University of Pécs Medical School

GENERAL MEDICINE Major

STUDY PROGRAM 2017/2018

Subjects of the Basic module (obligatory subjects and criterion requirements)
### 1\(^{st}\) semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OAA-ANT</td>
<td>Behavioral Science 1 (Medical Anthropology)</td>
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<tr>
<td>OAA-B1I</td>
<td>Biophysics 1</td>
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<tr>
<td>OAA-BML</td>
<td>Public Health 1 (The Basics of Disease Prevention)</td>
<td>8</td>
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<tr>
<td>OAA-MB1</td>
<td>Molecular Cell Biology 1</td>
<td>10</td>
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<td>OAA-MET</td>
<td>Biometrics</td>
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<tr>
<td>OAA-OET</td>
<td>Behavioral Science 2 (Medical Ethics)</td>
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<tr>
<td>OAA-OKG</td>
<td>Medical Communication Skills</td>
<td>20</td>
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<td>OAA-ORK</td>
<td>Medical Chemistry</td>
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<td>OAR-ELS</td>
<td>First Aid</td>
<td>26</td>
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<tr>
<td>OAR-OKA</td>
<td>General Chemistry</td>
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<td>ATT1</td>
<td>Physical Education 1</td>
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### 2\(^{nd}\) semester

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<tr>
<td>OAA-AA1</td>
<td>Anatomy 1</td>
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<tr>
<td>OAA-AED</td>
<td>Public Health 2 (General Epidemiology and Demography)</td>
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<tr>
<td>OAA-BEB</td>
<td>Introduction to Biochemistry</td>
<td>36</td>
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<td>OAA-B12</td>
<td>Biophysics 2</td>
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<td>OAA-MB2</td>
<td>Molecular Cell Biology 2</td>
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<td>OAA-SF1</td>
<td>Histology and Embryology 1</td>
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<td>OAR-APG</td>
<td>Summer Practice in Hospital Care</td>
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<td>OAR-API</td>
<td>Nursing Skills Theory - Hospital Care</td>
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<tr>
<td>OAR-OKG</td>
<td>Summer Practice in Medical Communication Skills</td>
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<tr>
<td>ATT2</td>
<td>Physical Education 2</td>
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<td>OAA-AA2</td>
<td>Anatomy 2</td>
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<td>OAA-BKA</td>
<td>Biochemistry</td>
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<td>OAA-EL1</td>
<td>Physiology 1</td>
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<td>OAA-HUG</td>
<td>Basics of Human Genetics</td>
<td>68</td>
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<td>OAA-KET</td>
<td>Public Health 3 (Environmental Health)</td>
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<td>OAA-SF2</td>
<td>Histology and Embryology 2</td>
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<td>ATT3</td>
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<tr>
<td>OAA-EL2</td>
<td>Physiology 2</td>
<td>76</td>
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<td>OAA-IMM</td>
<td>Basic Immunology</td>
<td>84</td>
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<tr>
<td>OAA-NEA</td>
<td>Anatomy, Histology, Embryology and Neuroanatomy</td>
<td>87</td>
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<tr>
<td>OAA-OBA</td>
<td>Medical Biochemistry</td>
<td>91</td>
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<tr>
<td>OAA-SZO</td>
<td>Behavioural Science 3 (Medical Sociology)</td>
<td>94</td>
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<td>ATT4</td>
<td>Physical Education 4</td>
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<td>Physical Education courses 1-2-3-4-5</td>
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<tr>
<td>OAR-HUF-O</td>
<td>Final Examination in Medical Hungarian - oral</td>
<td>100</td>
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<tr>
<td>OAR-HUF-W</td>
<td>Final Examination in Medical Hungarian - written</td>
<td>101</td>
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OAA-ANT  BEHAVIORAL SCIENCE 1 (MEDICAL ANTHROPOLOGY)

Course director: DR. ÁRPÁD CSATHÓ, associate professor
Department of Behavioural Sciences

1 credit • semester exam • Basic subject • autumn semester • recommended semester: 1
Number of hours/semester: 14 lectures + 0 practices + 0 seminars = total of 14 hours
Course headcount limitations (min.-max.): 5 – 300  Prerequisites: none

Topic
Medical Anthropology can shortly be described as a subfield of anthropology that draws upon psychological, cultural, and biological anthropology to better understand those factors which influence human health and well-being. Within this scope, there are many different conceptual approaches, and one of these, the adaptational or ecological approach, receives a special focus during the course. Thus, the discussion of the course topics put an emphasis on the three different mechanisms of adaptation acquired by individuals to adapt to an environment: the biological, cultural and psychological adaptations. By attending the course, students will understand the basic concepts of medical anthropology, and acquire knowledge about the interactions between the many different influential factors (e.g. biological and cultural factors) of human health and behavior.

