

BULLETIN

UNIVERSITY OF DEBRECEN

ACADEMIC YEAR 2024/2025

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 9 departments of basic sciences, 5 diagnostical departments and 21 clinical departments specializing in various fields e.g. clinical chemistry, internal medicine, surgery, orthopedics, radiology, neurology, neurosurgery, psychiatry, pediatrics, obstetrics and gynecology, cardiology and pulmonology, otorhino-laryngology, dermatology, ophthalmology, stomatology and urology. Our hospitals serve as city hospitals for Debrecen therefore students may also obtain their clinical training here. The Faculty of Medicine started MD training in English in 1987 with 49 students. The current number of students in the English Program exceeds 1500. Besides educating medical students, the Faculty also coordinates the BSc in Medical Diagnostics and MSc programs in Clinical Laboratory Research, Molecular Biology and Nutrition. The curriculum described in this Bulletin provides a firm background for a future physician. Learning all these subjects requires highly motivated, devoted students. Please take your studies seriously, and enjoy the process of becoming a medical doctor.

Best wishes,
László Mátyus
Dean, Faculty of Medicine

CHAPTER 2

INTRODUCTION

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 38 departments; including 21 different clinical departments with more than 1,800 beds. It is not only the best-equipped institution in the area but it also represents the most important health care facility for the day-to-day medical care in its region.

The Kenézy Gyula County Hospital (with some 1,400 beds) is strongly affiliated with the University of Debrecen and plays an important role in teaching the practical aspects of medicine.

There are also close contacts between the University and other health care institutions, mainly (but not exclusively) in its closer region. The University of Debrecen has a Teaching Hospital Network consisting of 26 hospitals in Israel, Japan and South Korea.

It is also of importance that the University of Debrecen has a particularly fruitful collaboration with

the Nuclear Research Institute of the Hungarian Academy of Sciences in Debrecen, allowing the coordination of all activities that involve the use of their cyclotron in conjunction with various diagnostic and therapeutic procedures (e.g. Positron Emission Tomography 'PET').

Scientific Research at the Faculty of Medicine

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

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CHAPTER 6

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CHAPTER 7

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CHAPTER 9

UNIVERSITY CALENDAR

UNIVERSITY CALENDAR OR MEDICINE PROGRAM**2023/2024 ACADEMIC YEAR****CRASH COURSE OF HUNGARIAN LANGUAGE: August 26, 2024 – September 06, 2024****OPENING CEREMONY: September 08, 2024****1st SEMESTER****REGISTRATION WEEK: September 02, 2024-September 08, 2024**

Year	Course	Examination Period
Basic Medicine Course	September 09, 2024 – December 13, 2024 (14 weeks)	December 16, 2024 –January 31, 2025 (7 weeks)
1st year Medicine 2nd year Medicine 3rd year Medicine 4th year Medicine 5th year Medicine	September 09, 2024 – December 13, 2024 (14 weeks)	December 16, 2024 –January 31, 2025 (7 weeks)

2nd SEMESTER**REGISTRATION WEEK: February 03, 2025-February 09, 2025**

Year	Course	Examination Period
Basic Medicine Course	February 10, 2025 – May 16, 2025 (14 weeks)	May 19, 2025 – June 13, 2025 (4 weeks)
Basic Medicine Course II.	January 06, 2025-June 13, 2025 (23 weeks)	June 16, 2025– July 04, 2025 (3 weeks)
1st year Medicine 2nd year Medicine 3rd year Medicine 4th year Medicine	February 10, 2025 – May 16, 2025 (14 weeks)	May 19, 2025 – July 04, 2025 (7 weeks)
5th year Medicine	February 10, 2025 – May 16, 2025 (14 weeks)	May 19, 2025 – July 11, 2025 (8 weeks)

SUMMER HOSPITAL PRACTICE

Year	Dates in 2025
1st or 2nd year Medicine: Nursing Practice (4 weeks)	July 07, 2025– August 15, 2025
3rd year Medicine: Internal Medicine (3 weeks)	July 07, 2025– July 25, 2025 or July 28, 2025– August 15, 2025
4th year Medicine: Freely Chosen clinical department	July 07, 2025– July 25, 2025

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 30% 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 30%, 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 30% 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 2 nd semester SCTs OR the average of the best 6 SCTs	Bonus points (%)
45.00-49.99	2
50.00-54.99	4
55.00-59.99	6
60.00-64.99	8
65.00-69.99	10

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-Macmillan

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.

Circulation 1.

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 Szentandrassy, 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 Young's, shear and bulk modulus. Density and pressure. Variation of pressure with depth. Pressure measurements.

9th week:

Lecture:

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

10th week:

Lecture:

Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids. Macroscopic description of an ideal gas. The

kinetic theory of gases.

Energy in thermal processes. Heat and internal energy.

11th week:

Lecture:

Specific heat. Calorimetry. Latent heat and phase change. The first law of thermodynamics. The second law of thermodynamics. Entropy. Refrigerators and heat pumps.

12th week:

Lecture:

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

13th week:

Lecture:

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

14th week:

Lecture:

Interactive seminar and preparation for the ESE.

Contact person: Dr. Zoltán Varga, Associate Professor, Department of Biophysics

Recommended book: Serway-Vuille: College Physics, Brooks/Cole

Subject: **INTRODUCTION TO 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 BIOPHYSICS II.**

Year, Semester: Basic Medicine Course, 2nd

Number of teaching hours:

Lecture: **56**

Seminar: **28**

1st week:

Lecture: 1-4. Properties of electric charges. Insulators and conductors. Coulomb's law. Electric field. Electric field lines. Electric flux and Gauss's law.

Seminar: Material related to lectures 1-4.

2nd week:

Lecture: 5-8. Electrical energy and capacitance. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric.

Seminar: Material related to lectures 1-8.

3rd week:

Lecture: 9-12. 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.

Seminar: Material related to lectures 5-12.

4th week:

Lecture: 13-16. Direct current circuits. Resistors in parallel and series. Kirchhoff's rules and complex DC circuits. RC circuits. Conduction of electrical signals by neurons.

Seminar: Material related to lectures 9-16.

5th week:

Lecture: 17-20. Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on current loop and electric motors. Magnetic field of a long straight wire and Ampere's law. Magnetic field between two parallel conductors. Magnetic field of loops and solenoids.

Seminar: Material related to lectures 13-16.

6th week:

Lecture: 21-24. Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law. Generators. Self-inductance RL circuits.

Seminar: Material related to lectures 17-20.

7th week:

Lecture: 25-28. Alternating current. Resistors, capacitors and inductors in AC circuits. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves.

Seminar: Material related to lectures 21-24.

8th week:

Lecture: 29-32. The nature of light. Reflection, refraction and dispersion. Prisms. The rainbow. Huygen's principle. Total internal reflection and its medical applications.

Seminar: Material related to lectures 25-28.

9th week:

Lecture: 33-36. Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. Thin lenses. Images formed by lenses. Lens aberrations.

Seminar: Material related to lectures 29-32.

10th week:

Lecture: 37-40. Wave optics. Conditions for interference, polarization of light. Diffraction. The camera, the simple magnifier, the compound microscope, the telescope and the eye.

Seminar: Material related to lectures 33-36.

11th week:

Lecture: 41-44. Quantum physics. Blackbody radiation. Photoelectric effect. Particle theory of light. The production and attenuation of X-ray. Characteristic X-ray.

Seminar: Material related to lectures 37-40.

12th week: Lecture: 45-48. Atomic physics. Early model of the atom. Quantum mechanics and the hydrogen atom. The spin magnetic quantum numbers. Lasers and holography. Seminar: Material related to lectures 41-48.	processes. Medical application of radioactivity. Nuclear reactions. Nuclear fission and fusion. Positron and other antiparticles. Seminar: Material related to lectures 49-52.
13th week: Lecture: 49-52. Some properties of the nuclei. Binding energy. Radioactivity, the decay	14th week: Lecture: Preparation for the final exam.

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:

CHAPTER 10

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, Csontos: Organic chemistry for premedical students (2010)

Subject: **HUNGARIAN LANGUAGE FOR BMC STUDENTS**

Year, Semester: Basic Medicine Course 2nd

Number of teaching hours:

Practical: **36**

1st week:

Practical: 1. lecke, 2. lecke I. rész

2nd week:

Practical: 2. lecke II. rész

3rd week:

Practical: 3. lecke

4th week:

Practical: 4. lecke, 5. lecke I. rész

5th week:

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

6th week:

Practical: 6. lecke II. rész, 7. lecke (Összefoglaló) + midterm test

Self Control Test

7th week:

Practical: 8. lecke

8th week:

Practical: 9. lecke

9th week:

Practical: 10. lecke

10th week:

Practical: 11. lecke, 12. lecke

11th week:

Practical: 13. lecke

12th week:

Practical: 14. lecke (Összefoglalás) + end term test

Oral exam

Reading materials:

Gerő Ildikó-Kovács Judit: Színesen magyarul.

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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 30%, 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	2
50.00-54.99	4
55.00-59.99	6
60.00-64.99	8
65.00-69.99	10

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 Szentandrassy, 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 Young's'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 I-II.**

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: Chemsitry (7th edition)

Erdődi, Csontos: 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 (303 credits), required elective (27 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 17 compulsory final examinations in the curriculum.

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.

Compulsory courses for the 1. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	Anatomy, Histology and Embryology I. Lecture	AOANAT1E23EN	28	28		ESE	4	None
1	Anatomy, Histology and Embryology I. Practical	AOANAT1G23EN			56	AW5	3	None
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 I. Lecture	AOOKEM1E23EN	23	40		ESE	5	None
1	Medical Chemistry I. Practical	AOOKEM1G23EN			18	AW5	1	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 II. Lecture	AOANAT2E23EN	42	36		ESE	5	Anatomy, Histology and Embryology I. Lecture
2	Anatomy, Histology and Embryology II. Practical	AOANAT2G23EN			56	AW5	3	Anatomy, Histology and Embryology I. Lecture
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 Chemistry II. Lecture	AOOKEM2E23EN	28	28		FE	5	Medical Chemistry I. Lecture
2	Medical Chemistry II. Practical	AOOKEM2G23EN			30	AW5	2	Medical Chemistry I. Lecture
2	Nursing practice	AO_NYGY_NURSIN G			120	AW2	4	suggested to cover after 1st and/or 2nd year but has to be completed before the 3rd year

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 III. Lecture	AOANAT3E23EN	42	26		FE	5	Anatomy, Histology and Embryology II. Lecture
1	Anatomy, Histology and Embryology III. Practical	AOANAT3G23EN			56	AW5	3	Anatomy, Histology and Embryology II. Lecture
1	Biochemistry I. Lecture	AOBKEM1E23EN	52	28		ESE	6	Medical Chemistry II. Lecture
1	Biochemistry I. Practical	AOBKEM1G23EN			40	AW5	3	Medical Chemistry II. Lecture
1	Hungarian Language II/1.	AOHUN03T3			28	AW5	2	Hungarian language I/2.
1	Medical Physiology I. Lecture	AOOETN1E23EN	48	28		ESE	6	Anatomy, Histology and Embryology II. Lecture, Biophysics Lecture
1	Medical Physiology I. Practical	AOOETN1G23EN			42	AW5	2	Anatomy, Histology and Embryology II. 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	AOBKEM2E23EN	52	28		FE	6	Biochemistry I. Lecture
2	Biochemistry II. Practical	AOBKEM2G23EN			30	AW5	2	Biochemistry I. Lecture
2	Hungarian Language II/2.	AOHUN04T4			28	AW5	2	Hungarian language II/1.
2	Medical Genetics Lecture	AOGEN05T2	30			ESE*	2	Cell Biology Lecture
2	Medical Genetics Practical	AOGEN06T2			26	AW5	2	Cell Biology Lecture
2	Medical Physiology II. Lecture	AOOETN2E23EN	68	28		FE	9	Anatomy, Histology and Embryology III. Lecture, Medical Physiology I. Lecture, Biostatistics
2	Medical Physiology II. Practical	AOOETN2G23EN			42	AW5	3	Anatomy, Histology and Embryology III. Lecture, Medical Physiology I. Lecture, Biostatistics

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 III. 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 III. Lecture
1	Pathology I.	AOPAT03T5	28		45	ESE	5	Anatomy, Histology and Embryology III. Lecture
1	Propedeutics of Internal Medicine (Internal Medicine I.)	AOBEL22T5	28		28	ESE	4	Medical Physiology II. Lecture, Anatomy, Histology, Embryology III. Lecture

Compulsory courses for the 3. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
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.
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	Medical Microbiology II.	AOMIK04T6	20		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 Sciences
2	Pathology II.	AOPAT04T6	42		45	FE	6	Pathology I., Immunology
2	Internal Medicine summer practice	AO_NYGY_INTMED			90	AW2	3	Nursing Practice, Propedeutics of Int. Med., it has to be completed before the 4th year

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	Propeutics 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	26	4	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.	AOTRA02T7	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	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.
2	4th year summer practice	AO_NYGY_4TH YEAR			90	AW2	3	Internal Medicine summer practice after 3rd year, it has to be completed before the 5th year

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	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), Anatomy, Histology and Embryology III. Lecture
1	Neurology I.	AONEU03T9	15		10	AW5	4	Internal Medicine III. (Cardiology, Angiology), Anatomy, Histology and Embryology III. 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, Anatomy, Histology and Embryology III. 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	Infectology	AOFER02T10	15		20	ESE	2	Pathology II., Medical Microbiology II., Pharmacology II.
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), Anatomy, Histology and Embryology III. 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.	AOBLGY7G24EN			270	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.	AOSZUL3G24EN			120	FE	5	Successful completion of all compulsory subjects (I-V.)
1	Pediatrics III.	AOGYGY3G24EN			180	FE	7	Successful completion of all compulsory subjects (I-V.)
1	Psychiatry III.	AOPSZI3G24EN			90	FE	4	Successful completion of all compulsory subjects (I-V.)
1	Surgery III.	AOSEB09711-K1			150	FE	5	Successful completion of all compulsory subjects (I-V.)
1	Healthcare Management	AOEUMN0E23EN	80			SIGN	0	Successful completion of all compulsory subjects (I-V.)
1	Emergency Medicine Practical	AOSBGY0G24EN			120	SIGN	0	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	Basic Nursing Skill Practices	AOAASK0G24EN	4		10	AW5	1	Taking first aid and reanimation in the same semester
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

Required elective courses for the 1. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Basic Nursing Skill Practices	AOAASK0G24EN	4		10	AW5	1	Taking first aid and reanimation in the same semester
2	Computer Science	AOINF43T1			28	AW5	3	None
2	Getting Close to the Lab	AOKMGY0G23EN			42	AW5	3	Good or excellent marks of Biophysics and Biostatistics
2	History of Medicine	AOORT44T1	26			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.oetdk.unideb.hu
1	Basic Nursing Skill Practices	AOAASK0G24EN	4		10	AW5	1	Taking first aid and reanimation in the same semester
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Students' scientific activity for beginners	AOTDK04	10			AW5	1	None

Required elective courses for the 2. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Advanced students' scientific activity	AOTDK06	10			AW5	2	For the prerequisites please check the following website: www.oetdk.unideb.hu
2	Basic Nursing Skill Practices	AOAASK0G24EN	4		10	AW5	1	Taking first aid and reanimation in the same semester
2	Enzymology in laboratory medicine and in clinical practice	AOG6311004	14			AW5	1	Biochemistry I. Lecture + Practical
2	Getting Close to the Lab	AOKMGY0G23EN			42	AW5	3	Good or excellent marks of Biophysics and Biostatistics
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Medical Genomics	AOGEN43T2	12		2	AW5	2	Cell Biology Lecture
2	Modern biophysical methods in biology and medicine	AOMOD42T4	24			AW5	2	Biophysics Lecture, Cell Biology Lecture
2	Modern Techniques Allowing the Investigation of Physiological Phenomena	AOKOR42T4	24			AW5	2	Medical Physiology I. Lecture
2	Problem Based Learning in Physiology	AOPEL42T4			28	AW5	3	Medical Physiology I. Lecture
2	Selected Topics in Cell Biology	AOG157403-K1	28			AW5	2	Cell Biology Lecture
2	Social inequalities and health	AOG3673504	12		3	AW5	1	None
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	A Healthy Future-How to help future generations lead healthier lives?	AOG3673705	6	4	5	AW5	1	None
1	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
1	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
1	Clinical Neuroanatomy I.	AOKNAN1E24EN	28			AW5	2	Anatomy III.
1	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
1	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy II. FE)
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	Introduction to R	AOG3371405			30	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	Multimic approaches in 21st century medicine	AOG1672405	28			AW5	2	Biochemistry II.
1	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy II. FE)
1	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
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

Required elective courses for the 3. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
2	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
2	Clinical Gerontology	AOKLG42T6	30			AW5	3	Immunology, Medical Physiology II. Lecture
2	Clinical Neuroanatomy II.	AOKNAN2E24EN	28			AW5	2	Clinically oriented neuroanatomy I.
2	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
2	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and and Embryology II. FE)
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	Getting Close to the Lab	AOKMGY0G23EN			42	AW5	3	Good or excellent marks of Biophysics and Biostatistics
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Introduction to R	AOG3371405			30	AW5	2	None
2	Medical Imaging	AOOKE42T6	16			AW5	1	Pathology I.
2	Oncoimmunology	AOG2971106		28		AW5	2	Immunology
2	PBL in haemostasis	AOPBL42T6		20		AW5	2	Clinical Biochemistry I.
2	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy II. FE)
2	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
2	Refraction, refractive errors, corrections, refractive surgery	AOREF42T9	5			AW5	1	None
2	Social inequalities and health	AOG3673504	12		3	AW5	1	None
2	Surgical operative	AOG517407	4		8	AW5	1	Basic Surgical

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	techniques							Techniques
2	Take a deep breath! From marathon running to COVID-19 ECMO-everything you need to know about respiration	AOG5871006	28			AW5	2	Physiology II., Anatomy, Histology and Embryology II. Lecture

Required elective courses for the 4. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	A Healthy Future-How to help future generations lead healthier lives?	AOG3673705	6	4	5	AW5	1	None
1	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
1	Basic microsurgical training. Introduction to microsurgery	AOG517507	2		10	AW5	1	Basic Surgical Techniques, Surgical Operative Techniques
1	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
1	Clinical biochemistry and laboratory evaluation of thrombophilia	AOTHR42T7	12			AW5	1	Clinical biochemistry II.
1	Clinical Neuroanatomy I.	AOKNAN1E24EN	28			AW5	2	Anatomy III.
2	Clinical Neuroanatomy II.	AOKNAN2E24EN	28			AW5	2	Clinically oriented neuroanatomy I.
1	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
1	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
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,

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								Rheumatology- Immunology
1	Fundamentals of Sports Medicine, Prevention, and Rehabilitation in musculoskeletal system	AOG621108	16		8	AW5	2	None
1	Geriatric Medicine	AOGER42A7	20			AW5	3	Internal Medicine II (Immunology and Rheumatology)
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	How NOT to live up to the antimicrobial therapeutic options of future generations (Practice-oriented antimicrobial stewardship)	AONATL0E24EN		30		AW5	2	Medical Microbiology II.
1	Introduction to R	AOG3371405			30	AW5	2	None
1	Medical imaging reporting	AOG469207		6	18	AW5	2	Anatomy, Histology and Embryology II. Lecture, Physiology II, Propedeutics of Internal Medicine
1	Multiomic approaches in 21st century medicine	AOG1672405	28			AW5	2	Biochemistry II.
1	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
1	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
1	Surgical anatomy - selected chapters	AOG518407	24			AW5	2	Basic Surgical Techniques
1	Surgical operative techniques	AOG517407	4		8	AW5	1	Basic Surgical Techniques
1	Surgical techniques in gynecology	AONGYT0E24EN	16			AW5	1	None
1	Transplantation of the abdominal organs	AOG497907	12		4	AW5	1	Surgery I.
1	Traumatology II.	AOTRA42T7	10			AW5	2	Pathology II.
1	Travel and Tropical Medicine, Vaccinations	AOG307702	20		5	AW5	2	Microbiology II.

Required elective courses for the 4. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
2	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
2	Basic microsurgical training. Introduction to microsurgery	AOG517507	2		10	AW5	1	Basic Surgical Techniques, Surgical Operative Techniques
2	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
2	Clinical studies in practice	AOOKF208	14	14		AW5	2	Pharmacology I.
2	Clinico-radiological case reports	AOKLR41T8		24		AW5	1	None
2	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
2	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
2	Diagnostic and Operative Hysteroscopy	AOG5581108		12	4	AW5	1	None
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	Endometriosis: basics, diagnosis and treatment	AOG558908	16			AW5	1	ObGyn I.
2	Epidemiology, pathophysiology, diagnosis and treatment of osteoporosis.	AOEPI01T7	11	2	2	AW5	1	Internal Medicine II. (Immunology and Rheumatology)
2	From the molecular basics to targeted therapy; advances in clinical therapy of gynaecological tumours	AOG558708	16			AW5	1	Obstetrics and Gynecology I.
2	Fundamentals of sports medicine II.	AOG620608	11	3	10	AW5	2	Fundamentals of sports medicine
2	Fundamentals of Sports Medicine,	AOG621108	16		8	AW5	2	None

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	Prevention, and Rehabilitation in musculoskeletal system							
2	Getting Close to the Lab	AOKMGY0G23EN			42	AW5	3	Good or excellent marks of Biophysics and Biostatistics
2	Haemostasis Journal Club	AOHEJC023EN		14		AW5	1	Clinical Biochemistry II.
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Holistic & Integrative Medicine	AOG128408	38			AW5	2	None
2	How NOT to live up to the antimicrobial therapeutic options of future generations (Practice-oriented antimicrobial stewardship)	AONATL0E24EN		30		AW5	2	Medical Microbiology II.
2	Introduction to R	AOG3371405			30	AW5	2	None
2	Magnetic resonance imaging: from basics to practice	AOMRE41T8		24		AW5	1	Biophysics Lecture
2	Maternal-fetal medicine: pregnancy, mother and fetus across medicine	AOG5581308	18			AW5	1	Obstetrics and Gynecology I.
2	Metabolic Imaging (PET/CT) in Oncology	AOG469507	6		18	AW5	2	Pathology II., Internal Medicine I.
2	Oncoimmunology	AOG2971106		28		AW5	2	Immunology
2	Preclinical imaging in oncological research	AOPRKA0E23EN		28		AW5	2	Nuclear medicine
2	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
2	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
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	Rare diseases	AOG138107	10			AW5	1	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine I.
2	Reproductive Endocrinology and	AOG558510	15			AW5	2	Obstetrics and Gynecology I.

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	Infertility							
2	Recent Advances of Infertility Management and Gynaecological Oncology	AOINF42T8	20			AW5	2	Obstetrics and Gynecology I.
2	Social inequalities and health	AOG3673504	12		3	AW5	1	None
2	Surgical anatomy - selected chapters	AOG518407	24			AW5	2	Basic Surgical Techniques
2	Surgical operative techniques	AOG517407	4		8	AW5	1	Basic Surgical Techniques
2	Take a deep breath! From marathon running to COVID-19 ECMO-everything you need to know about respiration	AOG5871006	28			AW5	2	Physiology II., Anatomy II.
2	Travel Medicine for medical scholars	AOUTA42T8	30			AW5	2	Pathology II, Medical Microbiology II., Pharmacology I.
2	Ultrasound diagnosis in Obstetrics and Gynecology	AOG5581508	16			AW5	1	Obstetrics and Gynecology I.

Required elective courses for the 5. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	A Healthy Future-How to help future generations lead healthier lives?	AOG3673705	6	4	5	AW5	1	None
1	Advanced Surgical Operative Techniques	AOHMGY42T10	4		20	AW5	2	Basic microsurgical training. Introduction to microsurgery; Surgery II.
1	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
1	Basic laparoscopic surgical training	AOG517607-K10	5		15	AW5	2	Basic Surgical Techniques; Surgical Operative Techniques; Surgery II.
1	Basic microsurgical training. Introduction to microsurgery	AOG517507	2		10	AW5	1	Basic Surgical Techniques, Surgical Operative Techniques
1	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
1	Clinical Pharmacology	AOKFA42T9	20	8	2	AW5	2	Pharmacology II.
1	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
1	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
1	Facts and Recent Achievements of Andrology	AOAND41A8		30		AW5	2	Urology
1	Fundamentals of sports medicine	AOG620207	12	2	10	AW5	2	Internal Medicine propedeutics, Rheumatology-Immunology
1	Fundamentals of Sports Medicine, Prevention, and Rehabilitation in musculoskeletal system	AOG621108	16		8	AW5	2	None
1	History of Medicine	AOORT44T1	26			AW5	2	None
1	How NOT to live up to the antimicrobial therapeutic options of	AONATL0E24EN		30		AW5	2	Medical Microbiology II.

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	future generations (Practice-oriented antimicrobial stewardship)							
1	Introduction to R	AOG3371405			30	AW5	2	None
1	Medical imaging reporting	AOG469207		6	18	AW5	2	Anatomy, Histology and Embryology II. Lecture, Physiology II, Propedeutics of Internal Medicine
1	Multiomic approaches in 21st century medicine	AOG1672405	28			AW5	2	Biochemistry II.
1	Pharmacotherapy	AOG248110	30			AW5	3	Pharmacology II.
1	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
1	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
1	Radiation Therapy in Clinical Practice	AOSUG44T9	20	10	12	AW5	3	Pharmacology II., Radiology and Nuclear Medicine II.
1	Surgical anatomy - selected chapters	AOG518407	24			AW5	2	Basic Surgical Techniques
1	Surgical techniques in gynecology	AONGYT0E24EN	16			AW5	1	None
1	Thesis I.	AODIP47T9				AW3	5	None
1	Travel and Tropical Medicine, Vaccinations	AOG307702	20		5	AW5	2	Microbiology II.

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	Assertive communication, communication styles, group dynamics	AOG3371005		14	14	AW5	2	None
2	Basic laparoscopic surgical training	AOG517607-K10	5		15	AW5	2	Basic Surgical Techniques; Surgical Operative Techniques; Surgery II.
2	Basic microsurgical training. Introduction to microsurgery	AOG517507	2		10	AW5	1	Basic Surgical Techniques, Surgical Operative Techniques
2	Biomedical Research data management and publication basics	AOG3371205		14	14	AW5	2	None
2	Clinical studies in practice	AOOKF208	14	14		AW5	2	Pharmacology I.
2	Clinico-radiological case reports	AOKLR41T8		24		AW5	1	None
2	Developing presentation and oral presentation skills	AOG1671206			28	AW5	2	None
2	Diagnosis and conservative treatment of acute and overuse sports injuries	AOG621305	6	3	6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
2	Diagnostic and Operative Hysteroscopy	AOG5581108		12	4	AW5	1	None
2	Endometriosis: basics, diagnosis and treatment	AOG558908	16			AW5	1	ObGyn I.
2	Facts and Recent Achievements of Andrology	AOAND41A8		30		AW5	2	Urology
2	From the molecular basics to targeted therapy; advances in clinical therapy of gynaecological tumours	AOG558708	16			AW5	1	Obstetrics and Gynecology I.
2	Fundamentals of sports medicine II.	AOG620608	11	3	10	AW5	2	Fundamentals of sports medicine
2	Fundamentals of	AOG621108	16		8	AW5	2	None

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	Sports Medicine, Prevention, and Rehabilitation in musculoskeletal system							
2	Getting Close to the Lab	AOKMGY0G23EN			42	AW5	3	Good or excellent marks of Biophysics and Biostatistics
2	Haemostasis Journal Club	AOHEJC023EN		14		AW5	1	Clinical Biochemistry II.
2	History of Medicine	AOORT44T1	26			AW5	2	None
2	Holistic & Integrative Medicine	AOG128408	38			AW5	2	None
2	How NOT to live up to the antimicrobial therapeutic options of future generations (Practice-oriented antimicrobial stewardship)	AONATL0E24EN		30		AW5	2	Medical Microbiology II.
2	Introduction to R	AOG3371405			30	AW5	2	None
2	Maternal-fetal medicine: pregnancy, mother and fetus across medicine	AOG5581308	18			AW5	1	Obstetrics and Gynecology I.
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	Oncoimmunology	AOG2971106		28		AW5	2	Immunology
2	Prevention and rehabilitation of acute and overuse sport injuries	AOG621505	9		6	AW5	1	Anatomy, Histology and Embryology III. Lecture (Anatomy, Histology and Embryology II. FE)
2	Principles and main aspects of animal experiments	AOG518806	20			AW5	1	None
2	Principles of Physical Medicine and Rehabilitation	AOREH42T6	16			AW5	2	Internal Medicine III., Surgery II.
2	Preclinical imaging in oncological research	AOPRKA0E23EN		28		AW5	2	Nuclear medicine
2	Reproductive Endocrinology and Infertility	AOG558510	15			AW5	2	Obstetrics and Gynecology I.
2	Social inequalities and health	AOG3673504	12		3	AW5	1	None
2	Surgical anatomy - selected chapters	AOG518407	24			AW5	2	Basic Surgical Techniques
2	Surgical biomaterials	AOG518110	12			AW5	1	Surgical operative techniques; Basic

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								microsurgical training. Introduction to microsurgery, Surgery II.
2	Take a deep breath! From marathon running to COVID-19 ECMO-everything you need to know about respiration	AOG5871006	28			AW5	2	Physiology II., Anatomy II.
2	Thesis II.	AODIP48T10				AW3	5	Thesis I.
2	Ultrasound diagnosis in Obstetrics and Gynecology	AOG5581508	16			AW5	1	Obstetrics and Gynecology I.

Required elective courses for the 6. year

Sem	Subjects	Neptun code	L	S	P	Exam	Crd	Prerequisites of taking the subject
1	A Healthy Future-How to help future generations lead healthier lives?	AOG3673705	6	4	5	AW5	1	None
1	How NOT to live up to the antimicrobial therapeutic options of future generations (Practice-oriented antimicrobial stewardship)	AONATL0E24EN		30		AW5	2	Medical Microbiology II.
1	Surgical techniques in gynecology	AONGYT0E24EN	16			AW5	1	None
1	Thesis III.	AODIP49T11				AW3	5	Thesis II.
1	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
2	Clinico-radiological case reports	AOKLR41T8		24		AW5	1	None
2	Diagnostic and Operative Hysteroscopy	AOG5581108		12	4	AW5	1	None
2	Endometriosis: basics, diagnosis and treatment	AOG558908	16			AW5	1	ObGyn I.
2	How NOT to live up to the antimicrobial therapeutic options of future generations (Practice-oriented antimicrobial stewardship)	AONATL0E24EN		30		AW5	2	Medical Microbiology II.
2	From the molecular basics to targeted therapy; advances in clinical therapy of gynaecological tumours	AOG558708	16			AW5	1	Obstetrics and Gynecology I.
2	Haemostasis Journal Club	AOHEJC023EN		14		AW5	1	Clinical Biochemistry II.
2	Maternal-fetal medicine: pregnancy, mother and fetus across medicine	AOG5581308	18			AW5	1	Obstetrics and Gynecology I.
2	Oncoimmunology	AOG2971106		28		AW5	2	Immunology
2	Preclinical imaging in oncological research	AOPRKA0E23EN		28		AW5	2	Nuclear medicine
2	Thesis IV.	AODIP50T12				AW5	5	Thesis III.
2	Ultrasound diagnosis in Obstetrics and Gynecology	AOG5581508	16			AW5	1	Obstetrics and Gynecology I.

Freely Chosen Courses

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Affiliated Department of Infectology	How to survive a pandemic	AOG3071002	2	2	28	AW5	None	István Zsolt Várkonyi M.D., Ph.D.
Affiliated Department of Infectology	Infectology consultations in practice	AOIKGY0G24 EN	1	1-2	14	AW5	Medical Microbiology II.	István Zsolt Várkonyi M.D., Ph.D.
Department of Anatomy, Histology and Embryology	Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks	AOG108504-K1	1	2	12	AW5	Anatomy, Histology, Embriology II.	Ervin Wolf M.Sc., Ph.D.
Department of Anatomy, Histology and Embryology	Functional Anatomy of the Visual System	AOG108204-K1	1	2	16	AW5	Anatomy, Histology, Embriology II.	Zoltán Kisvárdy M.Sc., Ph.D., D.Sc.
Department of Anatomy, Histology and Embryology	Advanced Histology	AOG107803-K8	1	1	16	AW5	Anatomy, Histology and Embryology I.	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, Embriology I., Cell 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, Embriology II.	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.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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 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	Anatomy, Histology and Embryology III. Lecture	Zoltán Hegyi M.Sc., Ph.D.
Department of Anatomy, Histology and Embryology	Comparative Anatomy I.	AOG1001502	1	2	20	AW5	None	Csaba Matta M.Sc., Ph.D.
Department of Anatomy, Histology and Embryology	Comparative Anatomy II.	AOG1001701	1	1	14	AW5	None	Csaba Matta 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 Anesthesiology and Intensive Care	Pathophysiology and treatment of acid-base disorders, blood gas analysis in the everyday practice	AOG118306	1	2	16	AW5	Anatomy II., Biochemistry II., Physiology II.	Tamás Végh M.D., Ph.D.
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	Theoretical and Methodological Questions of Patient Satisfaction Studies	AOG359308	1	2	15	AW5	None	Bence Döbrössy M.A.
Department of Behavioural Sciences	Yoga and Meditation I.	AOG3512001-K1	1	1	30	AW5	None	Sándor Egri M.A., Ph.D.
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	Sándor Egri M.A., Ph.D.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Behavioural Sciences	Health and Healing in World Religions	AOG352101	1	1	20	AW5	None	Bence Döbrössy 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 Kőműves M.A., Ph.D.
Department of Behavioural Sciences	End of Life Decisions I. Introduction	AOG3512701	1	1	15	AW5	None	Sándor Kőműves M.A., Ph.D.
Department of Behavioural Sciences	End of Life Decisions II. Last Resorts	AOG3512801	1	1	15	AW5	None	Sándor Kőműves 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 Kőműves 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	Doctors, Patients and Carers in Literature and Film	AOG35A401	2	1-2	26	AW5	None	Eszter Ureczky M.A.
Department of Behavioural Sciences	Bioethical cases	AOG358706	2	1	30	AW	None	János Kristóf Bodnár M.A., Ph.D.
Department of Biochemistry and Molecular Biology	Biochemistry of Apoptosis	AOG167406	1	-	20	AW5	Biochemistry II.	
Department of Biochemistry and Molecular Biology	Retroviral Biochemistry	AOG167506	1	2	20	AW5	None	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.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Biochemistry and Molecular Biology	Clinical Proteomics	AOKPRO0E23 EN	1	2	15	AW5	None	Gergő Kalló M.Sc., Ph.D.
Department of Biochemistry and Molecular Biology	Novel regulatory mechanism of gene expression in health and disease-Journal Club	AOG1672207	2	1-2	30	AW5	Pathology II.	Pál Krisztián Bene M.Sc., Ph.D.
Department of Biochemistry and Molecular Biology	Validation, representation and evaluation of scientific results	AOG1672001	2	1-2	28	AW5	None	Károly Jambrovics M.Sc., Ph.D.
Department of Biochemistry and Molecular Biology	Validation, representation and evaluation of scientific results II.	AOG1672601	2	1-2	28	AW5	None	Károly Jambrovics M.Sc., Ph.D.
Department of Biophysics and Cell Biology	Description of the new healthcare information technology developments	AOG1571003	1	1	14	AW5	Computer Science	
Department of Biophysics and Cell Biology	Reconciling Science and Religion	AOG1571202	1	2	16	AW5	None	Ferenc Papp M.Sc., Ph.D.
Department of Cardiology	Cardiac regeneration and cardioprotection	AOG317908	1	2	15	AW5	Internal Medicine III.	Dániel Czuriga M.D., Ph.D.
Department of Dermatology	Wound healing	AOG177205	1	1	12	AW5	None	István Juhász M.D., Ph.D., C.Sc.
Department of Dermatology	Aesthetic Dermatology	AOG177909	1	2	16	AW5	Anatomy, Histology and Embryology II., Medical Physiology II.	Éva Remenyik M.D., Ph.D., D.Sc.
Department of Dermatology	Plastic and reconstructive surgery	AOPLSURG02	1	12	15	AW5	None	István Juhász M.D., Ph.D., C.Sc.
Department of Dermatology	Myths and frequent questions in dermatological allergology - immunology	AOG179906	1	2	15	AW5	Physiology, Immunology	Andrea Szegedi M.D., Ph.D., D.Sc.
Department of Foreign Languages	Hungarian for Advanced Learners	AOG2691207	2	1-2	28	AW5	Hungarian Language III/2	Katalin Rozman M.A
Department of Foreign Languages	Hungarian Language Elective General II.	AOG269102-K1	2	2	28	AW5	Hungarian Crash Course	Katalin Rozman M.A.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Foreign Languages	Hungarian Language Elective General I.	AOG268901-K1	2	1	28	AW5	Hungarian Crash Course	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective - Medical I.	AOG26108A1-K1	2	1	30	AW5	None	Katalin Rozman M.A.
Department of Foreign Languages	Hungarian Language Elective - Medical II.	AOG26108A2-K1	2	2	30	AW5	Completion of Hungarian Language Elective Medical I.	Katalin Rozman M.A.
Department of Foreign Languages	Latin Medical Terminology I.	AOG2611002	1	2	30	AW5	Latin Language	Katalin Rozman 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	28	AW5	Crash Course	Katalin Rozman M.A.
Department of Foreign Languages	Latin Medical Terminology II.	AOG26111	2	2	28	AW5	Latin Medical Terminology I.	Katalin Rozman 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	1	1	15	AW5	Pathology II.	Barbara Dóra Halasi M.D.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Forensic Medicine	Forensic psychiatry cases	AOG2871110	1	2	15	AW5	Clinical Biochemistry II., Pathology II.	
Department of Forensic Medicine	Practice-based legal training for medical students	AOG287706	1	2	15	AW5	Anatomy, Histology and Embryology II., Biochemistry II., Physiology II.	
Department of Forensic Medicine	Crime scene investigation course for medical students	AOG287906	1	2	15	AW5	Anatomy II., Biochemistry II., Physiology II.	
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 Immunology	The Biology of tumour-associated immune cells	AOG297906	2	2	26	AW5	None	Árpád Lányi M.Sc., Ph.D.
Department of Immunology	Complex regulation of the immune response	AOIVME0E24 EN	2	1	28	AW5	Registration for the Immunology (AOIMM02T5)	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 of Internal Medicine	Current endoscopic practice in gastroenterology	AOG137707	1	1	14	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	István Altörjay M.D., Ph.D., D.Sc.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Internal Medicine	Selected chapters and case presentations in lympho-, and myeloproliferative diseases	AOG137405	1	1	16	AW5	Pathology II., Clinical Biochemistry II., Propedeutics in Internal Medicine	
Department of Internal Medicine	Clinical cases and differential diagnosis in general medicine	AOG158507	1	1	12	AW5	Pathology II., Clinical Biochemistry II., Propedeutics of Internal Medicine	
Department of 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	Propedeutics of Internal Medicine, 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	1-2	15	AW5	Internal Medicine II.	Harjit Pal Bhattoa M.D., Ph.D.
Department of Medical Imaging	Neuroanatomy in the radiological practice	AOG4871106	1	1	14	AW5	Anatomy, Histology and Embryology II.	
Department of Medical Imaging	Nobel prize and molecular biology	AOG4871203	1	2	14	AW5	None	Teréz Nyesténé Nagy M.D., B.Sc.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Medical Imaging	Basics of point-of-care ultrasound (POCUS)	AOPOCU0K24 EN	1	2	15	AW5	Radiology and nuclear medicine II.	Róbert Rostás M.D.
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	Infections of the immunocompromised	AOG429407	1	2	14	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Introduction to Medical Mycology	AOG4210207	1	1-2	14	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Clinical Mycology	AOG4210107	1	1-2	12	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Chapters in the history of medical virology	AOG4210807	1	2	15	AW5	Medical Microbiology II.	György Veress M.Sc., Ph.D.
Department of Medical Microbiology	Antimicrobial agents in clinical practice	AOG429007	2	1	30	AW5	Medical Microbiology II.	László Majoros M.D., Ph.D.
Department of Medical Microbiology	Current concepts and practices in antiviral therapy	AOG4291007	1	1	14	AW5	Medical Microbiology II.	Anita Szalmás M.Sc., Ph.D.
Department of Metagenomics	Bacteriophages	AOG64037	1	1	20	AW5	Medical Microbiology II.	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.	László Novák 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 Neurosurgery	Neuro-oncology	AOG2771007	1	1-2	14	AW5	Pathology II., Clinical Biochemistry II., Microbiology 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.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
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 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 Operative Techniques and Surgical Research	The Digital Health Course-for the medical students of the University of Debrecen	AOG518601	1	1-2	14	AW5	None	Norbert Németh M.D., MBA, Ph.D., D.Sc.
Department of Operative Techniques and Surgical Research	Manual skill developing practices on simulators I.	AOG5181007	1	1-2	14	AW5	Basic Surgical Techniques	Norbert Németh M.D., MBA, Ph.D., D.Sc.
Department of Operative Techniques and Surgical Research	Manual skill developing practices on simulators II.	AOG5181207	1	1-2	12	AW5	Manual skill developing practices on simulators I.	Norbert Németh M.D., MBA, Ph.D., D.Sc.
Department of Operative Techniques and Surgical Research	Skill Trainer Course for Simulation Education	AOSTSO0G24 EN	1	1-2	14	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.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Orthopedic Surgery and Traumatology	State of the art treatment of big joint's injuries. Diagnostic and treatment of pediatric bone and arthritic injuries	AOG578608	1	2	12	AW5	Traumatology I., Traumatology II.	István Frenzl 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 Pediatrics	Histopathology of obesity	AOELHP0K23 EN	1	2	20	AW5	Pathology II.	Tamás Röszer M.D.
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 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	Application of ketamine and electricity in psychiatry	AOKETA023E N	1	2	15	AW5	None	Szabolcs Morvai M.D.
Department of Psychiatry	Person-centered psychotherapy	AOG478509	1	1	15	AW5	None	Anikó Égerházi M.D., Ph.D.
Department of Psychiatry	Psychoimmunology	AOG4781105	1	1	15	AW5	None	Ede Frecska M.D., M.A., Ph.D.
Department of Psychiatry	Personality Disorders	AOG4781306	0	2	15	AW5	None	Annamária Pusztai Ph.D.
Department of Public Health and Epidemiology	Introduction to clinical decision making	AOG3671502	2	2	28	AW5	None	Szilvia Fialat 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. habil.
Department of Public Health and Epidemiology	Meta-analysis	AOG3671002	1	2	14	AW5	None	Szilvia Fialat M.D., Ph.D.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Public Health and Epidemiology	Evidence based diet	AOG36716022	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	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. habil.
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 Public Health and Epidemiology	Public Health Genomics	AOG3673903	2	1-2	30	AW5	None	Róza Ádány M.D., Ph.D., D.Sc.
Department of Pulmonology	Asthma bronchiale	AOG587707	1	1	8	AW5	Pathology II.	László Brugós M.D., Ph.D.
Department of Pulmonology	Lung cancer	AOG587607	1	1	10	AW5	Pathology II.	
Department of Sports Medicine	Spine protection, ergonomic practical knowledges	AOG620403	1	1	14	AW5	Anatomy, Histology and Embryology I. Lecture + Practical	Sándor Szántó M.D., Ph.D., D.Sc.

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Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Department of Sports Medicine	Athlete performance diagnostics	AOG620907	2	1	14	AW5	None	Tóbiás Módy M.D.
Department of Surgery	All about pancreas	AOPANC0K23 EN	1	2	19	AW5	Physiology II., Pathology II.	Gergely Zádori M.D.
Department of Surgery	Surgical Oncology	AOG497408	1	1	10	AW5	Pathology II.	Tamás Dinya M.D.
Department of Surgery	Robots. lasers and gadgets: the present and future of surgery	AOG498507	1	1	15	AW5	Basic Surgical Techniques	Zsolt Varga
Department of Surgery	Problem based learning in surgery- the surgical mindset	AOG498307	1	1	15	AW5	Basic Surgical Techniques	Dezső Tóth M.D., Ph.D. habil.
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.

CHAPTER 12

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	Clinical case studies	AOG328307	1	1	15	ESE	Clinical Biochemistry II.	Zsuzsa Bagoly M.D., Dr. habil., Ph.D.
Division of Clinical Laboratory Science	Platelet Function and Platelet Function Disorders	AOG632006	1	2	12	AW5	Clinical Biochemistry II.	Zsuzsa Bagoly M.D., Dr. habil., Ph.D.
Division of Haematology	Innovative cell therapy and clinical practice, with haemopoietic stem cells and beyond	AOG137127	2	1-2	30	AW5	Pathology II, Clinical Biochemistry II, Medical Microbiology II	Miklós Udvardy M.D., Ph.D., D.Sc.
Division of Haematology	Novelties in the diagnosis, genetics, and targeted therapy of myeloproliferative disorders	AOG1371808	1	2	15	AW5	Internal Medicine I.	Árpád Illés M.D., Ph.D., D.Sc.
Division of Haematology	Novelties in the diagnosis, genetics and targeted therapy of lymphoproliferative disorders	AOG1371608	1	2	15	AW5	Internal Medicine I.	Árpád Illés M.D., Ph.D., D.Sc.
Division of Haematology	Coagulopathies	AOG1371407	1	1	15	AW5	Internal Medicine I.	Árpád Illés M.D., Ph.D., D.Sc.
Division of Haematology	Diagnostics of patients with rare diseases, rare hematological diseases, special focus on red blood cell disorders	AOG1372207	3	1	48	AW5	Internal Medicine I.	Boglárka Brúgós M.D., Ph.D.
Division of Haematology	Current treatment of thromboembolic diseases. Thrombophilia, thrombosis and thromboprophylaxis in pregnancy	AOG1372407	1	1	14	AW5	Internal Medicine I.	Ágota Schlammadinger M.D., Ph.D.

ACADEMIC PROGRAM FOR CREDIT SYSTEM

Department	Subject	Neptun code	Crd	Sem	Hours	Exam	Prerequisites of taking the subject	Coordinator
Division of Nephrology	Introduction for attendance for CKD patients	AOG128605	1	1	15	AW5	Physiology II. (min. grade 3)	Réka P. Szabó M.D., Ph.D.
Division of Nuclear Medicine and Translational Imaging	Medical imaging: current methods and new trends	AOG468905	1	1	12	AW5	Physiology	László Balkay M.Sc., Ph.D.
Division of Radiology and Imaging Science	Selected Chapters from the Cross-Sectional Anatomy of the Human Body	AOCSA01L3	2	1	28	ESE	Anatomy, Histology and 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	The basics of ultrasound imaging and it's practical application	AOG487906	1	2	15	AW5	Anatomy, Histology and Embryology II., Pathology I.	
Division of Rheumatology	Rheumatology: Research and Clinical	AOG149108	1	2	10	AW5	Internal Medicine II. (Immunology and Rheumatology)	Zoltán Szekanecz M.D., Ph.D., D.Sc.
Division of Rheumatology	Vascular and microcirculation abnormalities in systemic sclerosis	AOG1450007	1	2	10	AW5	Immunology-Rheumatology	Gabriella Szűcs M.D., Ph.D., 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 given time period (8:00-14:00), except with the permission of the Head of the given Department.

There is a lecture book of practical blocks providing a guideline to the student on the requirements he/she should comply with in course of the practical blocks of the specific semesters and on the basic knowledge and skills he/she has to acquire on the given speciality during the gradual training. The level of knowledge and skills to be learned is graded as follows:

O: student has observed the given intervention

P: student has performed the given intervention

Participation: Student attends the intervention and (if possible) actively contributes.

The lecture book may specify the expected number of interventions to be performed.

The practices can be completed

- at the clinics, departments of the University (in Debrecen);
- at teaching hospitals of the University in Hungary (in Nyíregyháza, Miskolc, 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 2023/2024:

semester	weeks	dates
1.	11-12	November 18, 2024 – November 24 , 2024
	13-14	December 2, 2024 - December 13, 2024
2.	11-12	April 21, 2025 – May 2, 2025
	13-14	May 5, 2025 – May 16, 2025

CHAPTER 14

ACADEMIC PROGRAM FOR THE 1ST YEAR

Department of Anatomy, Histology and Embryology

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

Year, Semester: 1st year/1st semester

Number of teaching hours:

Lecture: **28**

Seminar: **28**

1st week:

Lecture: Week 1

Lecture: 1. General osteology and arthrology. 2. Lining epithelial tissues.

Seminar:

Histology: Cells and tissues. Introduction to microtechniques (video material)

2nd week:

Lecture: 1. The muscular system: general introduction. 2. Glandular epithelium.

Seminar:

Histology: Epithelial tissue I: Simple epithelia.

3rd week:

Lecture: 1. Joints of the pectoral girdle. Shoulder joint. 2. Connective tissue I.

Seminar:

Histology: Epithelial tissue II: Stratified epithelia.

4th week:

Lecture: 1. The elbow and the wrist. 2. Connective tissue II.

Seminar:

Histology: Epithelial tissue III: Glandular epithelium. Pigment epithelium.

5th week:

Lecture: 1. Anatomy of the hand 2. Blood.

Seminar:

Histology: Connective tissue.

6th week:

Lecture: 1. Brachial plexus. Innervation of the upper limb. 2. Blood formation.

Seminar:

Histology: Blood. Bone marrow.

7th week:

Lecture: 1. Statics of the pelvis. Hip joint. 2. Adipose tissue and cartilage.

Seminar:

Histology: Consultation.

8th week:

Lecture: 1. Knee and ankle joint. 2. Bone tissue and osteogenesis.

Seminar:

Histology: Adipose tissue. Cartilage.

9th week:

Lecture: 1. Anatomy of the foot. 2. Muscle tissue.

Seminar:

Histology: Bone. Bone formation.

10th week:

Lecture: 1. Lumbosacral plexus. Innervation of the lower limb. 2. Nerve tissue.

Seminar:

Histology: Muscle tissue.

11th week:

Lecture: 1. Spermiogenesis. Oogenesis. 2.

Fertilization and blastulation.

Seminar:

Histology: Nervous tissue.

12th week:

Lecture: 1. Gastrulation and the early differentiation of the mesoderm. 2. Differentiation of the mesoderm and ectoderm.

Seminar:

Histology: Embryology consultation.

13th week:

Lecture: 1. Differentiation of the endoderm and

the folding of the embryo 2. Fetal membranes. External features of the fetus. Twins. Birth defects.

Seminar:

Histology: Embryology consultation.

14th week:

Lecture: 1. Development of the limbs. 2. *Spare lecture.*

Seminar:

Histology: Embryology consultation.

Requirements

MED Anatomy, Histology and Embryology - I- Lecture

Requirements

The topics for lectures and seminars are listed in the Bulletin, any deviations and changes will be published on the Department's e-learning platform by the end of the first week of the semester.

Attendance at all seminars is compulsory in accordance with the Rules and Regulations of the UD, and absences will be noted by the tutor. The director of the institute may refuse to sign the subject if the number of absences from seminars in a semester exceeds three, even if certified. Absences from seminars may not be made up in another group due to the high number of students.

Rules for examinations

There are no self-control tests during the semester. At the end of the semester, the subject is concluded by an End Semester Examination (ESE) consisting of one written (MOODLE, embryology) and two oral parts (histology and anatomy). The ESE will cover the material from the lectures, exercises and seminars of the semester, as well as the official textbooks. The first exam will be considered an "A" exam.

1. The ESE starts with the *written Embryology test*. If the test is passed, the student proceeds to the dissection or histology stations. Failure of the test is the end of the exam. The written test is graded:

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

If you fail the written exam in Embryology in the "C"- chance exam, you will also be given an oral Embryology topic at the beginning of the Histology part of the exam. The exam can only be continued if this is passed.

2. After the common written part, students continue the exam with an *oral histology (histology*

practice room) or *oral anatomy (dissection room)* part. For both of these two additional stations, students draw one topic each, which contains two questions (anatomy of the limbs) for the anatomy part and two sections (general histology) for the histology part.

For both the anatomy topic and the histology topic, the student will receive 1-1 mark, but the student must achieve a „pass” in both anatomy questions / sections.

Failure in either part of the examination will result in a retake of the entire examination.

Grade= (Anatomy mark + Histology mark + Embryology mark)/3

Anatomy mark = one mark in the oral examination

Histology mark = one mark in the oral examination

Embryology mark = one mark in the written exam

Correction of the Final Grade

If the student wishes to improve his/her grade in the examination, he/she must retake all parts of the examination. The previous mark will be cancelled.

Applying for and failing an examination

Rules of the Neptun system apply.

Conditions

To sit the examination in this subject, you must have successfully completed the “Anatomy, Histology and Embryology – I – Practical” course.

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

Year, Semester: 1st year/1st semester

Number of teaching hours:

Practical: **56**

1st week:

Practical: 1A Introduction, terminology

Introduction to anatomical terminology. Terms to describe the anatomical position and location, planes and directions, definition of the axis of a movement and their importance in the anatomical descriptions. Gross anatomical features of the body.

1B Bones of the upper limb.

Bones of the upper limb, orientation on the bones, defining the anatomical position of bones. Identifying left or right bones.

