the assessment of these patients requires special knowledge, andrologists are needed in these cases. Andrology covers the physiology and pathophysiology of the male reproductive system. Unfortunately andrology can’t get the required attention due to time limit during the education of urology.
The aim of the course is to gain detailed knowledge on the physiological basics and clinical practice of wide spectrum of andrological disorders. Throughout ten weeks experts of andrology will demonstrate the different fields of andrology.
During the course 4 certified absences are allowed. In case of 5 absences maximum grade can be 4 (good), in cases of 6 and 7 absences grade 3 (satisfactory) and grade 2 (pass) can be gives, respectively. If the student has at least 8 absences, the course will not be signed.

Program (location: seminary room of the Department of Urology):
1st week: Introduction, anatomy of the male reproductive tract, setting up an andrological diagnosis (Mátyás Benyó)

2nd week: Sexual dysfunctions (background, diagnosis) (Mátyás Benyó)
3rd week: Sexual dysfunctions (treatment), male contraception (Mátyás Benyó
4th week: Role of the hormones in the male reproductive tract (Gyula Drabik)
5h week: Causes of male infertility, environmental exposure (Mátyás Benyó)
6th week: Ageing male, late onset hypogonadism (Gyula Drabik)
7th week: Sperm analysis, assisted reproduction (Zsuzsanna Molnár)
8th week: Development of the testicles, the relationship of testicular cancer with male infertility (Mátyás Benyó)
9th week: Surgery of the penis and urethra, effects of radical procedures on sexual function (Mihály Murányi)
10th week: Microsurgical andrological procedures, closing test (Mátyás Benyó)

Suggested reading: European Association of Urology: Guidelines on Male Infertility, Guidelines on Males Sexual Dysfunction (www.uroweb.org).
Closing test: multiple choice questions, MCQ

Division of 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% = grade 1 (fail); 61%-70% = grade 2 (pass); 71% - 80% = grade 3 (satisfactory); 81% - 90% = grade 4; (good) 91% = grade 5 (excellent). Students should download free Office guide books from the internet offered at the webpage of the course (Email registration is required for downloading files). Students who did not get exemption/did not show up at the exemption test/repeaters/students older than first year MUST ATTEND on the course. They should join to one of the groups mentioned in the timetable. The number of the seats is limited in the classroom. Students who has informatics course in the given appointment (according to the timetable) have priority to attend the lesson. Others are allowed to join to the given group if there are free seats. Older students have to do the whole course as well. Students passing the exemption test will automatically receive 5 (excellent) grade at the end of the semester. Students who failed the exemption test must attend the course and do the final test at the end. Students having ECDL (European Computer Driving 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, Szöllősi Eds.), Medicina, 2009;

Web address for the course material: http://biophys.med.unideb.hu/en/elect_bpmethods_lecture.htm
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 curriculum

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: 1. multiplicity of signaling pathways. 2. Regulation by compartmentation of signaling components

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: Cellminer: a versatile on-line tool for data mining in panels of cancer cell lines.

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: Consultation. Test.

Requirements

Requirement for signature:

- maximum 3 recorded absences total (no make-up possible)

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: online 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 at 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.

Division of Clinical Laboratory Science

Subject: **CLINICAL BIOCHEMISTRY AND LABORATORY EVALUATION OF THROMBOPHILIA**
Year, Semester: 4th year/1st semester
Number of teaching hours:
Lecture: **12**

1st week:
Lecture: Control mechanisms of blood coagulation Biochemistry of antithrombin III. Laboratory diagnosis of antithrombin III deficiencies.

2nd week:
Lecture: Biochemistry of protein C and protein S. Laboratory diagnostics of protein C and protein S deficiencies

3rd week:
Lecture: Thrombophilias caused by APC resistance and prothrombin 20210 polimorphism and their laboratory diagnostics. Rare thrombophilias.

4th week:
Lecture: Hereditary thrombophilias in the clinical practice. Obstetric and gynecologic aspects of hereditary thrombophilias.

5th week:
Lecture: Laboratory diagnostics of antiphospholipid syndrome. 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: **ENZYMOLOGY 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.)

2nd week:
Lecture: The most important definitions of enzyme kinetics. Michaelis Menten model, interpretation and definition of KM, and VMAX.

3rd week:
Lecture: Types of enzyme inhibitions. Enzyme regulation.

4th week:
Lecture: The most important serum enzymes in medical laboratories, their determination, their diagnostic significance I. -Muscle Enzymes

5th week:
Lecture: The most important serum enzymes in medical laboratories, their determination, their diagnostic significance II. -Liver Enzymes

6th week:
Lecture: The most important serum enzymes in medical laboratories, their determination, their diagnostic significance III. -Bone Enzymes, Pancreatiy enzymes

7th week:
Lecture: The most important serum enzymes in medical laboratories, their determination, their diagnostic significance IV. -Miscellaneous Enzymes

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 Nuclear Medicine and Translational Imaging

Subject: **MEDICAL IMAGING REPORTING**
Year, Semester: 4th year/1st semester**,** 5th year/1st semester
Number of teaching hours:
Seminar: **6**
Practical: **18**

1st week:
Seminar: Overview of morphological and functional imaging

2nd week:
Seminar: Structured reporting: conventional describing or structured report

3rd week:
Seminar: Reports of conventional (X-ray, ultrasonography) imaging

4th week:
Seminar: Report of CT and MRI

5th week:
Seminar: Reports of conventional nuclear medicine modalities (static and dynamic images)

6th week:
Seminar: Reports of hybrid technologies (PET/CT, SPECT/CT)
Practical: Then is practical parts of the course real clinical case-studies will be presented and students working in a groups will analyze written reports and make comparison to DICOM images with experts (computer work).

Requirements

Students will appreciate the clinical impact of imaging report. They will understand key elements of structured report. They will read reports of different imaging modalities with experts. They will translate written result to images, and comprehend impression of specialists.

Division of Radiology and Imaging Science

Subject: **MEDICAL IMAGING**
Year, Semester: 3rd year/2nd semester
Number of teaching hours:
Lecture: **16**

1st week:
Seminar: Digital X-Ray imaging

2nd week:
Seminar: Ultrasound imaging

3rd week:
Seminar: CT imaging

4th week:
Seminar: Magnetic Resonance Imaging I.