Conditions for acceptance of the semester
According to the Code of Studies and Examinations

Mid-term exams
-

Making up for missed classes
According to the Code of Studies and Examinations

Reading material
- Obligatory literature
- Literature developed by the Department
  Available on Neptun
- Notes
- Recommended literature
  Donald Joralemon: Exploring Medical Anthropology, Allyn and Bacon, 1999
  Tony McMichael: Human Frontiers, Environments and Disease, Cambridge, Univ. Press, 2001

Lectures
1 The subject and subfields of medical anthropology. Health concepts.
   Dr. Csathó Árpád
2 The concept of adaptation and plasticity in medical anthropology.
   Dr. Csathó Árpád
3 Urban ecology: The effects of urbanization on health.
   Dr. Csathó Árpád
4 Stress as a bio-cultural interaction.
   Dr. Csathó Árpád
5 Pain perception, and its bio-cultural variability.
   Dr. Csathó Árpád
6 Placebo-nocebo effects. The anthropology of the drug effects.
   Dr. Csathó Árpád
7 Mortality and the basic concepts of demography.
   Dr. Csathó Árpád
8 The concepts of death. The development of the death belief in childhood.
   Dr. Csathó Árpád
9 Behavioural science models for human addiction.
   Dr. Csathó Árpád
10 Human nutrition in a biocultural context.
   Dr. Csathó Árpád
11 The interactions of environmental and biological factors on physical development. The concept of secular trends.
   Dr. Csathó Árpád
The anthropology of human aging.
Dr. Csathó Árpád

The types of the environment, gene-environment interactions.
Dr. Csathó Árpád

Philosophical anthropology.
Dr. Szolcsányi Tibor

Practices

Seminars

Exam topics/questions

Exams are organized during the exam period on the days announced well in advance. The exam has two parts organized one after the other on the same day: a short written part followed by an oral part. On each exam day, first, the students need to write a short test having about 20 simple-choice test questions, lasting about 20 minutes. The questions in the test are related to the topics listed below. The test writing will be immediately followed by the oral part of the exam. During the oral part the students are required to discuss two of topics with examiner extensively. The final grade received by the students is calculated based on the written and the oral grades.

1. Interpretation of the different concepts of health.
2. The classification of the adaptation processes based on their mechanisms and the time constrain (i.e. duration).
3. Explanation of acclimatization with examples.
4. Explanation of cultural adaptation with examples.
5. Main methods to investigate adaptation processes to urban environment.
6. Explanation of acculturation with examples.
7. The description of the main stages of cultural shock with examples.
10. Differences in pain quality and pain duration: phasic vs. tonic pain, acute vs. chronic pain.
11. The microcontextual and the macrocontextual elements of the total drug effect.
12. Definition of placebo and nocebo effects with examples.
14. The main stages of the concept of death in childhood.
15. The concept of the secular trends. The effects of the biological and cultural factors on the development of the positive and negative secular trends.
16. The biocultural background of eating disorders.

Participants
Biophysics 1

Course director: DR. ANDRÁS SZILÁRD LUKÁCS, associate professor
Department of Biophysics

4 credit • semester exam • Basic subject • autumn semester • recommended semester: 1

Number of hours/semester:
28 lectures + 28 practices + 0 seminars = total of 56 hours

Course headcount limitations (min.-max.): 5 – 200
Prerequisites: none

Topic
The course addresses the physical basis of the structure and function of biological systems. The main topics include atomic and nuclear physics, thermodynamics, transport processes, molecular and supramolecular systems, bioelectric phenomena, and biological motion.

Conditions for acceptance of the semester
Completion and proper documentation of each laboratory practice and approval thereof by the course instructor. Maximum 3 absences from practices. Students are not allowed to be late from the practicals. Being late counts as an absence. During the semester the students write mid-term tests. Based on the results the students can be exempted from some parts of the colloquium.

Mid-term exams
Making up for missed classes
Missed practices can be made up during make-up opportunities provided by the department. During each make-up lab, only one missed practice can be executed.