2nd week:

Practical: 2A Joints of the upper limb

Review of general arthrology based on the

relevant lecture. Defining the types of movement. Joints of the upper limb: articular surfaces, ligaments, axis of movements, range of motion, blood supply.

2B Surface anatomy of the upper limb.

Palpable structures, major surface anatomical landmarks and pulse points of the upper limb. General organization and layers of the upper limb. Epifascial structures: cutaneous nerves and superficial veins. Course of superficial veins and their major anastomoses. Pattern of cutaneous innervation.

Dissection: Proper dissection techniques, removal of subcutaneous fat. Demonstration of the “orange peel” appearance of retinacula cutis,

dissection of the epifascial structures. Removal of skin of the shoulder, arm and forearm in one flap. Skin incision in the midline of the volar surface from the shoulder to the wrist, where the incision encircles the wrist. Isolation of subcutaneous veins and cutaneous nerves.

3rd week:

Practical: 3A Axilla 1.

Discussion of the location, walls and contents of the axillary fossa. The brachial plexus and its branches, axillary artery and its branches. Axillary lymph nodes and the lymphatic drainage of the upper limb. Thoracohumeral muscles and their innervation.

Dissection: Removal of skin of thoracic wall with the mammary gland. Dissection of thoracic muscles in infraclavicular region. Incision of brachial fascia in the medial bicipital groove towards the axillary fossa. Dissection of branches of brachial plexus, axillary artery and vein.

3B Axilla 2. Dissection of ventral regions, muscles, vessels and nerves 1.

Triangular and quadrangular spaces and structures passing through them. Muscles of the shoulder. Rotator cuff muscles. Anterior region of the arm, medial bicipital groove, flexors of the arm, branches of the brachial artery.

Dissection: demonstration of the borders and structures of the triangular and quadrangular spaces, completion of the dissection of the axillary fossa. Dissection of the anterior region of the arm.

4th week:

Practical: 4A Dissection of the ventral region, muscles, vessels and nerves 2.

Borders and structures of the cubital fossa. Anterior region of the forearm.

Dissection: Removal of cubital fascia (bicipital aponeurosis remains intact). Dissection of terminal branches of the brachial artery, arterial anastomosis around the elbow joint, median nerve, median cubital vein. Demonstration of their relation to the bicipital

aponeurosis. Removal of antebrachial fascia to the flexor retinaculum. Dissection of flexor muscles, arteries and nerves of forearm. Demonstration of radial and ulnar and median arteries and nerves, and median nerve.

4B Dissection of the ventral region, muscles, vessels and nerves 3.

Anterior carpal region. Walls of the carpal tunnel and structures passing through it. Synovial sheaths of flexors. Contents of the Guyon's canal: ulnar nerve and artery. Structure of the palm and digits: muscles, arteries and nerves.

Dissection: Dissection of Guyon's canal and its structures. Transection of flexor retinaculum to expose the contents of carpal tunnel. Incision and reflection of skin of the palm along the margins of the thenar and hypothenar to metacarpophalangeal joints. Dissection of the thenar and hypothenar muscles. Dissection of the mesothenar by layers, demonstration of superficial and deep palmar arches, median and ulnar nerves and their branches. Removal of skin from at least one of the fingers. Demonstration of proper palmar digital arteries and nerves, as well as the tendons of the long flexors.

5th week:

Practical: 5A Dorsal regions, muscles, vessels and nerves 1.

Scapular region. Borders of the triangular and quadrangular spaces. Spinohumeral muscles. Posterior region of the arm.

Dissection: Incision and reflection of skin to the paravertebral line. Dissection of spinohumeral, scapular and triceps brachii muscles, triangular and quadrangular spaces and their contents.

5B Dorsal regions, muscles, vessels and nerves 2.

Posterior region of forearm. Dorsal carpal region, extensor tendon sheaths. Dorsum of the hand. Anatomical snuffbox.

Dissection: Removal of antebrachial fascia. Dissection of extensor muscles of forearm and their vessels and nerves. Removal

of skin of the dorsum of hand. Demonstration and the extensor retinaculum, dorsal venous plexus and cutaneous nerves.

6th week:

Practical: 6A Consultation

Summary of the sensory and motor innervation of the upper limb. Symptoms of paralysis.

6B Buffer

7th week:

Practical: 7A Bones, ligaments and joints of pelvic girdle

Bones of the pelvic girdle: hip bone and sacrum. Orientation on the bones, defining their anatomical position. Identifying left or right bones. Ligaments of the pelvic girdle. Sacroiliac joint. Inclination of the pelvis. Statics and biomechanics of pelvis: the sacrum as a two handed lever, the transfer of body weight to the lower limbs. Terminal line, greater and lesser pelvis. Diameters of pelvis.

7B Bones of the lower limb

Bones of the lower limb. Orientation on the bones, defining the anatomical position of bones. Identifying left or right bones.

8th week:

Practical: 8A Joints of the lower limb

Joints of the lower limb: articular surfaces, ligaments, axis and types of movements, range of motion, blood supply.

8B Surface anatomy of the lower limb

Palpable structures, major landmarks and pulse points of the lower limb. Epifascial structures: superficial veins and cutaneous nerves. Segmental innervation of the lower limb. Blood flow against gravity: valves of veins and musculo-venous pump mechanism. Lymphatic drainage of the lower limb and major lymph nodes.

Dissection: Removal of skin of the lower limb in one flap: skin incision from the midpoint of inguinal ligament to the ankle. The incision encircles the ankle. Isolation of epifascial veins

and cutaneous nerves.

9th week:

Practical: 9A Dissection of the ventral regions, muscles, vessels and nerves 1.

Borders, compartments contents of subinguinal hiatus. Lumbar plexus. Anterior region of the thigh. Fascia lata and saphenous hiatus. Borders and contents of the femoral triangle. Branches of the femoral artery, arterial anastomosis around the hip joint. Femoral canal.

Dissection: Incision of fascia lata longitudinally in the line of ASIS. Dissection of lacunae of subinguinal hiatus.

9B Dissection of the ventral regions, muscles, vessels and nerves 2.

Extensor and adductor muscles of the thigh. Tensor fasciae latae and the iliotibial tract. Obturator canal. Borders of the adductor canal and its contents.

Dissection: Dissection of extensor muscles, femoral triangle and the entrance of adductor canal. Dissection of adductor muscles and the branches of the obturator nerve. Course of the greater saphenous vein.

10th week:

Practical: 10A Dissection of the ventral region, muscles, nerves, arteries 3.

Anterior region of the leg. Muscles of the extensor and fibular compartments, their blood supply and innervation. Lateral malleolar region. Dorsum of the foot.

Dissection: Removal of crural fascia, dissection of muscles in the fibular and extensor compartments. Dissection of structures around the lateral malleolus. Removal of skin from dorsum of the foot. Dissection of extensor retinaculum, dorsal venous plexus and cutaneous nerves. Separation of extensor tendons.

10B Dissection of the ventral region, muscles, nerves, arteries 1.

Gluteal region. Inner and outer hip muscles. Sacrotuberous and sacrospinous ligaments. Greater

sciatic foramen, suprapiriform and infrapiriform hiatus. Lesser sciatic foramen. Sacral plexus. Blood supply of gluteal region.

Dissection: Removal of skin of gluteal region to the origin of gluteus maximus. Detaching gluteus maximus tendon from the sacrum. Dissection of vessels, nerves and neurovascular gateways of gluteal region. Demonstration of suprapiriform and infrapiriform hiatuses. Course of the pudendal neurovascular structures. Demonstration of the site of intramuscular injections.

11th week:

Practical: 11A Dissection of the ventral region, muscles, nerves, arteries 2.

Posterior region of the thigh, flexor muscles of the thigh. Branches of sciatic nerve. Borders of the popliteal fossa and its contents.

Dissection: Separation of hip flexors, demonstration of the hamstring group. Dissection of sciatic nerve and its terminal branches, medial and lateral cutaneous sural nerves, course of sural n. Dissection of popliteal fossa, removal of popliteal fat pad. Articular branches of the popliteal artery.

11B Dissection of the ventral region, muscles, nerves, arteries 3.

Posterior region of the leg. Medial malleolar region.

Dissection: Removal of crural fascia, dissection of the epifascial structures. Transection of the Achilles tendon, dissection of posterior tibial artery and tibial nerve. Structures around the medial malleolus, dissection of tarsal tunnel.

12th week:

Practical: 12A Dissection of the ventral region, muscles, nerves, arteries 4.

Structure of the foot. Medial, intermediate and lateral plantar eminences. Medial and lateral plantar grooves and their contents. The arches of the foot.

Dissection: Dissection of the sole of the foot. Incision of skin along the medial and lateral margins of the foot to metatarsophalangeal joints. Detaching plantar aponeurosis from calcaneus. Dissection of neurovascular structures, intrinsic muscles and tendons of sole of the foot. Demonstration of the stirrup and medial and lateral slings.

12B Consultation

Summary of the sensory and motor innervation of the lower limb. Symptoms of paralysis.

13th week:

Practical: 13A Consultation

Review of gross anatomy of upper and lower limbs - open lab with supervision.

13B Buffer

14th week:

Practical: 14A Practical exam - first chance

14B Practical exam - second chance

Only for students who failed the first chance or could not attend it due to a documented medical condition.

Self Control Test

Requirements

MED Anatomy, Histology and Embryology – I - Practical

Requirements

The topics of the practicals are described in the bulletin. According to the Rules and Regulations of the UD attendance at the practicals is compulsory and absences will be noted by the tutor. The head of the Department may refuse to sign the subject if the number of absences from the practical course exceeds three in a semester. Due to the high number of

students, missed practicals cannot be made up with another group.

Rules for the practical examination

The practical examination will be oral and will take place in the dissecting room during the 14th week at the time of the practicals. The aim of the examination is to IDENTIFY macroscopic anatomical structures. A list of structures will be published by the Department, on its e-learning platform, during the first week of the semester.

The practical exam is passed with a 60% or better.

A successful Practical Exam will be converted into a grade as follows:

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

A failed Practical Exam may be repeated once during the semester and once during the examination period. The grade of the Practical Exam cannot be improved, only students who have not achieved 60% or could not show up due to medical reasons (proven with a doctor's note) on the previous occasion are allowed to retake the Practical Exam.

The Department will publish details of the Practical Examination on its e-learning platform.

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:

Practical: Introduction. Understanding the course requirements. The concept of communication. Communication at the University of Debrecen –practical aspects.

2nd week:

Practical: Communication - basic concepts. Channels of communication: verbal and non-verbal communication. Theoretical and practical aspects.

3rd week:

Practical: Communication styles. Assertive communication techniques.

4th week:

Practical: Professional communication in the healthcare. Doctor-patient interview – basic concepts, attitude, and basic communication skills. Active listening.

5th week:

Examples of doctor-patient communication

situations. Anxiety, assertivity, and aggression in professional communication in healthcare. Observation, evaluation, professional opinion.

6th week:

Examples of doctor-patient communication situations. Anxiety, assertivity, and aggression in professional communication in healthcare. Observation, evaluation, professional opinion. Group analysis, discussion of individual experiences.

7th week:

Practical: Basic concepts of empathy, role in healthcare. Problems of empathy. Conflict management styles. Feedback in medical communication: the mirroring and the normalizing technique. Evaluation of personal communication style.

8th week:

Practical: The importance of communication with people in different medical situations. The concept of suggestive communication in medicine: when to use and how to use suggestive techniques?

9th week:

Practical: Application of the theoretical study material: student presentations. Feedback for the presenters: positive comments, negative

comments, questions.

10th week:

Practical: Application of the theoretical study material: student presentations. Feedback for the presenters: positive comments, negative comments, questions. Closing the semester: course discussion, feedback for the teacher.

Required reading material: Pilling, J.: Medical Communication in Practice. Medicina, 2021.

Recommended reading: Varga, K: Beyond the words. Communication and suggestion in medical practice. Medicina, 2011.

Requirements

Aims:

Introducing and recognizing fundamental characteristics of human communication and developing basic knowledge, skills, and attitudes that are most important in the doctor-patient relationship. Providing support for developing professional identity, identify personal communication skills, and developing effective, professional communication skills. Enhancing the ability for teamwork and the understanding of interpersonal relationships in medical settings through fieldwork and other examples.

This course serves as a basis for the courses Medical Psychology (3rd year) and Behavioural Medicine (4th year) providing a more specific understanding and knowledge of the behavioral aspects of medical practice.

Theoretical study material covered and required to know:

Basic concepts of communication. Concepts of verbal and non-verbal communication and appropriate application in healthcare settings. Understanding the basic skills and attitudes in healthcare communication. Concept and medical usage of assertive communication and suggestive communication.

Provided practical skills required to know:

Communication techniques: basics of medical communication techniques. Conscious and appropriate usage of non-verbal communication in different healthcare situations. Active listening. Mirroring technique. Attitudes: patient-centered healthcare, empathy. Skills: assertive communication skills. Suggestive communication skills.

Framework and process of learning:

Besides providing theoretical information, small-group learning discussions, role-plays, and observational tasks will be introduced. This way students can be active participants in learning and acquiring practical skills. Students will be facilitated to give feedback and formulate and express individual professional opinions as a form of free discussion, oral and written presentation. Shared individual experiences provide the possibility for further, group-level evaluation.

Course requirements:

Attendance at the practicals, completion of the field study the oral presentation, and the written essay.

Grade: 5 grade practical grade.

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: Practising ventilation without equipment.

9th week:

Practical: Practising 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 órákor?*, numbers 1000-1000000000, verbs expressing activities 2, everyday expressions, ordinal numbers) - **5th day:** 7. lecke, 8. lecke (Revision 1, everyday objects, food and drink, adverbs of frequency)

2nd week:

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

10th week:

Practical:

Requirements

9.00 - 10.30: language classes

10.30 - 11.00 break

11.00 - 12.30: language classes

Attending the language classes is compulsory. Being late for a class is considered as an absence. In case of missing more than 8 lessons, students have to retake the course for an extra fee.

Assessment: five grade evaluation. The final mark is based on the written and oral tests at the end of the course, class participation is also considered. 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 have to pass all the word quizzes in order to take the final tests.

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

The final grade is given based on the following:

Final Score	Grade
<60%	fail (1)
60-69%	pass (2)
70-79%	satisfactory (3)
80-89%	good (4)
90-100%	excellent (5)

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

Year, Semester: 1st year/1st semester

Number of teaching hours:

Practical: **24**

1st week:

Practical: 1. lecke: Itt az ideje gyakorolni, 2. lecke: Zoli

2nd week:

Practical: 3. lecke: UniBike és a Nagyerdő

3rd week:

Practical: 4. lecke: Debrecenbe utazik a családom

4th week:

Practical: 5. lecke: Panoráma a Nagytemplomból

5th week:

Practical: 6. lecke: Együtt a család Debrecenben (Összefoglalás)

6th week:

Practical: Revision, Mid-term test (written)

Self Control Test (Mid-term test (written))

7th week:

Practical: 7. lecke: Van kedved moziba menni?

8th week:

Practical: 8. lecke: Megyünk az egyetemre

9th week:

Practical: 9. lecke: Mit csinálsz a Malomparkban?

10th week:

Practical: 10. lecke: Kirándulunk a Hortobágyon, 11. lecke: Ez az utolsó óra?

11th week:

Practical: Revision , End-term test (written)
Self Control Test (end-term test (written))

12th week:**Practical:** End-term test (oral)**Self Control Test (end-term 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. In case of more than 2 absences, the signature may be refused. Making up a missed class with another group is not allowed. 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

During the semester students must sit for 2 written language tests and an oral exam.

A further minimum requirement is the knowledge of 160 words per semester divided into 8 word quizzes. There are four word quizzes before and another four 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. Missed word quizzes cannot be made up for on the day of the written test.

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 material of the failed part. The remedial test must be done before the end of week 14. The oral test can only be taken if the written tests are successful.

Coursebook: Fodor, Marianna - Mezei, Zsuzsa Livia: Szívből magyarul

Assignments, audio files, oral exam topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

Department of Medical Chemistry

Subject: **MEDICAL CHEMISTRY I. LECTURE**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Lecture: **23**

Seminar: **40**

1st week:

Lecture: Introduction to Medical Chemistry

Quantum mechanical model of atoms

Seminar: Lecture topics of the week

2nd week:

Lecture: The periodic table. Types of chemical bonds

Covalent bonding. Intermolecular forces

Seminar: Lecture topics of the week

3rd week:

Lecture: Solutions and colloids

Chemical equilibrium

Seminar: Lecture topics of the week

4th week:

Lecture: Acid-base equilibria. Buffers.

Regulation of blood pH

Thermodynamics

Seminar: Lecture topics of the week

5th week:

Lecture: Electrochemistry

Chemical kinetics I.

Seminar: Lecture topics of the week

6th week:

Lecture: Chemical kinetics II.

Introduction to organic chemistry (reactant-substrate, intramolecular electronic displacement effects, reaction types and mechanisms)

Seminar: Lecture topics of the week

Self Control Test (1st SCT)

7th week:

Lecture: Hydrocarbons I. II.

Seminar: Lecture topics of the week

8th week:

Lecture: Aromatic compounds

Organic halogen compounds. Alcohols and phenols

Seminar: Lecture topics of the week

9th week:

Lecture: Aldehydes, ketones and quinones

Carboxylic acids

Seminar: Lecture topics of the week

10th week:

Lecture: Carboxylic acid derivatives. Organic sulfur compounds

Seminar: Lecture topics of the week

11th week:

Lecture: Stereochemistry

Seminar: Lecture topics of the week

12th week:

Lecture: Nitrogen-containing organic compounds. Nitrogen-containing heterocycles

Seminar: Lecture topics of the week

13th week: Stereochemistry

Lecture: Organic chemistry for life sciences and medicine

Seminar: Lecture topics of the week

14th week:

Lecture: Information about the exam period

Seminar: Lecture topics of the week

Self Control Test (2nd SCT)

Requirements

The program consists of lectures and seminars. Attendance at lectures is not compulsory but essential for the successful completion of the course. Attendance at seminars is compulsory and recorded. Maximum 3 excused seminar absences are allowed.

Prerequisites for the Medical Chemistry Lecture I. signature and exam registration: successfully completing the 'Medical Chemistry Practical I' subject (with a passing grade or better).

There are two control tests during the semester scheduled for week 6 and week 14. Control tests are optional, and there is no possibility to rewrite them.

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)

Students who passed both control tests get an offered grade. Offered grades are registered in Neptun and are accepted as the final exam grade unless the student declines it by the end (Sunday midnight) of week 14.

The end of semester exam is a written exam consisting of 2 modules: General chemistry and Organic chemistry. There are 3 exam chances in a semester (A, B and C chance exams). Students may get exempted from a given written exam module in case they successfully completed the control test of the corresponding module (with a passing grade or better). Results of control tests and exam modules can be carried to B or C chance exams.

Information for repeaters:

- seminar attendance is compulsory
- results of control tests and written exam modules from the previous year(s) are not considered
- repeaters may write the control tests

Subject: **MEDICAL CHEMISTRY I. PRACTICAL**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Practical: **18**

1st week:

Practical: Laboratory safety instructions and fire regulations

Chemical calculations. Concentration of solutions

Laboratory equipment, volumetric apparatus. (Micro)pipetting

3rd week:

Practical: Quantitative analysis. Acid-base titrations: strong acid - strong base, weak acid - weak base titrations. Introducing and using titrators

5th week:

Practical: Ion exchange chromatography
Paper chromatography

7th 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

9th week:

Practical: Electrometric pH measurement

11th week:

Practical: Reaction kinetics. Kinetic study of the saponification reaction of ethylacetate (effect of concentration and temperature on rate)

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 on the same week while the missed lab is still running with the permission of the laboratory teacher.

The practical is graded by the laboratory teacher. Evaluation is based on the results of practical

control tests written during the practical classes besides the manual work. Students who fail one or more control tests will have the opportunity to improve until the end of week 12. Passing grades can be also improved.

The 'Medical Chemistry Practical I' subject is a prerequisite for the signature and exam registration in 'Medical Chemistry Lecture I'. Students must pass the Medical Chemistry Practical I to be eligible to take the Medical Chemistry I exam.

Division of Biomathematics

Subject: **BIOSTATISTICS**

Year, Semester: 1st year/1st semester

Number of teaching hours:

Seminar: **28**

1st week:

Lecture: 1. Introduction. Math introduction, functions.

2nd week:

Lecture: 2. Set theory. Conditional probability and its clinical implications. Marginalization, Bayes' theorem. Independent events.

3. Descriptive statistics (measures of central tendency and spread; percentiles, quartiles). Histograms, box and whisker plot.

Seminar: Conditional probability, marginalization, Bayes' theorem. Independent events.

3rd week:

Lecture: 4. Discrete random variables. Characterization and graphical representation of discrete distributions (probability distribution and cumulative distribution function). Binomial and Poisson distributions.

Seminar: Descriptive statistics.

4th week:

Lecture: 5. Continuous random variables. Probability density function. Normal and standard normal distributions.

Seminar: Characterization and graphical representation of discrete distributions. Binomial and Poisson distributions.

5th week:

Lecture: 6. Sampling, biased and unbiased estimation. Central limit theorem. Standard error

of the mean. Basics of hypothesis testing.

Seminar: Normal and standard normal distributions.

6th week:

Lecture: 7. Introduction to hypothesis testing: null and alternative hypothesis, level of significance, type I and type II errors, one and two-tailed tests. p value. z-test, one sample t-test.

Seminar: Sampling. Central limit theorem. Standard error of the mean.

7th week:

Lecture: 8. Statistical tests: paired and unpaired t-test, F test.

Seminar: Hypothesis testing. z-test, one sample t-test.

8th week:

Lecture: 9. Diagnostic methods with a statistical approach (specificity, sensitivity, positive- and negative predictive value). ROC curve. Analysis of discrete random variables. Chi-squared test. Epidemiologic investigations: relative risk and odds ratio; Kaplan-Meier curve.

Seminar: Statistical tests: paired and unpaired t-test, F test.

9th week:

Lecture: 10. Summary

Seminar: Diagnostic methods with a statistical approach (specificity, sensitivity, positive- and negative predictive value). ROC curve. Chi-squared test. Epidemiologic investigations:

relative risk and 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, 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). Set theory. Probability, conditional probability, marginalization, Bayes' theorem. Descriptive statistics (determination of mean, median, mode, standard deviation from data set; construction of histograms, box and whisker plot). Discrete and continuous random variables; cumulative distribution function, density function. Binomial, Poisson, normal, and standard normal distribution. 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; diagnostic methods with a statistical approach, epidemiologic investigations (relative risk, odds ratio, Kaplan-Meier curve).

3. Type of the exam:

Colloquium (written). 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 three lectures students write an electronic test of up to 5 minutes (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, calculations will be solved. Attendance to seminars is mandatory. During the semester on three seminars students write an electronic test of up to 15 minutes for earning bonus points. Bonus points earned by the electronic tests written both in the lectures and seminars are added to the test result of part B of the final exam and/or the grade-offering test (only to part B, see section 4.3). Maximum 10 bonus points can be earned.

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 groupwise seminars. No 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 final exam:

Students will write a grade-offering course test between weeks 12-13. The structure and the evaluation of the grade-offering test will be identical to that of the final exam. The grade-offering test does not count as an A chance exam, writing it is not mandatory. Writing the grade-offering test is only possible at the appointed time and there will not be any alternative appointments for writing it.

Usually, exams will be held once a week during the exam period. The exam is written.

Structure of the grade-offering test and 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, simple- and multiple-choice questions, fill-in questions etc.), calculations, graphs. Maximum score of part B is 100 points (without bonus points).

Evaluation of the grade-offering test and the final exam:

- 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., part A does not have to be retaken. But the exemption from retaking part A of the exam is not valid for repeated courses or exam courses, that is the exemption from retaking part A is valid only in the 1st semester.
- If the result of part A is less than 75%, part B is not evaluated.
- If the student passes part A, bonus points are added to the score of part B (max 100 points). Based on this final score (FS), that does not include the points earned in Part A, the following grades are offered:

- FS<60 fail (1)
- 60≤FS<70 pass (2)
- 70≤FS<80 satisfactory (3)
- 80≤FS<90 good (4)
- 90≤FS excellent (5)

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

A grade of 2 (pass) 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.

The grade of the grade-offering test or the final exam can be corrected only once, but in this case the final grade is determined by the result of the re-written test.

4.4. Rules for C chance exams:

Evaluation of C-chance exams is performed according to the following table:

	Result of part B is a fail	Result of part B is above the passing level
Result of the minimum requirement questions (part A) is a pass ($\geq 75\% = 30p$)	final exam grade: FAIL	exam grade is according to the result of the 'B' test (see 4.3)

Result of the minimum requirement questions (part A) is a fail, but at least 65% (≥ 26 p)	final exam grade: FAIL	oral exam
Result of the minimum requirement questions (part A) is less than 65% (< 26 p)	'B' test not scored, final exam grade: FAIL	

5. Reading materials:

- Educational material published on the eLearning platform of the course can be downloaded as pdf format (elearning.med.unideb.hu – Department of Biophysics and Cell Biology/English Courses/1st semester/Biostatistics – AOBIST02T1)
- Wayne W. Daniel: Biostatistics, A foundation for Analysis in the Health Sciences, John Wiley&Sons

6. Recommended reading material:

- Practice problems in biostatistics (editors: Zoltán Varga and Tibor G. Szántó). University of Debrecen, Department of Biophysics and Cell Biology, Division of Biomathematics, 2022, ISBN 978-963-490-459-5. It can be downloaded as pdf format (elearning.med.unideb.hu – Department of Biophysics and Cell Biology/English Courses/1st semester/Biostatistics – AOBIST02T1)

7. Exemptions:

Requests for exemptions from the biostatistics course must 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.

8. Information for repeaters:

For repeaters the attendance on seminars is not compulsory. Students repeating the course are subject to the same rules and requirements as those taking the course for the first time.

9. Rules for calculators:

Rules for calculator usage during course tests and the final examination. 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 if 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. Lasers and their application in biology and medicine.
6. Optics, optical microscopy, electron microscopy.

Seminar: Material related to lectures 3-4.

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. Ion channels (gating, selectivity), the "patch clamp" technique.

Seminar: Material related to lectures 15 and 16.

10th week:

Lecture: 19. Resting potential, action potential, and electrical excitability. Measurement of membrane potential.
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. Fluid mechanics, blood circulation.
24. Flow cytometry. Confocal laser scanning microscopy.
Seminar: Material related to lectures 21 and 22.

13th week:

Lecture: 25. Biophysics of respiration.
26. Biomechanics.
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 semester

Prerequisites of the course: No prerequisites.

Course coordinator: Prof. Dr. Péter Nagy

Study advisor: Dr. Tamás Kovács

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

Educational manager: Dr. 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 of 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.unideb.hu/en> and the e-Learning web page of the subject

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 (5-10 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 (Q_{ave}), based on which students will be given bonus points according to the following:

- 6p – $Q_{ave} \geq 95\%$
- 5p – $95\% > Q_{ave} \geq 90\%$
- 4p – $90\% > Q_{ave} \geq 80\%$
- 3p – $80\% > Q_{ave} \geq 70\%$
- 2p – $70\% > Q_{ave} \geq 60\%$
- 1p – $60\% > Q_{ave} \geq 40\%$

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 (SCTs) 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 (Xave). 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 Xave 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 Xave students may earn SCT bonus points counted to the FE result are as follows:
Xave – 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 Xave 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 (0-6)
- 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 -

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);
- students who took Biophysics before the academic year of 2018/19: those students who 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.

10. Rules for C chance exams

Evaluation of C-chance exams is performed according to the following table:

	If result of part II is a fail	If result of part II is above the passing level
If result of the minimum requirement questions is a pass (≥ 16)	final exam grade: FAIL	exam grade is according to the result of part II
If result of the minimum requirement questions is a fail, but at least 14	final exam grade: FAIL	oral exam
If result of the minimum requirement questions is less than 14	Part II is not scored, final exam grade: FAIL	

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: Dr. Enikő Nizsalóczy (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.

-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. The quiz is composed of true/false, multiple choice and simple calculation problems. 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. Ineligible students are not allowed to attend the given lab according to their timetable. The lab will be considered as a missed one, and the student must make it up (after passing the test) according to 7/4.

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:

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

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 II. LECTURE**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Lecture: **42**

Seminar: **36**

1st week:

Lecture: 1. Structure and movements of the vertebral column. Deep axial muscles. Development of the muscles and bones of the trunk. 2. Introduction to the peripheral vegetative nervous system 3. Introduction to the cardiovascular system. Histology of vessels.

Seminar:

Histology: 1. – 2. -

2nd week:

Lecture: 1. Mediastinum. The anatomy of the trachea, lungs and pleura. The diaphragm. Anatomy of the respiratory movements. 2. Histology and development of the trachea, lungs and the respiratory tract. 3. Anatomy and development of the heart I.

Seminar:

Histology: 1. Review of basic histology. 2. -

3rd week:

Lecture: 1. Anatomy and development of the heart II. 2. Development of the vessels, aortic arches. 3. Innervation and lymphatic drainage of the thoracic wall and the organs of the thorax.

Seminar:

Histology: 1. Blood vessels. 2. –

4th week:

Lecture: 1. Anatomy of the anterolateral and posterior abdominal wall. Inguinal canal. Direct and indirect inguinal hernias. 2. Introduction to

the alimentary canal. Formation of the gut tube. Separation of body cavities. 3. Development of the peritoneum and intestine.

Seminar:

Histology: 1. Development of the heart and vessels – embryology consultation. 2. -

5th week:

Lecture: 1. Anatomy of the peritoneum. 2. The portal circulation. Porto-caval anastomosis. 3. Anatomy, histology and embryology of the stomach.

Seminar:

Histology: 1. Trachea. Lungs. Development of the respiratory system. 2. -

6th week:

Lecture: 1. Anatomy, histology and embryology of the small intestine and pancreas. 2. Anatomy, histology and embryology of the large intestine and anal canal. 3. Anatomy of the liver, gallbladder and the extrahepatic bile duct.

Seminar:

Histology: 1. Esophagus. Stomach. Pylorus-duodenum. Jejunum. 2. Colon, vermiform appendix. Rectum.

7th week:

Lecture: 1. Histology and embryology of the liver and gallbladder. 2. Retroperitoneum. 3. Anatomy of the kidney, adrenal gland and urinary system..

Seminar:

Histology: 1. Development of the gastrointestinal system – embryology consultation. 2. Liver, gallbladder, pancreas. Development of the liver and gallbladder – embryology consultation.

8th week:

Lecture: 1. Histology of the urinary bladder and urinary tracts. 2. Development of the urinary bladder and urinary tracts. 3. Structure of the pelvic floor and perineum.

Seminar:

Histology: 1. Kidney. 2. Ureter, urinary bladder. Fetal penis.

9th week:

Lecture: 1. Fascias and ligaments of the lesser pelvis. 2. External genitalia: the penis and the vulva. Development of the external genitalia. 3. Male internal genital organs I.: testis and epididymis. Scrotum.

Seminar:

Histology: 1. Development of the urogenital system – embryology consultation. 2. -

10th week:

Lecture: 1. Male internal genital organs II: ductus deferens-spermatic cord, seminal vesicles, prostate. 2. Female internal genital organs I.: ovaries and fallopian tube. 3. Female internal genital organs II.: uterus and vagina. Pregnant uterus.

Seminar:

Histology: 1. Testis, epididymis. Spermatic cord. Seminal vesicle. Prostate. 2. Vagina. Ovary. Mammary gland.

11th week:

Lecture: 1. Female internal genital organs III.: placenta and fetal circulation. 2. Development of internal genitalia. 3. Innervation and lymphatic drainage of the abdominal cavity and pelvic viscera.

Seminar:

Histology: 1. Uterine tube. Uterus. 2. Pregnant uterus. Placenta.

12th week:

Lecture: 1. Parts of the skull. Neurocranium. 2. Viscerocranium. 3. Temporomandibular joint. Development of the skull.

Seminar:

Histology: 1. Development of the genital organs – embryology consultation. 2. -

13th week:

Lecture: 1. Histology of lymphatic tissue I. 2. Histology of lymphatic tissue II. 3. Radiographic and sectional anatomy of the thorax, abdomen and pelvis.

Seminar:

Histology: 1. Thymus. Folliculus lymphaticus. Lymph node. 2. Spleen. Palatine tonsil. Lingual tonsil.

14th week:

Lecture: 1. Spare lecture. 2. Spare lecture. 3. Spare lecture

Seminar:

Histology: 1. – 2.

Requirements

MED Anatomy, Histology and Embryology – II - Lecture

Requirements

The topics for lectures and seminars are listed in the Bulletin, any deviations and changes will be published on the Department's e-learning platform by the end of the first week of the semester.

Attendance at all seminars is compulsory in accordance with the Rules and Regulations of the UD, and absences will be noted by the tutor. The director of the institute may refuse to sign the subject if the number of absences from seminars in a semester exceeds three, even if certified. Absences from

seminars may not be made up in another group due to the high number of students.

Rules for examinations

There are no self-control tests during the semester. At the end of the semester, the subject is concluded by an End Semester Examination (ESE) consisting of one written (MOODLE, embryology) and two oral parts (histology and anatomy). The ESE will cover the material from the lectures, exercises and seminars of the semester, as well as the official textbooks. The first exam will be considered an "A" exam.

1. The ESE starts with the *written Embryology test*. If the test is passed, the student proceeds to the dissection or histology stations. Failure of the test is the end of the exam. The written test is graded:

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

If you fail the written exam in Embryology in the "C"-chance exam, you will also be given an oral Embryology topic at the beginning of the Histology part of the exam. The exam can only be continued if this is passed.

2. After the common written part, students continue the exam with an *oral histology (histology practice room)* or *oral anatomy (dissection room)* part. For both of these two additional stations, students draw one topic each, which contains two questions (trunk and viscera) for the anatomy part and two sections (corresponding histology part, see Bulletin) for the histology part.

For both the anatomy topic and the histology topic, the student will receive 1-1 mark, but the student must achieve a „pass” in both anatomy questions / sections.

Failure in either part of the examination will result in a retake of the entire examination.

Grade= (Anatomy mark + Histology mark + Embryology mark)/3

Anatomy mark = one mark in the oral examination

Histology mark = one mark in the oral examination

Embryology mark = one mark in the written exam

Correction of the Final Grade

If the student wishes to improve his/her grade in the examination, he/she must retake all parts of the examination. The previous mark will be cancelled.

Applying for and failing an examination

Rules of the Neptun system apply.

Conditions

To sit the examination in this subject, you must have successfully completed the “Anatomy, Histology and Embryology – I – Practical” course.

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY II. PRACTICAL**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Practical: **56**

1st week:

Practical: 1A Bones of the trunk

Anatomy of the vertebral column. Structure of a typical vertebra. Regions of the vertebral column, regional characteristics of vertebrae. Joints of the vertebral column: syndesmosis, synchondrosis, synostosis, synovial joints - intervertebral, atlantooccipital, atlantoaxial, lumbosacral and sacrococcygeal joints. Curvatures and movements of the vertebral column.

1B Thoracic wall. Intercostal space. Pectoral region. Back muscles.

Structure of the sternum and ribs. Typical and atypical ribs. Joints of the thorax. Costovertebral and costotransverse joints: axis, movements, ligaments. Costal mechanisms of breathing: pump handle and bucket handle movements. Intercostal space: intercostal muscles and their functions in inspiration and expiration. Intercostal artery and vein. Origin, composition, course and branches of intercostal nerves. Blood supply, innervation and lymphatic drainage of the thoracic wall. Structure, support, blood supply, innervation and lymphatic drainage of the breast. Back muscles.

Dissection: reflection of skin from anterior thoracic wall to mid-axillary line. Separation of mammary gland from pectoralis major fascia. Demonstration of pectoral muscles. Opening the thoracic wall: cutting ribs with a scissors in mid-axillary line after detaching abdominal muscles and diaphragm. Demonstration of thoracic situs. Thymus.

2nd week:

Practical: 2A Mediastinum superius.

Definition and parts of the mediastinum. Superior mediastinum.

Dissection: dissection of the structures of the

superior mediastinum by layers: left and right brachiocephalic vein, superior vena cava. The course of the right and left recurrent laryngeal nerves. Demonstration of the branches of the arch of aorta. Trachea. Opening the tracheal bifurcation and demonstration of the carina.

2B Trachea. Lungs. Pleura. Diaphragm I.

Trachea and bronchial tree. Lobes dual circulation, lymphatic drainage, innervation of the lungs. The bronchopulmonary segment. Layers parts, sinuses and innervation of the pleura.

Dissection: Demonstration of the layers of pleura and pleural sinuses. Course and syntopies of the trachea and principal bronchi. Branching pattern of bronchial tree. Demonstration of isolated lungs and removal of the lungs from thoracic cavities. Surfaces and impressions of the lungs. Hilum and root of the lung. Demonstration of the structures in the hilum. Dissection of the bronchopulmonary segments, segmental bronchi, demonstration of the pulmonary artery and pulmonary vein. Dissection of the bronchial arteries. Demonstration of the nerves in front of and behind the hilum of the lung.

3rd week:

Practical: 3A Pericardium. Heart I.

Layers, innervation and blood supply of pericardium. Pericardial cavity, pericardial sinuses. Surfaces, parts and syntopies of the heart.

Dissection: opening the fibrous pericardium to demonstrate the pericardial cavity and the sites of reflection. Removal of the fat from the surface of the heart, demonstration of the grooves on the surface of the heart. Anatomical position, surfaces, surface anatomical features and syntopies of the heart.

3B Heart II.

Chambers of the heart. Fibrous skeleton, orifices and valves of the heart.

Dissection: dissection of right atrium with a 'V' cut along the margins of right auricle. Opening right ventricle along the interventricular septum and right AV orifice to the pulmonary trunk. Dissection of left atrium by opening the left auricle. Opening left ventricle along interventricular septum and AV orifice. Opening aorta and pulmonary trunk above their valves.

4th week:**Practical: 4A Heart III.**

Conducting system of the heart. Extracardial innervation of the heart, cardiac plexus. Blood supply of the heart. Radiographic view of the heart. Surface projections of the thoracic viscera.

Dissection: Dissection of the right and left coronary arteries, demonstration of their origin, course and branches. Demonstration of the coronary sinus and veins draining into it. Demonstration of radiographs.

4B Posterior mediastinum.

Borders and structures of the posterior mediastinum. Esophagus. Branches of the thoracic aorta and the azygos and hemiazygos veins. Sympathetic trunk.

Dissection: Dissection of the structures of the posterior mediastinum. Esophagus and the branches of the thoracic aorta, sympathetic trunk, splanchnic nerves, thoracic duct, tributaries of the azygos and hemiazygos veins.

5th week:**Practical: 5A Abdominal wall. Inguinal canal.**

Regions of the abdominal cavity and their surface anatomical projections. Dermatomes of the abdominal wall. Muscles and fascias of the anterolateral abdominal wall, structure of the rectus sheath. Peritoneal folds on the inner surface of the abdominal wall. Inguinal canal.

Dissection: Incision and reflection of skin on anterolateral abdominal wall from the midline to

midaxillary line (sparing umbilicus with a circular incision). Demonstration of subcutaneous fasciae and rectus sheath. Segmental innervation and blood supply. Separation of muscular layers of lateral abdominal wall. Inguinal canal: superficial inguinal ring and spermatic cord remains intact. Opening the abdominal wall with three incisions from umbilicus to left sternal margin and to both ASIS.

5B Anatomy of the abdominal cavity.**Peritoneum.**

Development of the peritoneum: peritoneal cavity, peritoneal layers and ligaments.

Subdivision of the peritoneal cavity, compartments, omental bursa. Peritoneal relations of abdominal viscera.

Dissection: demonstration of abdominal situs and peritoneum. One peritoneum should be kept intact on each floor.

6th week:**Practical: 6A Abdominal aorta and the hepatic portal vein.**

Unpaired visceral branches of the abdominal aorta. Venous drainage of abdominal viscera, porto-caval anastomosis.

Dissection: Dissection of lesser omentum and portal triad. Dissection of the branches of celiac trunk, superior and inferior mesenteric arteries and veins (posterior layer of mesentery remains intact). Arterial arcades of jejunum and ileum. Tributaries of hepatic portal vein, demonstration of porto-caval anastomosis.

6B Stomach. Small intestine. Large intestine.

Structure, syntopies, blood supply and innervation of the stomach, small and large intestine.

Dissection: Peritoneal relations and blood supply of the stomach, small and large intestine. Demonstration of the parts, structures and syntopies of the stomach on an isolated specimen. Identification of the parts of the duodenum, opening of the descending part and the demonstration of the greater and lesser

duodenal papilla. Differentiation of the jejunum and ileum based on the arterial arcades and the length of the vasa recta. Demonstration of ileocecal junction, opening the cecum and demonstration of the ileocecal valve. Parts of the large intestine, demonstration of the teniae.

7th week:

Practical: 7A Liver. Gallbladder. Spleen. Pancreas.

Structure, syntopies, blood supply and innervation of the liver, gallbladder, spleen and pancreas.

Dissection: Demonstration of the peritoneal relations, surfaces and lobes of the liver. Parts of the gallbladder, cystic duct, bile duct, demonstration of the cystic artery in Calot's triangle. Demonstration of the position, surfaces and syntopies of the spleen. Ligaments and structures in the hilum of the spleen. Surfaces, parts, syntopies and blood supply of the pancreas. Surface projections of abdominal viscera.

7B Retroperitoneum I. Kidney, suprarenal gland.

The retroperitoneum and its divisions: compartments and their organs. Capsules and fasciae of the kidney. Location, parts and syntopies of the kidneys. Adrenal gland. Blood supply of the kidneys and suprarenal glands.

Dissection: demonstration of capsules of the kidney. Opening the renal fascia and adipose capsule, adrenal gland remains intact. Opening the kidney in situ in frontal plane. Demonstration of the structures of the hilum of the kidney. Demonstration of physiological constrictions and crossings of ureter. Demonstration of the arteries of the suprarenal gland.

8th week:

Practical: 8A Buffer (consultation)

8B Retroperitoneum II. Diaphragm II.

Posterior abdominal wall. Structure of the diaphragm and structures piercing it. Lumbar plexus, abdominal aorta, inferior vena cava,

sympathetic trunk. Summary of the autonomic innervation and lymphatic drainage of abdominal viscera.

Dissection: Dissection of common iliac artery and vein, lumbar plexus, posterior abdominal wall. Demonstration of paraaortic lymph nodes and autonomic nervous system. Demonstration of the crura of the diaphragm, lumbocostal triangle.

9th week:

Practical: 9A Pelvic floor. Pelvic situs.

Peritoneal relations of the pelvic viscera.

Structure of pelvic floor. Fascias and fascial compartments of the pelvis. Peritoneal relations of pelvic viscera and their connection to the pelvic floor.

Dissection: Review of bones, ligaments and diameters of the pelvis. Demonstration of peritoneal relations of the female and male pelvic organs. Fascias of the true pelvis, ligaments and fascial compartments. Demonstration of the pelvic floor.

9B Perineum. External genitalia.

Structure of the female and male perineum: urogenital and anal trigones. Layers of the perineum, fascias and structures.

Dissection: Demonstration of the female and male external genital organs. Removal of the skin and dissection of the superficial perineal pouch. Demonstration of the erectile bodies and muscles associated with them. Transection of gluteus maximus to expose ischioanal fossa. Removal of ischioanal fat pad and demonstration of the anterior recess. Demonstration of the levator ani, perineal membrane, superficial and deep perineal pouches. Demonstration of the pudendal canal, course of the internal pudendal artery and vein and pudendal nerve.

10th week:

Practical: 10A Arteries and nerves of the pelvis.

Branches of the internal iliac artery and vein. Branches of the sacral plexus. Autonomic innervation of the pelvic organs and perineum.

Dissection: dissection of the branches of internal iliac artery and vein. Preparing for bisection of pelvis: detaching abdominal muscles from iliac crest, mobilization of internal and external iliac vessels and related viscera. Bisection of the organs in the midline. Partial removal of iliac bone along sacroiliac joint to the greater sciatic notch.

10B Rectum. Urinary bladder and urethra. Male internal genital organs.

Structure of the rectum and anal canal. Anatomy of the urinary bladder and urethra. Layers of the testis and scrotum. Descent of the testis. Structure blood supply and innervation of the male internal genital organs.

Dissection: Demonstration of rectum, urinary bladder and genital organs on bisected pelvis and isolated pelvic complex. Position and curvatures of the rectum in the pelvis. Anal canal. Demonstration of the layers and fasciae of the testis and scrotum. Demonstration of testis and epididymis. Layers and structures of the spermatic cord.

11th week:

Practical: 11A Female internal genital organs. Placenta, umbilical cord.

Structure peritoneal relations, supporting and suspending structures, blood supply and innervation of the female internal genital organs. Placenta and umbilical cord.

Dissection: Demonstration of female genital organs on bisected pelvis and isolated pelvic

complex. Demonstration of isolated umbilical cord and placenta.

11B Skull 1

Division of the skull: neurocranium, viscerocranium. Division of the viscerocranium: calvaria and the base of the skull. Division of the internal cranial base: anterior, middle and posterior cranial fossa. Connections of the bones of the skull, types of sutures. Frontal, parietal and occipital bones.

12th week:

Practical: 12A Skull 2

Sphenoidal and temporal bones.

12B Skull 3

Calvaria, internal and external cranial base.

13th week:

Practical: 13A Skull 4

Bones of viscerocranium. Temporomandibular joint. Nasal cavity.

13B Skull 5

Orbit. Temporal, infratemporal and pterygopalatine fossae.

14th week:

Practical: 14A Practical exam - first chance

14B Practical exam - second chance

Only for students who failed the first chance or could not attend it due to a documented medical condition.

Self Control Test

Requirements

MED Anatomy, Histology and Embryology – II - Practical

Requirements

The topics of the practicals are described in the bulletin. According to the Rules and Regulations of the UD attendance at the practicals is compulsory and absences will be noted by the tutor. The head of the Department may refuse to sign the subject if the number of absences from the practical course exceeds three in a semester. Due to the high number of students, missed practicals cannot be made up with another group.

Rules for the practical examination

The practical examination will be oral and will take place in the dissecting room during the 14th week at the time of the practicals. The aim of the examination is to IDENTIFY macroscopic anatomical structures. A list of structures will be published by the Department, on its e-learning platform, during the first week of the semester.

The practical exam is passed with a 60% or better.

A successful Practical Exam will be converted into a grade as follows:

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

A failed Practical Exam may be repeated once during the semester and once during the examination period. The grade of the Practical Exam cannot be improved, only students who have not achieved 60% or could not show up due to medical reasons (proven with a doctor's note) on the previous occasion are allowed to retake the Practical Exam.

The Department will publish details of the Practical Examination on its e-learning platform.

Department of Foreign Languages

Subject: **HUNGARIAN LANGUAGE I/2.**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Practical: **28**

1st week:

Practical: Orientáció, 1. Emlékszel?

2nd week:

Practical: 2. Napirend

3rd week:

Practical: 3. Melyik a jobb?

4th week:

Practical: 4. A testem

5th week:

Practical: 5. Beteg vagyok

6th week:

Practical: 6. Ismétlés a tudás anyja

7th week:

Practical: Revision, Mid-term test (written)
Self Control Test (written test)

8th week:

Practical: 7. A család

9th week:

Practical: 8. Zumbázni szeretnék!

10th week:

Practical: 9. Mit csináltál tegnap?

11th week:

Practical: 10. Hol nyaraltatok?

12th week:

Practical: 11. Vizsga lesz!

13th week:

Practical: Revision, End-term test (written)
Self Control Test (written test)

14th week:

Practical: End-term test (oral)
Self Control Test (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. In case of more than 2 absences, the signature may be refused. Making up a missed lesson with another group is not allowed.

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

During the semester students must sit for **two written language tests**, and **an oral exam**. If a student is late for the test, he/she is not allowed to take it.

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. Missed word quizzes cannot be made up for on the day of the written test.

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 material of the failed part. The remedial test must be done before the end of week 14. The oral test can only be taken if the written tests are successful.

Coursebook: Györfffy, Erzsébet- Mezei, Zsuzsa Livia: *Magyarules*

Assignments, audio files, oral exam topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

Department of Internal Medicine

Subject: **NURSING PRACTICE**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Practical: **120**

Department of Medical Chemistry

Subject: **MEDICAL CHEMISTRY II. LECTURE**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Lecture: **28**

Seminar: **28**

1st week:

Lecture:

Amino acids, peptides

Proteins (structure, classification)

Seminar: Lecture topics of the week

2nd week:

Lecture:

Proteins (function and regulation)

Proteins (folding, targeting)

Seminar: Lecture topics of the week

3rd week:

Lecture:

Protein modifications in the cell I-II

Seminar: Lecture topics of the week

4th week:

Lecture:

Protein analysis I-II

Seminar: Lecture topics of the week

5th week:

Lecture:

Carbohydrates I-II

Seminar: Lecture topics of the week

6th week:

Lecture:

Carbohydrates (roles in biology)

Carbohydrate analysis

Seminar: Lecture topics of the week

7th week:

Lecture:

Lipids I. (structure, classification)

Lipids II. (biological roles, lipid analysis)

Seminar: Lecture topics of the week

8th week:

Lecture:

Nucleosides, nucleotides

Nucleic acids (DNA, RNA)

9th week:

Lecture:

DNA: mutations and repair

Nucleic acid analysis

Seminar: Lecture topics of the week

10th week:

Lecture:

Biomolecular chemistry in medicine

Co-ordination chemistry

Seminar: Lecture topics of the week

11th week:

Lecture:

Biological functions of alkali metal and alkaline earth metal cations

The bioinorganic chemistry of iron

Seminar: Lecture topics of the week

12th week:**Lecture:**

The bioinorganic chemistry of Cu and Zn
The bioinorganic chemistry of nonmetals:
oxygen

Seminar: Lecture topics of the week**13th week:****Lecture:**

The bioinorganic chemistry of nonmetals:
selenium and halogens
Gasotransmitters (NO, CO, H₂S)

Seminar: Lecture topics of the week**14th week:****Lecture:**

Toxic metals and nonmetals
Information on the final exam. Research
opportunities at the Dept. of Medical Chemistry

Seminar: Lecture topics of the week**Requirements**

The program consists of lectures and seminars. Attendance at lectures is not compulsory but essential for the successful completion of the course. Attendance at seminars is compulsory and recorded. Maximum 3 excused seminar absences are allowed.

Prerequisites for Medical Chemistry Lecture II registration: Medical Chemistry Practical I and Medical Chemistry Lecture I.

Prerequisites for Medical Chemistry Lecture II signature and exam registration: successful completion of the 'Medical Chemistry Practical II' subject (with a passing grade or better).

There is one control test opportunity (on bioorganic chemistry) scheduled for week 10. Taking the control test is optional, and even in the case of a certified absence, the test cannot be taken a second time.

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)

The final exam at the end of the semester is a comprehensive exam involving topics of Medical Chemistry I and II. Students have a maximum of 3 exam chances in a semester (A, B and C chance exams).

The final exam is composed of a written and an oral part. The written exam consists of 2 modules (Bioorganic chemistry and Bioinorganic chemistry). To pass the written exam, students must pass both modules (Bioorganic and Bioinorganic). Students may get exempted from the first (bioorganic chemistry) module of the written exam in case they successfully completed the control test (with a passing grade or better). Results of control tests and written exam modules can be carried to B or C chance exams. Students must pass the written exam to be eligible to take the oral exam.

The second part of the final exam is the oral exam covering all topics in Medical Chemistry. The oral exam consists of a total of four questions, one from each chapter: 1. General chemistry 2. Organic chemistry 3. Bioorganic chemistry 4. Bioinorganic chemistry.

Information for repeaters:

- seminar attendance is compulsory
- results of control tests and written exam modules from the previous year(s) are not considered
- repeaters may write the control tests

Subject: **MEDICAL CHEMISTRY II. PRACTICAL**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Practical: **30**

5th week:

Practical: Identification of proteins using SDS polyacrylamide gel electrophoresis (PAGE) and Western blot

6th week:

Practical: Enzyme kinetics. Assay of glycogen phosphorylase activity

7th week:

Practical: Enzyme kinetics. Assay of catalase activity

8th week:

Practical: Qualitative analysis of mono- and disaccharides
Polarimetric analysis of carbohydrates

9th week:

Practical: Photometric determination of iron

10th week:

Practical: Polymerase Chain Reaction (PCR) produced in the Fenton's reaction. Effect of metal

ion chelator and hydroxyl radical scavenger compounds

11th week:

Practical: Detection of hydroxyl radicals produced in the Fenton's reaction. Effect of metal ion chelator and hydroxyl radical scavenger compounds

12th week:

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

13th week:

Practical: Measuring superoxide anion radical production. Assaying superoxide dismutase (SOD) activity
Detection of radical scavenging compounds (antioxidants) with ABTS decolorization assay

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 on the same week while the missed lab is still running with the permission of the laboratory teacher.

The practical is graded by the laboratory teacher. Evaluation is based on the results of practical control tests written during the practical classes besides the manual work. Students who fail one or more control tests will have the opportunity to improve until the end of week 14. Passing grades can be also improved.