5th week:
Seminar: Radionuclide imaging

6th week:
Seminar: Risks of medical imaging

7th week:
Seminar: Multimodal imaging

Requirements

The aim of the course is to teach students the basis of how the different medical imaging modalities work with respect to clinical application. With the knowledge that they acquired throughout the first two years of medical school, students will learn, before studying radiology, how this key diagnostic course many fit among the clinical subjects.
One absence is allowed.
Final test: written

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 Kisvárday 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 pararubral 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: The role of the transcription factor BACH1 in macrophage function and tissue homeostasis
2. Title: Transcriptional analysis of the angiogenic effect of macrophages
Tutor: László Nagy M.D., Ph.D., M.H.A.Sc.
3. Title: Characterization of the nuclear tissue transglutaminase
4. Title: The effect of tissue transglutaminase-deficient states on the metabolism of differentiating and terminally differentiated NB4 neutrophil granulocytes
5. Title: The role of tissue transglutaminase in the differentiation of neutrophil granulocytes
Tutor: Zoltán Balajthy M.Sc., Ph.D.
6. Title: Production of dendritic cells and macrophages from embryonic stem cells.
7. Title: Transcriptional programming of dendritic cells
8. Title: Transcriptional programming of embryonic stem cell-derived myeloid cells
Tutor: István Szatmári M.Sc., Ph.D.
9. Title: Bioinformatic analysis of tissue-specific and tumor-specific gene expression regulation
Tutor: László Bálint Bálint M.D., Ph.D.

10. Title: Effects of various coeliac autoantibodies on transglutaminase 2 activities and interactome.
11. Title: Studying structure and function relationship of transglutaminases and its application in translational medicine
Tutor: Róbert Király M.Sc., Ph.D.
12. Title: Epigenetic regulation of homologous recombination
13. Title: Genomic analysis of chromosomal R-loops
Tutor: Lóránt Székvölgyi M.Sc., Ph.D.
14. Title: Analysis of the regulatory elements of the macrophage genome using next generation sequencing data
Tutor: Gergely Nagy M.Sc., Ph.D.
15. Title: Biochemical characterization of retroviral and retroviral-like proteases
Tutor: János Mótyán M.Sc., Ph.D.
16. Title: Analysis of protein interaction networks
17. Title: Metabolomic analysis of saliva
18. Title: Proteomic analyses in diabetes
19. Title: System biology approaches to diabetes
Tutor: Éva Csősz M.Sc., Ph.D.
20. Title: Evaluation of the browning potential and inducibility from human fat tissue biopsies
Tutor: Mária Szatmári-Tóth M.Sc., Ph.D.
21. Title: Regulation and effector functions of alternatively activated macrophages
Tutor: Zsolt Czimmerer M.Sc., Ph.D.
22. Title: Assembly and analysis of the reference genome for the diploid domestic rabbit using PacBio and 10X Chromium sequencing data
23. Title: Bioinformatic meta-analysis of ChIP-seq and ChIA-PET datasets to understand the regulation of transcriptional units
Tutor: Endre Barta M.Sc., Ph.D.
24. Title: Characterization of adipocytes with thermogenic potential
25. Title: Plasticity of the thermogenic potential of adipocytes, identification of key extrinsic and intrinsic factors
26. Title: The effect of environmental factors on the in vitro differentiation and beigeing potential of primary adipocytes
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., Ph.D.
29. Title: Analysis of hemoglobin forms in pathologic states
30. Title: Metabolomic analyses in diabetes
Tutor: Gergő Kalló M.Sc., Ph.D.
31. Title: Characterization of genetic risk factors of chronic pancreatitis
Tutor: András Szabó M.Sc., Ph.D.

Department of Biophysics and Cell Biology

1. Title: Investigation of cell surface distribution of erbB-2 oncoprotein in breast tumor cell lines
2. Title: Role of tumor stem cells in trastazumab resistant breast tumors
Tutor: János Szöllősi M.Sc., Ph.D., D.Sc., M.H.A.Sc.

3. Title: Studying the inactivation of voltage gated potassium ion channels in heterologous expression systems
Tutor: György Panyi M.D., Ph.D., D.Sc.

4. Title: Epigenetic regulation of nucleosome-DNA cohesion
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 depedence of nuclear receptor function studied by single molecule microsocpy
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 inflitrating T cell populations
Tutor: Péter Hajdu M.Sc., Ph.D.

24. Title: Genetically engineered NK cells as off-the-shelf living drugs in cancer therapy
25. Title: Universal chimeric antigen receptors (CARs): new weapons for lymphocytes fighting autoimmune disases
Tutor: Árpád Szöőr M.D., Ph.D.

Department of Anesthesiology and Intensive Care

1. Title: Experimental testing of the neuromuscular junction
Tutor: Ákos Fábián M.D., Ph.D.
2. Title: Preemptive and preventive analgesia
Tutor: Béla Fülesdi M.D., Ph.D., D.Sc.
3. Title: The role of hypotermia 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.

Department of Behavioural Sciences

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 Kőmüves 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.

17. Title: Bioethical and biopolitical challenges of modern health care (Faculty of Medicine)
18. Title: Ethical and health policy aspects of the research and clinical use of controlled substances (Faculty of Medicine)
Tutor: János Kristóf Bodnár M.A., Ph.D.

Division of Cardiac Surgery

1. Title: Mid-term results of transcatheter aortic valve implantations - review of the literature
Tutor: Tamás Maros M.D.
2. Title: Composite grafts in coronary surgery - review of the literature
Tutor: Ambrus Horváth M.D.
3. Title: Sutureless aortic valve implantation - rewiew of the literature
Tutor: Lehel Palotás M.D.
4. Title: Non-occlusive mesenteric ischaemia after cardiac surgery-review of the literature
Tutor: Tamás Debreceni M.D.

Department of Family and Occupational Medicine

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., 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 Public Health and Epidemiology

1. Title: 1. Migration of health workers in the European Union with a focus on regulation 2. Mutual recognition of diplomas in the European Union: a historical overview 3. Prevention and management of diabetes in the EU Member States, with reference to regulation 4. The burden of diabetes in the EU Member States 5. Burden of disease of complications of diabetes mellitus in the EU Member States
Tutor: Orsolya Varga M.D., Ph.D.
2. Title: 1. Mental health of youth 2. Interventions to improve the mental health of youth 3. Mental health of health care workers 4. Interventions to improve the mental health of health care workers 5. Relationship between health literacy and health status (only for dentist students) 6. Relationship between health literacy and medication adherence (only for pharmacist students) 7. Social support among university students
Tutor: Éva Bíró M.D., Ph.D.
3. Title: 1. Sociodemographic, environmental and lifestyle determinants of obesity 2. The effect of neighborhood environment on physical activity and diet 3. The effect of dietary interventions on the risk of chronic non-communicable diseases 4. Use of Healthy Eating index for the characterization of diet quality 5. Prevalence and determinants of dietary supplement use (only for pharmacist students) 6. Patterns and correlates of anabolic androgenic steroid use (only for pharmacist students) 7. Associations between