Reading material
- Obligatory literature
- Literature developed by the Department
  1. Damjanovich Sándor, Fidy Judit, Szöllősi János (eds.): Medical Biophysics, Medicina, Budapest, 2009
  2. Biophysics Laboratory Manual, Pécs University Press, Pécs
  3. Online materials on departmental website (http://biofizika.aok.pte.hu)
- Notes
- Recommended literature

Lectures
1. Introduction to Biophysics
   Dr. Grama László
2. Electromagnetic radiation, Electromagnetic spectrum
   Dr. Grama László
3. Foundations of quantum physics
   Dr. Grama László
4. Structure of the atom
   Dr. Grama László
5. Quantum numbers. Spin
   Dr. Grama László
6. Molecular orbitals. Singulet and triplet state
   Dr. Grama László
7. X-ray
   Dr. Grama László
8. X-ray diffraction
   Dr. Grama László
9. Laser
   Dr. Grama László
10. Structure of the atomic nucleus. Radioactivity
    Dr. Grama László
11. Interaction of radioactive radiation with matter
    Dr. Grama László
12. Biological effects of radioactive radiation
    Dr. Grama László
13. Foundations of thermodynamics
    Dr. Lukács András Szilárd
14. Laws of thermodynamics
    Dr. Lukács András Szilárd
15 Thermodynamic potentials
   Dr. Lukács András Szilárd
16 Diffusion
   Dr. Szabó-Meleg Edina
17 Osmosis
   Dr. Szabó-Meleg Edina
18 Fluid flow
   Dr. Grama László
19 Biophysics of circulation. Cardiac biophysics
   Dr. Hild Gábor
20 Protein structure and folding
   Dr. Hild Gábor
21 The cell membrane. Resting potential
   Dr. Hild Gábor
22 Sensory receptors, action potential
   Dr. Hild Gábor
23 Vision
   Dr. Hild Gábor
24 Hearing
   Dr. Hild Gábor
25 Cytoskeleton
   Dr. Hild Gábor
26 Motor proteins, cell motility
   Dr. Hild Gábor
27 Structure and mechanics of striated muscle
   Dr. Bugyi Beáta
28 Molecular basis of muscle function and contraction regulation
   Dr. Bugyi Beáta

Practices
1 Introduction. Laboratory safety rules
2 Introduction. Laboratory safety rules
3 Direct current measurements
4 Direct current measurements
5 Alternative current measurements
6 Alternative current measurements
8 Electric conductivity. Refractometry
9 Electric conductivity. Refractometry
10 Spectroscopy and spectrophotometry
11 Spectroscopy and spectrophotometry
12 Polarimetry
13 Polarimetry
14 Make-up lab, seminar
15 Make-up lab, seminar
16 Viscosity of fluids
17 Viscosity of fluids
18 Surface tension
19 Surface tension
20 Adsorption and swelling
21 Adsorption and swelling
22 Centrifugation
23 Centrifugation
24 Electrophoresis
25 Electrophoresis
26 Make-up lab, seminar
27 Make-up lab, seminar
27 Make-up lab, seminar
28 Make-up lab, seminar
Seminars

Exam topics/questions

Can be found on the departmental website: http://biofizika.aok.pte.hu

Participants

Czimbalek Lívia Mária (CZLAAA.T.JPTE), Dr. Bódis Emőke (BOEAAD.T.JPTE), Dr. Bugyi Beáta (BUBEAB.T.JPTE), Dr. Grama László (GRLHAAO.PTE), Dr. Hild Gábor (HIGMAAO.PTE), Dr. Kengyel András Miklós (KEAFACO.PTE), Dr. Lukács András Szilárd (LUATAA0.PTE), Dr. Szabó-Meleg Edina (MEEDAA.T.JPTE), Dr. Talián Csaba Gábor (TACRAAO.PTE), Dr. Vízegrády Balázs (VIBAAB.T.JPTE), Huber Tamás (HUTEAB.T.JPTE), Huberné Barkó Szilvia (BASFAA.T.JPTE), Kollár Veronika Tünde (KOVGACT.PTE), Leipoldne Víg Andrea Teréz (VIAFAAO.PTE), Szatmári Dávid (SZDHAAT.PTE), Tóth Mónika Ágnes (TOMIAAT.PTE), Türmer Katalin Erzsébet (TUKIAAT.PTE), Ujfalusi Zoltán (UJZDAA.T.JPTE)
### OAA-BML PUBLIC HEALTH 1 (THE BASICS OF DISEASE PREVENTION)