The 'Medical Chemistry Practical II' subject is a prerequisite for the signature and exam registration in 'Medical Chemistry Lecture II'. Students must pass the Medical Chemistry Practical II to be eligible to take the Medical Chemistry II final exam.

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. Basic functions and constituents of cells
2. Cell membrane, intracellular compartmentalization

2nd week:

Lecture: 3. Passive transport processes
4. Active transport processes
Seminar: Material related to lectures 1-2.

3rd week:

Lecture: 5. Ca homeostasis
6. Osmo-, volume and pH regulation
Seminar: Material related to lectures 3-4.

4th week:

Lecture:
7. Cytoskeleton I. (microtubules)
8. Cytoskeleton II. (intermedier and microfilaments)
Seminar: Material related to lectures 5-6.

5th week:

Lecture: 9. Cell-cell and cell-matrix contacts
10. Cellular energetics, mitochondrion, endosymbiosis
Seminar: Material related to lectures 7-8.

6th week:

Lecture: 11. Nucleus, chromatin
12. Transport of proteins synthesized on free ribosomes. Nuclear envelope, transport through nuclear pores
Seminar: Material related to lectures 9-10.

7th week:

Lecture: 13. Vesicular transport I.
14. Vesicular transport II.
Seminar: Material related to lectures 11-12.

8th week:

Lecture: 15. Cell division (mitosis, meiosis). Mechanism of cell division.
16. Cell cycle and its regulation
Seminar: Material related to lectures 13-14.

9th week:

Lecture: 17. Cell signaling I. General concepts. Nuclear receptors. G-protein coupled receptors.
18. Cell signaling II. Receptor tyrosine kinases. The Ras/MAPK, PI3K/Akt and PLC/CaMK pathways.
Seminar: Material related to lectures 15-16.

10th week:

Lecture: 19. Cell signaling III. Proteolytic Signals. Pathways to the nucleus.
20. Cell-cell communication in the nervous and immune system

Seminar: Material related to lectures 17-18.

11th week:

Lecture:
21. Cell fates: Differentiation
22. Cell fates: Oncogenes, tumor cells
Seminar: Material related to lectures 19-20.

12th week:

Lecture:
23. Cell fates. Cell senescence, apoptosis
24. Cell fates: stem cells
Seminar: Material related to lectures 21-22.

13th week:

Lecture: 25. From genes to cell function: overview of the main regulatory mechanism
26. Cell and gene therapies
Seminar: Material related to lectures 23-24.

14th week:

Lecture: 27. Cell motility
28. Consultation

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

Subject officer: Dr. Árpád Szöör

Education manager: Dr. Enikő Nizsalóczy (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:

Alberts et al.: Essential Cell Biology., 6th Edition. W.W. Norton & Company, 2023., ISBN-13: 978-1324033356; Lodish et al.: Molecular Cell Biology, 8th edition, W. H. Freeman, 2016.; Alberts et al.: Molecular Biology of the Cell. 7th edition, W.W. Norton& Company, 2022.

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 0-3. 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 also be short online quizzes (SOQ) at the beginning of each seminar, covering all the material that scheduled for discussion in the given seminar. The best 10 scores of these SOQs will be averaged (SOQave) and converted into bonus points and used when determining offered grades (see 5.4.1)

There will also be two SCT-s (comprised of test and essay questions) during the semester. The dates and topics for SCT-s are announced in the beginning of the semester. These tests will have a strong focus on keywords and definitions.

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 tests is not compulsory; tests cannot be made up for, even in the case of a justified absence. Missed tests carry a score of 0.

SCTs are scored on a 0-100% scale, averaged (=SCTave) and this average is used for offering exemptions and bonus points towards the final grade (see 5.2 and 5.4.1). 1/10th of the average % score achieved in the SOQs on week 11-14 will be added to the % score of the second SCT as a

bonus.

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 85 minute complex exam, including short essays, fill-in, short answer, multiple choice, relation analysis, sketch-recognition, term-matching, definition recognition, etc.

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, 3 points maximum

3. Average % result of SCTs (SCTave):

4 points for reaching 30%, +1 for each additional 10% reached, 10 points maximum

Total: 113 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 55 points: fail (1)

55-64.9 points: pass (2)

65-74.9 points: satisfactory (3)

75-84.9 points: good (4)

reaching, and above 85 points: excellent (5)

5.4. Exemptions

5.4.1. For those who achieve SCTave $\geq 50\%$ at the self-control tests, a final grade offering score is calculated as follows:

1. SCTave % expressed as points, 100 points maximum

2. Presentation grade, 3 points maximum

3. Result of short online quizzes (SOQave, of the 10 best %scores).

- 6p-SOQave $\geq 95\%$

- 5p-95% > SOQave $\geq 90\%$

- 4p-90% > SOQave >=80%
- 3p-80% > SOQave >=70%
- 2p-70% > SOQave >=60%
- 1p-60% > SOQave >=40%

Total: 109 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 SCTave >=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 SCTave 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: multidrug resistance

6th week:

Practical: Membrane transport: multidrug 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 and cell division

12th week:

Practical: Cell signaling and cell division

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: 2nd.

Prerequisites of the course: No prerequisites.

Teaching staff: Dr. Árpád Szőör and members of the Department

Education manager: Dr. 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 upon proper, independent completion of the lab. All labs must be accepted by a valid signature in order to receive the end of term signature.

Labs can only be performed by students who arrive well prepared. This is checked by a ~10 min test at the beginning of the lab, graded on a scale of 0-5 according to the following table:

Number of correct answers	Test Points (TP)
Less than 5	0
5	1
6	2
7	3
8	4

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

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

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

The practical grade cannot be improved in the exam period.

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

CHAPTER 15

ACADEMIC PROGRAM FOR THE 2ND YEAR

Department of Anatomy, Histology and Embryology

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY III. LECTURE**

Year, Semester: 2nd year/1st semester

Number of teaching hours:

Lecture: **42**

Seminar: **26**

1st week:

Lecture: 1. Introduction to the head and neck: palpable structures of the head and neck. Division of the neck. Fascias of the neck. 2. Blood supply and lymph drainage of the head and neck. Branches of cranial nerves somatically innervating the head and neck. Cervical plexus. 3. Branches of cranial nerves vegetatively innervating the head and neck.

Seminar:

Histology: -

2nd week:

Lecture: 1. Histology of the skin. 2. Endocrin I.: hypothalamo-hypophysialis system. 3. Endocrin II.: thyroid gland, parathyroid gland, adrenal gland.

Seminar:

Histology: Skin.

3rd week:

Lecture: 1. Development of the pharyngeal apparatus. Pharyngeal arteries. 2. Regional anatomy of the oral cavity. Anatomy of teeth. 3. Development of the tongue and thyroid gland. Formation of the face and palate.

Seminar:

Histology: Hypophysis, epiphysis, adrenal gland. Development of the skull and pharyngeal arches – consultation.

4th week:

Lecture: 1. Histology and development of teeth. 2. Anatomy of the pharynx. Spaces around the pharynx. 3. Functional anatomy of the larynx.

Seminar:

Histology: Lip. Tongue. Thyroid gland.

Parathyroid gland. Consultation of their development.

5th week:

Lecture: 1. Anatomy and development of the nasal cavity and paranasal sinuses. 2. Radiographic and sectional anatomy of the head and neck. 3. Introduction to the neuroanatomy (division of the CNS, general introduction). Revision of the histology of nervous tissue. The neuron.

Seminar:

Histology: Salivary glands. Tooth. Development of the tooth - consultation.

6th week:

Lecture: 1. Meninges. 2. Ventricles of the brain. Production, circulation and reabsorption of the CSF. 3. Anatomy and histology of the spinal cord.

Seminar:

Histology: Larynx. Epiglottis. Review of tonsils. Development of the larynx – consultation.

7th week:

Lecture: 1. Anatomy and histology of the brainstem. 2. Summary of the cranial nerves. 3. Anatomy and histology of the cerebellum.

Seminar:

Histology: Consultation.

8th week:

Lecture: 1. Anatomy and histology of the diencephalon. 2. Anatomy and histology of the basal ganglia. 3. Anatomy and histology of the telencephalon.

Seminar:

Histology: Review of the nervous tissue. Dorsal root ganglion. Sympathetic ganglion.

9th week:

Lecture: 1. Blood supply of the CNS. 2. Development of the nervous system I. 3. Development of the nervous system II.

Seminar:

Histology: Spinal cord.

10th week:

Lecture: 1. Anatomy, histology and development of the eye. 2. Orbit. Appendages of the eye. The eye. Protective apparatus (palpebrae, lacrimal apparatus) 3. Anatomy and histology of the external and middle ear

Seminar:

Histology: Cerebellar cortex and brainstem. Development of the nervous system – consultation I.

11th week:

Lecture: 1. Anatomy, histology and development of the inner ear. 2. Sensory systems I.: tracts of superficial sensation. 3. Sensory systems II.: Tracts of deep sensation. Proprioception.

Seminar:

Histology: Cerebral cortex. Development of the

nervous system – consultation II.

12th week:

Lecture: 1. Motor systems I.: motor units, tracts. 2. Motor systems II.: structures involved in motor coordination 3. Auditory pathway, vestibular apparatus

Seminar:

Histology: Eye, palpebral, lacrimal gland. Development of the eye – consultation.

13th week:

Lecture: 1. Visual pathway, reflexes (cornea, oculopalpebral, light reflex). 2. Control of gaze. Vestibuloocular reflex. 3. Olfaction. Gustation. Limbic system

Seminar: Seminar:

Histology: Inner ear. Development of the ear.

14th week:

Lecture: 1. Radiographic and sectional anatomy of the CNS. 2. Spare lecture. 3. Spare lecture

Seminar:

Histology: Consultation.

Requirements

MED Anatomy, Histology and Embryology - III- Lecture

Requirements

The planned topics for lectures and seminars are listed in the Bulletin, any deviations and changes will be published on the Department's e-learning platform by the end of the first week of the semester.

Attendance at all seminars is compulsory in accordance with the Rules and Regulations of the UD, and absences will be noted by the tutor. The head of the Department may refuse to sign the subject if the number of absences from seminars in a semester exceeds three, even if certified. Absences from seminars may not be made up in another group due to the high number of students.

Rules of the examination

There are no self-control tests during the semester. At the end of the semester, there is a written exam (MOODLE, embryology) and two oral exams (histology and anatomy). The exam will cover the lectures, exercises and seminars of Anatomy, Histology and Embryology I-II-II and the official textbooks. The first exam will count as an "A" chance exam.

1. Students start the exam with a written Embryology test. If this part is passed, the student

proceeds to the dissection or histology stations. Failure of the test is the end of the exam. The grade (E1) for the written Embryology test:

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

If the student fails the written exam in Embryology on the "C" chance, he/she will also receive an oral embryology question at the Histology station. At the Histology station, the exam can only be continued if this embryology question is passed.

2. After the common written part, the students continue the exam with an *oral histology (histology practice room)* or *oral anatomy (dissection room)* part. After successfully completing this station, the student must immediately proceed to the other station (anatomy for those who start with histology and histology for those starting with anatomy).

3. Histology station:

The student will be given 10 structures (from the key sections of the previous two semesters) from a predefined (e-learning) list, of which he/she must correctly identify at least 8 to proceed to the exam. The student then draws a topic on which two sections from the semester's material (head and neck, neuroanatomy) are pre-combined. The student receives separate marks (H1, H2) for the sections of the histology topic.

4. Anatomy station:

The student will be given 10-10 structures (upper and lower limb) from a pre-defined (e-learning) list, of which he/she must correctly identify at least 8-8 on anatomical preparations in order to proceed with the exam. The student then draws a topic with 3 pre-combined questions (viscera, head and neck, neuroanatomy). For the questions on the anatomy topic, the student receives separate marks (A1, A2, A3).

If any part of the examination is failed, the whole examination is cancelled

$$\text{Grade} = (E1 + H1 + H2 + A1 + A2 + A3) / 6$$

Correction of the Final Grade If the student wishes to improve his/her grade in the examination, he/she must retake all parts of the examination. The previous mark will be cancelled.

Signing up for the exam and postponing: Rules of the Neptun system apply.

Conditions: Signing up for the exam requires the successful passing of the “Anatomy, Histology and Embryology – III - Practical” course.

Subject: **ANATOMY, HISTOLOGY AND EMBRYOLOGY III. PRACTICAL**

Year, Semester: 2nd year/1st semester

Number of teaching hours:

Practical: **56**

1st week:

Practical: 1A: Surface anatomy of head and neck. Cutaneous innervation, muscles of facial expression and mastication.

Surface anatomy of the head and neck, surface projection of arteries, veins and nerves. Pulse points. Somatosensory innervation of the head. Muscles of facial expression and their innervation.

Dissection: Orientation points and palpable landmarks on the head and neck. Palpation of the hyoid bone and cervical viscera. Demonstration of the course of major arteries and veins. Incision of skin of the forehead face and neck in the midline, encircling the eyes, nose and mouth. Dissection of the facial artery and vein, parotid duct, muscles of facial expression, branches of the facial nerve and the cutaneous branches of trigeminal nerve. Dissection of the platysma and the layers of the cervical fascia, external jugular vein and branches of the cervical plexus.

1B: Parotid gland. Parotid bed

Parotid bed. Parts, arterial supply, general and autonomic innervation and piercing structures of parotid gland. Parotid duct. Facial nerve.

Dissection: Unilateral removal of the substance of the parotid gland by gradual dissection of the branches of facial nerve. Dissection of external carotid artery, maxillary artery, superficial temporal artery and vein and auriculotemporal nerve. Demonstration of the buccal fat pad and the parotid duct.

2nd week:

Practical: 2A: Muscles and triangles of the neck. Supraclavicular trigone. Cervical plexus.

Triangles and regions of the neck. Borders and fascial relations of the supraclavicular trigone. Course and branches of subclavian artery and vein. Supraclavicular part of the brachial plexus.

Cervical plexus.

Dissection: Demonstration of triangles of the neck. Detaching the sternocleidomastoid from the clavicle, dissection of the branches of the cervical plexus. Removal of the fat from the supraclavicular fossa, dissection of the neurovascular structures. Demonstration of the ansa cervicalis on the surface of carotid sheath. Dissection of the branches of subclavian artery and vein and the branches of the brachial plexus.

2B: Carotid and submandibular trigone.

External carotid artery.

Borders, fascial relations and structures of the carotid triangle. Structures in the carotid sheath. Course of the common, internal and external carotid arteries, branches of the external carotid artery. Borders and structures of the submandibular trigone, and its connections to the fascial compartments around the oral cavity. Borders and structures of the lateral lingual groove. Blood supply and innervation of the submandibular and sublingual gl.

Dissection: Dissection of the neurovascular structures of carotid sheath, demonstration of the course and location of the common, internal and external carotid arteries. Dissection of the branches of external carotid artery, hypoglossal nerve, lingual artery and the submandibular gl.

3rd week:

Practical: 3A: Middle cervical region. Thyroid gland. Scaleno-tracheal fossa. Subclavian artery.

Borders, fascial relations and structures of the middle cervical region. Structure and arterial supply of the thyroid gland. Borders and structures of the scaleno-tracheal fossa: subclavian artery, cervical part of the sympathetic nervous system.

Dissection: Bilateral removal of clavicles.

Dissection of the branches of brachial plexus and subclavian artery. Demonstration of scalenus hiatus and scalenus tent. Mobilization of the infrahyoid muscles to demonstrate the thyroid gland. Demonstration of the esophagus and trachea. Dissection of sympathetic trunk and cervical ganglia. Dissection of the recurrent laryngeal nerve in the scalenotracheal fossa.

3B: Infratemporal fossa. Muscles of mastication. Maxillary artery. Pterygopalatine fossa.

Location, borders, fascial relations of the infratemporal fossa and its connections to the surrounding fascial compartments. Branches of the maxillary artery and mandibular nerve. Borders, connections and structures of the pterygopalatine fossa, branches of the maxillary nerve.

Dissection: Preparing for the unilateral removal of mandible: reflection of the muscles of mastication and the removal of the periosteum between the mental foramen and the neck of the mandible. Opening of the mandibular canal and gradual removal of the base of mandible to expose the inferior alveolar nerve. Dissection of the structures of the infratemporal fossa. Demonstration of the lingual nerve, chorda tympani, submandibular ganglion and auriculotemporal nerve.

4th week:

Practical: 4A: Oral cavity

Borders and structures of the oral cavity. Soft palate. Muscles, blood supply, sensory and motor innervation of the tongue. Blood supply and innervation of the teeth and gingiva. Connective tissue spaces around the oral cavity.

Dissection: Dissection of the muscles of the floor of mouth by layers. Demonstration of the structures of lateral lingual groove. Demonstration of the borders of the oral cavity, muscles of the floor of mouth on a median sagittal head specimen.

4B: Pharynx

General description of the pharynx, structure of

the pharyngeal wall and its attachment. Pharyngeal muscles and their innervation. Gaps on the pharyngeal wall and structures passing through them. Cavity of the pharynx. Blood supply and innervation of the pharynx. Waldeyer-ring.

Dissection: Demonstration of pharynx and tonsils on median sagittal head and isolated tongue-larynx-pharynx complex.

5th week:

Practical: 5A: Spaces around the pharynx. Nuchal region.

Location, borders, parts and structures of the parapharyngeal space. Borders, muscles and neurovascular structures of the nuchal region. Suboccipital trigone.

Dissection: Incision of skin of nuchal region in midline. Detaching nuchal muscles from the skull, dissection of greater occipital and third occipital nerves. Demonstration of the suboccipital trigone and the course of the vertebral artery.

Bending the head forward. Dissection of the structures in the parapharyngeal space. Demonstration of the retropharyngeal space and the posterior pharyngeal wall. Opening of the wall of the pharynx.

5B: Larynx

Cartilages, joints, muscles and cavity of the larynx. Blood supply, innervation and lymphatic drainage of the larynx.

Dissection: Demonstration of larynx on the isolated tongue-larynx-pharynx complex.

6th week:

Practical: 6A: Nasal cavity, paranasal sinuses

Walls, compartments and connections of the nasal cavity. Blood supply and innervation of nasal cavity. Location, blood supply, innervation and connections of paranasal sinuses.

Dissection: Demonstration of the nasal cavity on the skull and median sagittal head.

6B: Consultation (also embryology)

Review of the anatomy of head and neck- open lab with supervision.

7th week:**Practical: 7A: Meninges of the brain, spinal cord**

Review of terminology in relation to neuroanatomy; demonstration of planes, axis, poles. Parts of the nervous system. Demonstration of the spinal cord specimen. Roots, dorsal root ganglia, spinal nerves. Demonstration of the meninges of the spinal cord, denticulate ligaments. Location of the epidural and subarachnoid spaces. Demonstration of the meninges of the brain. Dura mater of the brain and the dural foldings, sinuses of the dura mater. Identification of the arachnoid and the pia mater. Subarachnoid cisterns, circulation of the cerebrospinal fluid. Innervation of the dura mater.

7B: Surface anatomical features of the brainstem, 4th ventricle

Parts, borders and connections of the brainstem. Identification of brainstem cranial nerves. Dissection of the fourth ventricle by bisection or wedge resection of cerebellum. Demonstration of the walls and openings of the fourth ventricle, the tela choroidea and choroid plexus. Identification of the structures of rhomboid fossa.

8th week:**Practical: 8A: Cranial nerves**

Localization of cranial nerve nuclei and major tracts in brainstem cross sections (with the aid of drawings or actual brainstem cross sections). Cross sections of brainstem are made at the level of spinomedullary junction, closed part of medulla oblongata, open part of medulla oblongata, pontomedullary junction, facial collicle and superior collicle.

8B: Cerebellum

Dorsal and inferior surface of the cerebellum and the median sagittal section through the vermis. Demonstration of cerebellar peduncles and cerebellar nuclei on the horizontal section of

cerebellum

9th week:**Practical: 9A: Diencephalon, 3rd ventricle**

Demonstration of the tela choroidea of third ventricle by carefully reflecting the fornix (the columns of the fornix are cut at the interventricular foramen). Demonstration of teniae. Demonstration of the walls, recesses and connections of the third ventricle after reflecting the tela choroidea (spare the pineal gland). Demonstration of diencephalon and its parts on the dissected and bisected brain specimen.

9B: Telencephalon I.

In one of the hemispheres, we approach the dorsal aspect of the corpus callosum by cutting horizontal slices. On the cut surfaces, gray and white matter, and the basic organization of cerebral white matter (semioval center, forceps, fascicles, the orientation of commissural, association and projection fibers) are demonstrated. Verification of the position of lateral ventricle on the cut surface of the hemisphere. Dissection of the central part and the anterior horn of the lateral ventricle, and demonstration of their walls. Demonstration of choroid plexus and teniae. Demonstration and removal of the opercula, demonstration of the insula. Dissection of the inferior horn of lateral ventricle (its position is first verified with a probe from the antrum of the lateral ventricle). Demonstration of basal ganglia and internal capsule on the Flechsig's cut (Flechsig's cut can be made directly on the intact hemisphere of the dissected brain; however, it is recommended to dissect first the lateral ventricle on the other side as well).

10th week:**Practical: 10A: Telencephalon II.**

Lobes and lobules, gyri and sulci, fissures, gray and white matter on the whole and bisected brain specimen. Comparison of the impressions of the neurocranium and the structures of the brain.

10B: Blood supply of the central nervous system. Circulation of the CSF

Discussion of blood supply to the central nervous

system. Demonstration of the circle of Willis, carotid and vertebrobasilar systems and their major branches, as well as their area of supply. Identification of major arteries on coronal brain slices.

11th week:

Practical: 11A: Coronal sections

Demonstration of the series of the coronal brain slices. From rostral to caudal, identify all the structures mentioned before on both surfaces of each slice.

11B: Anatomy of special senses.

Discussion of auditory and vestibular apparatus. Demonstration of the external middle and inner ear on the models. Demonstration of the position of tympanic cavity and its visible walls, internal and external acoustic meatus, position of semicircular canals, openings of vestibular aqueduct and cochlear aqueduct and the groove of auditory tube. Overview of structures of the auditory pathway and its reflexes (stapedius reflex, acoustic tensor tympani reflex, olivocochlear reflex) on the brain specimen. Demonstration of the structures of eye and orbit on the models. Discussion of the extraocular muscles. Dissection of the eye (one eye bisected in the coronal plane, one eye bisected along its optical axis; optionally, the sclera can be peeled off from one of the eyes to demonstrate the iris and the suspensory apparatus of the lens). Demonstration of the structures of the eye on the dissected eye specimen. Overview of the structures of visual pathway and its reflexes (pupillary light reflex, accommodation reflex,

corneal reflex, visual blink reflex, vestibuloocular reflex). Overview of structures participating in visual motor innervation.

12th week:

Practical: 12A: In situ brain dissection and revision I.

Dissection of the brain in situ follows the technique used for the isolated brain. Bearing in mind the demonstrative value of the specimen, sparing any structure is optional (except for the brainstem and cranial nerves, any structure can freely be removed). By the end of the dissection, exit points of cranial nerves, their intracranial course and dural pores will be visible.

12B: In situ brain dissection and revision II. Consultation

13th week:

Practical: 13A Consultation

Review of neuroanatomy- open lab with supervision.

13B Buffer

14th week:

Practical: 14A Practical exam - first chance

14B Practical exam - second chance

Only for students who failed the first chance or could not attend it due to a documented medical condition.

Self Control Test

Requirements

MED Anatomy, Histology and Embryology – III - Practical

Requirements

The topics of the practicals are described in the bulletin. According to the Rules and Regulations of the UD attendance at the practicals is compulsory and absences will be noted by the tutor. The head of the Department may refuse to sign the subject if the number of absences from the practical course exceeds three in a semester. Due to the high number of students, missed practicals cannot be made up with another group.

Rules for the practical examination

The practical examination will be oral and will take place in the dissecting room during the 14th week at the time of the practicals. The aim of the examination is to IDENTIFY macroscopic anatomical structures. A list of structures will be published by the Department, on its e-learning platform, during the first week of the semester.

The practical exam is passed with a 60% or better.

A successful Practical Exam will be converted into a grade as follows:

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

A failed Practical Exam may be repeated once during the semester and once during the examination period. The grade of the Practical Exam cannot be improved, only students who have not achieved 60% or could not show up due to medical reasons (proven with a doctor's note) on the previous occasion are allowed to retake the Practical Exam.

The Department will publish details of the Practical Examination on its e-learning platform.

Department of Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY I. LECTURE**

Year, Semester: 2nd year/1st semester

Number of teaching hours:

Lecture: **52**

Seminar: **28**

1st week:**Lecture: General introduction 1 hour**

General information, requirements, exam information. Tips and tricks of preparation for a successful exam.

Introduction to biochemistry 1 hour

Introduction

The genetic code, DNA and genome 2 hours

Components of the human genome. The structure of chromosomes and chromatin. Genome programs.

Seminar: General introduction.

2nd week:**Lecture: Genome replication and repair 2 hours**

Genome replication. Initiation, synthesis and termination in eukaryotes. The replication fork.

Synthesis of the leading and lagging strand.

Replication of chromosome ends (telomers).

Mutations. Causes and consequences of mutations. DNA repair mechanisms. Diseases caused by defective DNA repair.

Eukaryotic transcription 2 hours

Transcription in eukaryotes. Initiation and elongation. Characteristics of transcription factors. Transcription regulatory regions (promoters, enhancer, insulator) and their interactions. Nuclear receptors.

Posttranscriptional modifications of RNA, splicing.

Seminar: Lecture topics of the previous week.

3rd week:**Lecture: Translation, protein synthesis 1 hour**

The genetic code. Structure and function of

tRNA and the ribosome. Protein synthesis. Steps of translation (protein synthesis): initiation, formation of the peptide-bond, elongation and termination. Antibiotics. Antiviral effect of interferon.

Protein structure and function 3 hours

Protein maturation. Assisted protein folding and its enzymes and chaperons.

Protein structure levels. Domains and subunits. Methods to determine the 3D structure of proteins.

Protein dynamics, specific movements: pancreatic lipase and serine proteases.

Intrinsically disordered proteins: characteristics and biological functions. Misfolding: protein aggregation diseases. The structure-function relationships of proteins, through the examples of collagen and some metabolic enzymes. Hemoglobin; structure and function. Molecular changes caused by oxygen binding. The molecular basis of cooperativity. Molecular basis of oxygen release. Pathological forms of hemoglobin.

Seminar: Lecture topics of the previous week.

4th week:

Lecture: Posttranslational modifications and intracellular protein degradation 2 hours

Acylation: glutarylation, acetylation, succinylation. Biological function of protein processing. Classification of proteolytic enzymes. Structure and function of serine proteases. Mechanism of activation of serine proteases. Protease inhibitors.

Lysosomal and ubiquitin-dependent proteasomal protein degradation. The role of ubiquitin and ubiquitin-like proteins. Types of ubiquitinated proteins. Factors influencing protein half life. The structure and function of proteasome.

Autophagy 1 hour

Definition and types of autophagy. Regulation of macroautophagy initiation and its role in nutrient mobilization. The main steps of selective autophagy, its relation to the ubiquitin-proteasome system and role in the maintenance of cellular and tissue homeostasis. Diseases related to autophagy disorders.

Enzymes 1 hour

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.

Seminar: Lecture topics of the previous week.

5th week:

Lecture: Enzymes 2 hours

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.

Regulatory mechanisms in metabolism 2 hours

General regulatory principles in the regulation of metabolism. The structure of metabolic pathways. Regulatory possibilities with reactions leading to equilibrium or non-equilibrium. Systems increasing the sensitivity of regulation: allosteric, substrate cycle, interconversion cycle, cascades. General rules of regulations, the definition and role of commitment step. Feedback inhibition. The levels of regulation: quick allosteric or covalent modification or long-term gene level regulation. The regulatory possibilities of converse processes. The role of compartmentalization in regulation. Regulation with local or systemic factors and hormones. The regulatory role of insulin, glucagon and epinephrine.

Seminar: Lecture topics of the previous week.

6th week:

Lecture: Carbohydrate metabolism 1 hour

The central role of glucose. GLUT transporters. Glycolytic pathway. Shuttles. Gluconeogenesis.

Biochemistry of mitochondria 3 hours

Energy in biology. Oxidative phosphorylation. The PDH. The citric acid cycle and its regulation. The electron transport chain and its inhibitors. The mitochondrial genome. Mitochondrial biogenesis, mitophagy.

Seminar: Lecture topics of the previous week.

7th week:

Lecture: Carbohydrate metabolism 4 hours

Regulation of glycolysis and gluconeogenesis. Importance of glycogen. Degradation and

synthesis of glycogen. Regulation of glycogen synthesis and degradation. Metabolism of galactose and fructose. Pentose phosphate pathway. Synthesis of disaccharides. Metabolism of glucuronic acid. Glycoproteins. Inherited diseases in the carbohydrate metabolism.

Seminar: Lecture topics of the previous week.

8th week:

Lecture: Lipid metabolism 4 hours

Cycling of lipids in human body: endogenous, exogenous and reverse pathways. Biosynthesis of fatty acids: the transport of acetyl-CoA, reaction catalyzed by acetyl-CoA carboxylase. Fatty acid synthesis from acetyl-CoA and malonyl-CoA, the regulation of fatty acid synthesis. Elongation and desaturation of fatty acids. Synthesis and storage of triacylglycerols and their mobilization from adipose tissue. Beta oxidation of fatty acids. Oxidation of fatty acids with odd carbon number. Synthesis and utilization of ketone bodies.

Seminar: Lecture topics of the previous week.

Self Control Test

9th week:

Lecture: Lipid metabolism 4 hours

Synthesis of cholesterol, vitamin D, bile acids and steroid hormones. The cholesterol problem. Coordinated gene level regulation of synthesis and uptake – SREBP-2. ABC transporters. The central role of the liver. Familial and diet-related hypercholesterolemia. Biochemical background of drug targets.

Essential fatty acids. The metabolism of omega 3 and omega 6 fatty acids. Synthesis of arachidonic acid. Synthesis of lipid mediators: prostaglandins, leukotrienes, resolvins, lipoxins. Molecular mechanism of action of the steroid and non steroid anti-inflammatory agents.

Seminar: Lecture topics of the previous week.

10th week:

Lecture: Amino acid metabolism 4 hours

Essential amino acids. Proteinogenic and non proteinogenic amino acids. Amino acids in human metabolism. Formation and utilization of the intracellular amino acid pool. Exogenous amino acid sources, digestion of proteins. Endogenous amino acid sources: intracellular

protein breakdown. Amino acid transport. Nitrogen balance. Common reactions in the amino acid metabolism: fate of the nitrogen. Transamination and deamination. Formation and elimination of ammonia in the body. The urea cycle and its regulation. Mitochondrial carbamoyl phosphate synthase.

Seminar: Lecture topics of the previous week.

11th week:

Lecture: Amino acid metabolism 4 hours

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.

Seminar: Lecture topics of the previous week.

12th week:

Lecture: Nucleotide metabolism 4 hours

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. De novo synthesis of pyrimidine nucleotides. Regulation of pyrimidine nucleotide synthesis. Salvage pathways for the pyrimidines. Degradation of pyrimidine nucleotides. Nucleoside and nucleotide kinases. Orotic aciduria. Synthesis of deoxyribonucleotides. Synthesis of deoxythymidylate. Antitumour and antiviral action of base and nucleoside analogues.

Seminar: Lecture topics of the previous week.

13th week:

Lecture: Integrated metabolism 4 hours

Comparison of the amino acid metabolism with the carbohydrate and lipid metabolisms. Nitrogen transport between the tissues. Intercellular glutamine cycle. The fate of glucose in various tissues.

Metabolic interrelations in fasting and well-fed state. Regulation via insulin, mTOR, glucagon

and AMPK. The metabolic roles of insulin. The role of PPAR-s in adipogenesis, lipid metabolism, energy balance and in increasing the insulin sensitivity.

Seminar: Lecture topics of the previous week.

Self Control Test

14th week:

Seminar: Lecture topics of the previous week.

Reading materials:

Lubert Stryer: Biochemistry.

10th edition. W.H. Freeman, 2023. ISBN: 978-1319498504.

Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations.

7th edition. John Wiley & Sons, 2010. ISBN: 978-0-470-28173-4.

Requirements

On the seminars the material of the lectures of the previous week will be discussed.

Participation in all seminars is compulsory and can be missed only with medical proofs. The Department will not collect and verify the medical papers up to three missing seminars. In case of more than three absences the Department refuses the signature. In this case the student may ask the Dean for an override, for these requests students have to deliver the signed and stamped medical proofs (with unique medical document ID) about their all absences. Students can't make up a seminar with another group. Students can earn 10 points by writing seminar tests (see more details in the "Information about seminars" file on the e-learning page of the Department). Seminar points are counted for the offered grade, but can't be added to the written exam points at the end of the semester.

Students can write two control tests during the semester from the material of the lectures and seminars. Control tests consist of 2 x 40 single- and multiple choice test questions (each for 1.25 points), by the tests maximum 100 points can be reached. Control tests have to be written personally, on-line test-writing is not possible. Control tests are not obligatory.

During the semester 110 points can be collected by the two control tests of the material of the lectures (2 x 50 points) and 10 points by the seminar tests. At the end of the semester, on the basis of the collected points, grade will be offered for those students who collected at least 60 points and reached the 60% (6 points) of the seminar points as well. Grades: 2 (pass): 60-69.5 points; 3 (satisfactory): 70-79.5 points, 4 (good): 80-89.5 points and 5 (excellent): 90-110 points.

Students have to decide to accept the offered grade until the beginning of 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 for those students, who break the rules of test writings.

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, the department gives a chance to the student to prove his/her knowledge in an oral exam, in front of an examination committee, on the same day. (In this case students can get maximum a passing grade).

Those students who collect at least 150 points during the two semesters from the two courses (Biochemistry I. and 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. Scores of the exams will be counted into the point collecting system if they are better than the scores collected by the control tests.

Please follow the announcements of the department about the control tests, exams and other current information on the e-learning page of the Department (<https://elearning.med.unideb.hu>, login with your university network ID and password). Specific rules for repeaters regarding the seminars and practices as well can be found on the Departments e-learning page.

Subject: **BIOCHEMISTRY I. PRACTICAL**

Year, Semester: 2nd year/1st semester

Number of teaching hours:

Practical: **40**

1st week:

Practical: - Safety instructions and fire regulations. Introduction to biochemical techniques.
- Bioinformatics: Study of protein structure using protein structural databases (demonstrative practice).

2nd week:

Practical: - Safety instructions and fire regulations. Introduction to biochemical techniques.
- Bioinformatics: Study of protein structure using protein structural databases (demonstrative practice).

3rd week:

Practical: - Safety instructions and fire regulations. Introduction to biochemical techniques.
- Bioinformatics: Study of protein structure using protein structural databases (demonstrative practice).

4th week:

Practical: - Studies on phosphatases.
- Study of proteolytic enzymes (demonstrative practice).

5th week:

Practical: - Studies on phosphatases.
- Study of proteolytic enzymes (demonstrative practice).

6th week:

Practical: - Studies on phosphatases.
- Study of proteolytic enzymes (demonstrative practice).

7th 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 (demonstrative practice).

8th 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 (demonstrative practice).

9th 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 (demonstrative practice).

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

- Study of biochemical features by applying problem-based learning (demonstrative practice).

11th week:**Practical:** - Studies on transaminases.

- Study of biochemical features by applying

problem-based learning (demonstrative practice).

12th week:**Practical:** - Studies on transaminases.

- Study of biochemical features by applying problem-based learning (demonstrative practice).

Requirements

Requirements: perform every laboratory practices and reach at least 60% of the practical points.

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

Description of the practices, notebooks and all information about the practices can be found on the e-learning site of the department (<https://elearning.med.unideb.hu>).

Students have to do all practices with their own group according to the schedule that is posted on our e-learning site. If someone is absent due to any serious reason, the missing experiment has to be performed with another group, within the three-week period of the given practice. Points can't be earned for the make-up practice without medical paper. If a student misses even one practice the semester of the student can't be signed.

During the practices students have to prepare notebooks. Students will be graded based on the points that are collected for the notebooks and practical tests.

You can read more detailed information about the practices on the e-learning page 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:** Emlékszik?**2nd week:****Practical:** Tegezés-Önözés**3rd week:****Practical:** Élelmiszerek 1.**4th week:****Practical:** Élelmiszerek 2. , Étkezések, étteremben 1.**5th week:****Practical:** Étkezések, étteremben 2.**6th week:****Practical:** Összefoglalás**7th week:****Practical:** Mid-term test (written)**Self Control Test****8th week:****Practical:** A városban 1.

9th week:**Practical:** A városban 2.**10th week:****Practical:** Édes otthon 1.**11th week:****Practical:** Édes otthon 2.**12th week:****Practical:** Összefoglalás**13th week:****Practical:** End-term test (written)**Self Control Test****14th week:****Practical:** End-term test (oral)**Self Control 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. In case of more than 2 absences, the signature may be refused. Making up a missed lesson with another group is not allowed.

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

During the semester students must sit for two written language tests, and an oral exam. If a student is late for the test, he/she is not allowed to take it.

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. Missed word quizzes cannot be made up for on the day of the written test.

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 material of the failed part. The remedial test must be done before the end of week 14. The oral test can only be taken if the written tests are successful.

Coursebook: Fodor, Marianna - Rozman, Katalin: Beszélek magyarul?! I.

Assignments, audio files, oral exam topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

Department of Physiology

Subject: **MEDICAL PHYSIOLOGY I. LECTURE**

Year, Semester: 2nd year/1st semester

Number of teaching hours:

Lecture: **48**

Seminar: **28**

1st week:

Lecture: Introductory remarks

Preparation for laboratory practices

Membrane transport mechanisms

Regulation of cell function, signal transduction

2nd week:

Lecture: Electrical properties of the cell membrane

Mechanisms underlying the action potential.

Neuromuscular junction. Synapse.

The autonomic nerves.

3rd week:

Lecture: Physiology of the body fluids. Liquor.

Blood plasma.

Red blood cells. Iron circulation.

Jaundice. Blood types.

Hemostasis 1

4th week:

Lecture: Hemostasis 2. White blood cells.

Regulation of striated muscle contraction

Regulation of smooth muscle contraction

Self Control Test

5th week:

Lecture: Mechanics of ventilation

Compliance, work of breathing

Gas transport in the blood

Control of breathing

6th week:

Lecture: Electrophysiology of cardiac myocyte

Mechanics and contractility of cardiac myocyte

Cardiac electrophysiology

ECG

7th week:

Lecture: The cardiac cycle

Cardiac mechanics

Autoregulation of cardiac output

Neuroendocrine control of cardiac functions

8th week:

Lecture: Cardiac work and energetics; cardiac failure

Principles of hemodynamics

Features of arterial circulation

9th week:

Lecture: Microcirculation

Lymphatic circulation, venous circulation

Components of vascular tone

Self Control Test

10th week:

Lecture: Cardiovascular reflexes I.

Cardiovascular reflexes II.

Renal, Humoral and Local Regulation of Circulation

11th week:

Lecture: Functions of vascular endothelium

Coronary and cerebral circulation

Pulmonary circulation

Splanchnic, cutaneous and skeletal muscle circulation

12th week:

Lecture: Energetics of muscle contraction

Exercise physiology

Circulatory shock

Self Control Test

13th week:

Lecture: Cardiovascular regulations under physiological and pathological conditions 1

Cardiovascular regulations under physiological and pathological conditions 2

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 matters, 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:

scoremark

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: Preparation for laboratory practices

2nd week:

Practical: 1. INVESTIGATION OF THE CARDIOVASCULAR FUNCTIONS

3rd week:

Practical: EXAMINATION OF THE BLOOD

4th week:

Practical: COMPUTER AIDED ACQUISITION AND PROCESSING OF BIOLOGICAL SIGNALS

5th week:

Practical: COMPUTER SIMULATION OF THE HUMORAL REGULATION OF INTESTINAL SMOOTH MUSCLE

6th week:

Practical: COMPUTER SIMULATION OF THE SKELETAL MUSCLE FUNCTION

7th week:

Practical: Remedial Lab

8th week:

Practical: EVALUATION OF ECG

RECORDINGS – RECOGNITION OF ECG ALTERATIONS

9th week:

Practical: DETERMINATION OF PARAMETERS CHARACTERISING THE RESPIRATORY FUNCTIONS

10th week:

Practical: EFFECTS OF ELECTROLYTES ON THE UTERINE SMOOTH MUSCLE FUNCTION

11th week:

Practical: COMPUTER SIMULATION OF THE FRANK-STRAHLING-MECHANISM

12th week:

Practical: INVESTIGATION OF THE ENDOTHELIAL FUNCTION ON ISOLATED ARTERIAL RING

13th week:

Practical: Remedial Lab

14th week:

Practical: Lab Exam

Requirements

1. Signature of the semester

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

All missed practices must be made up; however this does not reduce the number of absences!

Completion of all topic sheets in the Exercise Book, each verified by the signature of the teacher, is also a precondition of the signature of the semester.

Each student must attend on laboratory practices with the group specified by the Education Office.

For continuous updates on all education-related matters, please check the elearning.med.unideb.hu 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 Biochemistry and Molecular Biology

Subject: **BIOCHEMISTRY II. LECTURE**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Lecture: **52**

Seminar: **28**

1st week:

Lecture: Gene expression 4 hours

Levels of eukaryotic gene expression. The active chromatin and epigenome. Signal-dependent transcriptional regulation: the function of nuclear hormone receptors.

Seminar: General introduction.

2nd week:

Lecture: Gene expression 2 hours

RNA world: stability, miRNA, siRNA. Inherited gene expression. Problems related to gene expression. Gene therapy: the restoration of biochemical functions.

Signal transduction 2 hours

Forms of external signals. Receptors and transducers. Signaling pathways of non penetrating signals. Ion channel receptors. Seven transmembrane domain receptors. G proteins and GTP-ases. The adenylate cyclase and the

phospholipase C signaling pathway. Other phospholipases.

Seminar: Lecture topics of the previous week.

3rd week:

Lecture: Signal transduction 4 hours

c ADP ribose as secondary messenger. The cGMP phosphodiesterase system. Signaling via one-hydrophobic domain proteins: the cGMP system. Coupling of tyrosine kinase receptors to the signaling pathways, raf, MAP kinases. Cytokine receptors. Cell death receptors. Signals acting via cytoplasmic targets: the NO system. Intracellular signals. Signal crosstalk.

Seminar: Lecture topics of the previous week.

4th week:

Lecture: Biochemistry of cell proliferation 4 hours

Biochemical regulation of cell cycle. M-phase

kinase. Phosphorylation and proteolysis in the regulation of cell cycle. Cell cycle checkpoints. Products and biochemical function of proto-oncogenes. Mechanism of oncogene formation. Tumor suppressor genes and their biochemical functions.

Seminar: Lecture topics of the previous week.

5th week:

Lecture: Biochemistry of cell proliferation and apoptosis 2 hours

Definition and forms of programmed cell death. Biochemistry of programmed cell death. Therapeutical possibilities.

Biochemistry of stress 2 hours

Stress proteins and enzymes in eukaryotic cells. Heat shock proteins and their functions under normal circumstances. Role of chaperones and chaperonins. Hsp 70 and hsp 60 protein families. Thermotolerance of the cell. Hsp 90 protein family and their role in the cells. Transcriptional regulation of heat shock genes. Stress signals.

Seminar: Lecture topics of the previous week.

6th week:

Lecture: Biochemistry of the liver 3 hours

Biotransformation. The central role of liver in metabolism. Zonal heterogeneity. Biochemical consequences of ethanol consumption.

Hem synthesis and degradation 1 hour

Hem-proteins. Synthesis of hem, regulation of the synthesis. Disorders in hem synthesis. Degradation of hem: formation, conjugation and excretion of bile pigments. Hem oxygenase.

Seminar: Lecture topics of the previous week.

Self Control Test

7th week:

Lecture: Iron metabolism 2 hours

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: oxidative stress and adaptive mechanisms. Iron deficiency states and hemochromatosis.

Biochemistry of blood clotting 2 hours

Definition and key steps of hemostasis. Cellular, humoral and vascular aspects of blood clotting.

Structure, activation, adhesion and aggregation of thrombocytes. Resting, activated and super activated thrombocytes. The inhibition of thrombocyte activation.

Seminar: Lecture topics of the previous week.

8th week:

Lecture: Biochemistry of blood clotting 4 hours

Classification of blood clotting factors and their role. Factors depending on vitamin K. Complexes in blood clotting: structure and importance. The initial phase of blood clotting in human body and in test tube. The advanced phase of blood clotting. Regulation of blood clotting cascade. The role of thrombin in blood clotting. Role of thrombocytes and the vascular endothelium. Limiting factors, inhibitors and activators of blood coagulation. Fibrinolysis.

Seminar: Lecture topics of the previous week.

9th week:

Lecture: Biochemistry of the sport 2 hours

Molecular mechanism of force generation. Metabolic fuel of muscle. Aerobic and anaerobic work. Metabolism of muscle in various work load. Effect of exercise. Doping agents. Sarcopenia and its treatment. Myopathy (genetic and acquired).

Biochemistry of nutrition 2 hours

Vitamins. Structure, biochemical functions. Relationship between the biochemical functions and the symptoms of deficiency. Essential inorganic elements of the food (metabolism, function, deficiency).

Seminar: Lecture topics of the previous week.

10th week:

Lecture: Biochemistry of nutrition 1 hour

Energy storage and heat production. Basal metabolic rate. Proteins as N and energy source. Protein malnutrition. Vegetarianism. Clinical aspects of protein nutrition. Carbohydrates and lipids.

Biochemistry of adipose tissue and obesity 2 hours

Types of adipocytes, adipocyte differentiation, adipokines. Heat generation in brown/beige adipocytes, batokines.

Obesity. The molecular background of the regulation of appetite: orexigenic and anorexigenic signaling. Effects of incretins on appetite regulation. Human obesity genes, genetic predisposition. Molecular background of drug targets.

Metabolic syndrome 1 hour

The effects of abdominal obesity. Role of macrophages in adipose tissue. The mechanism of disease formation: type 2 diabetes and vascular diseases.

Seminar: Lecture topics of the previous week.

11th week:

Lecture: Biochemistry of the extracellular matrix 3 hours

Function and components of ECM.

Glycosaminoglycans 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 1 hour

The synapse. Blood-brain barrier and the transport processes in the CNS.

Seminar: Lecture topics of the previous week.

12th week:

Lecture: Neurobiochemistry 4 hours

Metabolic processes in the CNS: energy generation in neurons and astrocytes. Utilization of glucose and ketone bodies. Oxidation of free fatty acids. Biochemical background of the effect of hypoxia on the CNS.

Synthesis of neurotransmitters. Circadian rhythm.

Seminar: Lecture topics of the previous week.

Self Control Test

13th week:

Lecture: Neurobiochemistry 1 hour

Biochemical background of neurodegenerative diseases: Alzheimer's disease and Parkinson disease.

Biochemistry of skin 1 hour

Biochemical processes in the skin. The endocannabinoid system.

Overview lectures 2 hours

Seminar: Lecture topics of the previous week.

14th week:

Seminar: Lecture topics of the previous week.

Reading materials:

Lubert Stryer: Biochemistry.

10th edition. W.H. Freeman, 2023. ISBN: 978-1319498504.

Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations.

7th edition. John Wiley & Sons, 2010. ISBN: 978-0-470-28173-4.

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 and topics discussed in the seminars. Lecture slides will be uploaded before the lectures to the <https://elearning.med.unideb.hu> website of the Department (Faculty of Medicine / Department of Biochemistry and Molecular Biology / 06_BMBI Biochemistry II. (II. GM, DENT), login with your university network ID).

Attendance on the lectures is recommended, but not compulsory. Note that getting 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 the lectures of the previous week can be discussed. Participation in all seminars is compulsory and can be missed only with medical proofs. The Department will not collect and verify the medical papers up to three missing seminars. In case of more than three absences, the Department refuses the signature. In this case the student may ask the Dean for an override, for these requests students have to deliver the signed and stamped medical proofs (with unique medical document ID) about their all absences. Students can't make up a seminar with another group. On the seminars, students can earn 10 points by writing seminar tests (see more details in the "Information about seminars" file on the e-learning page of the Department). Seminar points are counted for the point collecting system of the semester, but will not be added to the points of the written part of the final exam.

Students can write two control tests during the semester from the material of the lectures and seminars. (Control tests have to be written personally, on-line test-writing is not possible.) Control tests are not obligatory.

In this semester, students can collect maximum 100+10 points: 100 points by writing two control tests based on the lecture material and 10 points by the seminar tests. Control tests consist of all together 80 single- and multiple choice test questions (each for 1.25 points), by the tests maximum 100 points can be collected. Semester points will be automatically erased of those students, who break the rules of test writings.

„Exam bonus points”: those students who finally reach at least 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 final exam.

Those students, who reaches at least 150 points during the two semesters (Biochemistry I. and Biochemistry 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 “Basic Biochemistry” (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, the department gives a chance to the student to prove his/her knowledge in an oral exam, in front of an examination committee, on the same day (in this case students can get maximum a passing grade).

The oral part of the examination starts with one basic question of „basic biochemistry” and a question about a basic medical orientation problem for which the biochemical background has to be explained. The „starting” questions have to be answered immediately. After properly answering the „starting” questions, students will have three theoretical questions (1 from metabolism, 1 from cell biochemistry and 1 from organ biochemistry). Questions of the oral examination will be posted on the e-learning site of the department at the end of the semester.

Please follow the announcements of the department on the e-learning page of the department: <https://elearning.med.unideb.hu> (Faculty of Medicine / Department of Biochemistry and Molecular Biology / 06_BMBI Biochemistry II. (II. GM, DENT), login with your university network ID and

password. Specific rules for repeaters regarding the seminars and practices as well can be found on the elearning site of the Department.

Subject: **BIOCHEMISTRY II. PRACTICAL**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Practical: **30**

1st week:

Practical: - Usage of medical devices in biochemistry.

2nd week:

Practical: - Usage of medical devices in biochemistry.

3rd week:

Practical: - Usage of medical devices in biochemistry.

4th week:

Practical: - Study of plasma components and their diagnostic significance.
- Bioinformatics: Study of disease-specific molecular patterns using databases (demonstrative practice).

5th week:

Practical: - Study of plasma components and their diagnostic significance.
- Bioinformatics: Study of disease-specific molecular patterns using databases (demonstrative practice).

6th week:

Practical: - Study of plasma components and their diagnostic significance.

- Bioinformatics: Study of disease-specific molecular patterns using databases (demonstrative practice).

7th week:

Practical: - Study of cell viability.
- Study of cell-biochemical features by applying problem-based learning (demonstrative practice).

8th week:

Practical: - Study of cell viability.
- Study of cell-biochemical features by applying problem-based learning (demonstrative practice).

9th week:

Practical: - Study of cell viability.
- Study of cell-biochemical features by applying problem-based learning (demonstrative practice).

10th week:

Practical: - Studies on blood clotting.

11th week:

Practical: - Studies on blood clotting.

12th week:

Practical: - Studies on blood clotting.

Requirements

Requirements: perform every laboratory practices and reach at least 60% of the practical points. Passing the course "Biochemistry II. Practical" is a required condition for obtaining the signature for "Biochemistry II. Lecture".

Description of the practices, notebooks and all information about the practices can be found on the e-learning site of the department (<https://elearning.med.unideb.hu>).

Students have to do all practices with their own group according to the schedule that is posted on our e-learning site. If someone is absent due to any serious reason, the missing experiment has to be

performed with another group, within the three-week period of the given practice. Points can't be earned for the make-up practice without medical paper. If a student misses even one practice the semester of the student can't be signed. During the practices students have to prepare notebooks. Students will be graded based on the points that are collected for the notebooks and practical tests. You can read more detailed information about the practices on the e-learning page 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: Jó és rossz szokások I.

6th week:

Practical: Jó és rossz szokások II.

7th week:

Practical: Mid-term test (written)

Self Control Test

8th week:

Practical: Klinikák és szakorvosok

9th week:

Practical: Utasítások

10th week:

Practical: Tessék mondani! I.

11th week:

Practical: Tessék mondani! II.

12th week:

Practical: Anamnézis, Összefoglalás

13th week:

Practical: Összefoglalás, End-term test (written)

Self Control Test

14th week:

Practical: End-term test (written)

Self Control 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. In case of more than 2 absences, the signature may be refused. Making up a missed lesson with another group is not

allowed.

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

During the semester students must sit for two written language tests, and an oral exam. If a student is late for the test, he/she is not allowed to take it.

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. Missed word quizzes cannot be made up for on the day of the written test.

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 material of the failed part. The remedial test must be done before the end of week 14. The oral test can only be taken if the written tests are successful.

Coursebook: Fodor, Marianna - Rozman, Katalin: Beszélek magyarul?! II.

Assignments, audio files, oral exam topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

Department of Human Genetics

Subject: **MEDICAL GENETICS LECTURE**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Lecture: **30**

1st week:

Lecture: (1) Basic principles of nucleic acid structure and gene expression I. (2) Basic principles of nucleic acid structure and gene expression II. (3) Fundamentals of cells and chromosomes I.