diet quality and dental caries (only for dentist students) 8. Socioeconomic and lifestyle determinants of dental caries (only for dentist students)
Tutor: Helga Bárdos M.D., M.Sc., Ph.D.
4. Title: 1. Contaminants of traditional Chinese and Indian medicines 2. Morbidity and mortality from oral cavity cancers in selected European countries 3. Toxicology of fluorides 4. Effect of smoking on drug metabolism 5. Toxicology of zinc
Tutor: Sándor Szűcs M.Sc., Ph.D.
5. Title: 1. Conducting systematic review on selected diagnostic research topics 2. Conducting systematic review on selected prognostic research topics 3. Conducting systematic review on selected intervention research topics
Tutor: Szilvia Fiatal M.D., Ph.D.
6. Title: 1. Evaluation of chronic care for adult overweighted in general medical practice 2. Evaluation of chronic care for adult smokers in general medical practice 3. Evaluation of chronic care for diabetes mellitus in general medical practice 4. Evaluation of chronic care for hypertension in general medical practice 5. Social inequalities in health 6. Disease burden of rare diseases 7. Evaluating effectiveness of population based screenings 8. Nutritional habit in the first trimester of pregnancy
Tutor: János Sándor M.D., Ph.D.
7. Title: 1. Assessment of health risks of micro- and nano-encapsulated plant protection products: a systematic literature review 2. Investigation of the DNA damaging potential of plant protection products using genotoxicological methods 3. Comparative assessment of the cytotoxic effect of glyphosate and glyphosate based herbicides 4. Assessment of health risks of micro- and nanoencapsulated plant protection products: a systematic literature review 5. Assessment of ergonomic risk factors among workers in different professions
Tutor: Károly Nagy Ph.D.
8. Title: 1. Alcohol consumption and human immunodeficiency virus infection 2. Pharmacological treatment of alcohol use disorders 3. Alcohol use by adolescents in Europe between 1993 and 2019 4. Alcohol use in the European Union 5. Health effects of flame retardants
Tutor: László Pál Ph.D.
9. Title: 1. Analyses of workforce crisis in Hungarian general practices 2. Frequency of influenza vaccination among chronic diseased patients in Hungary: A general practice based investigation 3. Frequency of influenza vaccination among the elderly: A general practice based investigation 4. The effectiveness of hypertension care in Hungary 5. Are serum uric acid levels are associated with cardiovascular risk score among hypertonic patients? 6. Investigation of stroke frequency in adult and mixed general practices 7. Investigation of AMI frequency in adult and mixed general practices
Tutor: Ferenc Vincze M.Sc.
10. Title: 1. Investigation of the global burden of chronic non-communicable diseases 2. Investigation of the global burden of chronic non-communicable diseases regarding socio-economic development 3. Trends in mortality from non-communicable diseases 4. Prevalence of complications due to diabetes mellitus in Europe 5. Socioeconomic determinants of diabetes mellitus complications across Europe
Tutor: Nóra Kovács M.Sc.
11. Title: 1. Health and health behaviour of adolescents 2. Problematic internet use among adolescents 3. Health promotion opportunities among school-aged children
Tutor: Gabriella Pénzes M.Sc.

Division of Cardiology

1. Title: Evaluation of "Flow separation resistance index" in coronary artery disease.
Tutor: Zsolt Kőszegi M.D., Ph.D.
2. Title: Pericardial fat tissue
3. Title: Safety antidiabetic therapy
Tutor: Tibor Fülöp M.D., Ph.D.
4. Title: Feasibility of pulmonary balloon angioplasty in CTEPH patients.

5. Title: Percutaneous interventional strategies in patients with chronic coronary artery occlusion.
Tutor: Tibor Szűk M.D., Ph.D.
6. Title: Structural interventions in cardiology
Tutor: Attila Kertész M.D., Ph.D.
7. Title: Pre-TAVI investigations - CT in focus.
8. Title: The role of cardiac-CT - general overview.
Tutor: Rudolf Kolozsvári M.D., Ph.D.
9. Title: Assessment of the right heart side by 3D echocardiography
10. Title: The role of 3D echocardiography in mitral valve disease
Tutor: Csaba Jenei M.D.
11. Title: Examining the correlation of immunohistochemistry parameters of patients with HER2 positive breast cancer and trastuzumab-induced cardiotoxicity.
Tutor: Dániel Czuriga M.D., Ph.D.
12. Title: Comparison of STEMI and NSTEMI cases after primary PCI: the role of secondary prevention
Tutor: László Fülöp M.D., Ph.D.
13. Title: Atrial fibrillation and new oral anticoagulant therapy
Tutor: Gábor Kolodzey M.D.
14. Title: Gestational hypertension management at the Department of Cardiology, University of Debrecen.
Tutor: Alexandra Kiss M.D., Ph.D.
15. Title: Investigating the effects of therapeutic hypothermia in patients after out-of-hospital arrest.
Tutor: Árpád Kovács 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: Angiotensin converting enzymes in the laboratory diagnostics
5. Title: Endogenous regulation of the renin-angiotensin-aldosterone system and its clinical significance
Tutor: Miklós Fagyas M.D., Ph.D.
6. 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: Importance of FDG PET/CT in cardiology
3. Title: Metabolic parameters in correlation with different oncological therapies
4. Title: Targeted radionuclide therapies in metastatic prostate cancer
5. Title: Targeted radionuclide therapies in neuroendocrin tumors
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: Transcriptional regulation of immune responses.
Tutor: Lajos Széles M.Sc., Ph.D.
2. Title: Analysis of mono-ADP-ribosylated proteins from pro- and eukaryotic cells.
Tutor: András Penyige M.Sc., Ph.D.

3. 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.
4. Title: Overview of the background of an arbitrary genetic disorder.
5. Title: Overview of the genetic background influencing the pharmacokinetics and pharmacodynamics of a drug.
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: Investigation the diet–microbiota interactions due to regular sport and personalized nutrition.
9. Title: Next-generation sequencing for the investigation of the small RNA transcriptome in hemato-oncology patients.
Tutor: Melinda Paholcsek M.Sc., Ph.D.
10. Title: Exosomes, as possible biomarkers.
Tutor: Beáta Soltész M.Sc., Ph.D.
11. Title: Study the role of microRNAs in ovarian cancer.
Tutor: Melinda Szilágyi-Bónizs M.Sc., Ph.D.

Department of Immunology

1. Title: The role of the HOFI/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 lympoid cells (ILC) in human diseases
Tutor: Attila Bácsi M.Sc., Ph.D., D.Sc.

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 senzors 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. habil.

2. Title: Treatment modalities in pancreas cancer
Tutor: Péter Árkosy M.D., Ph.D. habil.

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., Ph.D.

6. Title: Palliation in oncology
Tutor: Éva Szekanecz 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., Ph.D.

Department of Laboratory Medicine

1. Title: Evaluation of known and novel autoantibodies in the diagnostics of autoimmune and immune-mediated disorders

2. Title: Identification of novel biomarkers for the detection and prediction of cirrhosis associated infections
Tutor: Péter Antal-Szalmás M.D., Ph.D.