**Course director:** DR. ISTVÁN KISS, professor
Department of Public Health Medicine

<table>
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<th>Course director:</th>
<th>DR. ISTVÁN KISS, professor</th>
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<td>Department:</td>
<td>Department of Public Health Medicine</td>
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1 credit • semester exam • Basic subject • autumn semester • recommended semester: 1

**Number of hours/semester:** 7 lectures + 7 practices + 0 seminars = total of 14 hours

**Course headcount limitations (min.-max.):** 1 – 200  
**Prerequisites:** none

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### Topic

The subject analyses the factors influencing disease development, investigates the social and economic factors playing role in the health prevention. Represents the health care systems to introduce the students into this organisation, in where they should work later. Furthermore analyses some certain social group’s special health problems from the health prevention point of view.

After Public Health 6 the students must take a public health final exam which includes the material of all the Public Health subjects (Public Health 1 - 6).

### Conditions for acceptance of the semester

Participation in practicals is obligatory which is registered. Absences should not exceed 2x45 min. Otherwise signature of grade book is denied.

### Mid-term exams

- Making up for missed classes

Students may attend the practical of another group on the same week. Pre-consultation with practical leader is needed.

### Reading material

- **Obligatory literature**
  

- **Literature developed by the Department**
  
  Educational material uploaded on Neptun.

- **Notes**

- **Recommended literature**

### Lectures

1. Global public health situation.  
   Dr. Kiss István

2. The definition of health and disease. Health determinants.  
   Dr. Kiss István

   Dr. Kiss István

4. The role of social factors in disease development.  
   Dr. Kiss István

   Dr. Horváth-Sarródi Andrea

6. Mother and neonatal health.  
   Dr. Németh Katalin

   Dr. Berényi Károly

### Practices

1. Levels of prevention.
3. Health problems of the elderly
4. Rehabilitation, chronic nursing care, hospice
5. Special health situation of minorities
6. Special health situation of handicapped persons
7. Health problems of the youth.
Seminars

Exam topics/questions

1. Global public health situation.
4. The definition of health and disease.
5. Health determinants.
6. Educational status and income: their effects on disease development
7. The role of social factors in disease development (excluding educational status and income)
8. Health promotion.
9. Preventive tasks related to maternity and pregnancy
11. Health policy.
12. Levels of prevention.
13. Role of obesity and physical inactivity in disease development
14. Role of smoking and alcohol consumption in disease development
15. Health problems of the elderly (epidemiological characteristics and aging theories)
16. Health problems of the elderly (physiological characteristics, possibilities of prevention, primary, secondary prevention)
17. Rehabilitation, chronic nursing care, hospice
18. Special health situation of minorities
19. Special health situation of migrants, public health aspects
20. Special health situation of homeless people, public health aspects
21. Special health situation of handicapped persons, possibilities of prevention (mobility and sensory impairments)
22. Special health situation of handicapped persons, possibilities of prevention (intellectual disability)
23. Organization of childhood and youth health, age specific epidemiological characteristics
24. Childhood and youth health (drug use, risks of sexual behaviour, mental health, causes of violent death)

Participants

Dr. Berényi Károly (BEKFAO.PTE), Dr. Horváth-Sarródi Andrea (HOAF-ALO.PTE), Dr. Rákosy Zsuzsa (RAZVAAP.PTE)
OAA-MB1 Molecular Cell Biology 1

Course director: DR. HAJNALKA GABRIELLA ÁBRAHÁM, associate professor
Department of Medical Biology

6 credit • semester exam • Basic subject • autumn semester • recommended semester: 1

Number of hours/semester:
42 lectures + 12 practices + 30 seminars = total of 84 hours

Course headcount limitations (min.-max.): 1 – 200

Prerequisites: none

Topic
To provide molecular and cellular biological basis for the teaching of anatomy, biochemistry, physiology, pathology, pathophysiology, microbiology and pharmacology. To teach students molecular cell biology facts essential for clinical subjects. The course covers cellular and molecular characteristics of the structure and functions of the cell. Main topics: functional morphology of eukaryotic cells; mechanisms of the storage, replication and expression of genetics information.

The detailed list of topics will be available on the first seminar for each group.

Conditions for acceptance of the semester
According to the Code of Studies and Examinations

Mid-term exams
Making up for missed classes

Extra lab programs at the end of each practical cycle.