2nd week:

Lecture: (4) Fundamentals of cells and chromosomes II. (5) Patterns of inheritance I. (6)

Patterns of inheritance II.

3rd week:

Lecture: (7) Core DNA technologies: amplifying DNA, nucleic acid hybridization, and DNA sequencing I. (8) Core DNA technologies: amplifying DNA, nucleic acid hybridization, and DNA sequencing II. (9) Genetic testing in healthcare.

4th week:

Lecture: (10) Analyzing the structure and expression of genes and genomes. (11) Gene regulation and the epigenome I. (12) Gene regulation and the epigenome II.

Self Control Test (1st test in extra time on Monday morning.)

5th week:

Lecture: (13) Gene regulation and the epigenome III. (14) Uncovering the architecture and workings of the human genome. (15) An overview of human genetic variation I.

6th week:

Lecture: (16) An overview of human genetic variation II. (17) Human population genetics. (18) Comparative genomics and genome evolution.

7th week:

Lecture: (19) Human evolution. (20) Chromosomal abnormalities and structural variants I. (21) Chromosomal abnormalities and structural variants II.

8th week:

Lecture: (22) Molecular pathology: connecting phenotypes to genotypes I. (23) Molecular pathology: connecting phenotypes to genotypes II. (24) Mapping and identifying genes for monogenic disorders.

9th week:

Lecture: (25) Complex disease: identifying susceptibility factors and understanding pathogenesis. (26) Cancer genetics and genomics I. (27) Cancer genetics and genomics II.

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

10th week:

Lecture: (28) Principles of genetic manipulation of mammalian cells. (29) Model organisms and modeling disease. (30) Genetic approaches to treating disease.

11th week:

Lecture: Lectures of Medical Genomics compulsory elective course

12th week:

Lecture: Lectures of Medical Genomics compulsory elective course

13th week:

Lecture: Lectures of Medical Genomics compulsory elective course

Self Control Test (3rd test in extra time.)

14th week:

Lecture: Lectures of Medical Genomics compulsory elective course

Requirements

Conditions of signing the subject

Get a signature and pass (2) or better mark in Medical Genetics Practical.

During the semester there will be three self-control tests offered in the 4th, 9th and 13th weeks. The questions include single and multiple choice and short essay questions, e.g. figures, karyograms, pedigrees, calculations, definitions (glossary), etc. Glossary terms will be published, and terms of material of first test or second test can be questioned in the next tests as well.

Based on the % average of the three tests a final grade will be offered according to the next table:

Percentage (%)	Mark
50.00 – 64.99	pass (2)
65.00 – 74.99	satisfactory (3)
75.00 – 84.99	good (4)
85.00 – 100	excellent (5)

Bonuses based on mark of Medical Genetics Practical (bonus=mark-1) are added as percentages to the average of the three tests.

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 50% 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 Medical Genetics Lecture 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. They will be questioned about the material of previous semesters.

Students, who did not earn a signature in the previous year, are considered as the other students registering the course at the first time.

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, and the theoretical background of practical. The examination questions include single and multiple choice and short essay questions, figures, definitions (glossary terms), 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 (based on the average result of the three mid-semester tests), and calculated from their practical mark (see above).

The following table shows the bonus percentage based on the average result of the three mid-semester tests.

Average of the 3 tests (%)	Bonus %
0 – 39.99	0
40.00 – 44.49	1
44.50 – 48.99	2
49.00 – 53.49	3
53.50 – 57.99	4
58.00 – 62.49	5
62.50 – 66.99	6
67.00 – 71.49	7
71.50 – 75.99	8
76.00 – 80.49	9
80.50 – 100	10

Absence counts as 0%. These bonuses are counted only on the ESE. Bonuses are calculated only in the year of acquisition.

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: 2nd year/2nd semester

Number of teaching hours:

Practical: **26**

1st week:

Practical: Introduction to genetics. Basic principles of nucleic acid structure and gene expression.

2nd week:

Practical: Fundamentals of cells and chromosomes.

3rd week:

Practical: Patterns of inheritance and pedigree analysis.

4th week:

Practical: Core DNA technologies
Self Control Test

5th week:

Practical: Sequencing

6th week:

Practical: Gene regulation

7th week:

Practical: Population genetics.

8th week:

Practical: Discussion on material of lectures 7-19.

9th week:

Practical: Detection of human polymorphism by polymerase chain reaction. (Laboratory practical)
Self Control Test

10th week:

Practical: PCR evaluation of the human polymorphism experiment.

11th week:

Practical: Cytogenetics.

12th week:

Practical: Study of sex chromatin.
Demonstration of mammalian chromosomes.
Preparation of metaphase spreads. (Laboratory practical)

13th week:

Practical: Discussion on material of lectures 20-30.
Self Control Test

14th week:

Practical: Practice of the required elective course Medical Genomics.

Requirements

Conditions of signing the subject

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

The presence of students at practical 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 two weeks of absence, even if the student has an acceptable excuse. Missed practices can be made up for in the classes with other groups with the permission of the academic advisor. Permission is given only before the original time of the practice.

During the semester there will be three tests offered in the 4th, 9th and 13th weeks in Medical Genetics Practical together (at the same time) with tests in Medical Genetics Lecture. The questions include single and multiple choice and short essay questions, e.g. figures, karyograms, pedigrees, calculations, definitions (glossary), etc. Glossary will be published, and terms of material of first test or second test can be questioned in the next tests as well.

Based on the average of the three practical tests a final mark and bonuses will be offered according to the next table:

Average of the 3 test (in %)	Grade	Bonus (%)
0 - 39	1 (fail)	0
40 – 49	2 (pass)	1
50 – 59	3 (satisfactory)	2
60 – 74	4 (good)	3
75 – 100	5 (excellent)	4

Bonuses based on mark of Medical Genetics Practical are added as percentages to the average of the three tests for grade offering in Medical Genetics Lecture.

In case of grade 1 (fail) the subject is not signed.

The successful completion of Medical Genetics Practical is the prerequisite of the signature in Medical Genetics Lecture.

Rules concerning repeaters

Students have to register and attend the practices 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>

Department of Physiology

Subject: **MEDICAL PHYSIOLOGY II. LECTURE**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Lecture: **68**

Seminar: **28**

1st week:

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

2nd week:

Lecture: Tubular transport: proximal tubule
Tubular transport: loop of Henle and distal nephron
Urinary concentration and dilution, clinical correlates
Osmoregulation, water balance
Defense of body fluid volume, sodium balance

3rd week:

Lecture: Acid-base balance
Acid-base disturbances, Calcium homeostasis I.
Calcium homeostasis II.; physiology of bone
Potassium balance, mycturition
Food intake and its regulation

4th week:

Lecture: Energy balance
Regulation of body temperature
Neural regulation of gastrointestinal functions
Endocrine and paracrine regulation of gastrointestinal functions
Motor functions of the gastrointestinal tract

5th week:

Lecture: Motor functions of the gastrointestinal tract II
Secretion of saliva and gastric juice
Exocrine functions of pancreas, liver and intestines
Absorption of nutrients
The liver

Self Control Test

6th week:

Lecture: General principles of endocrinology
Mechanisms of hormone action
Pituitary gland
Growth hormone

7th week:

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

8th week:

Lecture: The actions of catecholamine
General principles in the regulation of gonadal functions
Male gonadal functions
Female gonadal functions
Pregnancy, lactation

9th week:

Lecture: The hormones of pancreatic islets I
The hormones of pancreatic islets II
Regulation of the function of pancreatic islets
Endocrine regulation of metabolism

10th week:

Lecture: The hormones of pancreatic islets I
The hormones of pancreatic islets II
Regulation of the function of pancreatic islets
Endocrine regulation of metabolism

11th week:

Lecture: Physiology of sensory functions and skin sensation.
Pain and temperature sensation.
Physical basis of sensory functions I. (wave actions).
Mechanisms of hearing and vestibular sensation.

Self Control Test**12th week:**

Lecture: Physical basis of sensory functions I. (wave actions).

Mechanisms of hearing and vestibular sensation.

Physical basis of sensory functions II. (optics).

Retinal mechanisms of vision.

Eye-movements, optical reflexes, basic mechanisms of color vision.

13th week:

Lecture: Role of brainstem in motor coordination.

Role of cerebellum, basal ganglia and cerebral

cortex in motor coordination I.

Role of cerebellum, basal ganglia and cerebral cortex in motor coordination II.

Vegetative system: peripheral, spinal and brainstem vegetative mechanisms.

Hypothalamic functions.

14th week:

Lecture: Monoaminergic system, motivation, reward, addiction, regulation of behaviour.

Sleep, wakefulness, attention, mechanisms of circadian rhythm.

Learning, memory, speech.

Requirements**1. Signature of the semester**

Attendance of lectures and seminars is compulsory. The signature of the semester may be refused in case of more than three absences from the seminars. In cases of more than four lecture absences these special advantages are withdrawn (see below). Completion of a missed seminar with a different group is not possible.

Each student must attend on seminars with the group specified by the Education Office.

For continuous updates on all education-related matters, please check the elearning.med.unideb.hu 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 2024/2025 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 during the 2024/2025 academic year, 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 2023/2024 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: **42**

1st week:

Practical: Preparation for laboratory practices

2nd week:

Practical: EFFECTS OF PHYSICAL EXERCISE ON THE CARDIORESPIRATORIC PARAMETERS. A STUDY OF RESTITUTION

3rd week:

Practical: EXAMINATION OF THE BLOOD

4th week:

Practical: EFFECTS OF NEUROTRANSMITTERS AND HORMONES ON THE UTERINE SMOOTH MUSCLE FUNCTION

5th week:

Practical: Remedial Lab

6th week:

Practical: SIMULATION OF THE RENAL TRANSPORT MECHANISMS

7th week:

Practical: COMPUTER SIMULATION OF THE GLUCOSE TOLERANCE TEST

8th week:

Practical: SIMULATION OF THE ACTION POTENTIAL IN THE SQUID AXON

9th week:

Practical: Remedial Lab

10th week: Practical: SIMULATION OF THE IONIC CURRENTS IN THE SQUID AXON	SOMATOSENSORY AND MOTORIC SYSTEMS
11th week: Practical: EXAMINATION OF THE CRANIAL NERVES	13th week: Practical: Remedial Lab
12th week: Practical: EXAMINATION OF THE	14th week: Practical: Lab Exam

Requirements

1. Signature of the semester

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

All missed practices must be made up; however this does not reduce the number of absences!

Completion of all topic sheets in the Exercise Book, each verified by the signature of the teacher, is also a precondition of the signature of the semester.

Each student must attend on laboratory practices with the group specified by the Education Office. For continuous updates on all education-related matters, please check the elearning.med.unideb.hu 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.

CHAPTER 16

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

Seminar: Orientation

3rd week:

Lecture: Introduction to Medical Sociology

Seminar: Orientation

4th week:

Lecture: Medicalization I.

Seminar: Orientation

5th week:

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

The concept of risk factor

6th week:

Seminar: Presentations I.

7th week:

Seminar: Presentations II.

8th week:

Seminar: Exam

12th week:

Self Control Test

13th week:

Seminar: Self Control Test

Requirements

Slides from lectures and seminars, as well as the required literature.

Exam: End of Semester Examination (ESE)

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 - ismételés

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.	panaszok
7th week: Practical: 4. fejezet: Összefoglalás	11th week: Practical: 6. fejezet: Gyógyszerelés
8th week: Practical: Mid-term test Self Control Test	12th week: Practical: 6. fejezet: Gyógyszerelés
9th week: Practical: 5. fejezet: Gyakori tünetek, kérdések, panaszok.	13th week: Practical: 7. fejezet: Összefoglalás
10th week: Practical: 5. fejezet: Gyakori tünetek, kérdések,	14th week: Practical: End-term oral test Self Control 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. In case of more than 2 absences, the signature may be refused. Making up a missed lesson with another group is not allowed.

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

During the semester students must sit for two tests. 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 mid-term test. If a student fails or misses any word quizzes he / she cannot take the mid-term and the end-term tests. A word quiz can be postponed by a week and students can take it only with their own teacher.

If students fail the end-term oral test, they fail the whole course.

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)

Coursebook: Lampé, Judit Ph.D.: Jobbulást kívánok I.!

Assignments, audio files, topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

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. Tissue specific immune responses.

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. Immune privilege.

12th week:

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

Practical: Congenital immunodeficiencies. Transplantation.

13th week:

Practical: The utility of flow cytometry in diagnosis, in clinical- and basic medical research. Agglutination, qualitative determination of rheumatoid factor.

Self Control Test

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 13.).

The first SCT contains the material of the lectures of weeks 1-3 as well as the material of seminars on weeks 1-4. To ensure a solid basic knowledge of immunology, students must score 70 points or above 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 70 points or above and the score of the second and third SCT one by one is 50 points or above, 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 or equal to 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.

Reading materials:

Fred S. Rosen: Case studies in immunology.

4th Edition 2004 ISBN: 0-8153-4102-4.

Peter Parham: The Immune System.

5th Edition. Garland Science, 2021. ISBN: 0-3935-3335-2.

Abbas, A.K., Lichtman, A.H., Pillai, S: Basic Immunology.

7th Edition, Saunders, 2023. ISBN: 0-4431-0519-7.

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.

Acutedeepveinthrombosis, pulmonary embolism.

Practical: *Physical examination of the blood vessels.*

10th week:

Lecture: 1. Anamnesis and physical examination of the abdomen Rectal digital examination.

2. Abdominal pain, vomiting, constipation and diarrhoea.

Practical: *Physical examination of the abdomen*

11th week:

Lecture: 1. Differential diagnosis of spleen and liver enlargement. Gastrointestinal bleeding

2. The characteristics of ascites and jaundice.

Practical: *Physical examination of the abdomen.*

12th week:

Lecture: 1. Hematologicanamnesis, diagnostics.

2. The examination of endocrine system.

Practical: *Physical examination of the lymph nodes and the endocrine system.*

13th week:

Lecture: 1. The locomotor system. Examination of the bones, joints and muscles.

2. Renal function, urinary system.

Practical: *Examination of the locomotor system.*

14th week:

Lecture: 1. Diagnosis of metabolic diseases.

2. Examination of the nervous system.

Practical: *Examination of the nervous system.*

Requirements

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

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

Examination:

Written test: 20 questions from the pool of the minimum questions (pass limit is 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. Disorders of iron metabolism. Laboratory diagnostics of microcytic anemias.

6th week:

Lecture:
11. Laboratory diagnostics of

hemoglobinopathies

12. Laboratory diagnostics of macrocytic and hemolytic anemias

7th week:

Lecture:

13. Laboratory diagnostics of acute and chronic leukemias and lymphomas I.

14. Laboratory diagnostics of acute and chronic leukemias and lymphomas II.

Practical: Molecular genetic methods in clinical biochemistry. Laboratory safety.

8th week:

Lecture: 15. Laboratory diagnostics of acute and chronic leukemias and lymphomas III.

16. Laboratory diagnostics of acute and chronic leukemias and lymphomas IV.

Practical: Hematology I. Blood collection, anticoagulants. Preparation of a blood smear, staining.

9th week:

Lecture:

17. Laboratory diagnostics of quantitative platelet disorders.

18. Laboratory diagnostics of central nervous system diseases. Laboratory investigation of the cerebrospinal fluid.

Practical: Hematology II. Evaluation of a normal smear. Red blood cell morphology. Determination of reticulocyte count.

Self Control Test

10th week:

Lecture:

19. ABO and Rh Blood Groups

20. Other blood group system (Kell, Kidd, Duffy, MN, Ss, I)

Practical: Hematology III. Determination of hemoglobin and hematocrit. Hematology analyzers.

11th week:

Lecture:

21. Compatibility testing. Transfusion reactions

22. Preparation of blood products

Practical: Hematology IV. Evaluation of peripheral smears in malignant hematological diseases. Protein electrophoresis, myeloma multiplex.

12th week:

Lecture:

23. Inherited metabolic diseases and their laboratory diagnostics I.

24. Inherited metabolic diseases and their laboratory diagnostics II.

Practical: Determination of ABO and Rh blood groups

13th week:

Lecture:

25. Inherited metabolic diseases and their laboratory diagnostics III.

26. Clinical biochemistry at the extremes of ages

Practical: Detection of irregular antibodies, antibody screening, compatibility testing.

14th week:

Lecture:

27. Therapeutic drug monitoring

28. Clinical biochemistry and laboratory diagnostics of porphyrias, Vitamins

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.

Requirements for examinations: The written examination is based on the whole lecture and practical material (Practicals in Laboratory Medicine, eds.: János Kappelmayer, 2023) as well as the textbook of William J. Marshall: Clinical Chemistry (9th Edition, 2021.).

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. Bacterial pathogenesis

Practical: Culture techniques. Methods used in the identification of bacteria

4th week:

Lecture: 7. Antibacterial immunity

8. Active and passive immunization.

Hypersensitivity

Practical: Sterilization and disinfection. Determining the sensitivity of bacteria to antibiotics

5th week:

Lecture: 9. Staphylococci

10. Streptococci

Practical: Serological reactions

6th week:

Lecture: 11. Mycobacterium genus

12. Causative agents of respiratory tract infections

Practical: Visiting the Department

7th week:

Lecture: 13. Enterobacterales I

14. Enterobacterales II

Practical: 1st WRITTEN EXAMINATION (General Bacteriology)

Self Control Test

8th week:

Lecture: 15. Vibrio, Campylobacter, Helicobacter

16. Pseudomonas and other non-fermentative Gram negative rods

Practical: Wound, skin and soft tissue infections caused by bacteria

9th week:

Lecture: 17. Neisseria, Legionella, Brucella

18. Clostridia

Practical: Bacterial respiratory tract diseases

10th week:

Lecture: 19. Non-Clostridial anaerobic infections

20. Treponema

Practical: Agents of bacterial intestinal infections and food poisoning

11th week:

Lecture: 21. Borrelia, Leptospira

22. Chlamydia and Mycoplasma

Practical: Central nervous system diseases caused by bacteria

12th week:

Lecture: 23. Rickettsia

24. Antibiotic stewardship

Practical: 2nd WRITTEN EXAMINATION

(Bacteriology with the exception of Spirochaetaceae, Chlamydiae, Rickettsiae and Mycoplasmas)

13th week:

Lecture: 25. Mycology I

26. Mycology II

Practical: Bacterial sexually transmitted diseases (STD)

14th week:

Lecture: 27. The human microbiome

28. Nosocomial infections

Practical: Urinary tract infections

Requirements

The students are required to attend the practices. The students have to sign the attendance register within ten minutes after the start of the practice. On request, the students have to provide personal identification to the lab teacher or to the educational technicians. The name of students leaving the laboratory without the permission of the lab teacher will be deleted from the attendance register. The students have to attend the practices with their own study groups. In exceptional cases, the student may make up a missed practice with another group in the same week, but only after previous consultation with the lab teachers. The Department will refuse the signature if a student is absent from more than two practices in a semester.

Two mid-semester tests are written during the 1st semester. The dates of tests are organized according to students' official time schedule and the availabilities of the lecture halls. Once the dates are announced, there is no way to modify them. If some of the students have conflicts with certain date and time points during the semester, they should notify the Department on the 1st week of the semester.

The students can survey their corrected tests only during the practices specified for this purpose by the Head of the Department (usually 2 weeks after the test). Thereafter, the students have no further chance to look at their tests. Complaints regarding the test results can be done only in writing, specifying the questions and the justification. The students can send their written complaints to the Academic advisor within 3 days after seeing their corrected tests. Based on the cumulative results of the tests, students are offered an End-Semester-Examination (ESE) grade. Those who are not satisfied with the offered grade or are below the passing level, should sit for an end-semester-examination hold in the examination period (the first oral exam of a student is an A –chance exam). 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

Number of teaching hours:

Lecture: **14**

Seminar: **5**

Practical: **23**

1st week:

Lecture: Surgical deontology. Terminology for surgery. Surgical armamentarium.

Seminar: Cutting, hemostatic, grasping-retracting, special and suturing instruments. Clips and staplers. Order of the instrumental trays and tables.

2nd week:

Lecture: Surgical sutures. Surgical suture materials.

Seminar: Knotting techniques (manual and instrumental) on different knotting pads. Conventional hand suturing techniques (interrupted, continuous sutures on gauze model). Suture removal.

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 bioprepate model.

5th week:

Lecture: Tracheostomy, conicotomy.

Practical: Conicotomy on phantom model. Scrubbing. Practising of skin incision and wound

closure with different suturing techniques on bioprepate model.

6th week:

Lecture: Injection techniques. Punction of vessels. 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. Practising of skin incision and wound closure with different suturing techniques on bioprepate model.

8th week:

Lecture: Basic principles of intestinal surgery.

Practical: Scrubbing. End-to-end one-layer intestinal anastomosis on small bowel bioprepate model.

9th week:

Lecture: Basic principles of the parenchymal organs« surgery.

Practical: Scrubbing. Parenchymal stitches on spleen bioprepate model. Practising wound closure with different suturing techniques on bioprepate model.

10th week:

Lecture: Basic principles of vascular surgery.

Practical: Scrubbing. Vascular suturing techniques on aorta bioprepate 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. Practising blood sampling, injection techniques and vein preparation,

cannulation on phantom models, preparation of infusion set.

Self Control Test

13th week:

Lecture: Insight into the basics of microsurgery, laparoscopic surgery and advanced technology. Basics of microsurgery.

Practical: Scrubbing. Practising 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.

Requirements: 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: <http://surgres.unideb.hu>

Exam: 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.

Compulsory Readings:

Lecture slides in pdf and supplementary materials (e-Learning folder of the course)

Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine, 4th (enlarged) edition, University of Debrecen, 2019

Recommended Readings: McLatchie G.R., Leaper D.J.: Oxford Handbook of Operative Surgery, Oxford University Press, 1996.

Myint F.: Kirk's Basic Surgical Techniques, 7th edition, Elsevier Health Sciences, 2018.

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: Histopractice:

-Acute myocardial infarction (coagulation necrosis)

-Gangrene in the lower leg

-Fat necrosis in the pancreas

-Caseous necrosis (lymphadenitis tuberculosa)

3rd week:

Lecture: -Abnormal glycogen and protein accumulation. Storage diseases. Amyloidosis.

-Oedema. Hyperemia. Congestio. Shock.

Practical: Histopractice:

-Fatty change in the liver

-Fatty change in the liver (lipid staining)

-Atheromatous plaque

-Cholesterolosis in the gallbladder

-Atrophia brunea cordis

4th week:

Lecture: -Haemorrhage. Thrombosis. Embolism. DIC.

-Morphologic patterns of the acute inflammatory response.

Practical: Histopractice:

-Simple endometrial hyperplasia

-Atrophia endometrii et myometrii

-Nodular hyperplasia in the prostate

-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: Histopractice:

-Amyloidosis (Kongó staining)

-Arterial thrombus

-Necrosis of the small bowel due to incarceration

-Hemorrhagic infarct in the lung

6th week:

Lecture: -Dysplasia, preneoplastic conditions.

-Characteristics of benign and malignant tumors. Differentiation and anaplasia.

Practical: Histopractice:

-Pulmonary edema

-Nutmeg liver

-Appendicitis acuta suppurativa

-Purulent meningitis

7th week:

Lecture: -Tumor dignity. Proliferation. Grading and staging.

-Prognostic and predictive tumor markers.

Characteristics of tumor cell populations.

Practical: Histopractice:

-Bronchopneumonia with lung abscess

-Septic abscesses in the myocardium due to systemic fungal infection (PAS staining)

-Chronic non-specific salpingitis

-Foreign body granuloma

Self Control Test

8th week:

Lecture: -Clonality, heterogeneity and progression.

-Mechanisms of local and distant tumor spread. Angiogenesis.

Practical: Histopractice:

-Keratoachantoma

-Condyloma

-Bowen's disease

-Invasive cervical cancer

9th week:

Lecture: -The biology of tumor growth. Heredity in cancer.

-Opportunistic infections. Systemic effects of neoplasia. (cachexia, immunosuppression, paraneoplastic syndromes)

Practical: Histopractice:

-Signet ring cell carcinoma in the stomach (PAS)

-Krukenberg type ovarian metastasis (PAS)

-Liver metastasis

-Teratoma adultum (cysticum) ovarii

-Leiomyoma

10th week:

Lecture: -Mono- and polygenic disorders. -

Immunodeficiencies. Tuberculosis.
-Humoral and cellular immunopathological mechanisms.

Practical: Histopractice:

- Allergic vasculitis
- Polyarteritis nodosa
- End stage lesion in Burger's disease
- Gouty tophus

11th week:

Lecture: -Immunodeficiencies. Tuberculosis.
-Systemic autoimmune diseases (SLE, Sjögren, RA, SS). Autoimmunity.

Practical: Histopractice:

- Polymiositis
- SLE lymphadenopathy
- Chronic synovitis (Rheumatoid arthritis)
- Rheumatoid nodule (Rheumatoid arthritis)

12th week:

Lecture: -Vasculitis.

- The pathology of transplantation.

Practical: Histopractice:

- Gaucher's disease
- Toxoplasma lymphadenitis
- Chronic lymphocytic leukemia (CLL)
- Follicular lymphoma (FL)

13th week:

Lecture: -Pathology of the lymphatic system.
-Malignant lymphomas, lymphoid leukemias.

Practical: Histopractice:

- Diffuse large B-cell lymphoma (DLBCL)
- Gastric lymphoma (MALT type)
- Hodgkin's disease (HL)
- 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: continuously available from the e-learning site

Downloadable material: Department of Pathology

Validation of Semester:

-Histopathology and macro pathology (autopsy) classes are compulsory.

-Participation will be verified by the lecturer right before the class

-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 (Oral and Organ Pathology): **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 andsite.

- 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 succesful 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 choosen from the topic list.

ESE: Two randomly choosen 1st semester topics to be presented.

FE: Three randomly choosen 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 repeted 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).

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.	cancer diagnosis and to search for alterations in the cancer genome
6th week: Lecture: Role of viruses in the malignant transformation. II. Carcinogenic RNA viruses.	10th week: Lecture: Cancer stem cells
7th week: Lecture: Chemical carcinogenesis. Carcinogenic chemicals in the environment	11th week: Lecture: Epidemiology of malignant diseases
8th week: Lecture: Tumor immunology in clinical practice	12th week: Lecture: Cancer screening. Cancer registries
9th week: Lecture: Molecular biological techniques in	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 programmes 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-psychosocial model.

Seminar: The role of psychology in medical practice.

2nd week:

Lecture: Seeking professional help (first encounter, medical history, diagnostic procedure). Doctor-patient interaction, compliance, the "difficult patient".

Seminar: Special problems of medical students and doctors.

3rd week:

Lecture: Health beliefs, models of health, health behaviours, illness cognitions. Models of illness. Health risk behaviours.

Seminar: Phases of doctor-patient consultation.

4th week:

Lecture: Adverse childhood experiences and adult health (ACE).

Seminar: Breaking bad news.

5th week:

Lecture: Pain - psychological and sociocultural factors.

Seminar: Stress management, time management, relaxation.

6th week:

Lecture: Chronic diseases, psychological preparation for surgery, intensive care unit, hospitalization.

7th week:

Lecture: Stress and coping (vulnerability, protective factors). Basics of psychology.

8th week:

Lecture: Crisis, presuicidal syndrome, burnout.

9th week:

Lecture: 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: Mid-term test

Self Control Test

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 is late it is considered as an absence. Students can miss only 10 percent of the classes that is maximum *2 occasions*. In case of more than 2 absences, the signature may be refused. Making up a missed lesson with another group is not allowed.

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

Students have to take a mid-term test during the semester and a comprehensive exam in the exam period. The successful completion of the mid-term test is the pre-requisite for obtaining the

signature at the end of the semester. A further minimum requirement is the knowledge of 200 words per semester divided into 9 word quizzes.

There are four word quizzes before and five after the midterm test. If a student fails or misses any word quizzes he / she cannot take the midterm test and cannot obtain the signature at the end of the semester. A word quiz can be postponed by a week and students can take it only with their own teacher.

The comprehensive exam consists of a role-play from a list of situations covered in the coursebook. The final grade is the result of the comprehensive exam taken in the exam period.

Coursebook: Lampé, Judit Ph.D.: Jobbulást kívánok II.!

Assignments, audio files, oral exam topics and vocabulary minimum lists can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

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: Physical examination, 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. Diagnostic steps and therapeutic guidelines in systemic autoimmune diseases.

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

Practical: SSc and Raynaud's syndrome. MCTD.

4th week:

Lecture: 10. Idiopathic inflammatory myopathies.

11. Allergic diseases and coeliac disease.

12. Systemic vasculitides.

Practical: Polymyositis and dermatomyositis

5th week:

Lecture: 13. Sjögren's syndrome, secondary vasculitides.

14. Early arthritis, rheumatoid arthritis, special forms (Felty, Caplan syndrome).

15. Immunomodulation in the treatment of autoimmune diseases.

Practical: Sjögren's syndrome and vasculitis.

6th week:

Lecture: 16. General characteristics of Spondyloarthritides. Ankylosing spondylitis, psoriatic arthritis and other groups.

17. Juvenile idiopathic arthritis, adult onset Still's syndrome, polymyalgia rheumatica.

18. Infection and arthritides

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

7th week:

Lecture: 19. Crystal deposition diseases.

20. Osteoarthritis, spondylosis. Low back pain.

21. Osteoporosis. Metabolic bone diseases.

Practical: Presentation of a case with SpA, ankylosing spondylitis and psoriatic arthritis.

8th week:

Lecture: 22. Soft tissue rheumatism, compression syndromes.

23. Shoulder regional syndrome, femur head necrosis.

24. Management of rheumatic diseases.

Practical: Presentation of a case with osteoarthritis, differential diagnosis of low back pain

9th week:

Lecture: 25. Diagnostic procedures in rheumatic diseases (laboratory and imaging).

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, $\geq 85\%$), 2nd part is practical exam; 3rd part is oral exam (two topics).

Subject: **INTERNAL MEDICINE SUMMER PRACTICE**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Practical: **90**

Department of Laboratory Medicine

Subject: **CLINICAL BIOCHEMISTRY II.**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **42**

Practical: **28**

1st week:

Lecture: 1. Coagulopathies, (general introduction), haemophilias.

2. von Willebrand disease

3. Platelet function disorders.

Practical: Laboratory informatics

2nd week:

Lecture: 4. Inherited thrombophilias.

5. Acquired thrombophilias

6. Prethrombotic state, thromboembolias, consumption coagulopathies

Practical: Laboratory diagnostics of coagulopathias

3rd week:

Lecture: 7. Laboratory diagnosis of autoimmune diseases

8. Disorders of sodium and water metabolism I.

9. Disorders of sodium and water metabolism II.

Practical: Laboratory diagnostics of Thrombophilia. Laboratory monitoring of anticoagulant therapy

4th week:

Lecture:

- 10. Disorders of potassium metabolism
- 11. Disturbances of the acid-base balance
- 12. Laboratory diagnostics of renal disorders

Practical: Laboratory diagnostics of platelet function disorders. Laboratory monitoring of antiplatelet therapy.

5th week:

Lecture:

- 13. Pathobiochemistry of the renal function I.
- 14. Pathobiochemistry of the renal function II.
- 15. Hypoglycaemias

Practical: Laboratory diagnostics of renal disorders.

6th week:

Lecture:

- 16. Pathogenesis and pathomechanism of diabetes mellitus
- 17. Pathobiochemistry and clinical biochemistry of the acute complications of diabetes mellitus
- 18. Laboratory diagnostics of diabetes mellitus

Practical: Examination of urine sediment

Self Control Test

7th week:

Lecture:

- 19. Disorders of lipid metabolism
- 20. Laboratory diagnostics of hyperlipidemia
- 21. Risk factors of atherosclerosis

Practical: Basic laboratory methods in metabolic diseases

8th week:

Lecture:

- 22. Laboratory diagnostics of acute coronary syndrome I.
- 23. Laboratory diagnostics of acute coronary syndrome II.
- 24. Laboratory diagnostics of hyperuricaemia and gout

Practical: Case presentation

9th week:

Lecture:

- 25. Pathobiochemistry of liver disorders
- 26. Laboratory diagnostics of liver disorders.
- Pathobiochemistry of acute hepatic disorders
- 27. Pathobiochemistry and laboratory diagnostics of cholestasis and cirrhosis

Practical: Laboratory investigation of cerebrospinal fluid and other body fluids.

10th week:

Lecture:

- 28. Pathobiochemistry and laboratory diagnosis of autoimmune liver diseases
- 29. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract I.
- 30. Pathobiochemistry and laboratory diagnostics of the gastrointestinal tract II.

Practical: Separation techniques.

Self Control Test

11th week:

Lecture: 31. Laboratory diagnostics of acute pancreatitis.

32. Clinical biochemistry of hypothalamus and hypophysis.

33. Pathobiochemistry of thyroid disorders.

Practical: Laboratory diagnostics of myocardial infarction, POCT

12th week:

Lecture:

34. Laboratory diagnostics of thyroid functions.

35. Clinical chemistry of parathyroid disorders. Disorders of calcium, phosphate and magnesium metabolism

36. Pathobiochemistry and laboratory diagnostics of adrenal cortex disorders

Practical: Laboratory evaluation of autoimmune diseases.

13th week:

Lecture:

37. Pathobiochemistry and laboratory diagnostics of adrenal medulla disorders

38. Clinical biochemistry of gonadal functions

39. Laboratory diagnostics of bone disorders

Practical: Laboratory evaluation of liver and pancreas function

Self Control Test**14th week:****Lecture:**

40. Laboratory diagnostics of muscle disorders

41. Demonstration of practical pictures

42. Summary of laboratory methods

Practical: Laboratory evaluation of liver and pancreas function - case presentation.**Requirements**

Participation 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.

Requirements for examinations: The examination (written and oral) is based on the whole lecture and practical material (Practicals in Laboratory Medicine, eds.: János Kappelmayer, 2023) as well as the textbook of William J. Marshall: Clinical Chemistry (9th Edition, 2021.).

Department of Medical MicrobiologySubject: **MEDICAL MICROBIOLOGY II.**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **20**Practical: **28****1st week:****Lecture:** 1. Protozoa I

2. Protozoa II

Practical: Anaerobic infections**2nd week:****Lecture:** 3. Flatworms

4. Roundworms

Practical: Infections of normally sterile body

sites (sepsis, bacteriemia, endocarditis, osteomyelitis)

3rd week:**Lecture:** 5. The structure and classification of viruses

6. The replication of viruses

Practical: Antibacterial therapy in practice

4th week:

Lecture: 7. The pathogenesis of viral diseases.
Host defenses in viral infections
8. Prevention of viral diseases by immunization and vaccination
Practical: Diagnosis of mycotic infections

5th week:

Lecture: 9. Antiviral chemotherapy
10. Parvoviridae, Adenoviridae, Poxviridae
Practical: 3rd WRITTEN EXAMINATION (Clinical Bacteriology and Mycology)

6th week:

Lecture: 11. Herpesviruses I
12. Herpesviruses II
Practical: Protozoal diseases

7th week:

Lecture: 13. Picornaviridae, Caliciviridae, Reoviridae
14. Orthomyxoviruses, Coronaviruses
Practical: Diagnosis of helminth infections

8th week:

Lecture: 15. Paramyxoviruses, RSV, Rubella virus
16. Hepatitis viruses
Practical: Laboratory diagnosis of viral infections

9th week:

Lecture: 17. Rabies. Slow virus infections and prions.
18. Arboviruses. Rotaviruses
Practical: Respiratory tract infections caused by viruses

10th week:

Lecture: 19. HIV
20. Human tumor viruses
Practical: Agents of viral skin rash. Congenital virus infections

11th week:

Lecture: make-up lectures
Practical: Agents of viral gastroenteritis. Hepatitis viruses

12th week:

Practical: 4th WRITTEN EXAMINATION (Parasitology, Virology)

13th week:

Practical: Emerging viral infections

14th week:

Practical: Review of procedures of microbiological sample collection

Requirements

The Department will refuse the signature if a student is absent from more than two practices in a semester. The students have to attend the practices with their own study groups. In exceptional cases, the student may make up a missed practice with another group in the same week, but only after previous consultation with the lab teachers. A student is not allowed to enter the Microbiology Practice Facility in case s/he is late for more than 10 minutes after the official start of the practice. The students have to sign the attendance register. On request, the students have to provide personal identification to the lab teacher or the educational technicians. The name of students who leave the laboratory without the permission of the lab teacher will be deleted from the attendance register.

During the semester, two tests will be written. Details of the tests will be announced at the beginning of the semester. Students whose cumulative test result (of the 2 tests written in the actual semester) scores at least 80% will get exemption from the written test at the final exam.

The final exam starts with a written test (consisting of minimal questions). The students answering correctly at least 8 out of the 10 questions are allowed to continue with the oral examination, which consists of one practical and three theoretical questions.

Department of Pathology

Subject: **PATHOLOGY II.**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **42**

Practical: **45**

1st week:

Lecture: -Arteriosclerosis. Hypertension and hypertensive vascular disease.

-Acute myocardial infarction.

-Myocarditis. Cardiomyopathies.

Practical: Histopractice:

-IRDS

-Bronchial asthma

-Boeck's sarcoidosis

-Bronchial squamous carcinoma

2nd week:

Lecture: -Diseases of the endocardium and the cardiac valves.

-Congenital heart diseases. Venous and lymphatic vessel disorders.

-ARDS. Pneumonia. Pulmonary embolisms.

Practical: Histopractice:

-Intrabronchial carcinoid tumor

-Small cell carcinoma

-Lipoma

-Embryonal rhabdomyosarcoma

3rd week:

Lecture: -Chronic obstructive pulmonary diseases.

-Interstitial lung disease.

-Tumors of the lung and pleura

Practical: Histopractice:

-Acute osteomyelitis

-Chondroma

-Osteosarcoma

-Barrett's esophagus (HE / PAS-AB)

4th week:

Lecture: -Soft tissue tumors.

-Non-neoplastic lesions of the bones. Pathology of the joints.

-Bone tumors.

Practical: Histopractice:

-Ulcus pepticum ventriculi

-Crohn's disease

-Ulcerative colitis

-Liver cirrhosis with HCC

5th week:

Lecture: -Diabetes mellitus

-Benign, preneoplastic and neoplastic lesions in the oral cavity. Diseases of hte salivary glands.

-Esophageal diseases. Gastritis. Gastroduodenal ulcers. Gastric cancer.

Practical: Histopractice:

-High grade adenoma in the colon

-Malignant transformation of adenoma

-Mucinous adenocarcinoma

-Nephropathia diabetica

6th week:

Lecture: -Maldevelopment of intestine.

Megacolon. Circulatory intestinal lesions.

-Enteritis, enterocolitis. Malabsorption.

Inflammatory bowel diseases.

-Colorectal cancer.

Practical: Histopractice:

-Crescentic glomerulonephritis

-Acute pyelonephritis

-Clear cell kidney carcinoma

-Invasive urothelial carcinoma

7th week:

Lecture: -Intra- and extrahepatic biliary tract diseases.

-Viral hepatitis. Drug induced liver diseases.

Acute and chronic liver failure.

-Liver cirrhosis.

Practical: Histopractice:

-Prostatic adenocarcinoma

-Pure seminoma

-Embryonal carcinoma with choriocarcinoma

-Fibroadenoma

8th week:

Lecture: -Tumors and circulatory disorders of the liver. Inherited metabolic liver diseases.

- The pathology of the pancreas and appendix.
- Glomerular diseases.

Practical: Histopractice:

- Invasive breast carcinoma, NST with DCIS
- Invasive lobular carcinoma
- Adenocarcinoma of the endometrium
- Perineal endometriosis

9th week:

Lecture: -Diseases affecting tubuli and interstitium. Kidney stones. Hydronephrosis.

- Cystic diseases and tumors of the kidney.
- Pathology of the urinary tract.

Practical: Histopractice:

- Serous cystadenocarcinoma of the ovary
- Tubal pregnancy
- Skin basal cell carcinoma
- Compound naevus

10th week:

Lecture: -Hyperplasia and carcinoma of the prostate.

- Testicular tumors.
- Non-neoplastic and preneoplastic conditions of the breast.

Practical: Histopractice:

- Skin melanoma
- Eye melanoma
- Hashimoto's thyroiditis
- Graves disease

11th week:

Lecture: -Breast cancer.

- Uterine tumors.
- Ovarian tumors.

Practical: Histopractice:

- Thyroid papillary carcinoma
- Thyroid follicular carcinoma
- Retinoblastoma
- Alzheimer's disease (HE/ tau)

12th week:

Lecture: -Diseases of pregnancy. Perinatal pathology.

- Melanocytic and epithelial skin tumors.
- Pathology of the thyroid and parathyroid.

Practical: Histopractice:

- Parkinson's disease (HE/ alpha-synuclein)
- Schwannoma
- Meningioma
- Glioblastoma

13th week:

Lecture: -The pathology of the adrenals.

- Ophthalmic pathology. Cerebrovascular diseases.
- Stroke.

Practical: Repeating practice.

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: Department of Pathology

Validation of Semester:

- Histopathology and macro pathology (autopsy) classes are compulsory.
- Participation will be verified by the lecturer right before the class
- 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 (Organ and Oral Pathology): **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 andsite.
- 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 succesful 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 choosen from the topic list.

ESE: Two randomly choosen 1st semester topics to be presented.

FE: Three randomly choosen 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 repeted 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).

Division of Clinical Physiology

Subject: **CLINICAL PHYSIOLOGY**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **14**

Seminar: **28**

1st week:

Lecture: Introduction, cellular and molecular factors of pathologic cardiac excitability.

Seminar: The basics of ECG.

2nd week:

Lecture: Pathologic contractile function of the heart (contractile proteins, intracellular Ca^{2+} -homeostasis and cardiac pumping).

Seminar: ECG diagnosis of arrhythmias I.

3rd week:

Lecture: Myocardial ischemia, myocardial infarction and new ischemic syndromes (hibernation, preconditioning, stunning).

Seminar: ECG diagnosis of arrhythmias II.

4th week:

Lecture: Cardiac hypertrophy and failure.

Seminar: Differential diagnostics of arrhythmias, evaluation of ECG recordings.

5th week:

Lecture: Heart failure (molecular pathophysiology).

Seminar: Conduction disorders, ECG signs of volume and pressure overload.

6th week:

Lecture: Endothelium, smooth muscle, vessels.

Seminar: Angina pectoris, myocardial infarction.

7th week:

Lecture: Hypertension.

Seminar: Exercise stress test ECG, Holter ECG.

8th week:

Lecture: New translational perspectives in cardiovascular medicine.

Seminar: Electronic pacemakers, mechanisms of

arrhythmias.

9th week:

Lecture: Stem cells in cardiovascular medicine.

Seminar: ECG signs of electrolyte disorders, differential diagnostics, practicing.

Self Control Test (Bonus points for the exam can be collected during the written mid-semester clinical physiology test during the 9th week.)

10th week:

Lecture: Cellular and molecular elements of the respiratory system with clinical significance.

Seminar: Evaluation of ECG recordings (oral ECG exam).

11th week:

Lecture: Clinical physiology of the respiratory system.

Seminar: Echocardiography I., standard views, normal values.

12th week:

Lecture: Clinical physiology of nutrition and metabolism.

Seminar: Echocardiography II., consequences of myocardial infarction, stress echocardiography, TEE.

13th week:

Lecture: Clinical physiology of the nervous system I.

Seminar: Respiratory function tests.

14th week:

Lecture: Clinical physiology of the nervous system II.

Seminar: Cardiac catheterisation.

Self Control Test (Result of the 9th and 14th weeks tests will form the basis for a

recommended final mark.)

Requirements

Students are expected to attend lectures and obliged to attend seminars. The Department may refuse the acknowledgement of the semester from this subject if a student is absent for more than two seminars. Seminar attendance is recorded electronically during the first 5 minutes of the seminars, thereby late arrivals by 6 or more minutes result in seminar absences. A successful oral ECG test (during the 10th week of the second semester) is also a prerequisite for Clinical Physiology.

Third year students are invited to participate in two written tests ("Assessment of the work" (AW) during the 9th and 14th weeks organized by the Division of Clinical Physiology. Single choice test questions (single right or single false answers should be chosen from five possibilities) will be asked to assess students' proficiency. Bonus points can be collected for the 9th week written exam to be included into the result of the pre-final (14th week exam) and final tests (during examination period). 20 questions covering the materials of lectures and seminars between 1-9 weeks will be asked on the 9th week written self control.

Students reaching higher than passing limits will be offered by a recommended grade following the 14th week self control. This pre-final exam will contain 50 questions where the entire curriculum of Clinical Physiology will be included. The Division cannot ensure opportunities for the inspection of the corrections of the above self controls on a personal basis, nevertheless test questions can be discussed after the tests during independent events organized for all students at the same time.

Students are expected to arrange this event where a minimum of 40 students should participate and to contact the academic 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: aok.unideb.hu/klinfiz. 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

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 Internal Medicine

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

Year, Semester: 4th year/1st semester

Number of teaching hours:

Practical: **60**

Department of Obstetrics and Gynecology

Subject: OBSTETRICS AND GYNECOLOGY BLOCK PRACTICE - 4TH YEAR

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

Number of teaching hours:

Practical: **30**

Requirements

Block practice is an integral part of the curriculum in obstetrics and gynecology, details are shown there.

Subject: OBSTETRICS AND GYNECOLOGY I.

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **10**

Practical: **20**

1st week:

Lecture: 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. Foetal 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. Puerperium.

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 foetus. Hands-on training in obstetric ultrasound with simulation equipment. Gynaecologic and obstetric examination, cervical cancer screening.

6th week:

Lecture: Abnormal labour. Indications of caesarean section and instrumental vaginal delivery

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 membranes. Postmaturity. Malpresentation and malposition. Abnormalities of the birth canal. Cephalopelvic disproportion.

7th week:

Lecture: Abnormal pregnancy. Medical disorders in pregnancy. Preeclampsia. Fetal abnormalities. Multiple pregnancy

Practical:

Medical disorders in pregnancy by organ systems. Hypertensive disorders in pregnancy. Infectious diseases in pregnancy. Preexisting and acquired diseases in pregnancy. Multiple 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: Reproductive endocrinology

Practical:

Ectopic pregnancy: diagnosis and management. Types of amenorrhoea, etiology. PCOS. Abnormal menstrual bleeding. Dysmenorrhoea, PMS.

10th week:

Lecture: Infertility. Assisted reproduction. Birth control.

Practical: Investigations and management of infertility. Medical treatment and assisted reproduction techniques.

11th week:

Practical: Block practice

12th week:**Practical:** Block practice**13th week:****Practical:** Block practice

Reading materials:

Symonds, I. Arulkumaran, S. (eds): Essential Obstetrics and Gynecology. Fifth Edition. Churchill Livingstone Elsevier, 2014. ISBN: 978-0-7020-3068-0.

14th week:**Practical:** Block practice**Requirements**

Attending practices is mandatory. Maximum two absences are allowed in a semester, regardless of the reason. Above that number, absences must be made up even if resulting from illness, official appointments, etc. (no certificates are needed), by joining other group, but not more than three times in a semester. Makeups should be done in the same week as when the missed practice was, if possible, because different topics are scheduled for each week. Signature in the lecture book will be declined if more than two absences remain uncompensated at the end of the semester.

Practices are focusing on deepening of knowledge of lecture material, emphasising 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 (5 x 6 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. Educational materials are 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. (Questions from a pre-published list of minimalisms might also be asked at the exam.)

Department of Orthopedic Surgery and TraumatologySubject: **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. Spondylosis and spondylolisthesis.

Congenital anomalies of the spine.

Scheuermann's disease and its treatment.

Degenerative changes of the spine. Spinal stenosis. Disc degenerations and prolapse.

Sciatica. Ankylosing spondylitis.

3rd week:

Lecture: 1. Bone tumor and tumor like lesions.

2. Bone infections. 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.

Subject: **TRAUMATOLOGY I.**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

1st week:

Lecture: 1. The role of traumatology in medicine. Process of fracture healing (biology, biomechanics). The diagnosis and treatment of fractures. Classifications of closed fractures. The basic principles of fractures treatment.
2. Classification and treatment of open fractures. Prevention and treatment of post-traumatic and post operative infections.
3. Process of wound healing. Closed and open soft tissue injuries, wound treatment. Types of bleeding. Diagnosis and treatment of closed and open vessel injuries.

2nd week:

Lecture: 1. Diagnosis and treatment tactics of dislocations. Recognition and treatment of posttraumatic pathological states. Compartment syndrome. Sudeck dystrophy. Disturbances of bone healing: delayed union and non-union. Posttraumatic arthritis.
2. Injuries in childhood. Injuries specific to growing bone and their treatment principles. Characteristic childhood injuries.
3. Injuries of thoracic cage. Pneumothorax, hemothorax. Cardiac injuries. Closed and open injuries of the abdomen. Diagnosis and operative treatment of abdominal organ injuries. Diaphragmatic rupture. Injuries to retroperitoneal organs.

3rd week:

Lecture: 1. Treatment protocol of severely injured patients, ATLS. Intensive care. Traumatic hemorrhagic shock. Fluid and electrolyte replacement.
2. Craniocerebral injuries. Fractures of the skull and calvaria. Brain edema. Recognition and treatment of intracranial hemorrhage.
3. Diagnosis and treatment of vertebral fractures with and without nervous system injuries. Physiology of nerve regeneration. Diagnosis and

basic treatment principles of peripheral nerve injuries.

4th week:

Lecture: 1. Injuries of the pelvic ring and acetabulum.
2. Occurrence of femur neck fractures, characteristics of fractures in elderly patients. Garden classification. Minimal invasive therapy: osteosynthesis using cannulated screws. Indication for the use of hip replacement.
3. Diagnosis, classification and treatment of per- and subtrochanteric femur fractures. Treatment of femur diaphysis fractures.

5th week:

Lecture: 1-2. Common fractures of the upper limb - treatment of fractures of the proximal humerus and wrist.
3. Diagnosis, classification and basic principles of treatment of crural and ankle fractures. Pilon fractures.

6th week:

Practical: Physical examination of the trauma patient. Anamnesis. General physical examination. Functional examination of the extremities (neutral 0 method). Examination of circulation and innervation. 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 Typhoid prophylaxis.

8th week:

Practical: Types of conservative fracture treatment. Roles of application of plasters. Soft

bandages, braces, orthoses. Traction treatment.

9th week:

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

10th week:

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

Requirements

The lectures will take place in the Augustza big lecture hall. We strongly advise to participate on the lectures, because the official textbook include not all the diagnostic and therapeutic knowledge. The practices will take place two hours a week at the Department of Orthopedic Surgery and Traumatology (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 Orthopedic Surgery and Traumatology (Main Building II. floor room 2036).

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.

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
Cholinergic-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 toxicology 12. 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 epidemiology 22. Epidemiological investigations,

Seminar: 11. Basic biostatistics 12. Using research results in clinical practice I

7th week:

Lecture: 23. Frequency measures in epidemiology 24. Study design

Seminar: 13. Types of epidemiological studies 14. Validity of epidemiological studies

8th week:

Lecture: 25. Analyses based on aggregate statistics 26. Conclusions of the epidemiological studies

Seminar: 15. Using research results in clinical practice II 16. Using epidemiological measures in practice (DEALE method)

9th week:

Lecture: 27. Preventive strategies 28. Randomized controlled trials

Seminar: 17. Preventive strategies 18. Critical evaluation of the epidemiological literature

10th week:

Lecture: 29. Interventional studies 30. Screening

Seminar: 19. Clinical trials 20. Screening programs

Requirements

Attendance of lectures is highly recommended. At the end of the second semester, Endre Jeney Memorial Contest will be open to students who have attended at least 60-60% of the lectures in the two semester. Student participation is recorded electronically in lectures. At the beginning and end of the lectures, students answer questions related to the topic of the lecture. Students who respond correctly to both pre and post questions 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 group seminars is obligatory. The head of the Department may refuse to accept the semester if a student is absent more than twice from the 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, outstanding surgeons. Diagnostics in surgery

Practical: Vascular surgery practice week

2nd week:

Lecture: Indications and contraindications of surgery, legal considerations. Preparation for surgery, postoperative complications. Shock. Coagulopathies, thrombosis prophylaxis

Practical: Breast-endocrine surgery practice week

3rd week:

Lecture: Wound healing, surgical infections. Tetanus, gas gangrene

Practical: Thoracic surgery practice week

4th week:

Lecture: Lecture1: Hemotherapy in surgery. Transplantation surgery: types, legal considerations, immunosuppression and complications

Lecture 2: Plastic surgery operations of the trunk and extremities (Zoltán Péter, M.D.)

Practical: General surgery, TRP practice week

5th week:

Lecture: Injuries of the esophagus. Esophageal cancer

Practical: Gastroenterologic surgery practice week

6th week:

Lecture: Gastroesophageal reflux disease, hiatal and diaphragmatic hernias. Gastric cancer

7th week:

Lecture: Cholelithiasis and benign biliary obstructions. Gall bladder and biliary tract malignancies

8th week:

Lecture: Surgical treatment of benign liver

diseases. Primary and secondary liver cancer and their surgical treatment

9th week:

Lecture: Acute and chronic pancreatitis. Cancer of the exocrine and endocrine pancreas

10th week:

Lecture: Surgery of the spleen and adrenals

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 5 x 2 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: compulsory written test covering the topics of the first semester.