3. Title: Vitamin D status in colorectal carcinoma
Tutor: Harjit Pal Bhattoa M.D., Ph.D.

4. Title: Cytogenetic aberrations in infertility
5. Title: Genetic examinations in t(12;21) positive childhood acute lymphoblastic leukemia
Tutor: Anikó Ujfalusi M.D., Ph.D.

6. Title: Analysis of serum human epididymis protein 4 (HE4) in the follow-up of cystic fibrosis patients
7. Title: Investigation of platelet microRNA expressions in septic conditions
Tutor: Béla Nagy Jr. M.D., Ph.D.

Division of Clinical Laboratory Science

1. Title: Effect of alfa2-plasmin inhibitor heterogeneity on the risk of thrombosis
2. Title: Method development for the detection of various antithrombin isoforms
Tutor: Éva Katona M.Sc., Ph.D. habil.

3. Title: Inherited hemostasis disorders; laboratory and molecular genetic aspects
4. Title: Laboratory monitoring of the new generation oral anticoagulants
Tutor: Zsuzsanna Bereczky M.D., Dr. habil., Ph.D.

5. Title: Characterization of the heparin-antithrombin interaction with surface plasmon resonance
6. Title: New methods for investigating the interactions of blood coagulation proteins
Tutor: Krisztina Pénzes-Daku M.Sc., Ph.D.

7. Title: Fibrinolytic marker levels and polymorphisms in inflammatory bowel diseases
8. Title: Investigation of fibrinolytic markers on the outcome of thrombolytic therapy in patients with ischaemic stroke
Tutor: Zsuzsa Bagoly M.D., Ph.D.

Department of Dermatology

1. Title: Ablative laser treatment in Hailey-Hailey disease
2. Title: DNA repair mechanisms
3. Title: Indications in ablative Er:YAG laser
4. Title: Methods of sunprotection
Tutor: Éva Remenyik M.D., Ph.D., D.Sc.

5. Title: Chemical burns - special features and treatment options
6. Title: Dermatofibrosarcoma protuberans - therapeutic possibilities
7. Title: Possibilities of skin grafting in the reconstruction of defects after removal of skin tumors
8. Title: Role of NPWT (Negative Pressure Wound Therapy) in the treatment of burns
9. 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.

10. 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.

11. Title: Different applications of the latissimus dorsi musculocutaneous flap
Tutor: Zoltán Péter M.D.

12. Title: Characteristics of chronic urticaria – analysing our patients' data
13. Title: Methotrexate use in psoriasis – the diagnosis of liver fibrosis as a possible side effect
Tutor: Krisztián Gáspár M.D., Ph.D.

14. Title: Lipid disorder associated dermatological symptoms
15. Title: Pathogenesis and therapy of acne
16. Title: Role of lipid environment in the activation of dermal macrophages
Tutor: Dániel Törőcsik M.D., Ph.D.

17. Title: New therapies in severe psoriasis vulgaris

18. Title: Omalizumab therapy in chronic urticaria
Tutor: Andrea Szegedi M.D., Ph.D., D.Sc.

19. Title: Drug hypersensitivity reactions: types and diagnostic approach
20. Title: Penicillin allergy: diagnostics and management
Tutor: Irina Sawhney M.D.

21. Title: Correlation of clinicopathological classification of melanoma with disease outcome
Tutor: Gabriella Emri M.D., Ph.D.

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: Celiac disease
4. Title: Inflammatory bowel diseases
Tutor: Zsolt Barta M.D., Ph.D.

5. Title: Management of infection with the human immunodeficiency virus type 2 (HIV-2)
6. Title: Pathomechanism of HIV dual infection, characterization of clinical features and disease prognosis
Tutor: Mohamed Mahdi M.D., Ph.D.

7. Title: Fecal microbiota transplant and Clostridium difficile infection
8. Title: Immunosuppressed conditions and Clostridium difficile infections
9. 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 Erdődi M.Sc., Ph.D., D.Sc.

3. Title: Regulation of macrophage activation
Tutor: László Virág M.D., Ph.D., D.Sc.

4. Title: Signal transduction pathways in pulmonary endothelial cells
Tutor: Csilla Csortos M.Sc., Ph.D., D.Sc.

5. Title: Study of metabolic processes with special regard to the involvement of mitochondrial activity.
Tutor: Péter Bay M.Sc., Ph.D., D.Sc.

6. Title: Application of High-Content Screening in Life Sciences
Tutor: Endre Kókai M.Sc., Ph.D.

7. Title: Overcoming insulin resistance by SMTNL1-mimicking peptide
8. Title: Signalling pathways in endometriosis
Tutor: Beáta Lontay M.Sc., Ph.D.

9. Title: Inhibition of sodium-glucose cotransporter of kidney by glucose-based compounds also interfering with glycogenolysis
Tutor: Tibor Docsa M.Sc., Ph.D.

10. Title: Regulation of protein phosphatase-1 by inhibitory proteins and the translocation of the targing subunit
Tutor: Andrea Kiss M.Sc., Ph.D.

11. Title: High-Throughput Screening
Tutor: Csaba Hegedűs M.D., L.D.S., Ph.D.

12. Title: Autophagy in physiological and pathological processes
Tutor: Katalin Kovács M.Sc., Ph.D.

13. Title: Posttranslational modifications of the mitochondrial fission protein Drp1 and their role on mitochondrial morphology.
14. Title: The effect proteasomal inhibition in Huntington's disease.
Tutor: Krisztina Tar M.Sc., Ph.D.

15. Title: The role of mechanotransduction in the upregulation of CXCL1 in the small intestine
Tutor: Karen Uray M.Sc., Ph.D.

Department of Medical Microbiology

1. Title: Antimicrobial cell-mediated immunity measured by mRNA tests
Tutor: József Kónya M.D., Ph.D., D.Sc.

2. Title: Role of HPV in head and neck cancers
Tutor: Krisztina Szarka M.Sc., Ph.D.

3. Title: Evaluation of fungicidal effect of antifungal agents using time-kill curves
4. Title: New and older agents in antifungal chemotherapy
Tutor: László Majoros M.D., Ph.D.

5. Title: Prevalance of human polyomaviruses
Tutor: Eszter Csoma M.Sc., Ph.D.

6. Title: Effects of human papillomavirus oncoproteins on cellular signaling pathways in keratinocytes
Tutor: Anita Szalmás M.Sc., Ph.D.

7. Title: Molecular epidemiology of aminoglycoside resistance in nosocomial Gram negative bacteria
Tutor: Gábor Kardos M.D., Ph.D.

8. Title: Intratypical variation of human papillomaviruses
Tutor: György Veress M.Sc., Ph.D.

9. 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., D.Sc.

4. Title: Lipid abnormalities in hypothyreoidism.
5. Title: The function of LDL in lipid metabolism
Tutor: György Paragh M.D., Ph.D., D.Sc.