Lecture slides, exam information and the minimalists for the exam can be downloaded from the elearning.med.unideb.hu portal under the Surgery I. course.

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).

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. Pathomechanism of atherosclerotic

diseases. Risk factors and prevention.

2. Acute coronary syndrome management.

Practical: Coronary Heart Disease: stable coronary artery disease, unstable angina, STEMI, NSTEMI management.

2nd week:

Lecture: 3. Stable coronary artery disease. Non-invasive and invasive imaging modalities for evaluating coronary artery stenosis and their complications. PCI.

4. Symptoms, types, diagnosis and therapy of hypertension.

Practical: Congenital and acquired heart disease. Heart murmurs, diagnosis and therapy, surgical indications.

3rd week:

Lecture: 5. Peripheral arterial disease: symptoms, diagnosis and therapy.

6. Aortic aneurysm: diagnosis, therapy. Vasculitis, disorders of microcirculation.

Practical: Examination of heart failure patients. Arrhythmias.

4th week:

Lecture: 7. Supraventricular and ventricular arrhythmias. Differential diagnostics of wide QRS complex tachycardias.

8. Bradyarrhythmias, syncope, pacemaker therapy

Practical: Hypertension and the heart.

5th week:

Lecture: 9. Chronic heart failure: pathomechanism, symptoms, diagnostics, pharmacological and device therapy (CRT, CCM).

10. Acute heart failure treatment.

Mechanical circulatory support. Heart transplant.

Practical: Peripheral artery disease.

6th week:

Lecture: 11. Atrial fibrillation. Non-

pharmacological treatment of tachyarrhythmias (ablation, ICD).

12. Anticoagulant and antithrombotic treatment in cardiology.

7th week:

Lecture: 13. Diabetes and heart diseases

14. Valvular heart disease: symptoms, diagnostics.

8th week:

Lecture: 15. Pulmonary hypertension. Grown-up congenital heart disease.

16. Myocarditis, pericarditis, infective endocarditis, rheumatic fever.

9th week:

Lecture: 17. Modern imaging modalities in cardiology (CR, MR).

18. Patient-tailored decision making in cardiology. Heart team concept.

10th week:

Lecture: 19. Surgical treatment of coronary, valvular and aortic diseases.

20. Inpatient and outpatient cardiac rehabilitation.

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**

Seminar: **26**

Practical: **4**

1st week:

Lecture: Principles of Radiological Techniques.
Contrast media in Radiology.

Practical:

Hands-on I. (modalities, contrast materials)

2nd week:

Lecture: Chest Radiology. Cardiovascular Radiology.

Seminar: Chest Radiology

3rd week:

Lecture: Urogenital Radiology, Gynaecological and Obstetric Radiology

Seminar: Urogenital Radiology

4th week:

Lecture: Breast Imaging. Interventional Radiology.

Seminar: Breast Imaging. Gynaecological and Obstetric Radiology

5th week:

Lecture: Gastrointestinal and Abdominal Radiology.

Seminar: Gastrointestinal and Abdominal Radiology. Cardiovascular Radiology.

(double practice)

6th week:

Lecture: Neuroradiology - brain, spine.

Seminar: Neuroradiology - brain.(double practice)

7th week:

Lecture: Head and Neck Imaging

Seminar: Neuroradiology - spine.

8th week:

Lecture: Musculoskeletal radiology.

Seminar: Musculoskeletal radiology. Online case presentation, referring, MCQ trial

9th week:

Lecture: Pediatric imaging.

Seminar: Pediatric imaging. Online case presentation, referring, MCQ trial

10th week:

Lecture: Emergency radiology.

Practical: Hands-on II. (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

Course requirements, signature requirements

Participation in practice classes is mandatory. Absences must be certified in a credible way.

As a main rule, students must make up for missed practice lessons. Making up for a missed practice is subject to the prior approval of the chief educational officer and the presentation of a credible certification (e.g. doctor's note). The number of made up practices cannot exceed one occasion (two hours), and the number of uncompensated, but certified absences may not exceed one occasion (two hours).

Rules of making up for absences: Students should make up for a missed practice by attending a practice of the same topic that of the missed practice, with another group. Students must pay attention that attending a practice with a topic that they have already heard does not qualify as

making up for the missed practice.

Chief Educational Officer: István Lampé D.M.D.

Prerequisite: Pathology II.

Exam

End semester exam

The exam will cover the textbook, lecture and practice lesson topics and materials.

The exam is held in the form of a tablet test. Exam days will be announced four (4) weeks before the exam-period. Students must register for the exam according to the rules of the Academic and Examination Regulation.

Textbook

R.A. Cawson: Essentials of Oral Pathology and Oral Medicine
Churchill Livingstone, 1998 (ISBN: 0443053480)

Recommended literature

Contemporary Oral and Maxillofacial Surgery

Mosby Elsevier Health and Science (2002) by Larry J. Peterson, Edward Ellis, James R. Hupp

Contact information

Educational Office of the Faculty of Dentistry (Dean's Office)

E-mail: fokot@dental.unideb.hu

Hours: Monday to Thursday 8:00-15:00, Friday 8:00-14:00.

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, bereavement.

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: Zita Fekete MA, Márta Fúzi 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.

Course material is available here: <https://elearning.med.unideb.hu>

Department of Internal Medicine

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

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Practical: **60**

Subject: **INTERNAL MEDICINE IV. (ENDOCRINOLOGY, NEPHROLOGY)**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

1st week:

Lecture: 1. Diagnostic approach to thyroid diseases. Iodine metabolism. Iodine deficiency. 2. Hyperthyroidism, signs and symptoms. Graves'disease. Graves' ophthalmopathy. Toxic

adenoma. Thyroid storm.

2nd week:

Lecture: 1. The thyroid nodule. Thyroid cancer. Multiple endocrine neoplasia, carcionoid

syndrome. Hypoglycemic disorders. 2. Hypothyroidism. Thyroiditis.

3rd week:

Lecture: 1. Adrenal insufficiency, adrenal crisis. Cushing's disease and Cushing's syndrome. 2. Hyper- and hypoparathyroidism. Hypercalcemic states.

4th week:

Lecture: 1. Mineralocorticoid excess. Congenital adrenal hyperplasia. Pheochromocytoma. 2. Diseases of the anterior pituitary. Hypo- and hyperfunction. Posterior pituitary, diabetes insipidus, SIADH

5th week:

Lecture: 1. Hyper and hypoparathyroidism. Hypercalcemic states. 2. Case presentation

6th week:

Lecture: 1. Chronic kidney disease - definition, significance, classification, causes and screening. Referral to a nephrology clinic, emergency states. 2. Accelerated vascular calcification, anaemia and disorders of the Ca-P metabolism in kidney disease.

Practical: Endocrinology I. History taking, physical examination and diagnostic procedures in patients with endocrine diseases.

7th week:

Lecture: 1. Primary glomerulonephritis. 2. Acute and chronic tubulointerstitial nephritis. Pregnancy and the kidney. Urinary tract infection, renal stones.

Practical: Endocrinology II. Case presentation of patients with the most common endocrine diseases (Graves' diseases, acromegaly, Cushing's disease)

8th week:

Lecture: 1. Systemic diseases (diabetes, lupus, vasculitis, myeloma) associated with glomerulopathy. 2. Vascular and hypertensive kidney damage.

Practical: Nephrology I. History taking, physical examination and diagnostic procedures in patients with kidney diseases.

9th week:

Lecture: 1. Acute renal failure - presentation, diagnosis, differential diagnosis, prevention. 2. Renal replacement therapy (hemodialysis, peritoneal dialysis).

Practical: Nephrology II. Case presentation of patients with the most common acute chronic kidney diseases (diabetes, hypertension, vascular kidney disease), differential diagnosis.

10th week:

Lecture: 1. Kidney transplantation, recipient and donor compatibility, immunosuppression. 2. Case presentation.

Practical: Renal replacement therapy. Presentation of the Division of Nephrology and the Extracorporeal Life Support Center

11th week:

Practical: Block practice

12th week:

Practical: Block practice

13th week:

Practical: Block practice

14th week:

Practical: Block practice

Requirements

Requirements for accepting the semester: Practices are compulsory, therefore nobody should be absent from any practice unless due to well-documented reasons. Missed practices should be repeated preferably the same week, confirmation of attendance should be presented to the tutor. Everyone must be able to communicate with the patients using basic Hungarian during history taking and physical examination. The official material of examinations includes the lecture and practice materials and the suggested readings.

Examination procedure:

1. Written test (minimum questions), pass limit 90%
2. Practical (bedside) examination
3. Theoretical examination

All the exam materials (minimum questions and answers, exam topics, lecture topics) can be downloaded from: <https://elearning.med.unideb.hu/>

Suggested readings:

D.G. Gardner, D. Shoback: Greenspan's Basic and Clinical Endocrinology, 10th Edition, McGraw-Hill, 2017 or later

J. Feehally, J. Floege, M. Tonelli, R.J. Johnson, eds.: Comprehensive Clinical Nephrology. Elsevier, 6th Edition, 2018

Subject: **4TH YEAR SUMMER PRACTICE**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Practical: **60**

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: Gynecologic screening and infections. HPV, upper-lower genital tract infections.

Practical: Methods of contraception. Family planning.

2nd week:

Lecture: Gynecological malignancies.

Practical: Precancerous lesions in gynecology: screening, diagnosis and treatment. Inflammatory diseases in gynecology.

3rd week:

Lecture: Benign gynecological tumors. Endometriosis.

Practical: Gynecological oncology. Medical and surgical management of gynecological malignancies.

4th week:

Lecture: Operative gynaecology

Practical: to be held in the Center for Medical Simulation:

Hands-on practice of pelvic examination on simulation models. Speculum examination, taking Pap smear. Performing transvaginal ultrasound examination on simulation equipment. (group A).

Benign tumors of the vulva, vagina, cervix, corpus and ovaries. Endometriosis: pathophysiology, diagnosis and treatment. (group B)

5th week:

Lecture: Pelvic floor dysfunction.

Urogynecology

Practical: Benign tumors of the vulva, vagina,

cervix, corpus and ovaries. Endometriosis: pathophysiology, diagnosis and treatment. (group A)

Hands-on practice of pelvic examination on simulation models. Speculum examination, taking Pap smear. Performing transvaginal ultrasound examination on simulation equipment. (group B).

6th week:

Practical: Menopause. Urogynecology. Uterovaginal prolapse.

7th week:

Practical: Pediatric and adolescent gynecology.

8th week:

Practical: Gynecological ultrasound. Differential diagnostics of pelvic masses

9th week:

Practical: Emergency gynecology

10th week:

Practical: Case reports

11th week:

Practical: Block practice

12th week:

Practical: Block practice

13th week:

Practical: Block practice

14th week:

Practical: Block practice

Reading materials:

Symonds, I., Arulkumaran, S. (eds.): Essential Obstetrics and Gynecology. Fifth Edition. Churchill Livingstone Elsevier, 2014. ISBN: 978-0-7020-3068-0.

Requirements

Attending practices is mandatory. Maximum two absences are allowed in a semester, regardless of the reason. Above that number, absences must be made up even if resulting from illness, official appointments, etc. (no certificates are needed), by joining other group, but not more than three times in a semester. Makeups should be done in the same week as when the missed practice was, if possible, because different topics are scheduled for each week. Signature in the lecture book will be declined if more than two absences remain uncompensated at the end of the semester.

Practices are focusing on deepening of knowledge of lecture material, emphasising practical aspects, demonstrating how these principles work in our important units, e.g. labour wards. Hands-on training will be mainly during the block practices (5 x 6 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. Educational materials are 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. (Questions a pre-published list of minimals might 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, agonists and antagonists, the ergot alkaloids and the therapy of migraine

Histamine and antihistaminic drugs

Seminar: Pharmacology of the gastrointestinal drugs. CNS pharmacology II: Antidepressants. Antiparkinsonian agents.

4th week:

Lecture: Non-steroidal antiinflammatory drugs I
Non-steroidal antiinflammatory drugs II

Pharmacotherapy of rheumatoid arthritis and gout

Hypothalamic and hypophyseal pharmacology

Thyroid and antithyroid drugs. Parathyroid hormone

Seminar: CNS pharmacology III:

Antipsychotics, Other neurodegenerative disorders, opioids. Muscle relaxants and the pharmacology of anesthesia.

5th week:

Lecture: Adrenocorticosteroids and adrenocortical antagonists

Pancreatic hormones and antidiabetic drugs-I

Pancreatic hormones and antidiabetic drugs-II

The gonadal hormones and inhibitors-I

The gonadal hormones and inhibitors-II

Seminar: Serotonin, histamine, NSAIDs
Pharmacological treatment of RA and gout.

6th week:

Lecture: Drugs and pregnancy

Pharmacology of doping

Agents that affect bone mineral homeostasis

Basic principles of antimicrobial chemotherapy

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: Antihelminthic and antiprotozoal agents. Disinfectants, antiseptics and sterilants

9th week:

Lecture: Cancer chemotherapy-I
Cancer chemotherapy-II

Cancer chemotherapy-III
Immunopharmacology-I
Immunopharmacology-II
Seminar: Antifungal and antiviral agents.
Pharmacological management of neoplastic diseases.
Self Control Test (Test from the topics of the first 8 weeks.)

10th week:

Lecture: Toxicology-I Introduction to toxicology
Toxicology-II Treatment of intoxicated patient
Ocular and dermatological pharmacology
Pharmacology of radiological contrast media
Preclinical and clinical drug development
Seminar: Immunopharmacology. Toxicology.
Drug development

Requirements

Prerequisites: Pharmacology I

Attendance at lectures is highly recommended, since the topics in examination cover the lectured topics. Attendance register will be performed regularly. Attendance at seminars is compulsory. The Department will refuse to sign the semester if he/she is absent from more than 2 seminars/semester. Two control tests during the semester 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 2 x 2 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. Emerging and re-emerging infections
2. Epidemiology of HIV/AIDS 3. Epidemiology of sexually transmitted diseases

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 hepatitis 5. Epidemiology and control of airborne infections

6. Vaccines and immunization, anti-vaccination
Seminar: 3. Outbreak investigation of hepatitis B virus infection in clinical setting; 4. Nosocomial infections: surveillance and prevention

3rd week:

Lecture: 7. Epidemiology of nosocomial infections 8. Epidemiology of gastrointestinal infections. 9. Prion diseases: facts and theories in preventive medicine

Seminar: 5. Concept and methods of health monitoring 6. Control of nosocomial infections

4th week:

Lecture: 10. Epidemiology and control of zoonoses 11. Introduction to epidemiology of non-communicable diseases 12. Epidemiology and control of metabolic diseases

Seminar: 7. Nosology (filling a death certificate); 8. Public health databases I

5th week:

Lecture: 13. Epidemiology of gastrointestinal and liver diseases; 14. Epidemiology of chronic respiratory diseases 15. Epidemiology of mental disorders and behavioral problems

Seminar: 9. Priority setting in health care 10. Public health databases II.

6th week:

Lecture: 16. Lifestyle and health: the effects of personal factors on health 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. Environment and health: the effects of socio-economical factors on health 20.

Lifestyle and health: the effects of alcohol and drug use on health 21. Domestic violence

Seminar: 13. Concept and practice of health promotion 14. Prioritizing using public health database

8th week:

Lecture: 22. Health status in developing and developed countries 23. Health policy principles in developed countries 24. Needs, demand and use of health service

Seminar: 15. Health policy analysis 16. Health technology assessment and economic evaluation

9th week:

Lecture: 25. Methods of financing health

services 26. Quality assurance in health systems.
 27. Quality measurement and development in health care
Seminar: 17. Assessing and improving quality of health services 18. Interpretation of public health databases (practice)

10th week:
Lecture: 28. Improvement of clinical effectiveness. 29-30. 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 (both pre and post questions) 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 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 in the same week.

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 practices and seminars of the full academic year. The final mark of the exam is the average of the marks given for written exam, the marks 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).

$$(a+b+c+d+e)/5$$

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 $x.4 \leq$ and $\geq x.6$, the student will get the opportunity to get a better mark by having extra oral questions, on the exam day

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

-if the average is below $x.4$ or above $x.6$ 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. Patient examinations.

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. Asthma, COPD.

9th week:

Lecture: Pneumonia. Tuberculosis. Pleural disorders.

Practical: TBC, pneumonia, NTM.

10th week:

Lecture: Interstitial 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 statute of the Organization and Operation of Medical University of Debrecen will be applied.

The student is obliged to attend the practices. Maximum one practice can be missed.

If a student is absent more than once from practices in a semester, he/she will not get signature.

The final examination will consist of a practical (X-ray examination) and an oral part, two questions from the topics. The topics will be given at the beginning 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 – Crohn’s disease, ulcerative colitis

Practical: Vascular surgery practice week

2nd week:

Lecture: Bowel obstruction – types and treatment. Hemorrhoids, anal prolapse and fissure. Perianal abscess and fistula, pylonidal cyst and their surgical treatment

Practical: Breast-endocrine surgery practice week

3rd week:

Lecture: Acute abdomen. Appendicitis and appendiceal cancer. Colonic diverticulosis and diverticulitis and their surgical treatment. Peptic ulcer and other benign gastro-duodenal diseases. Peritonitis and abdominal abscesses.

Gastrointestinal bleeding–types and treatment

Practical: Thoracic surgery practice week

4th week:

Lecture: Hernias in general. Inguinal, femoral and abdominal hernias

Practical: General surgery, TRP practice week

5th week:

Lecture: Benign diseases of the thyroid gland. Thyroid cancer. Diseases of the parathyroids – types and treatment

Practical: Gastroenterologic surgery practice week

6th week:

Lecture: Breast surgery and diagnostics. Benign breast lesions and non-invasive tumors. Breast cancer. Postoperative reconstruction, breast reduction and augmentation surgeries

7th week:

Lecture: Diseases of the thoracic wall and the pleura – types and treatment. Diseases of the lungs and mediastinum, and their surgical treatment. Thoracic injuries and their treatment. Indications and contraindications of thoracic surgeries, postoperative management and complications

8th week:

Lecture: Arterial diseases – diagnostic modalities, acute and chronic ischemia, revascularisation syndrome. Treatment and complications of vascular diseases. Surgery of the veins. Types of amputations

9th week:

Lecture: Surgical oncology: biological and clinical characteristics of the cancers, precancerous lesions. Prevention and diagnostics in oncology, classification of cancers. Multimodal therapy and prognosis. Minimally invasive techniques in surgery

10th week:

Lecture: Surgery of the colonic and rectal cancer

Requirements

There are 10 surgery lectures during the semester.

During the second semester the second half of the year has to complete 5 x 2 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: compulsory written test covering the topics of both semesters.

Lecture slides, exam information and the minimal for the exam can be downloaded from the elearning.med.unideb.hu portal under the Surgery II. course.

Department of Urology

Subject: **UROLOGY**

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

Number of teaching hours:

Lecture: **10**

Practical: **16**

1st week:

Lecture: Tumors of the urinary bladder.

Practical: Introduction to urological clinical practice, describing the place of urology among all fields of medicine. Visiting the wards and operating theatres.

2nd week:

Lecture: Disorders of the testis, scrotum and spermatic cord. Penile cancer.

Practical: Clinical investigation of genitourinary tract, urological laboratory and imaging examinations. Uro-radiological case presentations.

3rd week:

Lecture: Tumors of the prostate.

Practical: Differential diagnosis and treatment of the obstruction of the urine collecting system: transurethral and suprapubic bladder catheter, uretercatheter, DJ stent, nephrostomy tube. Video demonstration of catheter insertion.

4th week:

Lecture: Female urology. Urodynamic study.

Practical: Endoscopy and laparoscopy in urology: indications, methods, benefits, disadvantages, complications. Demonstration of the special instruments.

5th week:

Lecture: Injuries to the genitourinary tract, emergency diagnosis. Male infertility. Male sexual problems.

Practical: BPH and prostate cancer: diagnosis, treatment and follow up. Defining differences

between the two diseases. Touching prostate on probe.

6th week:

Lecture: Tumors of the kidney.

Practical: Differential diagnosis of scrotal disorders: varicocele, hydrocele, retention of the testicle, testicular atrophy, epididymitis, orchitis, trauma, torsion, testicular cancer, inguinal hernia, oedema. Case presentations at the ward.

7th week:

Lecture: Tumors of the testis.

Practical: Urological infections, prevention. When to treat bacteruria. Nosocomial infections. Urine analysis at our laboratory.

8th week:

Lecture: BPH. Retention urine. Clinical assessment and treatment.

Practical: Urinary stone disease: etiology, diagnosis, treatment. Discussing the problematic titles of urology.

9th week:

Lecture: Nonspecific infections. Specific infection. Pediatric urology. Congenital anomalies.

10th week:

Lecture: Urinary tract stones. Surgical and non surgical treatment. Radiomorphologic investigation in urology.

Requirements

Exam: oral type, the student has to pull 2 topics (1 cancer and 1 general).

Students have to attend all (8) urological practices during the semester. In case of absence the student must compensate for the missing practice (either with joining another group or asking the supervisor about his duty).

Student has 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.

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. In case of an improvement exam, the previous grade is not taken into account.

Division of Radiology and Imaging Science

Subject: **RADIOLOGY AND NUCLEAR MEDICINE II.**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **10**

Practical: **10**

1st week:

Lecture: Principles of radionuclide imaging. Radiobiology and radioprotection.

Practical: Nuclear Medical investigations procedures, demonstrated on bone scintigraphy. Visit to Nuclear Medicine Department. Tools for radiation protection.

2nd week:

Lecture: Isotope diagnostics in endocrinology. Radioiodine therapy of 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.

Requirements

Chance "A" is a written exam (supervised, in computer hall) with offered term mark. Repetaed exams will be oral.

One absence is allowed from the practicals.

Electronic materials: <https://elearning.med.unideb.hu/course/view.php?id=270>

CHAPTER 18

ACADEMIC PROGRAM FOR THE 5TH YEAR

Affiliated Department of Infectology

Subject: **INFECTOLOGY**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **15**

Practical: **20**

1st week:

Lecture:

Challenges in Infectious Diseases, 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

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

3rd week:

Lecture: Infection control in hospital settings. Multiresistant pathogens, nosocomial infections.

Practical:

Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major classes of infectious diseases

4th week:

Lecture: Infections of the urinary tract

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

5th week:

Lecture:

Bacteraemia and blood stream infection, infective endocarditis

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

6th week:

Lecture: Respiratory infections. 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

7th week:

Lecture: Staphylococcal and streptococcal infections.

Gastrointestinal infections.

Practical:

Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment options in major types of infectious diseases

8th week:

Lecture:

Viral hepatitis.

Zoonoses.

Practical:

Case studies (both in- and outpatient settings) for clinical aspects, differential diagnostic classification, diagnostic protocols, and treatment

options in major types of infectious diseases

9th week:

Lecture:

Exanthematous infectious diseases.

Vaccination in childhood and adults.

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

10th week:

Lecture: HIV/AIDS. Tropical infections. Traveller's diseases. 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

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.

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 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.

Textbook:

Dennis L. Kasper, Anthony S. Fauci: Harrison's Infectious Diseases

3rd Edition. McGraw-Hill Education-Europe, 2017. ISBN: 1259835979.

John E. Benett, Raphael Dolin, Martin J. Blaser: Principles and Practice of Infectious Diseases.

9th Edition. Elsevier – Health Sciences Division, 2019. ISBN: 0323482554.

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 Delhi. 2002.

MEDICAL ANTHROPOLOGY

Chapters from the following textbook: Cecil G. Helman: Culture, Health and Illness, Fifth Edition, Hodder Arnold, London, 2007. (different editions are available)

- The body: cultural definitions of anatomy and physiology
- Doctor-patient interaction
- Gender and reproduction
- Pain and culture
- Culture and pharmacology: drugs, alcohol and tobacco
- Cross-cultural psychiatry

(Titles of chapters can slightly differ in different editions.) + Handouts

Academic Advisor:

Karolina Kósa M.D., M.Sc., Ph.D.

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Further information is available:

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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: Cutaneous 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: Dermoscopy. Burn. Patient examination.

6th week:

Lecture: AIDS.

Mycotic infections.

Practical: Test: skin tumors + burn. Patient examination.

Self Control Test

7th week:

Lecture: Chronic venous 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.

(NB: the order of the lectures, seminars and practicals may change)

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

(NB: the order of the lectures, seminars and practicals may change)

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. The attendance will be recorded at all occasions.

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, in consideration of the practical, 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).

Group-change by a student is not recommended nor it is supported by the department, and only can be done by the written permission of the educational office. If someone changes groups arbitrarily without permission, the semester cannot be accepted even though the student has participated in all the practical classes.

The aim of our practical classes is to practice how to take patients' medical history and how to perform physical examination at bedside. During the practical classes students with tutors demonstrate different diseases, perform patient examinations, record anamnesis, and learn to describe physical status.

At the beginning of the practical, 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 (4) tests during the semester (oral/written), that will take place during practicals.

- These 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 (minimum questions, which are available at the website of the department). To pass, it is required to reach 60%. If the student scores less than 60%, the exam's 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. Connected to the clinical picture, the student might be asked to describe the skin symptoms and set up differential diagnoses.

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 (A00XY03T9) includes course material equivalent to 0.5 credits according to the electronic, Moodle-based teaching program entitled "Basic Life Support module (BLS)" and course

material equivalent to 2.0 credits according to the electronic, Moodle-based teaching program entitled "Advanced Life Support module (ALS)"

Department of Family and Occupational Medicine

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.

Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

2nd week:

Lecture: Early and late signs of death.

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

3rd week:

Lecture: Guest lecturer's topic

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

4th week:

Lecture: Types of injuries, vital injuries

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

5th week:

Lecture: Blunt force trauma, craniocerebral trauma

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

6th week:

Lecture: Wounds caused by pointed and sharp edged weapons

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

7th week:

Lecture: Firearm injuries

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

8th week:

Lecture: Electric injuries, injuries caused by low and high temperature

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

9th week:

Lecture: Traffic accident

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

10th week:

Lecture: Consultation

Practical: Self control test

Self Control Test

11th week:

Lecture:

13th week:

Practical:

Requirements

Attendance on 80% of the practices. Successful written exam on the last practice.

Department of Internal Medicine

Subject: **INTERNAL MEDICINE BLOCK PRACTICE I. - 5TH YEAR**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Practical: **60**

Subject: **INTERNAL MEDICINE V. (GASTROENTEROLOGY)**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

1st week:

Lecture: 1. Gastroesophageal 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. Colorectal cancer (etiology, premalignant lesions, diagnosis, screening, treatment)

4th week:

Lecture: 1. Hepatic cirrhosis, liver transplantation 2. Autoimmune liver diseases

5th week:

Lecture: 1. Alcoholic liver disease, non-alcoholic fatty liver disease. 2. Viral hepatitis

6th week:

Lecture: 1. Acute pancreatitis. 2. Diseases of the biliary tract. Liver neoplasms.

Practical: Endoscopic procedures

7th week:

Lecture: 1. Case Presentation. 2. Genetics of the metabolic diseases.

Practical: Disorders of the esophagus, stomach, small and large intestine

8th week:

Lecture: 1. Diabetes mellitus: pathomechanism, types, clinical symptoms and complications. 2. Type 1 diabetes mellitus, insulin therapy, insulin pump.

Practical: Disorders of the liver, pancreas and the biliary system. GI bleeding

9th week:

Lecture: 1. Type 2 diabetes mellitus, management. 2. Case presentation. Gout.

Practical: T1DM, insulin regimens, complications of diabetes mellitus

10th week:

Lecture: 1. Primary and secondary hyperlipoproteinemias: types, symptoms and treatment. Porphyrias 2. Obesity: etiology, diagnosis and treatment.

Practical: Obesity, T2DM, lipid disorders, gout

11th week:

Practical: Block practice

12th week:

Practical: Block practice

13th week:

Practical: Block practice

14th week:

Practical: Block practice

Requirements

Requirements for accepting the semester: Practices are compulsory, therefore nobody should be absent from any practice unless due to well-documented reasons. Missed practices should be repeated preferably the same week, confirmation of attendance should be presented to the tutor. Everyone must be able to communicate with the patients using basic Hungarian during history taking and physical examination. The official material of examinations includes the lecture and practice materials and the suggested readings.

Examination procedure:

<https://elearning.med.unideb.hu>

Department of Neurology

Subject: **NEUROLOGY BLOCK PRACTICE - 5TH YEAR**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Practical: 30

Requirements

The block practice lasts for 1 week. Attendance at all lectures, seminars and practices during the block practice is mandatory.

Practice books for signatures can be brought to the Secretary of Department of Neurology only during office hours. Signed practice books can be taken at the Secretary from the following 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 12:00- 13:00, Thursday 12:00-13:00.

Educational Advisor: Dr. Csépany Tünde Cecília, deputy: Árokszállási Tamás

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 12:00 - 13:00.

Educational Advisor: Dr. Csépany Tünde Cecília, deputy: Dr. Árokszállási Tamás

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 Anatomy, Histology and Embryology III. Lecture 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. Grade-offering test is organised at the 10th week of the semester. Passed (2), satisfactory (3), good (4) and excellent (5) grades will be offered for the best performing students. Participation at the grade-offering test is not considered as an 'A' chance exam."

Good (4) and excellent (5) grades will be offered for the best performing students. Participation at the competition is not considered as an 'A' chance exam. If the grade offered is accepted, it should be indicated in the Neptun system within one week. If the grade offered is not accepted in the Neptun system, the student has to take the exam. Places for exams are opened in the Neptun system before the exam period. Students have to register in Neptun for the exam. Without registration the exam cannot be taken. The first exam is the 'A' chance, the second exam is the 'B' chance, both of them are written (test) exams. If somebody failed both 'A' and 'B' chances, the third possibility is the 'C' chance, which is an oral exam in front of an examination committee. In case of C exam the student has to visit our Secretary in office hours in order to make an appointment with the examiners. Teaching materials presented at the lectures and practices are asked at the exams. If the student wishes to improve the grade, it is possible once in the exam period after registration in the Neptun for a free exam place.

Apart from some exceptions (see point 6.) students are not allowed to take exams during their block practice period.

6. Students who are allowed to complete the block practice abroad after the end of the semester can start their exams earlier, including even the block practice period (depending on the decision of Registrars Department).

7. The 6th academic year may not be started without signatures for both the first and second semesters of the 5th year.

8. Please consider the dignity of the patients when visiting the wards, laboratories and outpatient units. Inappropriate behavior (laughing, phoning etc.) during patient demonstration is not allowed. All patient data must be treated confidentially. The patient's chart is a legal document which may be used only on the ward. The patient's chart may not be photographed, copied or removed. If you make notes for yourself, please use only the patients' initials.

Department of Pediatrics

Subject: **PEDIATRICS BLOCK PRACTICE - 5TH YEAR**

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

Number of teaching hours:

Practical: **60**

Subject: **PEDIATRICS I.**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Lecture: **20**

Practical: **10**

1st week:

Lecture: Introduction to pediatrics.

(Epidemiology, physical examination)

Lecturer: Tamás Szabó M.D., Ph.D.

Lecture: Cardiopulmonary adaptation. Pediatric emergencies in the delivery room, Birth injuries.

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

2nd week:

Lecture: Rare diseases manifested in infancy and childhood.

Lecturer: Katalin Szakszon M.D., Ph.D.

Lecture: Respiratory problems in newborns (differential diagnostic approach).

Lecturer: Tamás Kovács M.D.

3rd week:

Lecture: Diseases of central nervous system in newborns.

Lecturer: Nagy Andrea M.D.

Lecture: Immunodeficiencies and autoimmune diseases in childhood.

Lecturer: Rita Káposzta M.D., Ph.D.

4th week:

Lecture: Special problems of prematurity (RDS, RPO, NEC, DAP, BPD).

Lecturer: Balázs Kovács-Pászthy M.D.

Lecture: Techniques of natural and artificial feeding. Special formulas. Vomiting in Neonates and infants.

Lecturer: Erika Bálega M.D.

5th week:

Lecture: Childhood psychological diseases.

Lecturer: Beáta Nagy M.A., Ph.D.

Lecture: Congenital and aquired diseases of the gastrointestinal tract requiring surgical intervention in neonates and young infants.

Lecturer: László Sasi Szabó M.D.

6th week:

Lecture: Seizures in infants and newborns. Hypoxic damage, Periventricular leukomalacia. Habilitation.

Lecturer: Mónika Bessenyei M.D.

Lecture: Differential diagnosis of gastrointestinal bleeding in infants and children.

Lecturer: Orsolya Kadenczki M.D.

7th week:

Lecture: Cardiac emergencies in newborns and infants.

Lecturer: Gábor Mogyorósy M.D., Ph.D.

Lecture: Diseases associated with lower and upper respiratory obstruction (differential diagnosis).

Lecturer: Zsolt Bene M.D.

8th week:

Lecture: Neonatal characteristics of renal function, urinary tract disorders.

Lecturer: Tamás Szabó M.D., Ph.D.

Lecture: Fluid and electrolyte balance. Acid-base balance disorders.

Lecturer: Tamás Kovács M.D.

9th week:

Lecture: Intrauterine and neonatal infections.

Lecturer: Gergely Balázs M.D.

Lecture: Failure to thrive in children.

Lecturer: Éva Nemes M.D., Ph.D.

10th week:

Lecture: The Hematologic disorders in newborns.

Lecturer: Csongor Kiss M.D., Ph.D., D.Sc

Lecture: Exanthematic diseases in Children.

Lecturer: Éva Nemes M.D., Ph.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 scales 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: Liason 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, two absences are allowed, additional absences can be made up by joining another 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

2nd week:

Lecture: Respiratory insufficiencies: definition, causes, types and basic guidelines of treatment

Practical: Breathing

3rd week:

Lecture: Oxygen therapy and artificial ventilation

Practical: Circulation

4th week:

Lecture: The treatment of the acid-base disturbances

Practical: Initial stabilization of the patient in critical condition

5th week:

Lecture: Sepsis and multiple organ failure

Practical: Frequent nursing tasks of the critical care patient

6th week:

Lecture: Brain death and donor conditioning

Practical: general anesthesia problem-based learning

7th week:

Lecture: Regional anesthesia

Practical: Intensive care problem-based learning

8th week:

Lecture: Intensive treatment of the hemodynamically unstable critically ill

Practical: Theory and practice of nutrition therapy

9th week:

Lecture: Life-threatening disturbances of fluid-electrolyte balance. Guidelines of volume therapy

Practical: Acid-base disorders

10th week:

Lecture: General (intravenous and inhalational) anesthesia

Practical: General and regional anesthesia (interactive video)

Requirements

On weeks 1-7 practicals are held at the Simulation Center of the Medical Faculty (Ophtalmology Clinic Building), whereas between 8-10 weeks at the Seminar hall of the Department/Ophtamology Clinic Building.

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 one oral question. 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 programme 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: The complexity of the diagnostic and therapeutic procedures in oncology – general considerations

Seminar: Systemic treatment options in oncology

2nd week:

Lecture: Molecular mechanisms of carcinogenesis

Seminar: Diverse roles of pathology in cancer management: from the diagnosis to the prognostic and predictive factors

3rd week:

Lecture: Diverse roles of radiology in cancer care: diagnostic tools, the assessment of response to systemic treatment, interventional radiology

4th week:

Lecture: Roles of nuclear medicine in oncology: diagnostic and therapeutic approaches

5th week:

Lecture: Radiotherapy in cancer management

6th week:

Lecture: Primary prevention in oncology

Lecture: Secondary prevention in oncology

Lecture: Emergency conditions in oncology

Seminar: Psycho-oncology in cancer care

7th week:

Lecture: Breast cancer

Lecture: Genitourinary malignancies I.: renal and bladder cancer

Lecture: Genitourinary malignancies II.: testicular and prostate cancers

Seminar: Soft tissue and bone sarcomas

8th week:

Lecture: Pancreatic, biliary cancers and hepatocellular carcinoma

Lecture: Colorectal cancers

Lecture: Oesophageal and gastric cancers

Seminar: Neuroendocrine tumors, GIST, cancers with unknown primaries

9th week:

Lecture: Lung cancers

Lecture: Pain management in cancer patients

Lecture: Supportive care in oncology

Seminar: Skin malignancies

10th week:

Lecture: Head and neck cancers

Lecture: Toxicity management of the immune checkpoint inhibitors

Lecture: Adult brain tumors

Seminar: Hospice care

Requirements

Requirements

Attendance at lectures is recommended, seminars are compulsory. Two absences from the seminars are allowed for the acceptance of the semester in clinical oncology. The slides presented in the classes will be uploaded in the e-learning system. However, the lecturers have the right to permit the uploading of only selected slides from their presentation and send questions which were only orally discussed on the lecture/seminar (for the grade-offering test). The educational materials presented and discussed on the lectures/seminars will be the topic of the pre-final grade offering test and the oral exams.

The pre-final, grade-offering test (30 questions, single-choice, 60% means pass of the exam) will be organized on the last week of the oncology schedule. Test questions will be composed by the presenting lecturers (from the slides presented and materials discussed orally on the lectures/seminars). In case of failure of the pre-final test or the refusal the offered grade by the student, an oral exam has to be taken in the exam period, this will be exam "A". In the exam period, only oral exam can be taken, the topic list covers the title of the lectures in the time-table.

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: Alcohols in forensic medicine

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

2nd week:

Lecture: Forensic toxicology

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

3rd week:

Lecture: Forensic genetics

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy

cases and case studies on the above mentioned topics.

4th week:

Lecture: Sudden death I.

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

5th week:

Lecture: Sudden death II.

Practical: Usual and special autopsy techniques, external examination of a dead person, autopsy cases and case studies on the above mentioned topics.

6th week:

Lecture: New methods in forensic pathology

7th week:

Lecture: Identification

8th week:

Lecture: Suffocation

9th week:

Lecture: Medical law, health insurance, compensation, disability

10th week:

Lecture: Consultation

11th week:

Lecture: Forensic psychiatry.

Requirements

Attendance on 80% of the practices. For visiting 75% of the lectures in both semesters, students can get facilitation on the exam.

Department of Internal Medicine

Subject: **INTERNAL MEDICINE BLOCK PRACTICE II. - 5TH YEAR**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Practical: **60**

Subject: **INTERNAL MEDICINE VI. (HAEMATOLOGY, HAEMOSTASEOLOGY)**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

1st week:

Lecture: 1. Haemopoiesis. Basic principles, 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, but participation is strongly encouraged. Haematology is a rapidly evolving discipline, so full acquisition of up-to-date knowledge is only possible by attending lectures.

Participation in the practical lessons is compulsory. In case of justified absence, it is accepted to make up the exercise at another time (with another group). Knowledge of the material presented in the lectures is considered essential during the practical lessons.

The end-of-semester exam consists of two parts:

-A written exam with 20 minimum questions. The pass mark is 80%. The question bank is available on the Institute's website.

-Theoretical exam, in which a practical question and two topics from general- and oncohematology will be discussed. The titles are available on the Institute's website.

Academic advisor: László Váróczy MD. Deputy: László Imre Pinczés MD.

The block practice schedule will be published by the academic advisors on the first day of the practice. The compulsory attendance time for the block practice is from 8 a.m. to 2 p.m. The daily tasks of the students are determined under the supervision of the assigned tutors, guided by the available patient population. A medical gown and phonendoscope are essential for participation. The key to the students' changing room is available for collection at the front office by the main entrance.

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 12:00 - 13:00.

Educational Advisor: Dr. Csépany Tünde Cecília, deputy: Dr. Árokszállási Tamás

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-minutes 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 grade-offering test is organised at the 10th week of the semester. Passed (2), satisfactory (3), good (4) and excellent (5) grades will be offered for the best performing students. Participation at the grade-offering test 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 90% of the practices is compulsory. More absences cannot be accepted even with medical certificate. In case of major illness the Head of the Department will decide the validity of the semester. Missed practices can be replaced by attending practice with another group in the same week, if it is not possible, then another appointment should be made with the practice leader. The head of the Department may refuse signing of the Lecture book in cases of one or more missed practices until replacement is done. On the last two practices when you have the opportunity to look into the life of the clinic you should come with your own group, and do not forget to bring a white coat. The list of lectures (subject, date, lecturer) is on website. Attendance on lectures is recommended as pictures of the most important eye diseases are shown during lectures. The entry and exit to the lecture hall are only allowed through the back door.

A written exam is organised on the first week after the semester for those students who attend at least 80% of the lectures. Certificate is not necessary for the absences, more than two absences cannot be accepted even with medical certificate. 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: 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. Acute suppurative otitis media
2. Treatment and complications of the otitis

media**Practical:**

General informations.
Exposition of general methods in otorhinolaryngology. Demonstration of instrumentes required at basic examinations:

practising of their use. (Use of the head mirror, otological examination with aural-speculum, examination with Otoscopy, rhinoscopy anterior, rhinoscopy posterior, laryngeal examination with mirror, pharyngeal examination).

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 salivatory glands. The facial nerve. 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. Malignant disorders of the larynx

and the hypopharynx, neckmass.

10. The upper airway stenoses. Vocal cord palsy, prolonged intubation,.

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-rhynolaryngological 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. Transoral and transtracheostomal intubation. Fiberoscopy, otoscopy.

9th week:

Practical: Vestibular examinations. Evaluation of spontaneous vestibular symptoms. Incuded examinations. (Rotatorical examination of electrical rotatory chair, electorny stigmography, analysis of optokinetic and positional nystagmus). Demonstration of examination methods.

10th week: Practical exam

Requirements

Education: Ten lectures and practices. The attendance of the lectures is recommended, the practices are compulsory. One practice may be missed, the others should be replaced. During the practice on the 6th week a Self Control Test, on the 10th week Practical Exam is organized.

Examination: the type of exam is an oral colloquium, two topics have to be worked out and presented, which is preceded by competency test written on the day of the exam.

In addition to the mandatory literature indicated below, the curriculum also includes the themes of lectures and practices.

Mandatory literature:

Hans Behrbohm, Oliver Kaschke, Tadeus Nawka, Andrew Swift: Ear, Nose and Throat Diseases with Head and Neck Surgery

ISBN: 978-3-13-671203-0.

Department of Pediatrics

Subject: **PEDIATRICS II.**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **15**

Practical: **10**

1st week:

Lecture: Differential diagnosis of hyperbilirubinemic states. Lecturer: György Balla M.D., Ph.D., D.Sc.

Solid tumors in childhood. Lecturer: István Szegedi M.D., Ph.D.

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: The Hemorrhagic Diseases in Children.

Lecturer: Csongor Kiss M.D., Ph.D., D.Sc.

Childhood acute and chronic renal failure.

Lecturer: Tamás Szabó M.D., Ph.D.

3rd week:

Lecture: Treatment for children with type 1 (insulin dependent) diabetes mellitus. Obesity, type 2 diabetes (Hypo- Hyperglycemia)

Lecturer: Enikő Felszeghy M.D., Ph.D.

Chronic respiratory diseases in childhood.

Lecturer: Zsolt Bene M.D., Ph.D.

4th week:

Lecture: Celiac diseases, malabsorption syndromes. Lecturer: Ilma Korponay-Szabó M.D., Ph.D., D.Sc.

Psychologist role in patient care. Lecturer: Beáta Nagy M.D., Ph.D., D.Sc.

5th week:

Lecture: Congenital malformations of the urinary tract. Lecturer: László Sasi Szabó M.D.

Differential diagnosis of fever in infant- and childhood. Lecturer: Éva Nemes M.D., Ph.D.

6th week:

Lecture: Congenital heart diseases. Cyanotic and acyanotic heart lesions. Lecturer: Gábor Mogorósy M.D., Ph.D.

7th week:

Lecture: Endocrine problems in children.

Lecturer: Rita Káposzta M.D., Ph.D.

8th week:

Lecture: Differential diagnosis of hematuria.

Lecturer: Andrea Berkes M.D., Ph.D.

9th week:

Lecture: Fainting states and epilepsy. Lecturer: Mónika Bessenyei M.D.

10th week:

Lecture: Pediatric emergency care. Lecturer: Éva Juhász M.D., Ph.D.

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, two absences are allowed, additional absences can be made up by joining another group.

CHAPTER 19

ACADEMIC PROGRAM FOR THE 6TH YEAR

General informations

Students can fulfil the 6th year practices:

1. At the clinics of the *University of Debrecen, Faculty of Medicine*.
Practices can be started only on Mondays!

2. *Outside of the University of Debrecen, Faculty of Medicine*

If students would like to spend their 6th year practices outside of Debrecen they have to apply for permission to the Sub-Committee for Educational matters and Credit Transfer via Neptun system.

General Rules of the 6th year practices:

All 35 weeks of the 6th year can be spent outside of the University of Debrecen at university hospitals with the permission of the Sub-Committee for Educational Matters and Credit Transfer.

In case of spending practices outside of Debrecen (abroad) students can split the rotations into 2 blocks (3-3 practices). After completing 3 practices students have to come back to Debrecen and take Final Exams.

Important! - Students can start their clinical rotation outside of Debrecen only after they have a valid permission from the committee. Any practice completed before having permission will not be accepted towards 6th year clinical rotation.

Submitting completed practices:

1. After completing the practice the hospital has to sign and stamp the pages of the practice book indicating the exact dates when the students did the practice. The copy of completed practice must be uploaded to the Neptun!
2. Assesment sheet - The evaluation of the practical skills of sixth-year students in internships was introduced from the spring semester of the Academic year 2022/23. **Completing the evaluation form is compulsory for all sixth-year students from the academic year 2023/2024**, as it will allow them to better monitor the development of their practical skills . **I is a prerequisite of taking the final exam. It must be uploaded to Neptun together with the practice book copy.**

Please note that **final exam** can be taken only after the requested weeks of a practice is fulfilled entirely and the PRACTICE COMPLETION + ASSESSMENT SHEET IS UPLOADED TO NEPTUN. -The Registrar's Office will approve the requests.

In case of spending the majority of practices in Debrecen students are highly advised to print the exam voucher sheet and take it to the final exam. The examiner supposed to sign it. It will be a proof of the completed exam. Please note that students cannot start the next practice without proving the fact of passing the previous exam.

State exam information

State exams are organized 3 times a year based on the decision of the Hungarian State Exam Committee: May, August and November.

Please note that the official study material for the written state exam can be found at the

zarovizsga.hu webpage.

The qualification of degree is based on the following Final Exams and End of Semester Exams + Thesis defense grade, written state exam grade, oral state exam grade, practical state exam grade:

- Final exams to be completed:
 - Anatomy, Histology and Embrology III. Lecture
 - Medical Chemistry II. Lecture
 - Biochemistry II. Lecture
 - Medical Physiology II. Lecture
 - Pathology II.
 - Clinical Biochemistry II.
 - Medical Microbiology II.
 - Pharmacology II.
 - Preventive Medicine and Public Health II.
 - Behavioural Sciences Final Exam
 - Internal Medicine VII.
 - Pediatrics III.
 - Surgery III.
 - Neurology III.
 - Psychiatry III.
 - Obstetrics and Gynecology III.
 - Hungarian Language

- End of Semester Exams to be completed:
 - Biophysics Lecture
 - Medical Genetics Lecture
 - Cell Biology Lecture
 - Urology
 - Pulmonology
 - Radiology and Nuclear Medicine II.
 - Orthopaedic Surgery
 - Traumatology I.
 - Stomatology
 - Dermatology
 - Otolaryngology
 - Ophthalmology
 - Forensic Medicine II.

- Furthermore to be completed:
 - Thesis defense
 - written state exam
 - oral state exam
 - practical state exam

Internship information:

Subject	
Internal Medicine VII.	9 weeks
Pediatrics III.	6 weeks
Neurology III.	4 weeks
Psychiatry III.	3 weeks
Surgery III.	5 weeks
Obstetrics and Gynecology III.	4 weeks
Emergency Medicine Practical	4 weeks
Healthcare Management	
Transfusiology Lecture	
Transfusiology Practical	

Subject: **INTERNAL MEDICINE**

Requirements of the internship in Internal Medicine

Duration: **9 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 internship in Neurology

Duration: **4 weeks**

Consulting hours for Educational Advisor: Monday, Thursday, 12:00 - 13:00.

Educational Advisor: Dr. Csépany Tünde Cecília, deputy: Dr. Tamás Árokszállási

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 handwritten negative neurological status even if he/she spends the practice abroad. As in the end of the practice students' activity, knowledge, interest, accuracy will be evaluated by a tutor. Students have to seek and contact their own tutor on the first day of their practice and discuss their exercises. If the student does not contact the tutor on time, we will not have the opportunity to do the student evaluation.

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.

Website: <https://elearning.med.unideb.hu>

Subject: **PSYCHIATRY**

Requirements of the internship in Psychiatry

Duration: **3 weeks**

Working hours: **8 a.m. to 2 p.m.**

The students must work under the supervision of their tutor. They spend 1 week in the psychotherapeutic ward and 2 weeks in general psychiatric ward. They make daily rounds with the staff of the ward, take part in the investigation of the new patients.

They must take part in small and large group therapy (weekly). Participation in the consultation held during the internship is mandatory.

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 one more week with practice in our department.

Subject: **OBSTETRICS & GYNECOLOGY**

Requirements of the internship in OB&GYN

Duration: **4 weeks**

Working hours: **8 a.m. to 2 p.m.**

Requirements for signing the lecture book: Participation in the internship program 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

Duration: **6 weeks**

Requirements for signing the lecture book: Participation in the clerkship program 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 4 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.

Registration for the exam is done in the Neptun system, on the dates indicated there

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**

Requirements of the internship in Surgery

Duration: **5 weeks**

Working hours: **7.30 AM and 1.30 PM** (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.

Subject: **HEALTHCARE MANAGEMENT**

The course is online. Details of its completion will be sent out at the beginning of the semester by the Registrar's Office. It will be introduced in an ascending system from the academic year 2024-

2025.

Subject: **EMERGENCY MEDICINE PRACTICE**

Requirements of the internship in Emergency Medicine

Duration: **4 weeks**

Working hours: **ten times 12-hour shifts.**

The emergency practice consists of four weeks, during which ten 12-hour shifts must be completed. During the practices, the students participate in the work of the emergency department. They learn the rules of the Hungarian emergency triage system, the daily practice of triage in the Emergency Unit, and the basics of patient examination in emergency situations.

The students participate in the examination and treatment of critically ill patients arriving at the department. They learn the practical basics of cardiopulmonary resuscitation.

The substitute of missed practices should be discussed with the study advisor.

Subject: **TRANSFUSIOLOGY LECTURE (THEORETICAL COURSE)**

Requirements of the Transfusiology Lecture

Duration: **1 week**

Working hours: **30 hours/1 week.**

Aim of course is to provide basic theoretical knowledge in the field of clinical transfusiology, with particular emphasis on the production and testing of blood products used in routine clinical practice, the practical and administrative tasks involved in their administration, the risks, potential complications and their management.

Completion of the theoretical course in transfusion medicine is compulsory for all students. The English program students will have the possibility to complete the course in person (in-person attendance) or online (only for those who are not in Hungary at the time of the course).

In the case of in - person completion attendance is compulsory and there is a catalogue for each day. A maximum of 10% of the lectures (3 hours) may be missed with the certificate.

To successfully complete the course, you must pass an exam, 21 out of 30 test questions must be answered correctly (single or multiple choice). The exam is taken in person via the e-learning platform. You will have 30 minutes to complete the test.

Subject: **TRANSFUSIOLOGY PRACTICE (PRACTICAL COURSE)**

Requirements of the Transfusiology Practice

Duration: **1 day**

Working hours: **8 hours/1day.**

Practical training in transfusion medicine is optional for the English program students. The training takes place in person for all participants; online completion of the practical course is not possible. For students who plan to work in Hungary, it is recommended to complete the practical course also, as only in this case (successful theoretical plus practical course) can we issue them a certificate that exempts them from the transfusion course during their residency training.

In addition to bedside ABO and RhD blood grouping techniques, the practical training primarily focuses on the clinical aspects of transfusion medicine in Hungary.

The practical training concludes with an exam where students are required to determine the blood type of one blood sample using the tile method and another blood sample using a Serafol card. They will also need to be able to make basic compatibility decisions.

The completion of the practical course also includes the documented observation of two red blood cell transfusions. The necessary form can be downloaded from the e-learning platform and after the observation of the two transfusions two separate forms should be filled and signed by the student and signed by the doctor(s) responsible for the transfusions. The filled, signed documents then should be uploaded to the e-learning platform (preferred format is PDF).