6. Title: Diagnostic tests and imaging techniques in endocrinology.
Tutor: Endre Nagy M.D., Ph.D., D.Sc.

7. Title: Adipokines and Insulin Resistance
8. Title: Insulin resistance and non-alcoholic fatty liver disease
9. Title: Obesity: Diagnosis and Treatment
10. Title: Obesity: Etiology and Co-morbidities
Tutor: Péter Fülöp M.D., Ph.D. habil.

11. Title: Diabetic neuropathy and oxidative stress
Tutor: Ferenc Sztanek M.D., Ph.D.

12. Title: Autoimmune disorders and GI tract
Tutor: Zsolt Barta M.D., Ph.D.

13. Title: The disease course after stent inplantation 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 approches 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: Gastoesophageal reflux disease
Tutor: László Dávida M.D.

Department of Pathology

1. Title: Molecular classification of glial neoplasms
2. Title: Overview of non-adenohypophysaer neoplastic lesion within and around the sella
3. Title: Use of IDH-1 immunohistochemistry in surgical neuropathology
Tutor: Péter Molnár M.D., D.Sc.

4. Title: Functional analysis of malignant lymphomas using image analysis
5. Title: Mitotic failures and cancer progression
6. Title: Molecular diagnostics of solid tumors
Tutor: Gábor Méhes M.D., D.Sc.

Department of Internal Medicine

1. Title: Familiar 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: Immune checkpoint inhibitors in advanced oral cancer
25. Title: Optional title on cancer chemotherapy
Tutor: Attila Megyeri M.D., Ph.D.

26. Title: Class I antiarrhythmic agents: dental implications
27. Title: COX-3 inhibitors in the dental practice
28. Title: Optional title in pharmacology
29. Title: Pharmacotherapy of bronchial asthma: dental implications
30. Title: Reflux disease and the dental patient
Tutor: Ágnes Cseppentő M.D.

31. Title: Optional title on antibacterial chemotherapy
Tutor: Zsuzsanna Gál M.Sc., Ph.D.

32. Title: Optional title in pharmacology
Tutor: Béla Juhász D.Pharm., Dr. habil., Ph.D.

33. Title: Optional title in pharmacology
Tutor: Balázs Varga D.Pharm., Ph.D.

34. Title: Optional title in pharmacology
Tutor: Mariann Bombicz D.Pharm.

35. Title: Optional title in pharmacology
Tutor: Dániel Priksz D.Pharm.

Department of Physiology

1. Title: Expression and significance of the TASK channels in physiological and pathological conditions
Tutor: Péter Szücs M.D., Ph.D.

2. Title: Alterations of intracellular calcium concentration in pathological conditions
Tutor: László Csernoch M.Sc., Ph.D., D.Sc.

3. Title: Regional differences in the electrophysiological properties of cardiomyocytes
Tutor: Péter Nánási M.D., Ph.D., D.Sc.

4. Title: Role of afterdepolarization mechanisms in the arrhythmogenesis
Tutor: Tamás Bányász M.D., Ph.D., D.Sc.

5. Title: Electrophysiological properties of mammalian cardiac tissues
Tutor: János Magyar M.D.,Ph.D.,D.Sc.

6. Title: Beat-to beat variability of cardiac repolarization
Tutor: Norbert Szentandrássy M.D., Ph.D.

7. Title: Studies on ion channels incorporated into artificial membranes
Tutor: István Jóna M.Sc., Ph.D., D.Sc.

8. Title: Role of late sodium current in the arrhythmogenesis
Tutor: Balázs Horváth M.D.,Ph.D.

9. Title: Role of potassium channels in neuron function
Tutor: Balázs Pál M.D.,Ph.D.

10. Title: Properties of vanilloid receptors
Tutor: István Balázs Tóth M.Sc., Ph.D.

11. Title: Role of Protein Kinase C isoforms in cell function.
Tutor: Gabriella Czifra M.Sc., Ph.D.

Department of Emergency Medicine

1. Title: Cardiac rhythm disturbances. Hypertensive emergencies.
Tutor: Zoltán Szabó M.D., Ph.D.

Division of Gastroenterology

1. Title: Gastric cancer: clinics and treatment
2. Title: Gastrointestinal bleeding
3. Title: Gluten sensitive enteropathy
4. Title: Inflammatory bowel diseases
5. Title: Lymphomas in the gastrointestinal tract
Tutor: István Altorjay M.D., Ph.D., D.Sc.

6. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C
7. Title: Pathomechanism of alcoholic hepatitis
8. Title: Signs, diagnostics and treatment of portal hypertension
9. Title: Therapeutic options in primary sclerotizing cholangitis
10. Title: Treatment of autoimmune hepatitis
Tutor: István Tornai M.D., Ph.D. habil.

11. Title: Biological treatment of ulcerative cholitis
Tutor: Károly Palatka M.D., Ph.D. habil.

12. Title: Are the bacterial infections predictable in liver cirrhosis?
13. Title: Role of the serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases
Tutor: Mária Papp M.D., 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.

Department of Internal Medicine

1. Title: Ischemic colitis.
2. 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., D.Sc.

3. Title: Diagnosis and treatment of chronic lymphocytic leukemia
4. Title: Novel therapeutic approaches in the treatment of multiple myeloma
5. Title: Philadelphia negative myeloproliferative meoplasms - novel genetic and therapeutic improvements
6. Title: Recent advances in the management of chronic ITP
Tutor: Péter Batár M.D., Ph.D.

Department of Internal Medicine

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: Osteoporosis in systemic sclerosis
2. Title: Quality of life in systemic sclerosis
Tutor: Szilvia Szamosi M.D.,Ph.D.

3. Title: Diagnosis and therapy of early arthritis
4. Title: Modern therapy of vasculitides
Tutor: Edit Végh M.D.

5. Title: Extra-articular manifestations in ankylosing spondylitis
Tutor: Nóra Bodnár M.D., Ph.D.

6. Title: Clinical and serological features, therapeutic possibilities of myositis-overlap syndromes at the Department of Rheumatology, University of Debrecen
Tutor: Levente Bodoki M.D., Ph.D.

7. 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: Misdiagnosis in neurology: causes and consequences
3. Title: Neurosonological investigations in acute and chronic stroke patients
4. Title: Non-invasive investigation of endothelial dysfunction.
5. Title: The autopsy as the ultimate yardstick of medicine. Is it still true?
Tutor: László Csiba M.D., Ph.D., D.Sc., M.H.A.Sc.

6. Title: COVID-19 and Multiple Sclerosis
7. Title: Diagnosis and differential diagnosis of multiple sclerosis
8. Title: Exercise in Multiple Sclerosis
9. Title: Multiple sclerosis - treatment in 2021
10. Title: Pregnancy in multiple sclerosis
Tutor: Tünde Csépány M.D., Ph.D.