CHAPTER 20

REQUIRED ELECTIVE COURSES

Affiliated Department of Infectology

Subject: **HOW NOT TO LIVE UP TO THE ANTIMICROBIAL THERAPEUTIC OPTIONS OF FUTURE GENERATIONS (Practice-oriented antimicrobial stewardship)**

Year, Semester: 4th year/1st-2nd semester, 5th year/1st-2nd semester, 6th year/1st-2nd semester

Number of teaching hours:

Seminar: 30

1st week:

1. Importance of the microbiom, its evolution and destruction, loss of diversity
2. Relation between the microbiome and non-infectious diseases

2nd week:

3. Impact of antibiotics on the microbiome
4. Practical knowledge about antibiotics

3rd week:

5. Antibiotic use and resistance- a one health approach.
6. Definition of stewardship, practical options

4th week:

- 7-8-9. The role of biomarkers

5th week:

10. pk/pd-dosing, TDM
11. Toxicity and interactions

6th week:

12. Allergy to antimicrobial agents
13. Molecular diagnostic options

7th week:

14. Interpretation of serological findings
15. Diagnostic stewardship

8th week:

- 16-17: Multi-resistant pathogens

9th week:

18. Clinical interpretation of bacterial culture

findings

19. Role of biofilms, biofilm-associated infections: infective endocarditis, osteomyelitis, spondylodiscitis, prosthetic infections

10th week:

20. Nosocomial infections, cannula-associated bloodstream infections, ventilator-associated pneumonias, prevention of catheter-associated urinary tract infections
21. Neuroinfections

11th week:

- 22-23. Antibiotic use in skin-soft tissue infections (toxin-mediated infections), burn patients

12th week:

24. Management of pneumonia
25. Antibiotic use in urinary tract infections, diagnostic pitfalls

13th week:

26. Antibiotic use in upper respiratory tract infections
27. Intra-abdominal infections and antibiotics, CDI

14th week:

28. Fungal infections-types of fungal infections, risk groups, clinical aspects
29. Antifungal agents, treatment of fungal infections
30. questions and answers as required

Requirements

Course objectives:

To promote responsible antimicrobial use and awareness of the importance of this topic among future physicians

Suggested reading:

current ESCMID/IDSA guidelines, DEKK MF 28 empirical antibiotic recommendations, betegbiztonsag.info-antimicrobials-outpatient empirical antibiotic recommendations, uptodate.com

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

Year, Semester: 4th year/1st semester, 5th year/1st semester, 6th year/1st 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-borne 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-borne 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 Travellers, 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.

Reading materials:

Andrew Brent, Robert Davidson and Anna Seale: Oxford Handbook of Tropical Medicine 4th Edition. Oxford Medical Handbooks, 2014. ISBN: 9780199692569.

DEENK Life and Natural 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 the course is to equip students with the skills and knowledge necessary to effectively find, evaluate, and use information. Identifying the type and scope of information required for various tasks and research. Effective Searching Strategies:

Learning how to use different search tools and databases. Developing advanced search techniques, such as using keywords, Boolean operators, and filters. Critical Evaluation of Information:

Assessing the credibility, reliability, and bias of information resources.

Distinguishing between different types of sources (e.g., scholarly vs. popular, primary vs.

secondary). Ethical Use of Information: Understanding issues related to plagiarism and intellectual

property. This course aim to foster critical thinking and empower students to become independent learners in an information-rich society.

Department of Anatomy, Histology and Embryology

Subject: **CLINICAL NEUROANATOMY I.**

Year, Semester: 3rd year-4th year/1st semester

Number of teaching hours:

Lecture: 28

2nd week:

Introduction. Development and embryological malformations of the nervous system.

3rd week:

Basic neurocytology.
Neurodegeneration. Multiple sclerosis. Brain tumors.

4rd week:

Blood-brain barrier. Neuroimmunology.
Neuroinflammatory diseases.

5th week:

Surface anatomy of telencephalon. Aphasia, agnosia, apraxia.

6th week:

Diencephalon. Neuroendocrinology.

7th week:

The anatomy of brainstem. Cranial nerve nuclei. Innervation areas of cranial nerves. Cerebellum.

8th week:

Medullary, pontine and mesencephalic syndromes.

9th week:

Limbic system.

10th week:

Spinal cord.

11th week:

Spine. Meninges. Production and circulation of cerebrospinal fluid. Lumbar puncture.

12th week:

Spinal nerves and somatic plexuses. Clinical testing of spinal segments. Deep tendon reflexes. Radiculopathies, plexopathies.

13th week:

Blood supply to the central nervous system. Stroke.

14th week:

Written exam. (case study)

Requirements

Aim of the course:

Successful studies in neurology require solid knowledge in neuroanatomy. This course is designed to review the anatomy of the human central and peripheral nervous system with strong emphasis on clinical relevance. Integration of functional neuroanatomy with contemporary clinical neuroscience will help medical and dentistry students in their studies in Neurology. The first semester covers the macroscopic and microscopic neuroanatomy of central and peripheral nervous system.

CHAPTER 20

Course coordinator: Dr. Hegyi Zoltán, hegyiz@anat.med.unideb.hu

Lecturers: Dr. Hegyi Zoltán

Exam: AW5

Compulsory reading:

Kiernan: The Human Nervous System

Subject: **CLINICAL NEUROANATOMY II.**

Year, Semester: 3rd year-4th year/2nd semester

Number of teaching hours:

Lecture: 28

2nd week:

Sensory functions I.: somatosensory systems.

Proprioception.

3rd week:

Sensory II.-Nociception. Pain, pain syndromes, chronic pain.

4rd week:

Sensory functions III.: auditory and vestibular apparatus. Hearing loss, vertigo, nystagmus

5th week:

Sensory functions IV: visual pathway and loss of visual fields.

6th week:

Motor functions I.: Upper and lower motor neuron. Pyramidal tract. Flaccid and spastic paralysis.

7th week:

Motor functions II.: Basal ganglia and cerebellum.

8th week:

Motor functions III.: Visual motor system, visual

reflexes and their disorders.

9th week:

Autonomic innervation and its disorders.

10th week:

Introduction to cognitive neuroscience.

Neurobiology of gender and gender differences.

11th week:

Memory and memory loss. Dementia.

12th week:

The neurobiology of consciousness and perception.

13th week:

Imaging and sectional anatomy of the central nervous system.

14th week:

Written exam. (case study)

Requirements

Aim of the course:

Successful studies in neurology require solid knowledge in neuroanatomy. This course is designed to review the anatomy of the human central and peripheral nervous system with strong emphasis on clinical relevance. Integration of functional neuroanatomy with contemporary clinical neuroscience will help medical and dentistry students in their studies in Neurology. The second semester covers the functional systems of the brain and an introduction to cognitive neuroscience.

Course coordinator: Dr. Hegyi Zoltán, hegyiz@anat.med.unideb.hu

Lecturers: Dr. Hegyi Zoltán

Exam: AW5

Compulsory reading:

Kiernan: The Human Nervous System

Department of Biochemistry and Molecular Biology

Subject: **MOLECULAR MECHANISM OF DISEASES OF GREAT POPULATIONS**

Year, Semester: 3rd year/1st semester

Number of teaching hours:

Lecture: **25**

1st week:

Lecture: Introduction to molecular medicine

2nd week:

Lecture: Genomic medicine

3rd week:

Lecture: Diabetes

4th week:

Lecture: Obesity

5th week:

Lecture: Vitamin D and immunodefects

6th week:

Lecture: Cancer I.

7th week:

Lecture: Cancer II.

8th week:

Lecture: Cancer II.

9th week:

Lecture: Osteoporosis

10th week:

Lecture: Immunodeficiencies

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, 1 corridor), and on the department

Subject: **MULTIOMIC APPROACHES IN 21ST CENTURY MEDICINE**

Year, Semester: 3rd year/1st semester, 4th year/1st semester, 5th year/1st semester

Number of teaching hours:

Lecture: **28**

Requirements

Learning objectives: the aim of the course is to prepare students to interpret omics technologies in biomedical research.

Factual knowledge to be acquired. Knowledge of the cellular and molecular biology fundamentals necessary for understanding genomics, transcriptomics and proteomics experiments. Understanding of the potential of NGS-based transcriptomics to answer medical biology questions. Knowing the mathematical basis for interpreting omics data. Knowing the basics of the omics technologies.

Credit points: 2

Exam: AW5, project work

Prerequisites: Biochemistry II.

Lecturers: Dr. András Mádi, Dr. Beáta Scholtz, Dr. Éva Csősz, Dr. István Szatmári, Dr. Gergő Kalló

Coordinator: Dr. András Mádi

Min. 5, max. 60 students

Program:

Investigations using omic technologies

Basics of eukaryotic gene expression regulation

From data to biological processes

Proteomics basics, why do we need proteomics?

Epigenetic and chromatin analysis

Basics of genomic studies based on deep sequencing

Basics of single cell genomic methods

Basic proteomic techniques

Proteomic techniques that provide structural information

Beyond oncogenes: gene expression changes in tumour tissue

What is beyond proteomic data?

Integration of omics data

Department of Biophysics and Cell Biology

Subject: **GETTING CLOSE TO THE LAB-HANDS-ON EXPERIENCE IN BIOPHYSICAL METHODS**

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

Number of teaching hours:

Practical: 42

1st week:

Practical: Getting familiar with the laboratory

and the measurement techniques to be used.
Discussion of the chosen research topic.

2nd week:

Practical: Learning and practicing general cell culture laboratory work.

3rd week:

Practical: Learning and practicing general cell culture laboratory work.

4rd week:

Practical: Learning and practicing the sample preparation procedures for experiments.
Learning and practicing the use of experimental measurement techniques.

5th week:

Practical: Learning and practicing the sample preparation procedures for experiments.
Learning and practicing the use of experimental measurement techniques.

6th week:

Practical: Learning and practicing the sample preparation procedures for experiments.
Learning and practicing the use of experimental measurement techniques.

7th week:

Practical: Learning and practicing the

evaluation and statistical analysis of experimental results. Conducting experiments.

8th week:

Practical: Learning and practicing the evaluation and statistical analysis of experimental results. Conducting experiments.

9th week:

Practical: Conducting experiments.

10th week:

Practical: Conducting experiments.

11th week:

Practical: Conducting experiments.

12th week:

Practical: Conducting experiments.

13th week:

Practical: Conducting experiments. Discussion of the presentation.

14th week:

Practical: Conducting experiments. Discussion of the presentation.

Requirements

During the course, the student will actively participate in research at the Institute and, under the guidance of a supervisor, will be able to carry out experiments on medically relevant questions in cellular or animal models or patient samples.

The student will choose from the scientific topics to be announced at the beginning of the course, learn about the processes of sample preparation, the use of experimental measurement techniques and basic methods of statistical analysis of experimental results, and carry out experiments on the topic.

At the end of the course, the student will be required to make a presentation to demonstrate the research topic studied and the laboratory work carried out. Completion of the course may later provide the basis for a thesis and student research projects.

Course coordinator: Dr. Florina Zákány, florina.zakany@med.unideb.hu

Lecturers: Dr. Florina Zákány and the members of the Department

Exam: AW5

Department of Clinical Basics

Subject: **CLINICAL PHARMACOLOGY**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Lecture: **20**

Seminar: **8**

Practical: **2**

Department of Clinical Oncology

Subject: **MOLECULAR ONCOLOGY AND CANCER PREVENTION**

Year, Semester: 3rd year/1st semester

Number of teaching hours:

Lecture: **13**

Seminar: **2**

1st week:

Lecture: Transformation; Carcinogenesis
Tumorigenesis; The modeling of tumorigenesis
Molecular classification of cancers; Targeted
therapy, personalized medicine

2nd week:

Lecture: The genetics of cancer / hereditary and
acquired genetic changes / High vs. low
penetrance genes / TCGA
Tumor heterogeneity and cancer stem cells
Tumor microenvironment / The role of
inflammation in cancer formation and
maintenance

3rd week:

Lecture: The rationale and strategies of cancer
prevention
Seminar: Summary and discussion of the
curriculum

4th week:

Lecture: Oncogenes as therapeutic target; NRs /

RTKs as therapeutic and preventive targets
Tumor suppressors / DNA repair / synthetic
lethality; Morphogenic tumor suppressor
pathways
Metabolic alterations in cancer / The Warburg
effect; Energy substrate sensors / AMPK, S6K,
mTOR / IDH

5th week:

Lecture: Cancer risk factors and risk
assessment; Biomarkers as surrogate endpoints
Proof of Concept - Clinical trials; Quantitation of
treatment effect size
Cancer drug development / Design; Molecular
screening / Drug repurposing

6th week:

Lecture: The theory and practice of immune
therapy and cell therapy in oncology
Seminar: Summary and discussion of the
curriculum

Requirements

Students are required to attend at least two thirds of the lectures. Expected for the successful completion of the course is the ability to apply cellular and molecular level knowledge of malignant dysregulation to current treatment options in oncology and targeted therapy. Understanding the rationale and current status of cancer prevention is also emphasized. Course performance is evaluated in oral exams based on the topics listed, and includes the interpretation of a graph from a research paper.

Department of Clinical Pharmacology in Medicine

Subject: **CLINICAL STUDIES IN PRACTICE**

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

Number of teaching hours:

Lecture: **14**

Seminar: **14**

1st week:

Drug development. Importance of human clinical studies.

2nd week:

Good Clinical Practice

3rd week:

Plan and steps of clinical studies

4th week:

Patient information sheet and informed consent form

5th week:

Source documents of clinical studies

6th week:

Permission of the authorities and ethical committee

7th week:

Preparation for a clinical study, site selection

8th week:

Adverse events and serious adverse events

9th week:

Monitoring of the clinical studies

10th week:

Recruitment of volunteers

11th week:

Special aspects: oncology

12th week:

Special aspects: rheumatology

13th week:

Special aspects: pulmonology

14th week:

Special aspects: dermatology

Requirements

To all lectures there is a one-hour practice, as well, where students take part in small groups (with rotation)

After the course the students will have to know the importance of human clinical trials, the basic definitions of drug development, the types and aims of clinical studies, special characteristics of organizing and monitoring them. They will have knowledge about the ethical and legal aspects, as well. The course will focus for practical knowledge.; that is why half of the lessons are in practice.

Coursebook: Lakner, Renczes, Antal: Handbook of Clinical Pharmacology Spring-Med

Kerpel-Frónius: Pharmacotherapy

Test in written form

Result: AW5

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; Nouns, adjectives

2nd week:

Practical: Chapter 2: Anatomical positions, planes and directions; Adjectives; Concord of genders

3rd week:

Practical: Chapter 3: Regions, bones and bone markings of the upper limb; Declensions and genitive phrases

4th week:

Practical: Chapter 4: Singular genitive form of the adjective phrases in anatomical terms of upper limb muscles; ordinal numbers

5th week:

Practical: Chapter 5: Basic diagnostic terms of upper limb injuries; adjective formations; Latin prefixes

6th week:

Practical: Revision

7th week:

Practical: Mid-term test

Self Control Test

8th week:

Practical: Chapter 6: Plural nominative forms in the anatomical terms of lower limb; anatomical abbreviations

9th week:

Practical: Chapter 7: Plural genitive forms in the anatomical terms of lower limb; joints and muscles of the lower limb; formation of complex adjectives

10th week:

Practical: Chapter 8: Latin and Greek word roots and term elements related to body parts and organs in clinical terms

11th week:

Practical: Chapter 9: Basic Greek prefixes and suffixes

12th week:

Practical: Revision

13th week:

Practical: End-term test

14th week:

Practical: Evaluation

Requirements

Requirements of the course:

Attendance

•Language class attendance is compulsory. The maximum percentage of allowable absences is 10 % of the classes. Students arriving more than ten minutes late for the classes are not allowed to enter the class. Being late is counted as an absence. If the number of absences is more than two, the final signature is refused and the student must repeat the course.

•Students are required to bring the coursebook or other study material given out for the course with them to each language class. Active participation is evaluated by the teacher in every class.

Attendance might be refused if a student's behaviour or conduct does not meet the requirements of

active participation or he/she fails to bring the coursebook in a printed or digital format to the class.
Testing, evaluation

•In each Latin language course, students must sit for 2 written language tests (40 - 40% of the final score). Students have to reach at least 50% of the points in each test, otherwise they have to retake it in week 14.

•A further way of assessment is 5-5 online assignments before the mid-term and the end-term tests (5 - 5%). The minimum requirement of a successful assignment is reaching at least 80% of the possible scores.

•A further requirement is the knowledge of the core vocabulary of cca. 400 words/medical terms per semester announced in the first week. There is a word quiz in the first 5 minutes of the class, every week. The word quiz is passed if the student knows at least 80% of the words asked in the quiz. Students obtain points (5-5%) by taking the word quizzes successfully.

Based on the final score the grades are given according to the following table:

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

•If the final score is below 60, the student once can take a remedial test on the failed parts of the material.

Coursebook: Basics of Medical Terminology (Latin and Greek Origins) 2024, by László Répás
Assignments, vocabulary lists and further details can be found on the elearning site of the Department of Foreign Languages (www.elearning.med.unideb.hu).

Department of Human Genetics

Subject: **MEDICAL GENOMICS**

Year, Semester: 2nd year/2nd semester

Number of teaching hours:

Lecture: **12**

Practical: **2**

11th week:

Lecture: 1. Introduction and the Human Genome Project
2. Genomes of bacteria, plants, fungi, animals and viruses
3. Traditional and NG Sequencing

12th week:

Lecture: 4. Comparative and functional genomics
5. The world of RNAs
6. Summary 1.

13th week:

Lecture: 7. Genome-wide association studies (GWAS) in complex genetic diseases, Personalized genome analysis
8. Clinical Laboratory Genetics 1
9. Clinical Laboratory Genetics 2

14th week:

Lecture: 10. Invasive and non-invasive approaches for prenatal diagnosis
11. Pharmacogenomics
12. Summary 2.
Practical: Expression and comprehensive genomics. GWAS.

Requirements

Conditions for completing the course

- Electronic course enrollment (theory and practical) at Neptun
- Participation in the practical at week 14.
- Getting a grade based on 2 mid-year tests or a practical exam during the exam periode.

Preparation for the Quizzes and Exam

- Attendance and note-taking at Lectures is recommended.
- The lecture slides, practical materials and announcements for the students will be available on the website at <https://elearning.med.unideb.hu>. The username and password for the system are the same as the network ID and password used for Neptun.
- Test questions will be available on elearning.

Mid-year Quizzes and the Final exam

- In weeks 12 and 14, students will write quizzes in the time of the lectures.
- Test questions will be available (questions only, without answers) allowing more effective note-taking.
- Based on the average of the two practical tests a final grade will be offered according to the next table:

70% - 100%: 5

60% - 69.9%: 4

50% - 59.9%: 3

40% - 49.9%: 2

- Students who do not write the two tests or do not accept the offered grade, must take final exam.

Three exam dates will be given in the exam period.

- The written exam contains essay(s) and test questions. Calculation of grades:

85% - 100%: 5

75% - 84.9%: 4

60% - 74.9%: 3

50% - 59.9%: 2

0% - 49.9%: 1

Department of Immunology

Subject: **ONCOIMMUNOLOGY**

Year, Semester: 3rd year/2nd semester, 4th year/2nd semester, 5th year/2nd semester, 6th year/2nd semester

Number of teaching hours:

Seminar: **28**

1st week:

Seminar: Immunological aspects of tumorigenesis

2nd week:

Seminar: Biochemical processes modulating immune responses during tumorigenesis (hypoxia, Warburg/reverse Warburg effect)

3rd week:

Seminar: The role of tumour-associated fibroblasts and mesenchymal stroma/cells in tumour progression.

4th week:

Seminar: The role of regulatory T cells in the tumour microenvironment.

5th week:

Seminar: Presentation, analysis and discussion of experimental publication(s) related to the topic.

6th week:

Seminar: Characteristics of T cell subpopulations during tumorigenesis, therapies targeting T cell response, T cell energy, exhaustion and therapeutic options to avoid/reverse them.

7th week:

Seminar: Role of tumour-associated macrophages in the tumour microenvironment.

8th week:

Seminar: Presentation, analysis and discussion of experimental publication(s) related to the topic.

9th week:

Seminar: Role of myeloid-derived suppressor cells in tumour progression.

10th week:

Seminar: The role of pre-metastatic niche formation, migration, exosomes in immune-transfection and metastasis.

11th week:

Seminar: Neovascularization, formation of tertiary, quaternary lymphoid structures and their role in tumorigenesis and development of antitumour response.

12th week:

Seminar: Presentation, analysis and discussion of experimental publication(s) related to the topic.

13th week:

Seminar: Presentation, analysis and discussion of experimental publication(s) in this area.

14th week:

Seminar: Summarize knowledge acquired during the course, evaluation of students' performance.

Requirements

The aim of the course is to develop students' critical thinking. During the course, students will learn about the biological functions of the cells that constitute the tumour microenvironment, which play a cardinal role in the regulation of the anti-tumour immune response, and the key regulatory mechanism involved in tumour progression or regression. By analysing publications presenting experimental work, students will learn about therapeutic strategies pursued in pre-clinical research, state-of-the-art technologies and therapeutic methods used in immuno-oncology.

Course format: lecturers will give summary lectures in an interactive format. Periodically, following some summary lectures, students will give an article presentation, which will contribute to the long-term retention of knowledge.

Therapeutic applications of regulatory mechanisms discovered in basic research will be highlighted.

Suggested reading material: review articles recommended by the lecturers, publications for analysis selected by the course coordinator

Lecturers: Dr. Árpád Lányi, Dr. Anett Türk-Mázló

Suggested reading material: review articles recommended by the lecturers, publications for analysis selected by the course coordinator.

During the semester, the student is required to present several reports on specific scientific publications related to immunology. The grade will be determined by the quality of the student

presentations and the activity shown during the course.

Department of Internal Medicine

Subject: **CLINICAL GERONTOLOGY**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **30**

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

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **24**

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

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **20**

Practical: **4**

Subject: **GERIATRIC MEDICINE**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **20**

1st week:

Lecture: Gerontology and Geriatrics. Aging in general. Communication with the elderly patient
History-taking in the Elderly.

Self Control Test

2nd week:

Lecture: Physiological and patho-physiological changes in the elderly. Pain medication in the elderly.

Self Control Test

3rd week:

Lecture: Age-related physiological changes in the heart. Circulatory disorders in the elderly.

Self Control Test

4th week:

Lecture: The most common respiratory diseases in the Elderly.

Self Control Test

5th week:

Lecture: Sarcopenia and immobilization in the Elderly.

Self Control Test

6th week:

Lecture: Changes of renal functions in the elderly.

Self Control Test

7th week:

Lecture: Endocrine changes with aging, endocrine diseases in the elderly. Metabolic changes and diseases in the elderly.

Self Control Test

8th week:

Lecture: Acute and chronic gastrointestinal disorders in the elderly.

Self Control Test

9th week:

Lecture: Depression, dementia in the elderly. Neuropathologic alterations.

Self Control Test

10th week:

Lecture: Diseases of the locomotor system in the elderly.

Self Control Test

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

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Seminar: **20**

Subject: **RARE DISEASES**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **10**

1st week:

Lecture: Rare disorders: introduction. (G. Pfliegler) Rare diseases: organizations Hungarian and international approach (J. Sándor)

2nd week:

Lecture: Molecular genetics in rare diseases (I. Balogh) Rare bleeding disorders - genotype, phenotype, laboratory and molecular genetics (Zs. Bereczki)

3rd week:

Lecture: Genetic disorders (É. Oláh) Manifestations of rare diseases in the eye (V. Nagy)

4th week:

Lecture: The role of biochemical laboratory in the diagnosis of rare disorders. (J. Kappelmayer) Lysosomal diseases and immunodeficiency (L. Maródi)

5th week:

Lecture: Orphan drugs. (G. Blaskó) Case presentations (E. Kovács, K. Urbán) Closing remarks (G. Pfliegler) Conditions for acceptance: test

Subject: **TRAVEL MEDICINE FOR MEDICAL SCHOLARS**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **30**

Requirements

1. Positioning travel medicine among the medical disciplines. Travel medicine in Hungary - first in Europe
2. Health status of the traveler. Risk factors of the traveler. Definition and analysis of the travel types. Prevention possibilities.
3. Classification of the travel related medical problems. Travel induced diseases: deep vein thrombosis, jet-lag, motion sickness, travel psychosis
4. Travel related medical problems: environmental hazards, traffic accidents, safety measurements, crime prevention
5. Vaccination-preventable and non-preventable infectious diseases. Traveler's diarrhoea. Safe food and drink.
6. Technique of the vaccination, contraindications, side effects
7. Pretravel advices for the immunocompromised traveler. Treatment abroad
8. Sexually transmitted diseases, morbidity, prevention. Post exposure prophylaxis of AIDS
9. Dermatological problems during the trip and after returning
10. Modalities and timing of the repatriation. Indication and contraindications of the repatriation. MEDIF. Fit-to-fly formula
11. Malariaprevention, different types of malaria, high risk areas, malaria as an emergency
12. Travelers with special needs: VFR. Migration problems
13. Diabetic traveler, patient with heart disease, preparing COPD patient for travel
14. Cabin environment, preparing patient for the air travel. Fear of flying.

Department of Laboratory Medicine

Subject: **EPIDEMIOLOGY, PATHOPHYSIOLOGY, DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS.**

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

Number of teaching hours:

Lecture: **11**

Seminar: **2**

Practical: **2**

1st week:

Lecture: Definition and epidemiology of osteoporosis I.

2nd week:

Lecture: Definition and epidemiology of osteoporosis II.

Self Control Test

3rd week:

Lecture: Pathophysiology of osteoporosis I.
Self Control Test

4th week:

Lecture: Pathophysiology of osteoporosis II.
Self Control Test

5th week:
Lecture: Pathophysiology of osteoporosis III.
Self Control Test

6th week:
Lecture: Pathophysiology of osteoporosis IV.
Self Control Test

7th week:
Lecture: Diagnosis of osteoporosis I.
 Diagnosis of osteoporosis II.
Practical: BMD measurement and Bone turnover marker measurement
Self Control Test

8th week:
Lecture: Treatment of osteoporosis I.

Treatment of osteoporosis II.
Self Control Test

9th week:
Lecture: Case-study and literature reviews I.
 Case-study and literature reviews II.
Self Control Test

10th week:
Lecture: BMD measurement and Bone turnover marker measurement I.
 BMD measurement and Bone turnover marker measurement II.
Self Control Test

Requirements

To get the latest and updated information on the complex condition of osteoporosis.
 Evaluation: Essay type written assignment

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.

To take up the course entitled „Advanced students' scientific activity” requires formerly presented lecture(s) at students' scientific conference(s) and/or accepted thesis. Please note also that the fulfillment of the course requires an active, scientific work of the student in one of the departments of the university as determined by the department where the scientific work is done (min. 2 x 2 hours/week). Exam: Oral progress report on the 14th educational week in the presence of the students' scientific officers from the host department and a representative from the Council of Students' Research Society is also invited for these occasions. Students present their work from the current semester and their scientific notes and logs. Please, consider all of these conditions and check again if you fulfil the requirements to take up the course.

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

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

Number of teaching hours:

Lecture: **10**

Requirements

To take up the course entitled „Students' scientific activity for beginners” requires an active, scientific work of the student in one of the departments of the university as determined by the department where the scientific work is done (min. 1x2 hours/week). Exam: Oral progress report on the 14th educational week in the presence of the students' scientific officers from the host department and a representative from the Council of Students' Research Society is also invited for these occasions. Students present their work from the current semester and their scientific notes and logs. Please, consider all of these conditions and check again if you fulfil the requirements to take up the course.

Subject: **UNDERSTANDING MEDICAL PROBLEMS THROUGH EXPERIMENTS**

Year, Semester: 1st year/2nd semester

Number of teaching hours:

Practical: **30**

1st week:

Practical: Insulin resistance

2nd week:

Practical: Intestinal motility disorders

3rd week:

Practical: Neurodegenerative diseases

4th week:

Practical: Blood vessel permeability

5th week:

Practical: Protein phosphatases in cancer

6th week:

Practical: Protein phosphatases and drug side effects

7th week:

Practical: Genetically modified phagocytes to fight cancer

8th week:

Practical: What do wound healing and cancer

have in common?

9th week:

Practical: Self-eating (autophagy)

10th week:

Practical: Cancer cell + Antibody + Natural Killer Cell = Cancer Cell Death

11th week:

Practical: Stressed cells

12th week:

Practical: Macrophage and cancer cell interactions

13th week:

Practical: Discussion of experimental results

14th week:

Practical: Presentation

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 Neurosurgery

Subject: **NEUROSURGERY**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **6**

Practical: **8**

1st week:

Lecture: 1. Neurosurgery in general, the topic of the neurosurgery. Main symptoms of different localisations, diagnostic possibilities.

Developmental anomalies of the central nervous system requiring neurosurgical intervention.

2nd week:

Lecture: 2. Intracranial tumours I. General review. Neuroepithelial tumors, meningioma, schwannoma, neurofibroma, haemangioblastoma.

3rd week:

Lecture: 3. Intracranial tumors II. Pituitary adenoma, craniopharyngioma, epidermoid/dermoid cysts, colloid cyst, germinoma, teratoma, lipoma, primary malignant lymphoma, metastatic tumours. Causes and management of hydrocephalus (obstructive, communicating, congenital, acquired).

4th week:

Lecture: 4. Spinal space-occupying lesions (tumors, disc prolapse and spondylosis). Tumours of peripheral nervous system.

5th week:

Lecture: 5. Neurotraumatology. Head, spinal and peripheral nerve injuries.

6th week:

Lecture: 6. Cerebrovascular diseases requiring neurosurgical treatment. Inflammatory processes, brain abscess.

7th week:

Practical: 1. Diagnosis and treatment of intracranial space occupying lesions (except hematomas). Neurosurgical aspects of hydrocephalus and intracranial developmental anomalies. Shunt operations.

8th week:

Practical: 2. Neurosurgical aspects of vascular diseases. Causes and outcome of subarachnoid haemorrhage. Cerebral aneurysm, angioma and fistula, their surgical management.

9th week:

Practical: 3. Craniocerebral and spinal trauma, diagnosis and neurosurgical treatment. Management of unconscious neurosurgical patients. Brain herniations.

10th week:

Practical: 4. Degenerative and space occupying spinal lesions. Their diagnosis and surgical treatment. Operability of spinal developmental anomalies.

Requirements

The fundamentals of neurological surgery can be found in the textbook. The convincing knowledge of this material and the active participation of each practical lesson are the condition of a successful examination. The six lectures will complete the textbook with new data and stress the importance of the symptomatology and diagnostic possibilities of the more frequent neurosurgical diseases, mainly from practical points of view. These will facilitate the understanding of the textbook and the theses of the examination as well. The task of the practicum is the collection of personal practical experience of the neurosurgical diseases at bedside.

The active participation in all practicum is obligatory. No more than two misses of lectures and one

miss of seminars and accepted written test exam are needed to get the credit.

Department of Obstetrics and Gynecology

Subject: **RECENT ADVANCES OF INFERTILITY MANAGEMENT AND GYNAECOLOGICAL ONCOLOGY**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Lecture: **20**

Requirements

Aim: To provide supplemental knowledge of modern human reproductive technology in five lectures. Lectures 6-16 are devoted to transmitting structured knowledge of gynaecological cancer management in sequence of their localisation and public health importance. The course is primarily aimed at providing graduate level audiovisual information that could not be fitted into the restricted schedule of regular lectures of semester II. in year IV. curriculum.

Topics:

Pathophysiology of reproductive failure

Infertility work-up, practical approach

Assisted reproduction. Homologous and heterologous insemination

In vitro fertilisation. Embryo 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: **DIAGNOSTIC AND OPERATIVE HYSTEROSCOPY**

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

Number of teaching hours:

Seminar: **12**

Practical: **4**

1st week:

Seminar: Basics of hysteroscopy, instruments, techniques

2nd week:

Seminar: Diagnostic hysteroscopy

3rd week:

Seminar: Operative hysteroscopic procedures

4th week:

Seminar: Dry lab-simulations, instruments

Requirements

Aim of the course:

Students get to know the indications, procedures of the minimally invasive surgeries. They will learn about the instruments that are used during hysteroscopy and get a dry-lap training, as well.

Lecturers: Dr. Török Péter, Dr. Lampé Rudolf, Dr. Farkas Zsolt, Dr. Lipták Márton

Subject: **ENDOMETRIOSIS: BASICS, DIAGNOSIS AND TREATMENT**

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

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Epidemiology, pathogenesis, pathophysiology and genetic features of endometriosis.

2nd week:

Lecture: Types and stages of endometriosis

3rd week:

Lecture: Diagnosis of endometriosis. Symptoms and signs, clinical examination, medical technologies

4th week:

Lecture: Treatment of pain in endometriosis

5th week:

Lecture: Treatment of infertility of endometriosis

6th week:

Lecture: Surgical treatment of endometriosis. Basics and rules

7th week:

Lecture: Review of different guidelines about endometriosis. Evidence-based decisions.

8th week:

Lecture: Consultation and written exam

Requirements

Endometriosis is estimated to affect 10% of reproductive-aged women, and as it can cause infertility, the early diagnosis is an essential public health demand. Because the diagnosis is typically delayed for years, detailed education of endometriosis is important for medical students. The aim of the course is to discuss the pathogenesis, diagnosis and treatment of endometriosis from the molecular basics to the evidence based medicine.

Subject: **FROM THE MOLECULAR BASICS TO TARGETED THERAPY; ADVANCES IN CLINICAL THERAPY OF GYNAECOLOGICAL TUMOURS**

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

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Introduction. Epidemiology and history of treatment of gynaecological malignancies. Importance of molecular understanding of tumours. Evidence based treatment of gynaecological malignancies and advances in

treatment according to clinical guidelines.

2nd week:

Lecture: Molecular basics of gynaecological tumours. Dual hypothesis of ovarian cancer. Molecular background of endometrial cancer.

Differential diagnostics of endometrial and endocervical tumours. Molecular changes in cervical cancer.

3rd week:

Lecture: Advances of operative management of ovarian cancer. Operative techniques of cervical cancer. Fertility sparing operations.

4th week:

Lecture: Individualized targeted therapies in gynaecological malignancies.

5th week:

Lecture: Role of endoscopic procedures in the diagnostic and treatment of gynaecological

malignancies.

6th week:

Lecture: Cervical cancer prevention, the future of screening. Possibilities in cervical cancer prevention via vaccination.

7th week:

Lecture: Role of tumour markers in the diagnosis and follow-up of gynaecological tumours.

8th week:

Lecture: Consultation and written exam

Requirements

The recent advances in the understanding of the basics of gynaecological tumours at a molecular level lead to new diagnostic and treatment approaches in the field. This has lead to changes in scientific guidelines, to the introduction of new biological therapies and individualizing treatments with better prognostic predictions. Much of the advances were made in the past decade, some of them in the recent years. The preliminary aim of the course is to provide and up-to-date and well structure knowledge on the subject. There are only 5 lectures obstetrics and gynaecology in the II. semester, of which only one covers the field of gynaecologic oncology, so this coures fills a gap in the curriculum of "Obstretics and gynaecology II" as well.

Subject: **MATERNAL-FETAL MEDICINE: PREGNANCY, MOTHER AND FETUS ACROSS MEDICINE**

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

Number of teaching hours:

Lecture: **18**

1st week:

Lecture: Intruduction (Dr. Deli Tamás, M.D., Ph.D.)

Maternal-fetal medicine: what is it?

Maternal aspects: Clinically relevant physiologic changes in pregnancy. medications allowed and forbidden in pregnancy.

Diagnosis tests: possibilities and limitations

Fetal aspects: The fetus as "full-righ" patient.

Fetal physiology. Fetal diseases and symptoms.

The pregnant patient in clinical practice: Shared decision-making and the role of multidisciplinary medical teams. Cases.

2nd week:

Lecture: Endocrinology. (Dr. Tamás Deli, M.D., Ph.D.)

The endocrine patient getting pregnant: IDDM, thyroid diseases, hyperprolactinaemia, hypopituitarism, Addison's disease, diabetes insipidus, acromegaly during pregnancy.

Pregnancy after PCOS. Pregnancy-derived endocrine diseases or follwing pregnancy: gestational diabetespostpartum thyreoditis, Sheehan's syndrome, lymphocytic hypophysistis. Cases.

3rd week:

Lecture: Internal Medicine. (Dr. Orsolya Tímár,

M.D., Ph.D.)

Hypertension and pregnancy: chronic hypertension, pregnancy induced hypertension. Pregnancy and liver disease: intrahepatic cholestasis of pregnancy, FNH. Gastrointestinal diseases in pregnancy: IBD, reflux. Thrombophilia and thromboembolism in pregnancy. Autoimmune diseases in pregnancy: SLE. Kidney diseases and pregnancy: nephrosis, kidney failure, pyelonephritis. Cases.

4th week:

Lecture: Oncology. (Dr. Ágnes Kövér M.D.) Malignant diseases diagnosed before and during pregnancy. The effect of tumors on fertility, pregnancy outcomes and the fetus. The effect of pregnancy on oncologic outcomes. Common gynecologic and non-gynecologic malignancies and pregnancy. Possibilities of oncotherapy (surgery, chemotherapy, endocrine therapy) during pregnancy. Cases.

5th week:

Lecture: Cardiology. (Dr. Edina Nagy-Baló M.D., Ph.D.) Echocardiography during pregnancy. Peripartum cardiomyopathy. Heart failure in pregnancy. Arrhythmias. Ischemic heart disease during pregnancy. Artificial valves and anticoagulation during pregnancy and breastfeeding. Cases.

6th week:

Lecture: Neonatology and paediatrics. (Dr. Gergő Balázs M.D.) The continuity of intrauterine and newborn diseases and symptoms. Adaption disorders.

Special care of preterm newborns and long-term effects of preterm babies. Long-term effects of peripartum trauma or hypoxia. Special care and long-term outcome of newborns with certain congenital malformations. Cases.

7th week:

Lecture: Anaesthesiology and intensive therapy. (Dr. Szilárd Stamári M.D.) Obstetrical anaesthesia. Anaesthesia for surgical procedures during pregnancy. Peripartum intensive care: postpartum haemorrhage, DIC, eclampsia, amniotic fluid embolism, pulmonary embolism. Resuscitation during pregnancy and peripartum. Intensive care after complicated labour. Case.

8th week:

Lecture: Neurology. Psychiatry. Dermatology. Ophthalmology. Traumatology. (Dr. Mónika Orosz M.D.) Cerebrovascular disease during pregnancy. Differential diagnostics of neurologic symptoms during pregnancy. Myasthenia gravis. Disc hernia. Psychiatric diseases and medication during pregnancy and breastfeeding. Pregnancy specific dermatologic diseases. Ophthalmologic diseases determining the mode of delivery. PRES. Trauma during pregnancy. Cases.

9th week:

Lecture: Consultation and written test exam. (Dr. Tamás Deli M.D., Ph.D.)

Requirements

Aim of the course:

The overwhelming majority of medical students end up in fields of medicine other than obstetrics. It is certain, however, that whichever medical speciality a physician finally works in, he will treat pregnant patients. This requires special knowledge, because pregnant women "function" differently: they have different physiology, cannot be treated by any kind of medication and a narrower spectrum of diagnostic tools are available. We always have to keep in mind the presence of our other small patient, the fetus—what is more, sometimes it is the fetus, that is ill, and the mother is healthy. The special field of medicine focusing on the complex problems of pregnant women and their unborn fetuses is called *maternal-fetal medicine*, and is a distinct subspeciality with separate training and exams in many countries. Yet, this exciting frontier is hardly addressed in medical schools curricula: it is often too special and unknown for non-obstetricians, and too broad

for obstetricians.

The major aim of this course **is** to present the multidisciplinary perspective of specialists who treat pregnant patients and their fetuses on a daily basis. We believe that this gap-filling course will be useful for the future GP's, internists, pediatricians, surgeons, anaesthesiologists and specialists of basically any other non-obstetrical medical professions. And, of course, the course also offers an insight into maternal-fetal medicine for those more interested in obstetrics. After providing the theoretical background, lecturers will also present interesting cases from their clinical practice-not only is this an interesting and interactive way of education, but also an effective first step to convert theoretical knowledge into clinical know-how.

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 planning. Oral contraception. Transdermal and vaginal contraception. Long acting methods. Intrauterine contraception (medicated and non-medicated intrauterine systems, IUD, IUS).

7th week:

Lecture: 7. Infertility: (Lecturer: Jakab, Attila M.D., Ph.D.) The infertile couple. Diagnostics test of female and male infertility. Anovulatory infertility. Infertility genetics. Reproduction and thyroid. Fertility preservation in cancer patients.

8th week:

Lecture: 8. Infertility: (Lecturer: Török, Péter M.D., Ph.D.) Uterine and tubal infertility. Endometriosis. Minimally invasive procedures. Ovulation induction. Assisted reproductive

techniques (ART).

9th week:

Lecture: 9. Menopause (Lecturer: Jakab, Attila M.D., Ph.D): Epidemiological issues of the menopause. Physiology of the menopausal transition. Postmenopausal Hormone Replacement Therapy (HRT). Postmenopausal abnormal bleeding. Cardiovascular changes and osteoporosis in the menopause. HRT in reproductive cancer patients.

10th week:

Lecture: 10. Reproductive Andrology (Lecturer: Benyó, Mátyás M.D.): Regulation of testicular function. Aging male. Male infertility. Semen analysis. Sperm function tests. Sperm preparation methods for assisted reproduction. Surgical treatment for male infertility. Sperm cryopreservation. Closing test (Jakab, Attila M.D., Ph.D.)

Requirements

Reproductive Endocrinology covers the physiology and pathophysiology of the female reproductive system, from puberty through the reproductive ages, until and beyond the menopause. Over the decades, advances of genetics, molecular biology and clinical epidemiology resulted in rapidly growing information and therapeutic 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

Subject: **SURGICAL TECHNIQUES IN GYNECOLOGY**

Year, Semester: 4th year/1st semester, 5th year/1st semester, 6th year/1st semester

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Basic anatomy and surgical techniques

2nd week:

Lecture: Surgical treatment of benign gynecological diseases

3rd week:

Lecture: Hysteroscopy

4th week:

Lecture: Reproductive surgery

5th week:

Lecture: Gynecologic onco-surgery

6th week:

Lecture: Endoscopic and vaginal surgical techniques in urogynecology

7th week:

Lecture: Robotic surgery

8th week:

Lecture: Consultation and exam.

Requirements

In the past decades, significant advancements have occurred in the field of gynecological surgical techniques. The manner and tools used for the execution of most previously routinely employed procedures have evolved, potentially altering the nature of possible complications. The aim of the course is to present various surgical techniques across the spectrum of gynecology, with particular emphasis on evidence-based decision-making.

Credit: 1

Exam: AW5

Coordinator of the course: Dr. Lampé Rudolf-lampe.rudolf@gmail.com

Lecturers:

Dr. Lampé Rudolf Associate Professor, Dr. Krasznai Zoárd Associate Professor, Dr. Török Péter Assistant Professor, Dr. Kozma Bence Assistant Professor, Dr. Sipos Attila Assistant Lecturer, Dr. Molnár Szabolcs Assistant Professor, Dr. Orosz Mónika Specialist in ObGyn

Compulsory reading:

Williams Gynecology, Fourth Edition 4th Edition.2012Barbara L. Hoffman, John O. Schorge, Karen D. Bradshaw, Lisa M. Halvorson, Joseph I. Schaffer, Marlene M. Corton 1260456862 97811260456868

Suggested reading:

ESGO Textbook of Gynaecological Oncology, 2023

Subject: **ULTRASOUND DIAGNOSIS IN OBSTRETICS AND GYNECOLOGY**

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

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Objectives of the ultrasound examinations and principles of ultrasound imaging

2nd week:

Lecture: Ultrasound examinations in early pregnancy. Role of ultrasound in infertile patients and in postmenopausal women

3rd week:

Lecture: Examining the normal and abnormal female pelvic anatomy. Ultrasound in gynecologic oncology

4th week:

Lecture: Ultrasound in multiple pregnancies. Fetal well being assessment: biometry and doppler studies. mIntrauterine growth restriction

and management

5th week:

Lecture: Normal ultrasound morphology of the fetus. Prenatal diagnosis of fetal anomalies. Sonographic morphology of the normal and abnormal fetal heart.

6th week:

Lecture: Benign uterine and adnexal anomalies.

7th week:

Lecture: Introduction to pelvic floor ultrasound. Urogynecology.

8th week:

Lecture: Consultation and written exam.

Requirements

Ultrasound is considered as the first-line imaging method of choice in women's health. It is a simple, accurate and safe technique, making it amenable to use in routine daily practice.

Ultrasonography is used both for screening and as a diagnostic tool in the presence of clinical symptoms. The accuracy of ultrasonography is dependent primarily on the skill of the operator in using the equipment in order to obtain and interpret representative images. The teaching and training of medical health professionals performing ultrasonography is, therefore, crucial. The preliminary aim of the course is to provide an up-to-date and well-structured theoretical knowledge on obstetrical and gynaecological ultrasound.

Credit: 1

Exam: AW5

Coordinator of the course: Dr. Orosz László-laszlo.orosz.dr@gmail.com

Lecturers:

Prof. Dr. Tóth Zoltán, Dr. Jakab Attila, Dr. Erdődi Balázs, Dr. Kozma Bence, Dr. Orosz László, Dr. Orosz Gergő

Tematics: 2 hour lectures/week

Department of Oncoradiology

Subject: **RADIATION THERAPY IN CLINICAL PRACTICE**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Lecture: **20**

Seminar: **10**

Practical: **12**

1st week:

Lecture: Introduction into Radiotherapy

Seminar: Patient administration, RV systems

Practical: Consultation: The structure of RT center

2nd week:

Lecture: Basics of Radiophysics and Radiobiology

Seminar: Consultation: Patient positioning, immobilization

Practical: Consultation: LINAC systems

3rd week:

Lecture: Tools of radiotherapy-external beam units

Seminar: Consultation: ICRU principles, basics of RT planning

Practical: Planning CT system

4th week:

Lecture: Tools of radiotherapy-brachytherapy

units

Seminar: Consultation: Radioprotection in radiotherapy

Practical: Consultation: Treatment on a LINAC

5th week:

Lecture: IMRT, IGRT, SRS-SRT-tool of modern radiotherapy. Radiosurgery in clinical practice.

Seminar: Consultation: Special techniques in radiotherapy

Practical: Consultation: image transfer, contouring, image registration and fusion

6th week:

Lecture: Complex treatment of lung cancers-role of radiotherapy.

Practical: Brachytherapy in clinical practice.

7th week:

Lecture: Complex treatment of breast cancers-role of radiotherapy.

8th week:

Lecture: Complex treatment of colorectal cancers-role of radiotherapy.

9th week:

Lecture: Complx treatment of prostate cancers-

role of radiotherapy.

10th week:

Lecture: Side effect management in radiotherapy.

Requirements

The objective of the Radiation Therapy in Clinical Practice course is to familiarize the students with the physical and technical foundations of modern radiation therapy. The purpose of describing the technical background and operation of the equipment used in practice is to get acquainted with the background of the RT procedures used in daily clinical practice. The course also aims to familiarize students with the indications and application of modern radiation therapy in the complex oncological patient management. With reviewing the most common indications, disease types and treatment options, our goal is to present the most common application of radiation therapy.

Suggested reading:

Kásler M.: Az onkológia alapjai. 2. jav. bőv. kiad. Medicina, Budapest, 2018. ISBN 978-963-226-653-4

Németh György: Sugárterápia. Budapest, Springer, 2001.

Kovács, Árpád; Simon, Mihály: A PROTON TERÁPIA ALAPVETŐ FIZIKAI, TECHNIKAI ASPEKTUSAI ÉS ALKALMAZÁSA A SUGÁRTERÁPIÁBAN

Pécs, Magyarország: Pécsi Tudományegyetem Egészségtudományi Kar (PTE ETK) (2021), 26 p.ISBN: 9789634296577

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 behavioural rules in the Operating Theatre. Main principles of surgical hemostasis. Basic surgical techniques of laparotomies, intestinal anastomoses, management of splenic injury, resection of the spleen and cholecystectomy. Operative techniques of preparation and cannulation of the external jugular vein, arteriotomy and closure of arteries, conicotomy and tracheostomy.

2nd week:

Practical: Overviewing basic surgical techniques on models prior to the living operations.

3rd week:

Practical: Paramedian laparotomy, one layer end-to-end jejuno-jejunostomy. Preparation and cannulation of the external jugular vein.

4th week:

Practical: Paramedian laparotomy, spleen

stitches, resection of the spleen, cholecystectomy. Preparation and cannulation of the external jugular vein. Preparation, arteriotomy and suturing of the common carotid artery and femoral artery. Conicotomy and tracheostomy.

5th week:

Practical: Paramedian laparotomy, spleen

stitches, resection of the spleen, cholecystectomy. 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.

Exam: AW5

Compulsory readings:

Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine, 4th (enlarged) edition, Debrecen University Press, 2019.

Recommended reading:

McLatchie G.R., Leaper D.J.: Oxford Handbook of Operative Surgery, Oxford University Press, 1996.

Myint F.: Kirk's Basic Surgical Techniques, 7th edition, Elsevier Health Sciences, 2018.

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: Practising the use of laparoscopic instruments in open pelvi-trainer. Operating in

three-dimensional field viewing two-dimensional structure by video-imaging.

3rd week:

Practical: Intracorporeal knotting technique on surgical training model in open and closed pelvi-trainer.

4th week:

Practical: Preparation on chicken thigh bioprepate model and practising intracorporeal

knotting technique in open and closed pelvi-boxes and MATT (Minimal Access Therapy Technique) trainer.

5th week:

Practical: Cholecystectomy on isolated porcine liver-gallbladder bioprepate model and/or phantom model in closed pelvi-box and MATT trainer.

6th week:

Practical: Cholecystectomy on isolated porcine liver-gallbladder bioprepate model and/or phantom model in closed pelvi-box and MATT trainer.

Self Control Test

Requirements

Prerequisite: Basic Surgical Techniques, Surgical Operative Techniques, Surgery II.

Aim of the course: Students have to learn the laparoscopic equipment and instruments and to perform basic laparoscopic interventions working in open and closed pelvi-trainer, MATT (Minimal Access Therapy Technique) trainer on surgical training models, phantom models and bioprepate model.

Course description: History and basic principles of endoscopic surgery. The use laparoscopic equipment and instruments. Intracorporeal knotting technique in open and closed pelvi-trainer on phantom models and bioprepate models.

Cholecystectomy in closed pelvi-trainer and MATT-trainer on liver-gallbladder phantom model and bioprepate model.

Exam: AW5

Recommended Readings:

Cushieri A., Buess G., Périssat J.: Operative Manual of Endoscopic Surgery, Springer Verlag, 1992.
Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine, 4th (enlarged) edition, Debrecen University Press, 2019.

Subject: **BASIC MICROSURGICAL TRAINING. INTRODUCTION TO MICROSURGERY**

Year, Semester: 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th 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:

Practice1: 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:

Practice2: 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 practising the perception of depth.

4th week:

Practice3: Practising microsurgical suturing and knotting techniques by closing incisions made from different directions on rubber glove pieces.

vascular anastomosis on the femoral artery of a chicken thigh's bioprepate model. Presentation of the „Sun Lee Microsurgical Museum”

5th week:

Practice4: Arterial anastomosis: end-to-end

Requirements

Prerequisite: Basic Surgical Techniques, Surgical Operative Techniques (the course can be taken in parallel)

Aim of the course: To learn how to use microscope and microsurgical instruments and to perform different microsurgical interventions. Students learn how to use microscope and microsurgical instruments, suture materials and needles. Basic interventions under the microscope by different magnifications to make harmony between eyes and hands. Knotting technique on training pads and performing end-to-end vascular anastomosis on femoral artery bioprepate model (chicken thigh).

Exam: AW5

Compulsory reading:

New surgical techniques procedures. Microsurgery. In: Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine. 4th (enlarged) Edition. Debrecen University Press, 2019. pp. 188-192. ISBN: 978-963-490-118-1.

Recommended Readings:

Acland R.D.: Practice Manual for Microvascular Surgery, The C.V. Mosby Company (St. Lois Washington, D.C. Totonto) 1989. ISBN 0-8016-0006-5

Van Dongen J.J., Remie R., Rensema J.W., van Wunnik G.H.J.: Manual of Microsurgery on the Laboratory Rat, Part I., Elsevier, 1990., ISBN 0-444-81139-7

Subject: **BASIC NURSING SKILL PRACTICES**

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

Number of teaching hours:

Lecture: **4**

Practical: **10**

1st week:

Lecture: Overview lecture on the basic practical tasks in nursing

blood pressire measurement, blood glucose testing, basic wound care, bandaging, and dressing

2nd-6th week:

Practical: Hygienic hand disinfection, injection and blood sampling techniques, infusion set-up,

Requirements

Prerequisite: taking First Aid and reanimation in the same semester

Aim of the course: For the summer nursing practice, beyond the subject framework, the course provides extra practice opportunities for the basic and skill-level tasks of hygienic hand disinfection, injection and blood sampling techniques, infusion set-up, blood pressure testing, blood glucose measurement, and wound care. The practice-based course is designed to provide additional practice beyond the topics of the compulsory subjects, therefore it is based on the knowledge acquired within the subject framework. Groups of 5-6 participants rotate through various task stations to complete practices

Exam: AW5

Recommended Readings:

Forrest K., McKimm J., Edgar S.: Essential Simulation in Clinical Education. Wiley-Blackwell, 2023, ISBN 978-0-470-67116-0

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. Asclepius. 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.

and the Faculty of Medicine. Consultation.

Self Control Test**13th week:**

Lecture: History of the Hungarian Medical Education. History of the University of Debrecen

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)

Compulsory reading: Lecture slides in pdf and supplementary materials (e-Learning folder of the course)

Recommended Readings:

Porter R.: The Cambridge Illustrated History of Medicine. Cambridge University Press, 1996.