11. Title: Cerebral vasoreactivity after epileptic seizure
12. Title: Cerebral vasoreactivity after sleep deprivation
13. Title: Clinical outcome of patients with acute ethanol consumption and acute ischemic stroke out of the time window
14. Title: Clinical outcome of patients with acute intracerebral hemorrhage and acute alcohol consumption
15. Title: COVID and stroke
16. Title: Effect of rheology abnormalities on neurovascular coupling
17. Title: Effect of sleep deprivation on neurovascular coupling
18. Title: Short-term changes in cerebral vasoreactivity after decrease of elevated blood pressure
Tutor: László Oláh M.D., Ph.D., D.Sc.

19. Title: Immunological relations of narcolepsy
20. Title: Wearable devices in epilepsy and sleep disorders
Tutor: Norbert Kozák M.D., Ph.D.

Department of Neurosurgery

1. Title: Treatment of silent cerebral aneurysms
Tutor: Sándor Szabó M.D., Ph.D.

2. Title: Craniocerebral injuries of early childhood
3. Title: Surgical strategies in meningiomas invading venous sinuses
4. Title: Treatment of brain tumors of first year of life
Tutor: László Novák M.D., Ph.D. habil.

5. Title: The role of extracellular matrix in neurosurgical pathologies
Tutor: Álmos Klekner M.D., Ph.D. habil.

6. Title: Treatment of trigeminal neuralgia, the role of stereotactic radiosurgery
Tutor: József Dobai M.D.

7. Title: Epidemiology and treatment strategies of spinal tumors
8. Title: Treatment options of spinal metastatic tumors
Tutor: Péter Ruszthi M.D.

9. Title: Diffusion tensor imaging possibilities in deep brain stimulation
Tutor: Gábor Fekete M.D., Ph.D.

10. Title: Instrumentation in spinal degenerative pathologies
Tutor: Rahmani Mohammad Tayeb 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: Screening /Diagnosis and Treatment of Cervical Cancer
Tutor: Zoltán Hernádi M.D., Ph.D., D.Sc.

5. Title: Non-invasive prenatal testing for chromosomal aneuploidies
Tutor: Olga Török M.D., Ph.D. habil.

6. Title: Efficiency and safety of first line chemotherapy in ovarian cancer
7. Title: Efficiency and safety of second and subsequent line chemotherapy in ovarian cancer
8. Title: Efficiency of HPV vaccination
Tutor: Róbert Póka M.D., Dr. habil., Ph.D.

9. Title: Meiotic abnormalities and their clinical significance in human reproduction
10. Title: Role of Doppler ultrasound in antenatal care
Tutor: Tamás Szilveszter Kovács M.D., Ph.D.

11. Title: Anovulatory infertility
12. Title: Examination of genetic concerns about the safety of assisted reproduction
13. Title: Role of antimullerian hormone (AMH) in clinical practice
14. Title: Ultrasound dating in pregnancy
Tutor: Attila Jakab M.D., Ph.D. habil.

15. Title: Cervical cancer prevention: the role and the future of HPV vaccination besides conventional screening
16. Title: New treatment strategies in ovarian cancer
Tutor: Zoárd Krasznai M.D., Ph.D. habil.

17. Title: Pregnancy in unknown location (PUL)
Tutor: Péter Daragó M.D.

18. Title: Analysis of perioperative results of endometriosis surgery
19. Title: Role of endoscopy in infertility work-up
Tutor: Péter Török M.D., Ph.D. habil.

20. Title: Autoimmune diseases in human reproduction
Tutor: Szilvia Vad M.D., Ph.D.

21. Title: Screening of preeclampsia in the first trimester of pregnancy
Tutor: László Orosz M.D., Ph.D.

22. Title: Pregnancy care in PCOS patients
23. Title: Special aspects of pregnancy care in patients with endocrine disorders
24. Title: Thyroid autoimmunity - clinical significance, prevention and treatment in human reproduction
Tutor: Tamás Deli M.D., Ph.D.

25. Title: Diagnosis and therapy in urogynecology
Tutor: Bence Kozma M.D., Ph.D.

26. Title: Laparoscopic techniques in benign gynecologic pathologies
27. Title: New surgical methods in gynecologic oncology
28. Title: Types and methods of labour induction and correlation with caesarean section rate
Tutor: Rudolf Lampé M.D., Ph.D. habil.

29. Title: Contraception in the 21st century
Tutor: Balázs Erdődi M.D.

30. Title: New methods in radical surgery of ovarian cancer
Tutor: Szabolcs Molnár M.D.

31. Title: Comparative study of caesarean sections in Europe
32. Title: The influence of mode of delivery on neonatal and maternal health
Tutor: Jashanjeet Singh M.D.

Department of Obstetrics and Gynecology

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: Advanced dry eye diagnostics
2. Title: Corneal topography/tomography
3. Title: Ocular manifestations of COVID infection
Tutor: László Módis M.D., Ph.D., D.Sc.

4. Title: Intraocular tumors
Tutor: Judit Damjanovich M.D., Ph.D.

5. Title: Presentation of non arteritic ischaemic optic neuropathy, its ophthalmologic and neuro-ophthalmologic importance
Tutor: Valéria Nagy M.D., Ph.D.

6. Title: Examination of keratoconus progression
7. Title: Longitudinal non-contact evaluation of the anterior segment of the eye in healthy humans
8. Title: Ophthalmological manifestations of immune-mediated diseases
9. Title: Treatment of non-infectious uveitis
Tutor: Mariann Fodor M.D., Dr. habil., Ph.D.

10. Title: Contact lens wear and complications
11. Title: Orthokeratology
Tutor: Beáta Kettesy M.D., Ph.D.

12. Title: Corneal measurments with Pentacam
13. Title: Refractive laser-surgical interventions
Tutor: Bence Lajos Kolozsvári M.D., Ph.D.

14. Title: Treatment of Graves' orbitopathy
Tutor: Zita Steiber M.D., Ph.D.

15. Title: Change in treatment of intraocular tumors from the first application of brachytherapy till now in Hungary
16. Title: Investigation of vascular endothelial growth factor level in the tear of uvel melanoma patients
Tutor: Éva Surányi M.D., Ph.D.

17. Title: Pathogenesis of Graves' orbitopathy
18. Title: Proliferation and hyaluronan production of retrobulbar fibroblasts in thyroid associated 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: Ocular manifestations in systemic autoimmune diseases
Tutor: Anikó Rentka M.D., Ph.D.

22. Title: Dry eye in blepharospasm
Tutor: Annamária Nagy M.D., Ph.D.

23. Title: BCVA change after intravitreal ranibizumab injection
24. Title: IOP change after intravitreal ranibizumab injection
Tutor: Erika Papp M.D.

25. Title: Treatment options for intraocular vascular disorders.
Tutor: Szabolcs Balla null

26. Title: Artificial intelligence in ophthalmology, review of the literature
Tutor: Beáta Bajdik M.D.

27. Title: Examination and treatment of diabetic maculopathy
28. Title: Stem cells of the cornea
29. Title: Surgical treatment of retinal diseases
Tutor: Lili Takács M.D., Ph.D.

Department of Orthopedic Surgery

1. Title: Topic will be discussed personally
Tutor: Zoltán Karácsonyi M.D.

2. Title: Topic will be discussed personally
Tutor: Csenge Szeverényi M.D., Ph.D.

3. Title: Topic will be discussed personally
Tutor: Tamás Bazsó M.D.

4. Title: Topic will be discussed personally
Tutor: Zsolt Hunya M.D.

Department of Otorhinolaryngology and Head and Neck Surgery

1. Title: The role of cochlear implant
2. Title: The role of the bone anchored hearing aids
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 utility of the neuromonitor during surgeries of the big salivary glands
Tutor: Szilárd Gyula Rezes M.D., Ph.D.

8. Title: Diagnostic possibilities of hearing loss and rehabilitation of sensorineural hearing loss
Tutor: Judit Szilvássy M.D., Ph.D. habil.

Department of Pediatrics

1. Title: Prognostic factors in childhod acute lymphoblastic leukemia
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 newborns.
Tutor: Andrea Nagy M.D.

4. Title: Anti-TNF use in pediatric inflammatory bowel disease
Tutor: Éva Nemes M.D., Ph.D.

5. Title: Characteristics of Graves' disease in childhood
6. Title: Primary immunedeficiency in childhood: case reports
7. Title: Systemic autoimmune diseases in childhood
Tutor: Rita Káposzta M.D., Ph.D.

8. Title: Mutational analysis of x-linked hyperphosphatemic ricket (XLH) in children
Tutor: Tamás Szabó M.D., Ph.D.

9. Title: Treatment options of resistant/relapsed pediatric Hodgkin lymphoma
Tutor: István Szegedi M.D., Ph.D.

10. Title: Diagnosis of medinastinal masses in children
Tutor: Imre Gáspár M.D.

11. Title: Implantable venous access systems in pediatric use: implantation, management and complications
Tutor: Ágnes Magyar M.D.

12. Title: Controversies in the surgical management of congenital diaphragmatic hernias
Tutor: László Sasi Szabó M.D.

13. Title: Prognostic importance of ultrasound in small bowel invagination
Tutor: Klára Nagy-Erdei M.D.

14. Title: Laparoscopic versus open pyeloplasty in children - A single centre experience and rewiev of the literature
Tutor: Levente Szabó M.D.

15. Title: Negative pressure wound therapy (NPWT) in pediatric surgery
Tutor: Péter Juhász M.D.

16. Title: Pediatric haemophilia - diagnostic approaches and novel therapies
Tutor: Zsuzsa Zele M.D.

17. Title: Cytogenetic and molecular genetic alterations in pediatric acute leukemias between 2015 and 2020
Tutor: Zsuzsanna Gaál M.D., Ph.D.

18. Title: Bioinformatic systems in childhood acute lymphoblastic leukemia
Tutor: Katalin Megyesán null

Department of Pediatrics

1. Title: Neurodevelopmental outcome in preterm and low birth weights infants
Tutor: Nóra Katona M.D.

2. Title: In utero circulation and preterm birth
3. Title: Perinatal consequences of maternal autoimmune diseases
4. Title: Respiratory and circulatory adaptation after birth
5. Title: Respiratory treatment of preterm neonates
6. Title: Screening and treatment of perinatal infections
7. Title: Special nutrition of neonates with congenital heart defect
Tutor: Balázs Kovács-Pászthy M.D.

8. Title: Mortality and morbidity of very low birth weight preterm infants
Tutor: Magdolna Riszter M.D.

9. Title: Less Invasive Surfactant Administration - a narrative rewiev
10. Title: Lung ultrasound in the Critically Ill Neonate
Tutor: Gergely Balázs M.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 Móré E. M.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 disfunctional 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: Pharmacological and non - pharmacological treatment methods in OCD
10. Title: The psychosocial effects of obesity
Tutor: Katalin Tolvay M.D.

11. Title: Brain imaging in psychiatry.

12. Title: Oxidativ stress and chronic inflamation 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 psychodelics
Tutor: Ede Frecska M.D., M.A., Ph.D.

Department of Pulmonology

1. Title: New perspectives in the treatment of lung cancer.
Tutor: Andrea Fodor M.D.

2. Title: New perspectives in the treatment of community acqiured 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: Cachexia as prognostic factor in treatment of NSCLC
Tutor: Attila Lieber M.D.

Department of Surgery

1. Title: Surgical treatment of Graves disease with ophthalmopathy
Tutor: Ferenc Győry M.D.

2. Title: Surgical treatment of bowel obstruction in colorectal diseases
Tutor: László Damjanovich M.D., Ph.D., D.Sc.

3. Title: Surgical and endovascular interventions in critical limb ischemia
Tutor: Sándor Olvasztó M.D.

4. Title: Histopathologic examination of the carotid plaques regarding their possible prognostic value
Tutor: Krisztina Litauszky M.D.

5. Title: Liver resections for metastases of colorectal cancer
Tutor: János Pósán M.D.

6. Title: Prevention of bronchial stump insufficiency after lung resections
Tutor: István Takács M.D.,Ph.D.

7. Title: The surgical treatment of hyper-parathyroidism
Tutor: Roland Fedor M.D., Ph.D.

8. Title: Different forms of hereditary colorectal cancer among our patients.
Tutor: Miklós Tanyi M.D.,Ph.D.

9. Title: Mesh implantation in the surgical treatment of thoracic defects
Tutor: Attila Enyedi M.D.

Department of Operative Techniques and Surgical Research

1. Title: Anesthesia in experimental animals
2. Title: Experimental animal models for metabolic diseases (diabetes, metabolic syndrome) in research
3. Title: Laser-Doppler in experimental surgery
Tutor: Ádám Deák D.V.M., Ph.D.

4. Title: Changes of red blood cells' micro-rheology in surgical pathophysiological processes
5. Title: Microvascular anastomosis techniques
Tutor: Norbert Németh M.D., MBA, Ph.D., D.Sc.

6. Title: Hemostatic agents (bioplasts) in surgery
7. Title: Ischemia-reperfusion injury and its prevention with different methods - experimental models
Tutor: Katalin Pető M.D., Ph.D.

8. Title: Analysis for laparoscopic skills assessment
9. Title: Hand hygiene and surgical scrub
Tutor: Erzsébet Ványolos M.Sc., Ph.D.

10. Title: Instruments and devices used in pharmacological care
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
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: Excersises of the physiotherapy in the postoperative treatment of the flexor tendon injuries (gyógytornász)
Tutor: István Frendl M.D.