Magner L.N., Kim O.J.: A History of Medicine. 3rd edition, CRC press, 2017.

Jackson M.: A Global History of Medicine. Oxford University Press, 2018.

Subject: **PRINCIPLES AND MAIN ASPECTS OF ANIMAL EXPERIMENTS**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **20**

1st week:

Lecture: History of animal experiments. The role of animal experiments in biomedical research.

animals.

5th week:

Lecture: Microbiological standards. Hygiene levels and categories of animal facilities.

2nd week:

Lecture: Legal & ethical aspects, and authorization of animal experiments.

6th week:

Lecture: Construction of animal facilities. Care and handling of experimental/laboratory animals.

3rd week:

Lecture: Principles of the planning and implementation of animal experiments.

7th week:

Lecture: Comparative anatomy and physiology of experimental/laboratory animals used in biomedical research.

4th week:

Lecture: Genetic standardization of laboratory

8th week:

Lecture: Anesthesia of experimental/laboratory animals. Monitoring of the vital parameters.

9th week:

Lecture: Blood sampling techniques in animal experiments.

10th week:

Lecture: In vivo, ex vivo, in vitro techniques and models.

Self Control Test

Requirements

Aim of the course: Being familiar with the legal background, ethical aspects, principles and aspects of experimental design of animal experiments that are still essential in biomedical research, in accordance with Hungarian law and EU regulations, as well as the recommendations of the Federation of European Laboratory Animal Science Associations (FELASA).

Exam: AW5 (written final test)

Compulsory Reading:

Lecture slides in pdf and supplementary materials (e-Learning folder of the course)

Recommended reading:

van Zutphen L.F.M., Baumans V., Beynen A.C.: Principles of Laboratory Animal Science. Elsevier 2001.

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**

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.

13th week:

Lecture: Summary. Written test.

Self Control Test

Requirements

Prerequisite: Basic Surgical Techniques

Aim of the course: 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)

Compulsory Reading:

Lecture slides in pdf and supplementary materials (e-Learning folder of the course)

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

Compulsory reading: Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine, 4th (enlarged) edition University of Debrecen, 2019.

Recommended reading:

Brigden R.J.: Operating Theatre Technique (A Textbook for Nurses, Operating Department Assistants, Medical Students, Junior Medical Staff and Operating Theatre Designers). 5th edition. Churchill Livingstone, 1990.

Kirk R.M., Williamson R.C.N.: General Surgical Operations. 4th edition. Churchill Livingstone, 2000.

Furka I., Mikó I.: Műtéttani alapismeretek (DVD with 591 photos and 94 min. video), Debreceni Egyetemi Kiadó, 2015. évi javított kiadás

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: Practising 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 and knotting techniques on pig leg biomodels (video-demonstration).
Practical: Dry practice. Practising how to put on surgical gloves correctly (two methods!).
Practising different suturing techniques and

apodactylic technique on pig-leg biopreparate model in team work (simple interrupted stitch, Donati stitch, simple continuous suture, suture removal). Evaluation of the suture lines, discussion of pitfalls.

3rd week:

Lecture: Blood sampling and injection techniques. Different suturing and knotting techniques on pig-leg biomodels (video-demonstration).

Practical: Practising blood sampling and intravenous injection techniques on models and on upper limb phantom models. Individual evaluation of different techniques, discussion of pitfalls. Practising 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 practising 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

Compulsory Reading: Mikó I., Furka I.: Basic Surgical Techniques, Faculty of Medicine. 4th (enlarged) edition, Debrecen University Press, 2019.

Recommended Readings: Brigden R.J.: Operating Theatre Technique (A Textbook for Nurses, Operating Department Assistants, Medical Students, Junior Medical Staff and Operating Theatre Designers). 5th edition. Churchill Livingstone, 1990.

Kirk R.M., Williamson R.C.N.: General Surgical Operations. 4th edition. Churchill Livingstone, 2000.

Furka I., Mikó I.: Műtéttani alapismeretek (DVD with 591 photos and 94 min. video), Debreceni Egyetemi Kiadó, 2015. évi javított kiadás

Department of Ophthalmology

Subject: **REFRACTION, REFRACTIVE ERRORS, CORRECTIONS, REFRACTIVE SURGERY**

Year, Semester: 3rd year/1st semester, 3rd year/2nd 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 of all the 5 seminars is compulsory in person, not online. Missed seminars should be repeated by attending seminars on the next semester.

The knowledge of students is assessed on a five-grade scale (test). Registration to the course should be done on the Neptun system.

Department of Orthopedic Surgery and Traumatology

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. Osteochondritis dissecans.
2. Methods of ligament, bone and joint replacement. Use of metals and plastics in traumatology. Biological osteosynthesis.

10th week:

Lecture: 1. Fractures of the neck and head of radius. Olecranon fractures. Fractures of the forearm diaphysis. Monteggia and Galeazzi fractures.
2. Carpal instability, treatment of fractures of carpal bones. Tendon and nerve injuries of the hand. Treatment of severely injured hand.

Requirements

The lectures will take place in the Augusta 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 Orthopedic Surgery and Traumatology.

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 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.

Participation in seminars: before the end of the semester, select one case per topic from the case presentations given (6 in total) and write a short essay of 300 words on each given 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:

350

Hyperlipidaemias

3rd week:

Lecture: Diseases of the biliary tract and the pancreas

4th week:

Lecture: Pharmacotherapy of cardiac arrhythmias

5th week:

Lecture: Pharmacotherapy of hypertension

6th week:

Lecture: Myocardial infarction and unstable angina

7th week:

Lecture: Pharmacotherapy of ischaemic heart disease Angina pectoris, AMI

8th week:

Lecture: Pharmacotherapy of rheumatic diseases

9th week:

Lecture: Chronic obstructive airway disease

10th week:

Lecture: Cancer therapy

11th week:

Lecture: Test writing

Requirements

Pharmacology final exam.

DEPARTMENT OF PHYSICAL MEDICINE AND REHABILITATION

Subject: **PRINCIPLES OF PHYSICAL MEDICINE AND REHABILITATION**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Theory of medical rehabilitation. Functional assessments of people with disabilities. - Zoltán Jenei M.D., Ph.D
Basic principles of therapy approaches in medical rehabilitation, measuring the effects of rehabilitation. - Zoltán Jenei M.D., Ph.D

2nd week:

Lecture: Intervention, treatments and service delivery in rehabilitation (inpatient, outpatient and community-based services).
Special features of pediatric rehabilitation

3rd week:

Lecture: Autonomy and compliance. Quality of Life
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.
II. Musculoskeletal rehabilitation.

6th week:

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

7th week:

Lecture: Objective measurement in medical rehabilitation
Medical assistive devices - Zsófia Hőgye PT,

8th week:

Lecture: Occupational therapy in medical

rehabilitation

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

Informations 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).

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. 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. Dietary problem of people with disabilities

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.
- b) Communicational problems.
- c) Characteristics of rehabilitation care.

6th week:

Lecture: Parent of children with disabilities - perspective of the PRM doctor.
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.
UN, WHO perspectives - on overview the role international organizations in disability issue.

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 matters, 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 work in team on one project, and prepare one mutual report, thus they get the same score at the end of the program regardless their contribution. The Journal Club and Lab Visit programs are carried out individually.
7. Evaluation of the students is based on the written report or the oral presentation using five grade score system (1-5). Grades are final, no make-up is allowed.
8. The list of offered programs 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 $[Ca^{2+}]_i$

3rd week:

Lecture: $[Ca^{2+}]_i$ dependent excitatory processes in the surface membrane of cardiac cells.

4th week:

Lecture: The structure of the skeletal muscle. Ionic channels underlying the excitability of the skeletal muscle. Molecular structure of ionic channels.

5th week:

Lecture: Changes in surface membrane function in inherited skeletal muscle disorders: degenerative forms (muscle dystrophies). Changes in surface membrane function in inherited skeletal muscle disorders: alterations in the muscle tone (myotonies).

6th week:

Lecture: The role of the surface membrane in the regulation of calcium homeostasis in neurons. Pathological conditions arising from abnormal calcium handling in neurons.

7th week:

Lecture: Changes in the membrane properties of the neurons under pathological conditions. Pathological conditions arising from the hyperexcitability of neurons.

8th week:

Lecture: The role of TRP channels in the regulation of biological processes of human skin cells. TRP-pathies.

9th week:

Lecture: The role of the endocannabinoid system in the transmembrane signaling of skin-derived cells. Is the human skin always "high"?

Requirements

1. Signature of the semester

Lecture attendance may be followed up by the Department. The lecture will not be delivered if 5 or fewer students show up. Nevertheless, the lecture material is going to be asked in the final assessment.

For continuous updates on all education-related matters, please check the elearning.med.unideb.hu 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 Public Health and Epidemiology

Subject: **A HEALTHY FUTURE-HOW TO HELP FUTURE GENERATIONS LEAD HEALTHIER LIVES?**

Year, Semester: 3rd year/1st semester, 4th year/1st semester, 5th year/1st semester, 6th year/1st semester

Number of teaching hours:

Lecture: **6**

Seminar: **4**

Practical: **5**

3rd week:

Lecture: 1. Characteristics of adolescence
2. Adolescent's lifestyle factors, healthy growth, morbidity and mortality

4th week:

Seminar: Overview of school-age children's health behaviour and health status based on international surveys (HBSC and related websites)
Overview of school-aged children's risky behaviour based on international surveys (HBSC, ESPAD, GYTS and related websites)

5th week:

Lecture: Adolescents' sexuality and mental health
Determinants of health, health and risky behaviour in adolescence

6th week:

Lecture: International approaches to school health promotion (WSCC, HPS, SHE)
Designing of evidence-based health promotion

programme (IUHPE, COM-B model, behaviour change wheel)

7th week:

Seminar: Planning a school health promotion programme
Planning healthy lifestyle session in schools

10th week:

Practical: Students' reports on their planned healthy lifestyle session I.
Students' reports on their planned healthy lifestyle session II.
Students' reports on their planned healthy lifestyle session III.

11th week:

Practical: Students' reports on their planned healthy lifestyle session IV.
Students' reports on their planned healthy lifestyle session V.

Requirements

Aim of the course:

The students will learn about the characteristics of adolescence, the health and risk behaviours and their prevalence, the health promotion activities that can be carried out in this age group, and gain insight into international and national studies, programmes and projects related to adolescents.

After completing the course, students should be able to provide health education for school-age children, taking into account the specificities of the age group.

The course can be taken by the students in any field of medicine, as they will also gain useful information for their own children, but those interested in pediatrics, family medicine or school medicine are strongly encouraged to take the course.

ECTS credit: 1

Lecturer: Dr. Gabriella Nagy-Pénzes

Subject: **SOCIAL INEQUALITIES AND HEALTH**

Year, Semester: 2nd year/2nd semester, 3rd year/2nd semester, 4th year/2nd semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **12**

Practical: **3**

4th week:

Lecture: Lecture 1-2: Dimensions of inequality: socioeconomic position and deprivation

Lecturer: Dr. Nóra Kovács

5th week:

Lecture: Lecture 3-4: Dimensions of inequality: vulnerable populations

Lecturer: Dr. Nóra Kovács

6th week:

Lecture: Lecture 5-6: Dimensions of inequality: geography

Lecturer: Dr. László Pál

7th week:

Lecture: Lecture 7-8: Dimensions of inequalities: protected characteristics

Lecturer: Dr. Nóra Kovács

8th week:

Lecture: Lecture 9-10: Health inequalities driven by socio-economic position

Lecturer: Dr. Orsolya Varga

9th week:

Lecture: Lecture 11-12: Measuring social inequalities in health: simple and complex measures of inequality

Lecturer: Dr. Nóra Kovács

10th week:

Practical: Practice 1-3: Social inequalities in health over the life course by Dr. Nóra Kovács

Requirements

The aim of the course is for students to understand the different dimensions of inequality and how socio-economic context in which people live affects their health.

The course provides detailed information about the existence and extent of social and health-related inequalities, trends and cross-country comparisons. Students will be able to obtain knowledge on commonly used measure of inequality in health

Department of Pulmonology

Subject: **TAKE A DEEP BREATH! FROM MARATHON RUNNING TO COVID-19 ECMO- EVERYTHING YOU NEED TO KNOW ABOUT RESPIRATION**

Year, Semester: 3rd year/2nd semester, 4th year/2nd semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **28**

1st week:

Lecture: Lung health, public health aspects, prevention of respiratory diseases

2nd week:

Lecture: Childhood respiratory conditions

3rd week:

Lecture: Pulmonary physiology overview

4th week:

Lecture: Asthma: from allergic to severe forms

5th week:

Lecture: Chronic obstructive pulmonary disease

6th week:

Lecture: Chest imaging, bronchoscopy

7th week:

Lecture: Cystic fibrosis, bronchiectasis, bronchiolitis

8th week:

Lecture: Lung cancer, lung cancer screening

9th week:

Lecture: COVID-19, respiratory infections

10th week:

Lecture: Obstructive sleep apnea

11th week:

Lecture: Respiratory rehabilitation, multimorbidity, chronic care, hospice

12th week:

Lecture: Rare lung diseases

13th week:

Lecture: Invasive and non-invasive ventilation, intensive care, ECMO

14th week:

Lecture: Exam

Requirements

It is a bridge course between the mandatory courses of physiology and pulmonology and for more advanced students it is a review course to synthesise knowledge on pulmonology. We aim to provide not only a comprehensive overview, but also a translation research type of thinking and the recent scientific developments on the different fields related to the respiratory system. to inspire students.

Lecturers: Dr. Ildikó Horváth, Dr. Attila Vaskó, Dr. Angéla Mikáczó, Dr. Anna Sárközi, Dr. Attila Lieber, Dr. Attila Makai, Dr. Tamás Kardos, Dr. Tímea Durzák, Dr. Isaac Susil, Dr. Zsuzsanna Miklós

The student is obliged to attend the lectures. Maximum three lectures can be missed.

If a student is absent more than three times from the course in a semester, he/she will not get signature.

Min.: 5 students

Suggested reading: ERS Handbook: Respiratory Medicine

Department of Sports Medicine

Subject: **DIAGNOSIS AND CONSERVATIVE TREATMENT OF ACUTE AND OVERUSE SPORTS INJURIES**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **6**

Seminar: **3**

Practical: **6**

1st week:

Lecture: Sándor Szántó: Introduction, course objectives. Pathomechanism of acute and overuse sports injuries (1 hour lecture)

Practical: Zsuzsanna Gyurcsik: Possibilities of preventing acute and overuse sports injuries from the perspective of a physiotherapist. (1 hour practice)

2nd week:

Lecture: Sándor Szántó: Neck and lumbar injuries in athletes acute and overuse injuries, diagnosis and treatment (1 hour lecture)

Practical: Sándor Szántó: Physical examination of the spine in cases of acute and overuse sports injuries (1 hour practice)

3rd week:

Lecture: Sándor Szántó: Upper extremity: acute and overuse injuries in athletes, diagnosis and conservative treatment (1 hour lecture)

Practical: Sándor Szántó: Physical examination of the upper limb in case of acute and overuse injuries (1 hour practice)

4th week:

Lecture: Sándor Szántó: Lower extremity: acute

and overuse injuries in athletes, diagnosis and conservative treatment (1 hour lecture)

Practical: Sándor Szántó: Physical examination of the lower limb in case of acute and overuse injuries (1 hour practice)

5th week:

Lecture: Márton Oláh: Imaging procedures for acute and overuse sports injuries (1 hour lecture)

Practical: Márton Oláh: Ultrasound examination in case of acute and overuse sport injuries (1 hour practice)

6th week:

Lecture: Sándor Szántó: Physiotherapy procedure for acute and overuse sports injuries (1 hour lecture)

Tóbiás Módy: Return to play-musculoskeletal aspects (1 hour lecture)

7th week:

Seminar: Sándor Szántó: review of the most important knowledge (1 hour seminar)

Sándor Szántó: theoretical and practical exam, assessment of acquired skills (2 hours seminar)

Requirements

Aim of the course:

Acute and overuse injuries of athletes are very common not only among elite, but also among recreational athletes. Appropriate on-field physical examination of these injuries, subsequent diagnosis including imaging tests and conservative treatment are the basis for a quick and complete recovery and return to the play. The purpose of this course is to introduce the mechanism, physical and imaging examination of the musculoskeletal system, and non-surgical treatment of acute overuse sports injuries.

Lecturers: Prof. Dr. Szántó Sándor, Dr. Gyurcsik Zsuzsanna, Dr. Módy Tóbiás, Dr. Oláh Márton

Subject: **FUNDAMENTALS OF SPORTS MEDICINE**

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

Number of teaching hours:

Lecture: **12**

Seminar: **2**

Practical: **10**

1st week:

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

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

Sandor Szanto: Cardiopulmonary exercise testing (1 hour lecture, 1 hour practice)

2nd week:

Lecture: Laszlo Balogh: Cooperation between trainers and sport physicians, using of sport physician's findings in designing of trainings (1 hour lecture, 1 hour practice)

Nora Erdei: Fundamentals and examination techniques in sports cardiology (1 hour lecture, 1 hour practice)

3rd week:

Lecture: Sandor Szanto: Sudden cardiac death of athletes, possibilities for prevention, physiological and pathological ECG findings (1 hour lecture, 1 hour practice)

Zoltan Karacsonyi: Acute sport injuries and their treatments (1 hour lecture, 1 hour practice)

4th week:

Lecture: Kata Gulyas: Sport illnesses and their treatments (1 hour lecture, 1 hour practice)

Daniel Takacs: Prevention of sport injuries, functional testing of musculoskeletal system, treatment of sport injuries from the aspect of physical therapist (1 hour lecture, 1 hour practice)

5th week:

Lecture: Zsuzsa Gyurcsik: Rehabilitation in musculoskeletal diseases, physical exercises, choices of physical therapy (1 hour lecture, 1 hour practice)

Emilia Zsanda: Fundamentals of nutrition of athletes, fluid supplementation and food supplements (1 hour lecture, 1 hour practice)

6th week:

Lecture: Robert Orosz: Sports psychology, relationship between poise of mind and physical capacity (1 hour lecture, 1 hour practice)

Sandor Szanto: Consultation and exam (2 hours)

Subject: **FUNDAMENTALS OF SPORTS MEDICINE II.**

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

Number of teaching hours:

Lecture: **11**

Seminar: **3**

Practical: **10**

Subject: FUNDAMENTALS OF SPORTS MEDICINE, PREVENTION, AND REHABILITATION IN MUSCULOSKELETAL SYSTEM

Year, Semester: 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **16**

Practical: **8**

1st week:

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

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

Sandor Szanto: Pathomechanism of overuse injuries. Acute sport injuries and their treatments (2 hours lecture)

2nd week:

Lecture: Zsuzsanna Gyurcsik: Prevention of overuse injuries. Prevention of sport injuries, functional testing of musculoskeletal system, treatment of sport injuries from the aspect of physical therapist (2 hours lecture)

Zsuzsanna Gyurcsik: Rehabilitation in musculoskeletal diseases, physical exercises, choices of physical therapy (1 hour lecture, 1 hour practice)

3rd week:

Lecture: Sandor Szanto: Athletes' neck and low back pain, diagnosis and management (2 hours lecture)

Zsuzsanna Gyurcsik: Prevention and treatment of cervical and low back pain (1 hour lecture, 1

hour practice)

4th week:

Lecture: Sandor Szanto: Overuse injuries of upper extremity, functional tests (1 hour lecture, 1 hour practice)

Zsuzsanna Gyurcsik: Humeroscapular dyskinesis, management of overuse injuries of shoulder (1 hour lecture, 1 hour practice)

5th week:

Lecture: Sandor Szanto: Overuse injuries of lower extremity, functional tests (1 hour lecture, 1 hour practice)

Zsuzsanna Gyurcsik: Prevention and treatment possibilities in overuse injuries of lower extremity (1 hour lecture, 1 hour practice)

6th week:

Lecture: Márton Oláh: Imaging techniques in overuse sports injuries (1 óra lecture, 1 hour practice)

Sandor Szanto: Consultation and exam (1 hour lecture, 1 hour practice)

Requirements

There is an increasing need for sports medicine, including regular controls of athletes by specialists, testing and optimizing of their performance, prevention, treatment and rehabilitation of their injuries, follow-up their co-morbidities. This course intends to present fundamentals of sports medicine for students during lectures and practices. So students can get knowledge about theoretical and practical aspects of mechanism, prevention and treatment of acute and overuse sport injuries. Beyond the theoretical knowledges we intend to improve practical skills of students in physical examination and non-pharmacological treatment of these injuries.

Credit points: 2

Prerequisites: Traumatology, Rheumatology-Immunology, Orthopedics

Exam: AW5, written

Lecturers: Sándor Szántó, János Magyar, Márton Oláh, Zsuzsanna Gyurcsik

Coordinator: Dr. Sándor Szántó
Min. 5, max. 20 students

Subject: **PREVENTION AND REHABILITATION OF ACUTE AND OVERUSE SPORT INJURIES**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Lecture: **9**

Practical: **6**

1st week:

Lecture: Sándor Szántó: Introduction, course objectives. Pathomechanism of acute and overuse sports injuries (1 hour lecture)

Zsuzsanna Gyurcsik: Possibilities for the prevention of sports injuries from the point of view of the physiotherapist, general concepts of treatment (1 hour lecture)

2nd week:

Lecture: Gyurcsik Zsuzsanna: Importance of the functional movement screen. (2 hours lecture)

Practical: Gyurcsik Zsuzsanna: Importance of the functional movement screen. (1 hours practice)

3rd week:

Lecture: Gyurcsik Zsuzsanna: Aspects of movement therapy based on tissue diagnosis. Treatment principles of tendinopathies (1 hour lecture)

Practical: Gyurcsik Zsuzsanna: Aspects of movement therapy based on tissue diagnosis. Treatment principles of tendinopathies (1 hour practice)

4th week:

Lecture: Gyurcsik Zsuzsanna: Acute and overuse sports injuries of the upper limb, different dysfunctions, evidence based exercise program. (1 hour lecture)

Practical: Gyurcsik Zsuzsanna: Acute and overuse sports injuries of the upper limb,

different dysfunctions, evidence based exercise program. (1 hour practice)

5th week:

Lecture: Gyurcsik Zsuzsanna: Acute and overuse sports injuries of the lower limb, different dysfunctions, evidence based exercise program. (1 hour lecture)

Practical: Gyurcsik Zsuzsanna: Acute and overuse sports injuries of the lower limb, different dysfunctions, evidence based exercise program. (1 hour practice)

6th week:

Lecture: Gyurcsik Zsuzsanna: Spine dysfunctions, core stabilization, integration of movements of the spine and limbs. (1 hour lecture)

Practical: Gyurcsik Zsuzsanna: Spine dysfunctions, core stabilization, integration of movements of the spine and limbs. (1 hour practice)

7th week:

Lecture: Gyurcsik Zsuzsanna: Importance of physiotherapy in sport prevention and rehabilitation. (1 hour lecture)

Practical: Gyurcsik Zsuzsanna: Importance of physiotherapy in sport prevention and rehabilitation. (1 hour practice)

Requirements

Aim of the course:

Acute and overuse injuries of athletes are very common not only among elite, but also among recreational athletes. A quick on-field physical examination of these injuries, subsequent diagnosis including imaging tests and conservative treatment are the basis for a quick and complete recovery and return back to sport. The purpose of this course is to introduce and practice the prevention strategy and overuse injuries, as well as update evidence-based treatment methods. In addition to medical care, early physiotherapy and physical therapy, which is a condition for returning to sports, is of particular importance.

Lecturers: Prof. Dr. Szántó Sándor, Dr. Gyurcsik Zsuzsanna

Department of Surgery

Subject: **TRANSPLANTATION OF THE ABDOMINAL ORGANS**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Lecture: **12**

Practical: **4**

Department of 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:

Drabik, Gyula MD, assistant lecturer

Murányi, Mihály MD, clinical specialist

Dániel Varga MD, assistant lecturer

(Coordinator: Drabik, Gyula MD, drabik.gyula@med.unideb.hu)

Aims of the Course

The incidence of infertility 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. If the student has at least 6 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 (Daniel Varga)

2nd week: Sexual dysfunctions (background, diagnosis) (Gyula Drabik)

3rd week: Sexual dysfunctions (treatment), male contraception (Gyula Drabik)

4th week: Role of the hormones in the male reproductive tract (Gyula Drabik)

5th week: Causes of male infertility, environmental exposure (Gyula Drabik)

6th week: Ageing male, late onset hypogonadism (Daniel Varga)

7th week: Sperm analysis, assisted reproduction (Daniel Varga)

8th week: Surgery of the penis and urethra, effect of radical procedures on sexual function I. – Peyronie disease, penile implant, urethral stricture (Mihály Murányi)

9th week: Surgery of the penis and urethra, effect of radical procedures on sexual function II. – Penile cancer, sclerosing lipogranuloma of the penis (Mihály Murányi)

10th week: Microsurgical andrological procedures, closing test (Gyula Drabik)

Suggested reading: European Association of Urology: Guidelines on Male Infertility, Guidelines on Males Sexual Dysfunction (www.uroweb.org).

Closing test: multiple choice questions, MC

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 of 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.

Reading materials:

Greg Perry: Microsoft Office.

2007. ISBN: 9789-6396-3737-5.

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 starts 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 grade 5 (excellent) 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 guidebooks 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 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 grade 5 (excellent) 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 who have 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: **28**

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

From cell biology to preclinical models: CDKs as drug targets

4th week:

Lecture: 4: GFP and friends-the molecule that drewt the Nobel Prize in Chemistry

5th week:

Lecture: 5: Apple of my eye: the corneal stem cell niche and methods for its restitution in limbal stem cell deficiency disease

6th week:

Lecture: Something only your mother can give you: the mitochondrion

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: Epigenetics at the doorstep of Cell Biology

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

Neptun code: AOG157403-K1, ECTS: 2 credit points

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 polymorphism and their laboratory diagnostics. Rare thrombophilias.

4th week:

Lecture: Hereditary thrombophilias in the clinical practice. Obstetric and gynecologic aspects of hereditary thrombophilias.

5th week:

Lecture: Laboratory diagnostics of antiphospholipid 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: **ENZYMOLGY IN LABORATORY MEDICINE AND IN CLINICAL PRACTICE**

Year, Semester: 2nd year/2nd semester, 3rd year/2nd semester

Number of teaching hours:

Lecture: **14**

1st week:

Lecture: Characteristics of enzyme function, conditions (effect of pH, temperature), classification of enzymes (Enzyme Commission, E.C.)

2nd week:

Lecture: The most important definitions of enzyme kinetics. Michaelis Menten model, interpretation and definition of K_M , and V_{MAX} .

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,

Pancreatic 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: **HAEMOSTASIS JOURNAL CLUB**

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

Number of teaching hours:

Seminar: **14**

During the 7 weeks, research articles will be presented and analysed.

Requirements

Aim of the course:

The course aims to interpret and present selected journal articles on the topic of haemostasis, and to improve the ability of students to answer questions related to the topic. During the course, students will receive help on how to compose a scientific presentation. By completing the course, the students will acquire skills on how to give scientific presentations and how to answer questions related to the topic of discussion.

Entrance conditions: min. 5 - max. 15 students.

Clinical biochemistry II. is a prerequisite.

Coordinator of the course: Dr. Bagoly Zsuzsa

Lecturers: Dr. Bagoly Zsuzsa and co-workers

Suggested reading:

Hemostasis and Thrombosis: Basic Principles and Clinical Practice by Victor J. Marder MD (Editor), William C. Aird MD (Editor), Joel S. Bennett MD (Editor), Sam Schulman MD (Editor), Gilbert C. White II MD (Editor)

CHAPTER 20

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: AW5

Division of Clinical Physiology

Subject: **ASSERTIVE COMMUNICATION, COMMUNICATION STYLES, GROUP DYNAMICS**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Seminar: **14**

Practical: **14**

Requirements

During the course, we review the theories and practical aspects of communication, including the latest research findings and research methods. Students gain specialized communication skills that provide insight into the basics and challenges of communication.

Through the course, students gain hands-on experience and thus gain competencies that they can use in their own professional careers. The training contributes to the development of effective communication in the workplace, research and science, the development of existing skills and the effective communication of situations that require an assertive attitude.

Credit points: 2

Exam: AW5, oral exam/written exam/test/project work

Grades are given for a paper based on a pre-arranged topic provided the student has participated in

the course occasions

Lecturers: Dr. Tünde Éva Polonyi

Coordinator: Dr. László Bálint Bálint

Min. 7, max. 20 students

Program:

Introduction to the theory and practice of communication

Overview of communication processes

Verbal and nonverbal communication, metacommunication

Models of communication

Communication styles 1. - passive, aggressive

Communication styles 2. - manipulative, assertive

Assertive communication

Effective communication within a workgroup

Intercultural communication

Digital communication

Group dynamics

Styles and types of conflict management

Disruptions of communication and their resolution 1

Disruptions of communication and their resolution 2.

Subject: **BIOMEDICAL RESEARCH DATA MANAGEMENT AND PUBLICATION BASICS**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Seminar: **14**

Practical: **14**

Requirements

The aim of the course is to prepare medical students entering the field of research for the challenges of research data management and publication. The aim is for the student to be informed about good practices in data management, to be able to prevent data loss and to easily navigate data generated by themselves or published by others. Be able to organise large amounts of research data, extract new information, manage references and notes and publish results.

Credit points: 2

Exam: AW5, project work

Lecturer: Dr. László Bálint Bálint

Coordinator: Dr. László Bálint Bálint

Min. 7, max. 20 students

Program:

The research life cycle: from idea to publication.

The rationale for data management.

The challenges of scientific reproducibility

Data definitions

Metadata and their significance

Data, information, knowledge

Data storage frameworks
Data management tasks within a research team
Reference management software
Annotation techniques
Structure of publications
Orcid, DOI
File nomenclature
Folder structures, Readme files, Data registries
Spreadsheet management for large data sets
File formats for long-term data security
Data loss prevention
Data sharing basics
Data registries
Anonymisation
Repositories
Preparing a data management plan

Subject: **DEVELOPING PRESENTATION AND ORAL PRESENTATION SKILLS**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Practical: **28**

1st week:

Practical: Introduction, orientation

2nd week:

Practical: Introductory presentation exercises

3rd week:

Practical: Practical tips for presentations (preparation, body language, handling unexpected situations, time management, etc.)

4th week:

Practical: Short presentation exercises (e.g. elevator pitch exercise)

5th week:

Practical: Using presentation software

6th week:

Practical: Preparation for individual presentations (work organisation, setting up a framework, expectations, etc.)

7th week:

Practical: Student presentations

8th week:

Practical: Student presentations

9th week:

Practical: Group evaluation of presentations and feedback

10th week:

Practical: The art of debate: introduction

11th week:

Practical: Preparation for group discussions

12th week:

Practical: Group discussions

13th week:

Practical: Group discussions

14th week:

Practical: Evaluation, closure

Requirements

The aim of the course is to develop the presentation and oral presentation skills of the participating students. Completion of the course will contribute to students' ability to communicate and present effectively and professionally in formal and informal situations, and practical sessions will develop students' rhetorical, argumentation and presentation skills through a variety of tasks and situations, while also developing other skills (e.g. critical thinking, collaboration, etc.). The course is practice-oriented, so in addition to short theoretical lectures, students will have the opportunity to improve their presentation skills in a variety of situations and settings throughout the semester.

Credit points: 2

Exam: AW5, project work

Lecturer: Dr. Balázs Venkovits

Coordinator: Dr. László Bálint Bálint

Min. 3, max. 20 students

Subject: **INTRODUCTION TO R**

Year, Semester: 3rd year/1st semester, 3rd year/2nd semester, 4th year/1st semester, 4th year/2nd semester, 5th year/1st semester, 5th year/2nd semester

Number of teaching hours:

Practical: **30**

1st week:

Practical: Information. R environment overview. Basic ways of using R.

2nd week:

Practical: Using RStudio. Run script files. Primitive data structures

3rd week:

Practical: Complex data structures (vector, matrix, list, data frame, factor).

4th week:

Practical: Indexing, filtering, and sorting data structures.

5th week:

Practical: Basics of RMarkdown, the concept of repeatable research.

6th week:

Practical: Read and write data files.

7th week:

Practical: Simple type conversion and transformation.

8th week:

Practical: Descriptive statistics and tables.

9th week:

Practical: Create and save graphics.

10th week:

Practical: Recap. Presentation and evaluation of homework. Discussing an exam task.

11th week:

Practical: Recap. Presentation and evaluation of homework. Discussing an exam task.

12th week:

Practical: Recap. Presentation and evaluation of homework. Discussing an exam task.

13th week:

Practical: Assess and discuss the exam task.

14th week:

Practical: Assess and discuss the exam task.

Requirements

- Basic skills in using the R statistical software package
- Data management, transformation of variables, statistical measurements, frequency tables and figures
- independent organization and implementation of a data processing workflow

Credit points: 2

Exam: AW5 (homework 40%, project work 60%)

Min. 3, max. 15 students

Lecturers: Dr. László Bálint Bálint, Dr. Kálmán Abari

Coordinator: Dr. László Bálint Bálint

Min. 3, max. 15 students

Division of Metabolism

Subject: **HOLISTIC & INTEGRATIVE MEDICINE**

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

Number of teaching hours:

Lecture: **38**

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 analyse 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.

Subject: **METABOLIC IMAGING (PET/CT) IN ONCOLOGY**

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

Number of teaching hours:

Lecture: **6**

Practical: **18**

1st week:

Lecture: Introduction in PET/CT imaging

Practical: Normal distribution/pathological findings, Pitfalls

2nd week:

Lecture: Lymphoma

Practical: Lymphoma case studies

3rd week:

Lecture: Lung cancer

Practical: Pathological findings on PETZ/CT in the lung

4th week:

Lecture: Tumours in gastrointestinal tract

Practical: GI case studies

5th week:

Lecture: Gynecological cancers and breast tumour

Practical: Case studies in gynecology and in breast cancer

6th week:

Lecture: PET/CT in oncology beyond FDG

Practical: Other malignancy: melanoma,

prostate cancer, brain tumours

7th week:

Lecture: Lymphoma

Practical: Lymphoma case studies

8th week:

Lecture: Lung cancer

Practical: Pathological findings on PET/CT in the lung

9th week:

Lecture: Tumors in gastrointestinal tract

Practical: GI case studies

10th week:

Lecture: Gynecological cancers and breast tumor

Practical: Case studies in gynecology and breast cancer

11th week:

Lecture: PET/CT in oncology beyond FDG

Practical: Other malignancy: melanoma, prostate cancer, brain tumors

Requirements

PET/CT has essential role in oncological imaging not only in diagnosis and staging, but to follow the patient during the whole oncological management.

Students will appreciate the clinical impact of FDG PET/CT through the case studies.

They will recognise the normal and pathological images, understand the background of pathological findings.

They come to an appropriate conclusion about how the findings will influence the therapeutic decision.

The topics will emphasize the understanding and practical application of the International

Guidelines.

During the lecture a brief summary of theoretical knowledge about the weekly topic will be provided. Then in practical parts of the course real clinical case-studies will be presented and students working in groups will analyse studies with experts (computer work)

Exam: case reporting: student will recognise pathological findings on a PET/CT case study and come to an appropriate conclusion how the result will influence patients' therapy

Evaluation of the exam: 5 grade (practical) /AW5

Subject: **PRECLINICAL IMAGING IN ONCOLOGICAL RESEARCH**

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

Number of teaching hours:

Seminars: 28

1st week: Introduction: The structure and the operation of a preclinical imaging laboratory, the significance of preclinical examinations, translational medicine, experimental design

2nd week:

Types of preclinical examinations I.: *in silico* and *in vitro* investigations with radiopharmaceuticals

3rd week: Types of preclinical examinations II: *Ex vivo* investigations with radiopharmaceuticals

4th week:

Types of preclinical examinations I.: *In vivo* investigations with radiopharmaceuticals, „3R” strategy

5th week:

PET radiopharmaceuticals in preclinical imaging

6th week: SPECT radiopharmaceuticals used in preclinical imaging

7th week:

Animal protection laws, animal husbandry legislation

8th week: Animal models of oncological diseases

9th week: Examination of animal models of oncological diseases with radiopharmaceuticals

10th week: Investigation of tumor-associated neo-angiogenesis and hypoxia with radiopharmaceuticals I.

11th week: Investigation of tumor-associated neo-angiogenesis and hypoxia with radiopharmaceuticals II.

12th week: Conclusion, Consultation

Requirements

The aim of the course:

The purpose of the course is to familiarize students with the diagnostic possibilities granted by the non-invasive nuclear medical imaging techniques in the field of preclinical research (positron emission tomography/PET, single-photon emission computed tomography/SPECT). This course also aims at providing information on the structure, operation and the regulations of the preclinical imaging laboratory. In addition, the students could gain insight into the design and the accomplishment of different types of preclinical investigations (*in vitro*, *in vivo*, *ex vivo*) that are of crucial importance in oncological research. Moreover, they can gain comprehensive knowledge on the development of preclinical tumor models applied in oncological experiments.

Credit points: 2

Exam: AW5

Coordinator: Dr. Képes Zita, kepes.zita@med.unideb.hu

Lecturers: Dr. Képes Zita, Dr. Trencsényi György
Prerequisite to take the subject: Nuclear medicine

Division of Radiology and Imaging Science

Subject: **CLINICO-RADIOLOGICAL CASE REPORTS**

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

Number of teaching hours:

Seminar: **24**

Requirements

The aim of the course is to present clinical cases for students from a clinico-radiological point of view. Collected case reports are presented on an interactive way on the university education eRad PACS system, supported by online peer reviewed case repositories. Students will become familiar with clinical PACS systems and will be able to detect basic pathologies on medical images.

Credit points: 1

Exam: AW5

Coordinator: Ervin Berényi M.D., Ph.D.

Subject: **FUNDAMENTALS OF CHEST RADIOGRAPHY**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Seminar: **18**

Subject: **MAGNETIC RESONANCE IMAGING: FROM BASICS TO PRACTICE**

Year, Semester: 4th year/2nd semester

Number of teaching hours:

Seminar: **24**

Subject: **MEDICAL IMAGING**

Year, Semester: 3rd year/2nd semester

Number of teaching hours:

Lecture: **16**

1st week:

Lecture: Planar X ray imaging

2nd week:

Lecture: CT imaging

3rd week:

Lecture: PET imaging

4th week:

Lecture: SPECT imaging

5th week:

Lecture: Magnetic resonance imaging I.

6th week:

Lecture: Magnetic resonance imaging II.

7th week:

Lecture: Ultrasound imaging

Requirements

The aim of the course is to teach students the basis of how the different medical imaging modalities work with respect to clinical application. With the knowledge that they acquired throughout the first two years of medical school, students will learn, before studying radiology, how this key diagnostic course many fit among the clinical subjects.

One absence is allowed.

Final test: written

Faculty of Medicine

Subject: **FREELY CHOSEN BLOCK PRACTICE**

Year, Semester: 4th year/1st semester

Number of teaching hours:

Practical: **30**

Subject: **THESIS I.**

Year, Semester: 5th year/1st semester

Number of teaching hours:

Subject: **THESIS II.**

Year, Semester: 5th year/2nd semester

Number of teaching hours:

Subject: **THESIS III.**

Year, Semester: 6th year/1st semester

Number of teaching hours:

Subject: **THESIS IV.**

Year, Semester: 6th year/2nd semester

Number of teaching hours:

CHAPTER 21

TITLES OF THESES

Department of Anatomy, Histology and Embryology

1. Title: Possible applications of morphofunctional matrices for classification of neurons (computer modelling)
Tutor: Ervin Wolf M.Sc., Ph.D.
2. Title: Correlation analysis of functional brain maps
3. Title: Investigation of contour integration processing in the primary visual cortex using voltage sensitive dye imaging
Tutor: Zoltán Kisvárdy M.Sc., Ph.D., D.Sc.
4. Title: Investigation of signalling mechanisms that regulate cartilage development and maturation
Tutor: Róza Zákány M.D., Ph.D.
5. Title: Interrogation of spinal dorsal horn circuits with electrophysiological and optogenetic tools
6. Title: Light- and electron microscopy level analysis of the axons and axon collaterals of spinal lamina I projection neurons
7. Title: Local synaptic connections of projection neurons in spinal lamina I
8. Title: Morphometric analysis of excitatory and inhibitory interneurons in the spinal dorsal horn
Tutor: Péter Szücs M.D., Ph.D.
9. Title: Extracellular matrix in the developing brainstem
Tutor: Ildikó Wéber M.Sc., Ph.D.
10. Title: Matrix metalloproteases in vestibular lesion
Tutor: Botond Gaál M.Sc., Ph.D.
11. Title: Investigation of neuronal network development in the spinal cord
Tutor: Zoltán Mészár M.Sc., Ph.D.
12. Title: The role of the molecular clock in healthy and osteoarthritic chondrocytes
Tutor: Csaba Matta M.Sc., Ph.D.
13. Title: Role of PACAP signalling in cartilage differentiation and regeneration
Tutor: Tamás Juhász M.Sc., Ph.D.
14. Title: Distribution of the extracellular matrix in the red nucleus and parabrachial area
Tutor: Éva Rácz M.Sc., Ph.D.
15. Title: The endocannabinoid-mediated

modulation of spinal nociception

16. Title: The role of astrocytes in spinal pain processing

Tutor: Zoltán Hegyi M.Sc., Ph.D.

17. Title: Quantitative morphological studies of primary afferent-motoneuron connections in the frog's brainstem

Tutor: András Birinyi M.Sc., Ph.D.

18. Title: Role of pro-inflammatory cytokines in neuron-glia interaction during inflammatory pain states

Tutor: Krisztina Holló M.Sc., Ph.D.

19. Title: Mapping of synapses on dendrites of GABAergic neuron subtypes in the cerebral cortex

Tutor: Petra Talapka Ph.D.

Department of Biochemistry and Molecular Biology

1. Title: The role of tissue transglutaminase in the differentiation of leukocytes

2. Title: Characterization of the nuclear tissue transglutaminase

3. Title: The effect of tissue transglutaminase-deficient states on the metabolism of differentiating and terminally differentiated NB4 neutrophil granulocytes

Tutor: Zoltán Balajthy M.Sc., Ph.D.

4. Title: Bioinformatic meta-analysis of ChIP-seq and ChIA-PET datasets to understand the regulation of transcriptional units

5. Title: Assembly and analysis of the reference genome for the diploid domestic rabbit using PacBio and 10X Chromium sequencing data
Tutor: Endre Barta M.Sc., Ph.D.

6. The analysis of the inflammatory response and the regulation of gene expression in tissue resident and bone marrow-derived macrophages.

Tutor: Pál Krisztián Bene M.Sc., Ph.D.

7. Title: Proteomic analyses in diabetes

8. Title: System biology approaches to diabetes

9. Title: Analysis of protein interaction networks

10. Title: Metabolomic analysis of saliva

Tutor: Éva Csősz M.Sc., Ph.D., D.Sc.

11. Title: Determining the activation and the browning potential from human adipose tissue

biopsies

Tutor: László Fésüs M.D., Ph.D., D.Sc.,
M.H.A.Sc.

12. Anti-inflammatory effects of arsenic-trioxide (As₂O₃) on differentiated acute promyelocytic leukemia (APL) cells

Tutor: Károly Jambrovics M.Sc., Ph.D.

13. Title: Metabolomic analyses in diabetes

14. Title: Analysis of hemoglobin forms in pathologic states

Tutor: Gergő Kalló M.Sc., Ph.D.

15. Title: The effect of coeliac disease patient-derived auto-antibodies on transglutaminase 2 activity and interactome.

16. Title: Translational research focusing on the structure-function relationship of transglutaminases

Tutor: Róbert Király M.Sc., Ph.D.

17. Title: Involvement of impaired apoptotic cell clearance in the development of insulin resistance

Tutor: Krisztina Köröskényi M.Sc., Ph.D.

18. Title: Novel molecular hubs of the browning program in different types of adipose tissue

Tutor: Endre Kristóf M.D., Ph.D.

19. Title: Exploring the role of cell surface receptors in mediating viral infection

Tutor: Mohamed Faisal Mahdi M.D., Ph.D.

20. Title: Human enzymes being similar to those of retroviruses (e.g. HIV virus): enzymatic studies on human proteolytic enzymes

21. Title: Biochemical characterization of the human homologs of retroviral capsid proteins

Tutor: János Mótyán M.Sc., Ph.D.

22. Title: Analysis of the regulatory elements of the macrophage genome using next generation sequencing data

Tutor: Gergely Nagy M.Sc., Ph.D.

23. Title: The role of the BACH1 transcription factor in macrophages and tissue homeostasis

Tutor: László Nagy M.D., Ph.D., M.H.A.Sc.

24. Title: Role of adenosine receptors in the skeletal muscle regeneration

25. Title: Phagocytosis and/or myoblast fusion

Tutor: Zsolt Sarang M.Sc., Ph.D.

26. Title: Characterization of the genetic risk factors for chronic pancreatitis

Tutor: András Szabó M.Sc., Ph.D.

27. Title: Differentiation of dendritic cells and

macrophages from embryonic stem cells

28. Title: Transcriptional programming of dendritic cells

29. Title: Transcriptional programming of embryonic stem cell-derived myeloid cells

Tutor: István Szatmári M.Sc., Ph.D.

30. Title: Potential role of GDF-3 cytokine in the thymus

31. Title: Skeletal muscle regeneration in the absence of the GDF-3 cytokine

Tutor: Zsuzsa Szondy M.D., Ph.D., D.Sc.

32. Title: Inflammatory mediator response to rexinoids in breast epithelial cells

33. Title: Bromodomain-containing chromatin-associated factors as chemopreventive targets

Tutor: Iván Uray M.D., Ph.D.

Department of Biophysics and Cell Biology

1. Title: Interference of of chelidonine with STAT3 signaling in human T lymphoma cells

Tutor: Andrea Dóczy-Bodnár

2. Title: Pharmacology of ion channels.

Tutor: Ferenc Papp

3. Title: Investigation of direct ligand-like effects of cyclodextrins on KV7.4 ion channel

Tutor: Florina Zákány

4. Title: Studying the inactivation of voltage gated potassium ion channels in heterologous expression systems.

Tutor: György Panyi

5. Title: Studying nuclear receptor function by modern microscopy techniques

Tutor: György Vámosi

6. Title: Intracrine signaling by membrane receptors

Tutor: György Vámosi

7. Title: Characterizing the corneal limbal stem cell niche and organoids produced for its regeneration.

Tutor: György Vereb

8. Title: Measuring molecular interactions for histopathological diagnosis

Tutor: György Vereb

9. Title: Optimizing CAR (chimeric antigen receptor) - transduced immune cells for tumor therapy

Tutor: György Vereb

10. Title: Elucidation of the catalytic mechanism

of ABC transporters

Tutor: Katalin Goda

11. Title: Study of ion channels pharmacology with animal venoms

Tutor: Péter Hajdu

12. Title: Role of T cell ion channels in tumor cell elimination

Tutor: Péter Hajdu

13. Title: Quantitative investigation of the associations of ErbB proteins using biophysical and molecular biological methods

Tutor: Péter Nagy

14. Title: How do cell penetrating peptides cross the cell membrane?

Tutor: Péter Nagy

15. Title: Examination of the membrane dipole potential in hypercholesterolemic mice

Tutor: Tamás Kovács

16. Title: Cytometry of cytotoxic lymphocytes

Tutor: Zsolt Bacsó

17. Title: Physiological roles of the multidrug resistance transporter P-glycoprotein.

Tutor: Zsolt Bacsó

18. Title: Functional characterization of de novo ion channel mutations in epilepsy

Tutor: Tibor G. Szántó

19. Title: Investigation of the inhibitory mechanism of NaV channels by 5-chloro-2-benzimidazole (CIGBI)

Tutor: Tibor G. Szántó

20. Title: Pharmacological studies on KV1.3 ion channel.

Tutor: Tibor G. Szántó

21. Title: Studying the interdomain communication in ABCG2

Tutor: Katalin Goda

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 hypothermia in neuroprotection

Tutor: Csilla Molnár M.D., Ph.D.

4. Title: Clinical studies in the field of neuromuscular block and its reversal

Tutor: Adrienn Pongrácz M.D., Ph.D.

Department of Behavioural Sciences

1. Title: Medicalization

Tutor: Sándor Kőműves M.A., Ph.D.

2. Title: Bioethical and biopolitical challenges of modern health care (Faculty of Medicine)

3. 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.

4. Title: Biopolitical and bioethical approaches to modern health problems

5. Title: Ethical issues of science and technology

6. Title: Gender issues in biopolitics and bioethics

7. Title: Questions of modern environmental ethics

Tutor: Szabina Péter Ph.D.

8. Title: Medical communication, patient satisfaction

9. Title: Psychological aspects of somatic diseases

Tutor: Eszter Tisljár-Szabó M.A. Ph.D.

Division of Cardiac Surgery

1. Title: Literature review of the intracardiac tumors

Tutor: Ákos Attila Berczi M.D.

2. Title: The off-label use of the sutureless biological aortic valve prosthesis

Tutor: Péter Csizmadia M.D.

3. Non-occlusive mesenteric ischaemia after cardiac surgery-review of the literature

Tutor: Tamás Debreceni M.D.

4. Title: Mid-term results of transcatheter aortic valve implantations - review of the literature

Tutor: Tamás Maros M.D.

5. Title: Sutureless aortic valve implantation - review of the literature

Tutor: Lehel Palotás M.D.

6. Title: Results of operations of aorta aneurysms-overview of the literature

Tutor: Tamás Szeráfin M.D., Ph.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. habil.

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)

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 M.Sc. 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. Impact of COVID-19 pandemic on stroke and AMI frequency in Hungary 5. Impact of COVID-19 pandemic on pregnancy outcomes

Tutor: Ferenc Vincze M.Sc., Ph.D.

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., Ph.D.

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 Péntes M.Sc., Ph.D.

12. Title: 1. The public health aspects mental disorders 2. Screening and treatment methods of hazardous and harmful patterns of alcohol consumption 3. Suicide prevention strategies 4. The public health aspects of childhood mental disorders

Tutor: Judit Diószegi, M.D., Ph.D.

13. Title: 1. Exposure to volatile organic compounds in healthcare settings

Tutor: Szabolcs Lovas, MSc., PhD

14. Title: 1. The problem of therapy resistance in cancer

Tutor: István Szász, MSc., Ph.D.

15. Title: 1. Genetic alteration and gene expression modulation during cancer progression

Tutor: Viktória Koroknai, MSc., Ph.D.

Division of Cardiology

1. Title: Less invasive measurement of coronary macro- and microvascular function

Tutor: Zsolt Kőszegi M.D., Ph.D.

2. Title: The importance of hydrostatic pressure during invasive intracoronary physiological measurements

Tutor: Áron Üveges M.D.

3. Title: Evaluation of the effect of pulmonary veins on left atrial appendage flow in atrial fibrillation patients undergoing cryoablation

Tutor: László Tibor Nagy M.D., Ph.D.

4. Title: Comparison of preprocedural transoesophageal and intracardiac echocardiographic parameters in atrial fibrillation patients undergoing cryoablation

Tutor: László Tibor Nagy M.D., Ph.D.

5. Title: Pericardial fat tissue

6. Title: Safety antidiabetic therapy

Tutor: Tibor Fülöp M.D., Ph.D.

7. Title: Structural interventions in cardiology

Tutor: Attila Kertész M.D., Ph.D.

8. Title: Pre-TAVI investigations - CT in focus.

9. Title: The role of cardiac-CT - general overview.

Tutor: Rudolf Kolozsvári M.D., Ph.D.

10. Title: Novel approaches in the treatment of acute and chronic heart failure

Tutor: Attila Borbély M.D., Ph.D.

11. Title: Assessment of the right heart side by

3D echocardiography

12. Title: The role of 3D echocardiography in mitral valve disease

Tutor: Csaba Jenei M.D.

13. Title: The practice of echocardiography among cancer patients

Tutor: Dániel Czuriga M.D., Ph.D.

14. Title: Comparison of STEMI and NSTEMI cases after primary PCI: the role of secondary prevention

Tutor: László Fülöp M.D., Ph.D.

15. Title: Efficacy of platelet aggregation inhibitors after acute coronary syndrome

16. Title: Vascular disease in patients post myocardial infarction

Tutor: Orsolya Tímár M.D., Ph.D.

17. Title: Vascular alterations in patients with previous acute coronary syndrome

Tutor: Orsolya Tímár M.D., Ph.D.

18. Title: Atrial fibrillation and new oral anticoagulant therapy

Tutor: Gábor Kolodzey M.D.

19. Title: Gestational hypertension management at the Department of Cardiology, University of Debrecen.

Tutor: Alexandra Kiss 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.

Division of Nuclear Medicine and Translational Imaging

1. Title: Importance of FDG PET/CT in cardiology

2. Title: Metabolic parameters in correlation with different oncological therapies

3. Title: Targeted radionuclide therapies in metastatic prostate cancer

4. Title: Targeted radionuclide therapies in neuroendocrin tumors

Tutor: Ildikó Garai M.D., Ph.D.