3. Title: Endoscopical treatment of shoulder dislocations (ÁOK, gyógytornász)
4. Title: The operative treatment and physiotherapy of the adult distal humeral fractured patients in our department (gyógytornász)
5. Title: Up-to-date operative treatment of femoral neck fractures (ÁOK)
Tutor: István Szarukán M.D.

6. Title: Fractures of the leg
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: Treaement of urethral stricture Reconstructive urological surgeries
Tutor: Mihály Murányi M.D.

8. Title: Assessment of bening prostate hyperplasia
Tutor: József Zoltán Kiss M.D.

9. Title: Effect of ochidopexy on male fertility
Tutor: Gyula Drabik M.D.

CHAPTER 22
LIST OF TEXTBOOKS

BMC

Introduction to Biophysics I.:

Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.
Gáspár R.: Physics for BMC students.
University of Debrecen.

Introduction to Medical Chemistry I.:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.

Introduction to Medical Chemistry II.:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
F., Erdődi, Cs., Csortos: Organic Chemistry for Premedical Students.
University of Debrecen, 2011.

Hungarian Language for BMC students:

Gerő Ildikó-Kovács Judit: Színesen magyarul.
2017.

Introduction to Biology I.:

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

Introduction to Biophysics II.:

Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.
Gáspár R.: Physics for BMC students.
University of Debrecen.

Introduction to Biology II.:

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

English for BMC students:

Clive Oxenden-Christina Latham-Koenig. Paul Seligson: English File 3E Pre-Intermediate Student's Book With Itutor.
3.. Oxford University Press, 2013. ISBN: 9780194598651.
Clive Oxenden-Christina Latham-Koenig. Paul Seligson: English File 3E Pre-Intermediate Student's Book With Itutor.
3.. Oxford University Press, 2013. ISBN: 9780194598651.

SBMC

Introduction to Biophysics:

Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN: 978-1285737027.

Introduction to Medical Chemistry:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
F., Erdődi, Cs., Csortos: Organic Chemistry for Premedical Students.
University of Debrecen, 2011.

Introduction to Biology:

Sadava, Hillis, Heller, Berenbaum: Life: The Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN: 978-1-4641-4124-9.

1st year

Biophysics Lecture:

Edited by János Szőllősi: Medical Biophysics.
Medicina, 2009.

Basics of Behavioural Sciences:

Segerstrale, U., Molnár, P.: Nonverbal Communication: Where Nature Meets Culture.
1st edition. Psychology Press, 1997. ISBN: 0-8058-2179-1.
Alan Stoudemire: Human Behavior. An

Introduction for Medical Students.
J.B. Lippincott Company, Philadelphia, 1994.
Márta Csabai and Péter Molnár: Medical Psychology.
Background material. Reprint University of Debrecen, 2008.
Smith, E. E., & Nolen-Hocksema, S.: Atkinson and Hilgards's Introduction to Psychology..
16th. Cengage Learning EMEA, 2014. ISBN: 978-1408089026.
Kantor, J. E.: Medical Ethics for Physicians-in-Training.
New York & London: Plenum.,
Helman, C. G.: Culture, Health and Illness.
CRC Press.(Chapter 1.),
Barry, A-M. – Yuill, Ch.: Understanding the Sociology of Health.
SAGE., 2012. ISBN: (Chapters 1., 2.).

Medical Chemistry Lecture:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN: 978-0321943170.
Gergely, P.: Organic and Bioorganic Chemistry for Medical Students.
3rd edition. Medical and Health Science Center, University of Debrecen, 2008.
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 2020.
URL: https://elearning.med.unideb.hu/pluginfile.php/140349/mod_resource/content/1/Bioinorganic-Chemistry/index.html

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: Biosatatistics: 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.:

Mezei Zsuzsa Lívia- Fodor Marianna: Szívből magyarul.

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.

Medical Chemistry Practical:

Ed. Dombrádi, V.: Laboratory Practicals in Medical Chemistry.
Medical and Health Science Center, University of Debrecen, 2009.

History of Medicine:

Roy Porter: The Cambridge Illustrated History of Medicine.
Cambridge University Press, 2006. ISBN: 978-0-521-68289-3.
Lois N. Magner, Oliver J. Kim: A History of Medicine.
3rd. CRC Press, 2018. ISBN: 9781138103825.
Mark Jackson: A Global History of Medicine.

1st. Oxford University Press, 2018. ISBN: 978-0-19-880318-8.

Anatomy, Histology and Embryology I. Lecture:

Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell: Gray's Basic Anatomy.
2nd edition. Elselvier, 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.: 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..
Alberts: Essential Cell Biology.
5th edition. Garland Public Inc., 2019. ISBN: 9798-0393-6803-62.

Latin Medical Terminology I.:

Répás László: Basics of Medical Terminology, Latin and Greek Origins I..
Répás László, 2016.

Hungarian Language I/2.:

Győrffy Erzsébet-Mezei Zsuzsa Lívia: Magyarules.
2018.

Medical Genetics Lecture:

Robert L. Nussbaum, Roderick R. McInnes, Huntington F. Willard, Ada Hamosh: Thompson and Thompson Genetics in Medicine.
8th edition. Saunders Elsevier, 2016. ISBN: 978-1-4377-0696-3.
Practical Courses in Genetics.
University Medical School of Debrecen, 2002.
Hartl D. L.: Essential Genetics: A Genomics Perspective.
6th edition. Jones & Bartlett Publishers, 2014. ISBN: 978-1-4496-8688-8.
Thomas D. Gelehrter, Francis S. Collins, David Ginsburg: Principles of Medical Genetics.
2nd. Williams and Wilkins, 1998. ISBN: 0-683-03445-6.
Tom Strachan, Andrew P. Read: Human Molecular Genetics.
4th. Garland Science, 2011. ISBN: 0-8153-4184-9.
Eberhard Passarge: Color Atlas of Genetics.
2nd edition. Georg Thieme Verlag, 2001. ISBN: 3-13-100362-6.

Medical Genomics:

Lesk, Arthur: Introduction to Genomics.
3rd edition. Oxford University Press, 2017. ISBN: ISBN-13: 978-0198754.
Csaba Szalai, Valéria László, Sára Tóth, Erna Pap, András Falus: Medical genetics and genomics.
URL: https://elearning.med.unideb.hu
Strachan, T.; Read, AP.: Human Molecular Genetics.
5th edition. Garland Science, 2019. ISBN: ISBN-13: 978-0367002.

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. Elselvier, 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. Elselvier, 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. Elselvier, 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.

History of Medicine:

Roy Porter: The Cambridge Illustrated History of Medicine.
Cambridge University Press, 2006. ISBN: 978-0-521-68289-3.
Lois N. Magner, Oliver J. Kim: A History of Medicine.
3rd. CRC Press, 2018. ISBN: 9781138103825.
Mark Jackson: A Global History of Medicine.
1st. Oxford University Press, 2018. ISBN: 978-0-19-880318-8.

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.
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