5. Title: In vivo imaging of preclinical animal models using tumor-specific radiopharmaceuticals

Tutor: György Trencsényi M.Sc., Ph.D.

Division of Radiology and Imaging Science

1. Title: Functional MRI Investigations in Internet Gaming Addiction Disorder

Tutor: Attila Mátyás Petró M.D.

2. Title: AI in acute stroke treatment

Tutor: Róbert Rostás M.D.

3. Title: Imaging of axial spondylarthritis

Tutor: Márton Oláh M.D.

4. Title: The effect of prenatal ultrasound on the development of neurons

Tutor: Bence Pelyvás 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: Endovascular Aortic Aneurysm Repair

Tutor: István Lázár M.D.

4. Title: Characteristics of acute endovascular stroke treatment with and without intravenous thrombolysis

Tutor: Balázs Kis 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 miRNA profile in tissue and plasma samples of glioblastoma patients.

Tutor: Zsuzsanna Birkó M.Sc., Ph.D.

4. Title: Application of genome editing with the CRISPR-Cas9 system in the treatment of genetic diseases.

Tutor: Krisztina Szirák M.Sc., Ph.D.

5. Title: Overview of the background of an arbitrary genetic disorder.

6. Title: Overview of the genetic background influencing the pharmacokinetics and pharmacodynamics of a drug.

Tutor: Judit Keserű M.Sc., Ph.D.

7. Title: Studying the expression of miR-184, miR-194-5p and miR-203a-3p in Wilms' tumor samples.

Tutor: Gergely Buglyó M.D., Ph.D.

8. Title: Cell-free nucleic acids as liquid biopsy biomarkers for diagnosis and treatment of diseases.

9. Title: Exosomes, as possible biomarkers.

10. Title: Study the role of non-coding RNAs in cancers.

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 lymphoid cells (ILC) in human diseases

Tutor: Attila Bácsi M.Sc., Ph.D., D.Sc.

4. Title: Possible use of non-polymorphic MHC-like CD1 molecules in diagnostics.

Tutor: Péter Gogolák M.Sc., Ph.D.

5. Title: Investigation of phytocannabinoid effects on human monocyte-derived dendritic cells

6. Title: Investigation of transient receptor potential channels on human monocyte-derived dendritic cells

Tutor: Attila Szöllősi M.D., Ph.D.

7. Title: Identification of new viral sensors and new regulatory mechanisms in the antiviral responses of human dendritic cells

8. Title: Role of dendritic cells in the development of autoimmune diseases

Tutor: Kitti Pázmándi M.Sc., Ph.D.

9. Title: Study of non-apoptotic cytotoxic processes during immune response, new way of killing apoptosis resistant tumor cells

Tutor: Gábor Koncz M.Sc., Ph.D.

Department of Clinical Oncology

1. Title: Prognostic factors in colorectal cancer

Tutor: Csilla András M.D., Ph.D. 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: (P)rehabilitation in oncology

6. Title: Supportive care in oncology
Tutor: Andrea Furka M.D., Ph.D. habil.

7. Title: Cardiotoxic side effects of fluorouracil in oncological patients

Tutor: Anita Árokszállási M.D., Ph.D.

8. Title: Palliation in oncology

Tutor: Éva Szekanecz M.D., Ph.D.

9. Title: Epigenetic control of chemopreventive drug action by bromodomain-containing chromatin readers

10. Title: Studies on serotonylated proteins in tumor cells

11. Title: The role of antimicrobial peptides in the interaction of breast cancer cells and macrophages

Tutor: Iván Uray M.D., Ph.D., med. habil.

12. Title: Prognostic factors in low grade and high grade gliomas

13. 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 Péntes-Daku M.Sc., Ph.D.
7. Title: Next-generation sequencing in rare, inherited coagulation diseases
Tutor: Réka Gindele M.Sc., Ph.D.
8. Title: COVID-19 associated coagulopathy in pregnancy
9. Title: Fibrinolytic marker levels and polymorphisms in inflammatory bowel diseases
10. Title: Investigation of fibrinolytic markers on the outcome of thrombolytic therapy in patients with ischaemic stroke
Tutor: Zsuzsa Bagoly M.D., Dr. habil., Ph.D.

Department of Oncoradiology

1. Title: Investigation of lung tumour trajectory based on retrospective 4DCT
Tutor: Mihály Simon
2. Title: Clinical aspects of radiosurgery
Tutor: Árpád Kovács M.D., Ph.D. habil.

3. Title: The role of 4D CT in radiation therapy.
Tutor: Erika Szántó M.D.
4. Title: Comparative analysis of 3D conformal and intensity-modulated locoregional breast irradiation
Tutor: Mária Besenyői M.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: Dermatofibrosarcoma protuberans - therapeutic possibilities
6. Title: Possibilities of skin grafting in the reconstruction of defects after removal of skin tumors
7. Title: Role of NPWT (Negative Pressure Wound Therapy) in the treatment of burns
8. Title: Role of hatchet flap plasty in the reconstruction of defects after removal of skin tumors
Tutor: István Juhász M.D., Ph.D., C.Sc.
9. Title: Deformities and discolorations of the nails: relation to other medical conditions. Overview of the literature and case reports.
Tutor: Éva Szabó M.D., Dr. habil., Ph.D.
10. Title: Different applications of the latissimus dorsi musculocutaneous flap
Tutor: Zoltán Péter M.D.
11. Title: Characteristics of chronic urticaria – analysing our patients' data
12. Title: Methotrexate use in psoriasis – the diagnosis of liver fibrosis as a possible side effect
Tutor: Krisztián Gáspár M.D., Dr. habil., Ph.D.
13. Title: Lipid disorder associated dermatological symptoms
14. Title: Pathogenesis and therapy of acne
15. Title: Role of lipid environment in the activation of dermal macrophages
Tutor: Dániel Töröcsik M.D., Dr. habil., Ph.D.
16. Title: Application of photodynamic therapy for multiple actinic keratoses
17. Title: Application of photodynamic therapy for non-melanoma skin tumours
18. Title: New treatment protocols for

photodynamic therapy

19. Title: Photodynamic therapy for acne and acne scars

Tutor: Emese Gellén M.D., Ph.D.

20. Title: Drug hypersensitivity reactions: types and diagnostic approach

21. Title: Penicillin allergy: diagnostics and management

22. Title: Psoriasis therapy and family planning

23. Title: Psoriasis treatment options in patients with cancer

24. Title: Treatment options of therapy resistant urticaria

Tutor: Irina Sawhney M.D.

25. Title: Merckel cell carcinoma-pathogenesis, diagnosis and treatment options

Tutor: Gabriella Emri M.D., Dr. habil., Ph.D.

26. Title: New therapies in severe psoriasis vulgaris

27. Title: Omalizumab therapy in chronic urticaria

Tutor: Andrea Szegedi M.D., Ph.D., D.Sc.

28. Title: Development and investigation of benign and malignant skin tumor derived cell cultures and co-cultures

Tutor: Imre Lőrinc Szabó M.D., Ph.D.

Affiliated Department of Infectology

1. Title: Epidemiological assessment of needlestick and sharps injuries at Infectology Clinic

2. Title: Epidemiological study into the association between body mass index and the frequency of wound infection after cesarean section

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: Factors implicated in the susceptibility to re-infections by SARS-CoV-2

Tutor: Mohamed Faisal Mahdi M.D., Ph.D.

6. Title: Fecal microbiota transplant and *Clostridium difficile* infection

7. Title: Immunosuppressed conditions and *Clostridium difficile* infections

8. 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 (literature review)

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., D.Sc.

3. Title: Regulation of macrophage activation

Tutor: László Virág M.D., Ph.D., D.Sc.

4. Title: Study of metabolic processes with special regard to the involvement of mitochondrial activity.

Tutor: Péter Bay M.Sc., Ph.D., D.Sc.

5. Title: Application of High-Content Imaging technology in Life Sciences

Tutor: Endre Kókai M.Sc., Ph.D.

6. Title: Overcoming insulin resistance by SMTNL1-mimicking peptide

7. Title: Signalling pathways in endometriosis

Tutor: Beáta Lontay M.Sc., Ph.D.

8. Title: Inhibition of sodium-glucose cotransporter of kidney by glucose-based compounds also interfering with glycogenolysis

Tutor: Tibor Docsa M.Sc., Ph.D.

9. Title: Regulation of protein phosphatase expression and activity in tumour cells

Tutor: Andrea Kiss M.Sc., Ph.D.

10. Title: High-Throughput Screening

Tutor: Csaba Hegedűs M.D., L.D.S., Ph.D.

11. Title: Autophagy in physiological and pathological processes

Tutor: Katalin Kovács M.Sc., Ph.D.

12. Title: Posttranslational modifications of the mitochondrial fission protein Drp1 and their role on mitochondrial morphology.

13. Title: The effect proteasomal inhibition in Huntington's disease.

Tutor: Krisztina Tar M.Sc., Ph.D.

14. Title: The effects of bacterial metabolites on intestinal motility.

15. Title: The role of HCN2 inhibition in the development of ileus.

16. 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: Evaluation of fungicidal effect of antifungal agents using time-kill curves
3. Title: New and older agents in antifungal chemotherapy
Tutor: László Majoros M.D., Ph.D.
4. Title: Prevalance of human polyomaviruses
Tutor: Eszter Csoma M.Sc., Ph.D.
5. Title: Effects of human papillomavirus oncoproteins on cellular signaling pathways in keratinocytes
Tutor: Anita Szalmás M.Sc., Ph.D.
6. Title: Intratype variation of human papillomaviruses
Tutor: György Veress M.Sc., Ph.D.
7. Title: Laboratory diagnosis of hepatitis E virus infection
8. Title: The roles of non-coding RNA molecules in infectious diseases
Tutor: Brigitta László M.Sc., Ph.D.
9. Title: Phylogenetic and functional analysis of sequence variation of high-risk human papillomaviruses
Tutor: Eszter Gyöngyösi M.Sc., Ph.D.
10. Title: The examination of biology of microbial 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 hypothyroidism.
5. Title: The function of LDL in lipid metabolism
Tutor: György Paragh M.D., Ph.D., D.Sc.
6. Title: Diagnostic tests and imaging techniques in endocrinology.
Tutor: Endre Nagy M.D., Ph.D., D.Sc.
7. Title: Lp(a) as a cardiovascular risk factor
8. Title: Therapeutic strategies in hyperlipoproteinemia(a)
Tutor: Mariann Harangi M.D., Ph.D. habil.
9. Title: Differential diagnosis in Graves'

- orbitopathy
10. Title: New treatment opportunities in Graves' orbitopathy
Tutor: Annamária Erdei M.D., Ph.D.
11. Title: Adipokines and Insulin Resistance
12. Title: Insulin resistance and non-alcoholic fatty liver disease
13. Title: Obesity: Diagnosis and Treatment
14. Title: Obesity: Etiology and Co-morbidities
Tutor: Péter Fülöp M.D., Ph.D. habil.
15. Title: Cardiovascular risk modification in CKD patient
Tutor: Réka P. Szabó M.D., Ph.D.
16. Title: Diabetic neuropathy and oxidative stress
Tutor: Ferenc Sztanek M.D., Ph.D.
17. Title: Familial antiphospholipid syndrome
Tutor: Pál Soltész M.D., Ph.D., D.Sc.
18. Title: Autoimmune disorders and GI tract
Tutor: Zsolt Barta M.D., Ph.D.
19. Title: Ischemic colitis.
20. Title: Life quality of Raynaud syndrome
21. Title: Sarcopenia in chronic diseases
22. Title: Therapeutic options for sarcopenia
Tutor: Zoltán Csiki M.D., Ph.D.
23. Title: The disease course after stent implantation in peripheral arterial disease
Tutor: György Kerekes M.D., Ph.D.
24. Title: Novel therapeutical approaches in multiple myeloma
25. Title: The impact of multi-drug resistance genes in the prognosis of lymphoproliferative disorders
Tutor: László Váróczy M.D., Ph.D. habil.
26. Title: Inherited and acquired thrombophilia
27. Title: New direct oral anticoagulants
28. Title: Stem cell therapy in peripheral arterial disorders
Tutor: Zoltán Boda M.D., Ph.D., D.Sc.
29. Title: Gastric cancer: clinics and treatment
30. Title: Gastrointestinal bicing
31. Title: Gluten sensitive enteropathy
32. Title: Inflammatory bowel diseases.
33. Title: Lymphomas in the gastrointestinal tract.
Tutor: István Altörjay M.D., Ph.D., D.Sc.
34. Title: Epidemiology, diagnostics and therapy of chronic hepatitis C
35. Title: Pathomechanism of alcoholic hepatitis

36. Title: Signs, diagnostics and treatment of portal hypertension.
37. Title: Therapeutic options in primary sclerotizing cholangitis
38. Title: Treatment of autoimmune hepatitis
Tutor: István Tornai M.D., Ph.D. habil.
39. 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.
40. Title: Chronic neutrophilic leukaemia
Tutor: Béla Telek M.D., Ph.D.
41. Title: Biological treatment of ulcerative colitis
42. Title: Extraintestinal association in IBD
Tutor: Károly Palatka M.D., Ph.D. habil.
43. Title: Bacterial infection in liver cirrhosis
44. Title: Clinical significance of chronic pancreatitis
45. Title: Current therapeutic options of acute pancreatitis
Tutor: Zsuzsa Vitális M.D., Ph.D.
46. Title: Philadelphia negative chronic myeloproliferative neoplasms - novel genetic and therapeutic improvements
47. Title: Recent advances in the management of chronic ITP
Tutor: Péter Batár M.D., Ph.D.
48. Title: Are the bacterial infections predictable in liver cirrhosis?
49. 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., D.Sc.
50. Title: Kidney pathology and outcomes in ANCA-Associated Vasculitis
51. Title: Long-term outcomes in elderly patients with ANCA-associated vasculitis
Tutor: Ibolya File M.D.
52. Title: Gastroesophageal reflux disease
Tutor: László Dávida M.D.

Department of Pathology

1. Title: Functional analysis of malignant lymphomas using image analysis
2. Title: Mitotic failures and cancer progression
3. Title: Molecular diagnostics of solid tumors
Tutor: Gábor Méhes M.D., D.Sc.
4. Title: Head and Neck region squamous cell

carcinoma

5. Title: Salivary gland neoplasms
Tutor: Tamás Csonka M.D., Ph.D.

Department of Pharmacology and Pharmacotherapy

1. Title: Cardiovascular risk factors
2. Title: Metabolic link between obesity and insulin resistance
Tutor: Zoltán Szilvássy M.D., Ph.D., D.Sc.
3. Title: 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: Alterations of intracellular calcium concentration in pathological conditions
Tutor: László Csernoch M.Sc., Ph.D., D.Sc.
2. Title: Regional differences in the electrophysiological properties of cardiomyocytes
Tutor: Péter Nánási M.D., Ph.D., D.Sc.
3. Title: Role of afterdepolarization mechanisms in the arrhythmogenesis
Tutor: Tamás Bányász M.D., Ph.D., D.Sc.
4. Title: Electrophysiological properties of mammalian cardiac tissues
Tutor: János Magyar M.D., Ph.D., D.Sc.
5. Title: Beat-to beat variability of cardiac repolarization
Tutor: Norbert Szentandrassy M.D., Ph.D.

6. Title: Role of late sodium current in the arrhythmogenesis
Tutor: Balázs Horváth M.D., Ph.D.
7. Title: Role of potassium channels in neuron function
Tutor: Balázs Pál M.D., Ph.D.
8. Title: Properties of vanilloid receptors
Tutor: István Balázs Tóth M.Sc., Ph.D.
9. 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., M.Sc., Ph.D., D.Sc.

Division of Endocrinology

1. Title: Diagnostic tests and imaging techniques in endocrinology
Tutor: Endre Nagy M.D., Ph.D., D.Sc.
2. Title: Clinical aspects and management of insulinomas
3. Title: Current treatment of Acromegaly
Tutor: Miklós Bodor M.D., Ph.D.
4. Title: Treatment of Graves' disease
Tutor: Annamária Erdei M.D., Ph.D.

Division of Gastroenterology

1. Title: Treatment of colon diverticulosis
Tutor: Tamás Bubán M.D.
2. Title: Gastric cancer: clinics and treatment
3. Title: Gastrointestinal bleeding
4. Title: Gluten sensitive enteropathy
5. Title: Inflammatory bowel diseases
6. Title: Lymphomas in the gastrointestinal tract
Tutor: István Altorjay M.D., Ph.D., D.Sc.
7. Title: Epidemiology, diagnosis and treatment of chronic hepatitis B virus
8. Title: Epidemiology, diagnosis and treatment of chronic hepatitis C virus
9. Title: Pathomechanism of alcoholic hepatitis
10. Title: Symptoms, diagnosis and management of portal hypertension
11. Title: The connection between blood coagulation and liver cirrhosis.
12. Title: The relationship between statins and liver disease.

13. Title: Treatment options for primary sclerosing cholangitis
Tutor: István Tornai M.D., Ph.D. habil.
14. Title: Biological treatment of ulcerative colitis
Tutor: Károly Palatka M.D., Ph.D. habil.
15. Title: Diagnostic and therapeutic difficulties of chronic pancreatitis
16. Title: Kidney dysfunction in liver cirrhosis
17. Title: The importance of bacterial infections in liver cirrhosis.
Tutor: Zsuzsa Vitális M.D., Ph.D.
18. Title: Can the development of bacterial infections be predicted in liver cirrhosis?
19. Title: Epidemiology, diagnosis, clinical presentation, factors influencing progression and efficacy of different medical treatments of autoimmune liver diseases
20. Title: Laboratory diagnosis of autoimmune hepatitis
21. Title: Role of serological markers in prediction of disease course and response to therapy in inflammatory bowel diseases
22. Title: The dialogue between the biliary tract and the gut - What do biomarkers tell us?
Tutor: Mária Papp M.D., Ph.D., D.Sc.
23. Title: Indications and practical significance of double balloon enteroscopy
24. Title: The role and importance of capsule endoscopy
Tutor: Sándor Kacska M.D.
25. Title: Epidemiological and clinical features of adult celiac disease
Tutor: Eszter Pályu M.D., Ph.D.
26. Title: Extraesophageal manifestations of reflux disease
27. Title: Intensive therapy of severe acute pancreatitis
28. Title: Management of massive gastrointestinal bleeding with viscoelastic tests
29. Title: Procurement of a high-end endoscopy workstation using multi-criteria decision support models
Tutor: László Dávida M.D.
30. Title: IBD and pregnancy.
31. Title: The role of 5-ASA treatment in ulcerative colitis.

32. Title: The role of small bowel ultrasound in IBD.

Tutor: Zsuzsa Bianka Élthes M.D.

33. Title: Extraintestinal manifestations of inflammatory bowel disease

Tutor: Endre Zoltán Balogh M.D.

Division of Haematology

1. Title: Inherited and acquired thrombophilia
2. Title: Stem cell therapy in peripheral arterial disorders.
3. Title: New direct oral anticoagulants
Tutor: Prof. Zoltán Boda M.D.
4. Title: COVID, post-COVID and haemostasis
Tutor: Prof. György Pál Pfliegler M.D.
5. Title: Immunotherapy of B cell lymphomas
6. Title: Safety profile of prolonged rituximab therapy in lymphomas
7. Title: The role of PET/CT imaging in lymphomas
8. Title: Targeted therapy in non-Hodgkin's lymphomas
9. Title: Infections in allogeneic transplantation
10. Title: Salvage treatment outcome in diffuse large B-cell lymphoma
Tutor: Lajos Gergely M.D., Ph.D., habil
11. Title: Monoclonal antibody-based therapies in multiple myeloma
12. Title: The importance of Fcγ receptor polymorphism in antiCD38 therapy for multiple myeloma.
13. Title: Coagulation tests in multiple myeloma
Tutor: László István Váróczy M.D., Ph.D., habil
14. Title: New agent for the treatment of TTP and our practice
Tutor: Katalin Rázsó M.D.
15. Title: Philadelphia negative chronic myeloproliferative neoplasms-novel genetic and therapeutic improvements
16. Title: Recent advances in the management of chronic ITP
Tutor: Péter István Batár M.D., Ph.D.
17. Title: Diagnosis and novel therapies in autoimmune hemolytic anemia
18. Title: Diagnosis and treatment of patients with hereditary hemorrhagic telangiectasia
Tutor: Boglárka Csilla Brúgós M.D., Ph.D.
19. Title: Clinical and biological prognostic factors in the treatment of patients with follicular

lymphoma

Tutor: Ádám Jóna M.D., Ph.D.

20. Title: Features of COVID-19 in hematology patients

21. Title: Fertility after chemotherapy for Hodgkin lymphoma

22. Title: Prognostic value of FDG-PET/CT in patients with mantle cell lymphoma

23. Title: Erdheim-Chester disease: diagnostics, treatment and follow-up

Tutor: Ferenc Magyari M.D., Ph.D.

24. Title: Novel therapies in the treatment of T-cell lymphomas.

25. Title: Our experiences with transplantation of T-cell lymphoma patients

Tutor: Edit Páyer M.D., Ph.D.

26. Title: New treatment options in haemophilia

Ágota Krisztina Schlamadinger M.D., Ph.D.

27. Title: Modern treatment modalities in chronic lymphocytic leukaemia

28. Title: Implication of the minimal residual disease in chronic lymphocytic leukaemia

29. Title: Genetic abnormalities in chronic lymphocytic leukaemia

Tutor: Róbert Szász M.D., Ph.D.

30. Title: The prognostic value of Δ SUVmax in the first-line treatment of Hodgkin lymphoma

Tutor: László Imre Pinczés M.D., Ph.D.

31. Title: Infectious complications and immunosuppression following hematopoietic stem cell transplantation

Tutor: Zita Brigitta Radnay M.D., Ph.D.

Division of Metabolism

1. Title: Significance of lipoprotein(a) in the development of cardiovascular disease

Tutor: György Paragh M.D., Ph.D., D.Sc.

2. Title: Adipokines and insulin resistance

3. Title: Hypertriglyceridemia, cardiovascular risk and pancreatitis: causes and consequences

4. Title: Obesity: diagnosis and treatment

5. Title: Obesity: etiology and consequences

6. Title: The role of adipokines in the complications of obesity

Tutor: Péter Fülöp M.D., Ph.D. habil.

Division of Nephrology

1. Title: Vascular calcification

Tutor: József Balla M.D., Ph.D., D.Sc.

2. Title: Atherosclerosis and chronic kidney disease

Tutor: István Kárpáti M.D., Ph.D.

3. Title: Cardiovascular risk modification in PD patients

Tutor: Réka P. Szabó M.D., Ph.D.

4. Title: Primary Membranous Nephropathy - after the PLA2-RA era

Tutor: Csilla Markóth M.D.

Division of Rheumatology

1. Title: Cognitive dysfunction, depression and anxiety in autoimmune diseases.

Tutor: Zoltán Szekanecz M.D., Ph.D., D.Sc.

2. Title: IgA deficiency in autoimmune diseases

Tutor: Szilvia Szamosi MD., Ph.D.

3. Title: The use of antifibrotic therapy in connective-tissue diseases associated ILD

Tutor: Szilvia Szamosi MD., Ph.D.

4. Title: JAK inhibitor use in rheumatoid arthritis

Tutor: Szilvia Szamosi MD., Ph.D.

5. Title: Autoinflammatory register: database evaluation

Tutor: Szilvia Szamosi MD., Ph.D.

6. Title: The role of rheumatoid factor in rheumatoid arthritis. Is it bad prognostic factor?

Tutor: Dr. Nóra Bodnár MD., Ph.D.

7. Title: Novelty of myositis specific and associated antibodies.

Tutor: Levente Bodoki MD., Ph.D.

8. Latest treatment recommendations in idiopathic inflammatory myopathies

Tutor: Levente Bodoki MD., Ph.D.

9. Title: Patients' follow-up with idiopathic inflammatory myopathies

Tutor: Levente Bodoki MD., Ph.D.

10. Title: IgG4 associated disease: disease course and treatment in our patient cohort.

Tutor: Ágnes Horváth M.D., Ph.D., Dóra Tari M.D.

11. Title: Autoimmune disease of the roma population

Tutor: Edit Végh MD., Ph.D.

12. Title: Diagnosis of psoriatic arthritis and treatment options

Tutor: Zsófia Pethő MD., Ph.D.

13. Title: Osteonecrosis of the jaw in patients with antiprotic therapy

Tutor: Zsuzsanna Gyetkó M.D.

14. Title: Diagnosis and therapy of IBD associated arthritis

Tutor: Rebeka Szelkó-Falcsik M.D.

15. Title: Investigation of risk for fracture and falls in patients with rheumatoid arthritis

Tutor: János Gaál M.D., Ph.D., D.Sc.

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: Diagnosis and differential diagnosis of multiple sclerosis

7. Title: Multiple sclerosis - treatment in 2024

8. Title: Pregnancy in multiple sclerosis

Tutor: Tünde Csépany M.D., Ph.D.

9. Title: Effect of sleep deprivation on neurovascular coupling

Tutor: László Oláh M.D., Ph.D., D.Sc.

10. Title: Wearable devices in epilepsy and sleep disorders

Tutor: Norbert Kozák M.D., Ph.D.

11. Title: Clinical outcome of patients with acute ethanol consumption and acute ischemic stroke out of the time window

12. Title: COVID-19 infection and non-traumatic intracerebral hemorrhage

Tutor: Tamás Árokszállási M.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

Tutor: László Novák M.D., Ph.D. habil.

4. Title: The role of extracellular matrix in neurosurgical pathologies

Tutor: Álmos Klekner M.D., Ph.D. habil.

5. Title: Treatment of trigeminal neuralgia, the role of stereotactic radiosurgery

Tutor: József Dobai M.D.

6. Title: Epidemiology and treatment strategies of spinal tumors

7. Title: Treatment options of spinal metastatic tumors

Tutor: Péter Ruszthi M.D.

8. Title: Diffusion tensor imaging possibilities in deep brain stimulation

Tutor: Gábor Fekete M.D., Ph.D.

9. Title: Instrumentation in spinal degenerative pathologies

Tutor: Péter Ruszthi M.D.

Department of Obstetrics and Gynecology

1. Title: Clinical trials of new drugs for the treatment of osteoporosis

Tutor: Ádám Balogh M.D., Ph.D., D.Sc.

2. Title: Diagnosis and Treatment of Endometrial Cancer

3. Title: Diagnosis and Treatment of Ovarian Cancer

4. Title: 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 antimüllerian 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., Ph.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.

Division of Gynecological Oncology

1. Title: Chemotherapy of ovarian cancer
2. Title: Prognostic relevance of HPV-infection in cervical cancer
3. Title: Surgical treatment of HPV-infection
4. Title: The prognostic role of CA-125 in ovarian cancer
Tutor: Zoltán Hernádi M.D., Ph.D., D.Sc.
5. Title: Chemotherapy of cervical cancer
6. Title: Epidemiology and therapy of vulvar cancer
7. Title: Epidemiology of metastatic ovarian cancer
8. Title: Follow-up of endometrial cancer patients, analysis of prognostic factors
9. Title: Prothrombotic states in gynaecologic cancer
10. Title: Superoxid anion production of granulocytes in gynecologic cancer
Tutor: Róbert Póka M.D., Dr. habil., Ph.D.
11. Title: Prognostic factors and treatment of cervical cancer
12. Title: The role of CA125 and HE4 in the follow-up of ovarian cancer
Tutor: Zoárd Krasznai M.D., Ph.D.

Department of Ophthalmology

1. Title: Pathogenesis, symptoms and therapy of corneal dystrophies (diploma thesis)
Tutor: László Módis M.D., Ph.D., D.Sc.
2. Title: Changes in visual acuity and macular oedema after anti-VEGF injections and grid photocoagulation in central retinal vein occlusion
3. Title: The role of the latest anti-VEGF injections in the treatment for macular oedema following central retinal vein occlusion
Tutor: Valéria Nagy M.D., Ph.D.
4. Title: Our observations of angio OCT examination in retinal vein occlusion patient
Tutor: Valéria Nagy M.D., Ph.D.
5. Title: Examination of keratoconus progression
6. Title: Ophthalmological manifestations of immune-mediated diseases
7. Title: Retinal detachment
8. Title: Endoresection of large uveal melanomas
Tutor: Mariann Fodor M.D., Dr. habil., Ph.D.
9. Title: Contact lens wear and complications
10. Title: Orthokeratology
Tutor: Beáta Kettesy M.D., Ph.D.

11. Title: Corneal measurements with Pentacam
12. Title: Refractive laser-surgical interventions
Tutor: Bence Lajos Kolozsvári M.D., Ph.D.
13. Title: Treatment of Graves' orbitopathy
14. Title: Examination of OCT (optical coherence tomography) angiographic changes in endocrine orbitopathy (EOP) as a function of orbital activity
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 uveal melanoma patients
Tutor: Éva Surányi M.D., Ph.D.
17. Title: Analysis of a wound healing assay on human corneal cells
18. Title: Up to date management of glaucoma
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: Dry eye in blepharospasm
Tutor: Annamária Nagy M.D., Ph.D.
22. Title: Treatment options for intraocular vascular disorders.
Tutor: Szabolcs Balla M.D., Ph.D.
23. Title: Artificial intelligence in ophthalmology, review of the literature
Tutor: Beáta Bajdik M.D.
24. Title: Examination and treatment of diabetic maculopathy
25. Title: Stem cells of the cornea
26. Title: Surgical treatment of retinal diseases
Tutor: Lili Takács, M.D., Ph.D.
27. Title: Biometry characteristics of high myopic eyes
28. Title: Possibilities of myopia control
Tutor: Noémi Széll M.D., Ph.D.

Department of Otorhinolaryngology and Head and Neck Surgery

1. Title: Implantable hearing aids

2. Title: Modern treatment of upper airway stenoses
3. Title: Postlaryngectomy voice and pulmonary rehabilitation
Tutor: Balázs Sztano M.D., Ph.D. habil
4. Title: The role of cochlear implant in hearing rehabilitation
5. Title: The role of middle ear implantation and active and passive bone anchored hearing aids in hearing rehabilitation
Tutor: László Toth M.D., Ph.D. habil
6. Title: Analysis of the aetiology and pathomechanism of the development of the otitis media with effusion
7. Title: Modern aspects of tonsillectomy versus tonsillotomy
8. Title: The effectiveness of surgical treatment of focal oto-rhino-laryngological diseases on dermatologic diseases.
9. Title: The utility of the neuromonitor during surgeries of the big salivary glands
Tutor: Szilárd Gyula Rezes M.D., Ph.D.
10. Title: Tinnitus as a symptom of the systemic microvascular dysfunction
Tutor: Zsuzsanna Piros M.D.

Department of Pediatrics

1. Title: Expression of thermogenic gene products in the adipose tissue of preschool children
2. Title: Immunohistochemical analysis of the developing human adipose tissue: hormone receptors, transcriptional regulators and thermogenic proteins
Tutor: Tamás Röszer M.Sc., Ph.D.
3. Title: Chronic morbidities of premature infants
Tutor: György Balla M.D., Ph.D., D.Sc., M.H.A.Sc.
4. Title: Prognostic factors in childhood acute lymphoblastic leukemia
Tutor: Csongor Kiss M.D., Ph.D., D.Sc.
5. Title: Adding an Electrocardiogram to the Pre-participation Examination in Competitive Athletes. Review.
Tutor: Gábor Mogorósy M.D., Ph.D.
6. Title: Malformations of the central nervous system in newborns.
Tutor: Andrea Judit Nagy M.D.

7. Title: Anti-TNF use in pediatric inflammatory bowel disease
Tutor: Éva Faragóné Nemes M.D., Ph.D.
8. Title: Pediatric endocrinological problems
9. Title: Primary immunodeficiency in childhood: case reports
10. Title: Systemic autoimmune diseases in childhood
Tutor: Rita Kinga Káposzta M.D., Ph.D.
11. Title: Etiology of renal graft dysfunction in pediatric kidney transplant patients
Tutor: Tamás Szabó M.D., Ph.D.
12. Title: Recent advances in the management of pediatric AML
Tutor: István Szegedi M.D., Ph.D.
13. Title: Emergency management of chest pain in children
14. Title: Emergency management of the diabetic ketoacidosis in children
Tutor: Éva Juhász M.D.
15. Title: Implantable venous access systems in pediatric use: implantation, management and complications
Tutor: Ágnes Magyar M.D.
16. Title: Immunotherapeutical treatment modalities in neuroblastoma
Tutor: Miklós Petrás M.D., Ph.D.
17. Title: Controversies in the surgical management of congenital diaphragmatic hernias
Tutor: László András Sasi Szabó M.D.
18. Title: Obesity - New therapeutical approaches
19. Title: Temple syndrome - case report
Tutor: Enikő Noémi Felszeghy M.D., Ph.D.
20. Title: Prognostic importance of ultrasound in small bowel invagination
Tutor: Klára Nagy-Erdei M.D.
21. Title: Laparoscopic versus open pyeloplasty in children - A single centre experience and review of the literature
Tutor: Levente Szabó M.D.
22. Title: Negative pressure wound therapy (NPWT) in pediatric surgery
Tutor: Péter Juhász M.D.
23. Title: Cytogenetic and molecular genetic alterations in pediatric acute leukemias between 2015 and 2020
Tutor: Zsuzsanna Gaál M.D., Ph.D.

Division of Neonatology

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 review
10. Title: Lung ultrasound in the Critically Ill Neonate
Tutor: Gergely Balázs M.D.

Department of physical medicine and rehabilitation

1. Title: Studying the effectiveness of physiotherapy modalities after botulinum toxin treatment for post-stroke and spasticity
Tutor: Zoltán Jenei M.D., Ph.D.
2. 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
Tutor: Zoltán Jenei M.D., Ph.D.
3. 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
Tutor: Zoltán Jenei M.D., Ph.D.
4. Title: The relationship of physiological and functional changes observed in complex rehabilitation programs (obesity and stroke rehabilitation) with adipocytes
Tutor: Zoltán Jenei M.D., Ph.D.

Department of Psychiatry

1. Title: The dietetic and gastrointestinal basis of autism
Tutor: Csaba Mór   E. M.D.
2. Title: Cognitive theory and therapy of depression
3. Title: Cognitive theory and therapy of generalized anxiety disorder
4. Title: Effectiveness of Cognitive Behaviour Therapy in OCD
5. Title: Effectiveness of schema therapy in personality disorders
6. Title: Emotion dependent and independent cognitive functions in unipolar depression
7. Title: Significance of dysfunctional attitudes in depression and anxiety disorders
8. Title: Theory of mind and mentalization deficits in patients with personality disorders
Tutor: Anik     gerh  zi M.D., Ph.D.
9. Title: Brain imaging in psychiatry.
10. Title: Oxidativ stress and chronic inflammation in psychiatric disorders
11. Title: Post-traumatic stress disorder and post-traumatic growth.
12. Title: The neurobiology of depression.
13. Title: The role of mikrobiota in mental health
14. Title: The therapeutic potentials of psychodelics
Tutor: Ede Frecska M.D., M.A., Ph.D.
15. Title: Role of mentalization in literacy
16. Title: Assessment of literacy in psychiatric disorders and the potential effects of pharmaceutical therapy
Tutor: Judit Zsuga M.D., Ph.D., D.Sc.

Department of Pulmonology

1. Title: New perspectives in the treatment of lung cancer
Tutor: Andrea Fodor M.D.
2. Title: Biologic therapy in severe asthma
Tutor: L  szl   Brug  s M.D., Ph.D.
3. Title: Relationship between smoking and lung diseases
4. Title: The role of bronchoscopy in the therapy of lung cancer
Tutor: Imre Varga M.D., Ph.D.
5. Title: Modern Therapy of NSCLC
Tutor: Tam  s Kardos M.D.

6. Title: Therapeutic possibilities in lung cancer treatment, side effects
Tutor: Attila Lieber M.D.
7. Title: Biomarkers in pulmonary diseases
8. Title: Eosinophilic pulmonary diseases
9. Title: New treatment options for rare lung diseases
10. Title: The role of the complement factor in respiratory diseases
Tutor: Ildik   Horv  th M.D., Ph.D., D.Sc.

Department of Surgery

1. Title: Surgical treatment of Graves disease with ophthalmopathy
Tutor: Ferenc Gy  ry M.D.
2. Title: Surgical treatment of bowel obstruction in colorectal diseases
Tutor: L  szl   Damjanovich M.D., Ph.D., D.Sc.
3. Title: Surgical and endovascular interventions in critical limb ischemia
Tutor: S  ndor Olvaszt   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: J  nos P  s  n M.D.
6. Title: Prevention of bronchial stump insufficiency after lung resections
Tutor: Istv  n Tak  cs M.D., Ph.D.
7. Title: The surgical treatment of hyperparathyroidism
Tutor: Roland Fedor M.D., Ph.D.
8. Title: Different forms of hereditary colorectal cancer among our patients.
Tutor: Mikl  s 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 and analgesia in animal experiments
2. Title: Animal welfare in animal experiments

3. Title: Experimental animal models for metabolic diseases (diabetes, metabolic syndrome, atherosclerosis, kidney tumors) in research
Tutor: Ádám Deák D.V.M., Ph.D.
4. Title: Changes of red blood cells' micro-rheology in surgical pathophysiological processes
Tutor: Norbert Németh M.D., MBA, Ph.D., D.Sc.
6. Title: Hemostatic agents 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 Professor István Furka Microsurgical Education and Training Center of the Department of Operative Techniques and Surgical Research
Tutor: Irén Mikó, M.D., Ph.D.
12. Title: An overview of inter-species differences in red blood cell deformability and aggregation
Tutor: Barbara Bedőcs-Baráth, M.Sc., Ph.D.

Department of Orthopedic Surgery and Traumatology

1. Title: Topic will be discussed personally (Orthopedic)
Tutor: Zoltán Karácsonyi M.D.
2. Title: Topic will be discussed personally (Orthopedic)
Tutor: Csenge Szeverényi M.D., Ph.D.
3. Title: Bone and ligament injuries of the hand (Traumatology and Hand Surgery)
Tutor: István Frendl M.D., Ph.D.
4. Title: Endoscopical treatment of shoulder dislocations (Traumatology and Hand Surgery)
5. Title: Up-to-date treatment of foot injuries (Traumatology and Hand Surgery)
Tutor: István Szarukán M.D.

6. Title: Fractures of the leg (Traumatology and Hand Surgery)
Tutor: András Nagy M.D.
7. Title: Topic will be discussed personally (Orthopedic)
Tutor: Tamás Bazsó M.D.
8. Title: Current concept in operative treatment of proximal tibial fractures (Traumatology and Hand Surgery)
Tutor: Zoltán Domokos Pap M.D.
9. Title: Topic will be discussed personally (Orthopedic)
Tutor: Zsolt Hunya M.D.
10. Title: Current treatment of intertrochanteric and subtrochanteric femoral fractures on osteoporotic bone (Traumatology and Hand Surgery)
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 Bercezi M.D., Ph.D.
4. Title: Bladder replacement after radical cystectomy
Tutor: Antal Farkas M.D., Ph.D.
5. Title: Pathology of clear cell renal cancer
Tutor: Krisztián Szegedi M.D.
6. Title: Treatment of urethral stricture
Reconstructive urological surgeries
Tutor: Mihály Murányi M.D.
7. Title: Assessment of benign prostate hyperplasia
Tutor: József Zoltán Kiss M.D.
8. Title: Effect of orchidopexy on male fertility
Tutor: Gyula Drabik M.D.
9. Laparoscopic and Robot assisted (DaVinci) partial nephrectomy
Tutor: János Dócs M.D.
10. Microsurgical interventions in andrology
Tutor: Dániel Varga M.D.

Department of Pharmacology

1. Title: Antibiotics and their application
2. Title: Antitumor agents and applications

- | | |
|---|--|
| <p>3. Title: Arrhythmias and antiarrhythmic drugs</p> <p>4. Title: Asthma and antiasthmatic agents</p> <p>5. Title: Degenerative disorders and treatments in the central nervous system</p> <p>6. Title: Epilepsies and treatments (antiepileptics)</p> <p>7. Title: Eye diseases and their treatments</p> <p>8. Title: Hypercholesterolemia and pharmacotherapy</p> <p>9. Title: Hypertension and treatments</p> <p>10. Title: Inflammation and nonsteroid and steroid antiinflammatory drugs</p> <p>11. Title: Neurodegenerative diseases and treatments</p> <p>12. Title: Optional title in cardiovascular pharmacology.</p> <p>13. Title: Sedativehypnotics and applications</p> <p>14. Title: Skin diseases and their treatments</p> <p>15. Title: Sleep disorders, sedation and treatments</p> <p>16. Title: The blood and its pharmacological interventions</p> <p>Tutor: Árpád Tószaki D.Pharm., Ph.D., D.Sc.</p> <p>17. Title: Antioxidants (in general, in diabetes, in diseases, as prooxidants, summarized or selected, etc.).</p> <p>18. Title: Application of mass spectrometry in the pharmaceutical and bioanalysis.</p> <p>19. Title: Application of Superoxide dismutase (SOD), Catalase (CAT) and glutathione peroxidase (GPx) mimetics in the the therapy of oxidative stress related disorders.</p> <p>20. Title: Drugs and drug related substances in the environment.</p> <p>21. Title: Free topic from instrumental analytical chemistry.</p> <p>22. Title: Microextraction techniques used in the analysis of drugs from different matrix.</p> <p>23. Title: Model systems used in drug metabolism studies.</p> <p>24. Title: Oxygen: the necessary "enemy"?</p> | <p>(oxidative stress, red-ox biology)</p> <p>25. Title: Sampling and sample preparation techniques used in the analysis of drug substances.</p> <p>26. Title: Small molecular gases (NO, CO, H₂S, CH₄, H₂) in the treatment of different disorders.</p> <p>27. Title: The role of the iron in oxidative stress related diseases.</p> <p>28. Title: Treatment of ischemic heart diseases.
Tutor: István Bak M.Sc., Ph.D. habil.</p> <p>29. Title: Anticoagulants</p> <p>30. Title: Characterisation of new H₂S-releasing-NSAIDs</p> <p>31. Title: Diuretics and their application</p> <p>32. Title: Hemeoxygenase/CO system and autophagy (experimental)</p> <p>33. Title: Management of Dyslipidemia</p> <p>34. Title: Pharmacotherapy an pregnancy</p> <p>35. Title: Pharmacotherapy and lactation</p> <p>36. Title: Pharmacotherapy in childhood</p> <p>37. Title: Pharmacotherapy in elderly patient</p> <p>38. Title: Role of H₂S in cardiovascular system
Tutor: István Lekli D.Pharm., Ph.D.</p> <p>39. Title: Doxorubicin induced cardiotoxicity</p> <p>40. Title: Isoproterenol induced hypertrophy</p> <p>41. Title: Pharmacologic therapies in Gastrointestinal Diseases</p> <p>42. Title: Pharmacotherapy and dietotherapy of metabolic syndrome</p> <p>43. Title: The role of autophagy in hem toxicity
Tutor: Alexandra Gyöngyösi Ph.D.</p> <p>44. Title: General anesthetics</p> <p>45. Title: Role of microRNAs in cardiovascular disease</p> <p>46. Title: The role of autophagic and apoptotic processes in different types of melanoma
Tutor: Erzsébet Szabó M.Sc., Ph.D.</p> |
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CHAPTER 22

LIST OF TEXTBOOKS

BMC**Introduction to Biophysics I.:**

Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN:
978-1285737027.

Gáspár R.: Physics for BMC students.
University of Debrecen

Introduction to Medical Chemistry I.:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN:
978-0321943170.

Introduction to Medical Chemistry II.:

McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN:
978-0321943170.
F., Erdődi, Cs., Csontos: Organic Chemistry for
Premedical Students.
University of Debrecen, 2011.

Hungarian Language for BMC students:

Gerő Ildikó-Kovács Judit: Színesen magyarul.
2017.

Introduction to Biology I.:

Sadava, Hillis, Heller, Berenbaum: Life: The
Science of Biology.
10th edition. Sinauer Macmillan, 2013. ISBN:
978-1-4641-4124-9.

Introduction to Biophysics II.:

Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN:
978-1285737027.
Gáspár R.: Physics for BMC students.
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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.

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Serway/Vuille: College Physics.
10th edition. Cengage Learning, 2014. ISBN:
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McMurry, J., Fay, R.C.: Chemistry.
7th edition. Pearson Education, 2015. ISBN:
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F., Erdődi, Cs., Csontos: Organic Chemistry for
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University of Debrecen, 2011.

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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 Szöllősi: Medical Biophysics.
Medicina, 2009.

Basics of Behavioural Sciences:

Segerstrale, U., Molnár, P.: Nonverbal
Communication: Where Nature Meets Culture.
1st edition. Psychology Press, 1997. ISBN: 0-
8058-2179-1.
Alan Stoudemire: Human Behavior. An
Introduction for Medical Students.
J.B. Lippincott Company, Philadelphia, 1994.
Márta Csabai and Péter Molnár: Medical
Psychology.
Background material. Reprint University of

Debrecen, 2008.

Smith, E. E., & Nolen-Hocksema, S.: Atkinson and Hilgards's Introduction to Psychology. 16th. Cengage Learning EMEA, 2014. ISBN: 978-1408089026.

Kantor, J. E.: Medical Ethics for Physicians-in-Training.

New York & London: Plenum.

Helman, C. G.: Culture, Health and Illness. CRC Press.(Chapter 1.),.

Barry, A-M. – Yuill, Ch.: Understanding the Sociology of Health.

SAGE., 2012. ISBN: (Chapters 1., 2.).

Cell Biology Lecture:

Alberts et al.: Essential Cell Biology. 6th edition. W.W. Norton&Company, 2023. ISBN-13: 978-1324033356

Lodish et al.: Molecular Cell Biology.

8th edition., W.H. Freeman, 2016.

Alberts et al: Molecular Biology of the Cell. 7th edition.. W.W. Norton&Company, 2022.

Cell Biology Laboratory Manual, latest version on the subject's eLearning site.

URL: <https://elearning.med.unideb.hu>

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.

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.

Hungarian Language I/1.:

Mezei Zsuzsa Livia- Fodor Marianna: Szívből magyarul.

Biostatistics:

Wayne W. Daniel: Biosatistics: a foundation for analysis in the health sciences.

7th edition. John Wiley and Sons, New York, 1991. ISBN: 0-471-52988-5.

Latin Medical Terminology I.:

Répás László: Basics of Medical Terminology, Latin and Greek Origins I..

Répás László, 2016.

Physical foundations of biophysics:

Halliday-Resnick-Walker: Fundamentals of Physics.

Hungarian Language I/2.:

Györfy Erzsébet-Mezei Zsuzsa Livia: Magyarules.

2018.

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.

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Sobotta: Atlas of Human Anatomy.

15th edition. Urban & Fischer, 2013. ISBN: 978-0702052507.

Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell: Gray's Basic Anatomy.

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M.H. Ross: Histology. A Text and Atlas.
7th edition. Lippincott Williams & Wilkins, 2016.
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10th edition. Lippincott Williams & Wilkins,
2006. ISBN: 0-7817-9485-4.

Moore K.L., Dalley, A.F., Agur, A. M. R.:
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6th edition. Lippincott Williams & Wilkins,
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E.K. Sauerland: Grant's Dissector.
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McMurry, J., Fay, R.C.: Chemistry.
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University of Debrecen, 2008.

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Medical and Health Science Center, University
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Bioinorganic Chemistry for Medical Students
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Medical and Health Science Center, University of Debrecen, 2009.

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Medical Genetics Lecture:

Practical Courses in Genetics.
University Medical School of Debrecen, 2002.
Tom Strachan, Andrew P. Read: Human molecular genetics.
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ISBN: 978-0-815-34589-3.

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2017. ISBN: 978-963-12-7760-9.

Selected Problems of the Neural Control: Modelling of Single Neurons and Neural Networks:

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MIT Press, Cambridge, Massachusetts, and London, England, 1991., ISBN: ISBN 0-262-61071-X.

Functional Anatomy of the Visual System:

Eric R. Kandel, MD (winner of the Nobel Prize in 2000); James H. Schwartz, MD, PhD; Thomas M. Jessell, PhD; Steven A. Siegelbaum, PhD; and A. J. Hudspeth, PhD: Principles of Neural Science.
Fifth Edition. 2012. ISBN: 13: 978-0071390118.
Gordon M. Shepherd: The Synaptic Organization of the Brain.

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Modern biophysical methods in biology and medicine:

Damjanovich, S., Fidy, J., Szöllősi, J.: Medical Biophysics textbook (3rd revised edition).
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Lesk, Arthur: Introduction to Genomics.
3rd edition. Oxford University Press, 2017.
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Répás László, 2016.

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Fred A. Mettler: Essentials of Radiology.
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Medical Genetics Practical:

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University Medical School of Debrecen, 2002.

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Roy Porter: The Cambridge Illustrated History of Medicine.
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OECD Health Policy Studies: Health for

everyone?: Social Inequalities in Health and Health Systems.

OECD Publishing, Paris, 2019.

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3rd edition. Churchill Livingstone, 2006. ISBN: 0-443-06751-1.

John A. Kiernan, Nagalingam Rajakumar: Barr's The Human Nervous System.

10th edition. Wolters Kluwer/Lippincott Williams&Wilkins, 2014. ISBN: 978-1-4511-7327-7.

L. Komáromy: The Dissection of the Brain.

A Topographical and Technical Guide Medicina ISBN: 9-632-26050-3.

Snell, R.E.: Clinical Neuroanatomy for Medical Students.

5th edition. Lippincott Williams & Wilkins

ISBN: 0-7817-2831-2.

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A Topographical and Technical Guide Medicina, ISBN: 9-632-26050-3.

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John A. Kiernan, Nagalingam Rajakumar: Barr's The Human Nervous System.

10th edition. Wolters Kluwer/Lippincott

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Williams&Wilkins, 2014. ISBN: 978-1-4511-7327-7.

Biochemistry I. Lecture:

Lubert Stryer: Biochemistry.

9th edition. W.H. Freeman, 2019. ISBN: 9781319114671.

Thomas M. Devlin: Textbook of Biochemistry with Clinical Correlations.

7th edition. John Wiley & Sons, 2010. ISBN: 978-0-470-28173-4.

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Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.

Berne and Levy: Physiology.

6th edition. Mosby, 2009. ISBN: 0-3230-7362-X.

Guyton, A. C., Hall, J. E.: Textbook of Medical Physiology.

12th edition. Saunders, 2010. ISBN: 1-4160-4574-0.

J. B. West: Best and Taylor's Physiological Basis of Medical Practice.

12th edition. Williams & Wilkins, 1990.

Berne, R. M., Levy, M. N., Koeppen, B. M., Stanton, B. A.: Physiology.

6th edition. Mosby Inc, 2009. ISBN: 0-323-04582-0.

Medical Physiology I. Practical:

Physiological Practice, A Laboratory Guide.

2nd (revised) edition. 2007.

Medical Physiology II. Lecture:

A. Fonyó: Principles of Medical Physiology.

Medicina Publishing House, Hungary, 2002. ISBN: 963-242-726-2.

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Guyton, A. C., Hall, J. E.: Textbook of Medical Physiology.

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Alan Stoudemire: Human Behavior. An Introduction for Medical Students.

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Csabai, M. and Molnar, P.: Health, Illness and Care. A Textbook of Medical Psychology.. Springer, Budapest, 2000.

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Greenwood Press, 1990.

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Barry, A.-M. - Yuill, Ch. (Eds.): Understanding Health. A Sociology Introduction. SAGE, 2002.

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Kappelmayer Janos: Practicals in Laboratory Medicine.

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Kumar-Abbas-Fausto-Mitchell: Basic Pathology. 8th edition. WB Saunders, 2007. ISBN: 1-4160-2973-7.

Harsh Mohan MD, Ivan Damjanov MD : Pathology Simplified: A Quick Review for Examination.

Jaypee Brothers Medical Publishers, 2021. ISBN: 935465133X.

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John Hampton: The ECG in practice.

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Immunology:

Fred S. Rosen: Case studies in immunology.

4th Edition, 2004. ISBN: 0-8153-4102-4.

Peter Parham: The Immune System.

5th Edition. Garland Science, 2021. ISBN: 0-3935-3335-2.

Abbas, A. K., Lichtman, A. H., Pillai, S.: Basic Immunology.

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Levinson W., Chin-Hong P., Joyce E. A., Nussbaum J., Schwartz B.: Review of Medical Microbiology and Immunology. A Guide to Clinical Infectious Diseases.

17th edition. McGraw Hill, 2022. ISBN: 978-1-264-59823-6.

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Firestein, G. S., Budd, R. C., Gabriel, S. E., McInnes, I. B., O'Dell, J. R.: Kelley's Textbook of Rheumatology.

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4th (enlarged) edition. Debrecen University Press, 2019. ISBN: 978-963-490-118-1.

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Christof Koch and Idan Segev: Methods in Neuronal Modeling, From Synapses to Networks.

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Brigden R.J.: Operating Theatre Technique (A Textbook for Nurses, Operating Department Assistants, Medical Students, Junior Medical Staff and Operating Theatre Designers).

5th edition. Churchill Livingstone, 1990. ISBN: 0-443-03364-1.

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