Reading material

- Obligatory literature

- Literature developed by the Department

- Notes

- Recommended literature

Lectures

1 Educational objectives
   Dr. Ábrahám Hajnalka Gabriella

2 Comparison of prokaryotic and eukaryotic cells
   Dr. Ábrahám Hajnalka Gabriella

3 Modern morphological techniques I
   Dr. Ábrahám Hajnalka Gabriella

4 Methods of molecular biology I: Restriction endonucleases
   Dr. Szeberényi József

5 Methods of molecular biology II: DNA cloning. Genomic libraries
   Dr. Szeberényi József

6 Methods of molecular biology III: Polymerase chain reaction
   Dr. Szeberényi József

7 Methods of molecular biology IV: DNA sequencing
   Dr. Szeberényi József

8 Methods of molecular biology V: Transgenic organisms. Inhibition of gene function
   Dr. Szeberényi József

9 Methods of molecular biology VI: DNA chips
   Dr. Szeberényi József

10 Methods of molecular biology VII: Immunological methods
   Dr. Barthó né Dr. Szekeres Júlia

11 Closing lecture
   Dr. Szeberényi József

12 Modern morphological techniques II
   Dr. Ábrahám Hajnalka Gabriella

13 The cell nucleus
   Dr. Ábrahám Hajnalka Gabriella
14 Genome organisation  
   Dr. Szeberényi József

15 The structure and chemical composition of chromatin  
   ifj. Dr. Sétáló György

16 The phases of cell cycle.  
   ifj. Dr. Sétáló György

17 The regulation of cell cycle.  
   ifj. Dr. Sétáló György

18 Cell division. Mitosis, meiosis.  
   ifj. Dr. Sétáló György

19 DNA replication in prokaryotes  
   ifj. Dr. Sétáló György

20 DNA replication in eukaryotes  
   ifj. Dr. Sétáló György

21 DNA repair  
   ifj. Dr. Sétáló György

22 Transcription in prokaryotes  
   Dr. Pap Marianna

23 The synthesis and processing of pre-rRNA in eukaryotes  
   Dr. Pap Marianna

24 The synthesis of pre-mRNA in eukaryotes  
   Dr. Pap Marianna

25 The pre-m RNA processing in eukaryotes  
   Dr. Pap Marianna

26 Translation I: The components of protein synthesis  
   Dr. Pap Marianna

27 Translation II: The mechanism of protein synthesis  
   Dr. Pap Marianna

28 Translation III: The genetic code  
   Dr. Pap Marianna

29 Regulation of gene expression in prokaryotes  
   Kiss Katalin

30 Regulation of gene expression in eukaryotes I: Levels of gene regulation  
   Dr. Szeberényi József

31 Regulation of gene expression in eukaryotes II: Transcription factors  
   Dr. Szeberényi József

32 Closing lecture  
   Dr. Szeberényi József

33 Rough endoplasmic reticulum  
   Dr. Ábrahám Hajnalka Gabriella

34 Golgi complex. Protein glycosylation and sorting  
   Dr. Ábrahám Hajnalka Gabriella

35 Endocytosis. Vesicular transport  
   Dr. Ábrahám Hajnalka Gabriella

36 Cell defense mechanisms I: lysosomes, smooth endoplasmic reticulum  
   Dr. Ábrahám Hajnalka Gabriella

37 Cell defense mechanisms II: oxygen free radicals, membrane damage  
   Dr. Ábrahám Hajnalka Gabriella

38 Mitochondria I: Structure and function  
   ifj. Dr. Sétáló György

39 Mitochondria II: Genetic apparatus  
   ifj. Dr. Sétáló György

40 Cytoskeleton I: Microfilaments  
   Dr. Ábrahám Hajnalka Gabriella

41 Cytoskeleton II: Intermediate filaments and microtubules  
   Dr. Ábrahám Hajnalka Gabriella

42 Closing lecture. The cell membrane.  
   Dr. Ábrahám Hajnalka Gabriella
Practices
1. Light microscope. Tracing of biological molecules inside the cell.
2. Light microscope. Tracing of biological molecules inside the cell.
3. Centrifugation, chromatography
4. Centrifugation, chromatography
5. Plasmid isolation
6. Plasmid isolation
7. Protein electrophoresis and Western blotting
8. Protein electrophoresis and Western blotting
9. Isolation of nucleic acids
10. Isolation of nucleic acids
11. Restriction endonuclease digestion of DNA
12. Restriction endonuclease digestion of DNA

Seminars
1. General information. Preview of lab cycle I
2. Biological macromolecules
3. Light microscopy
4. Comparison of pro- and eukaryotic cells
5. Separation methods
6. Methods of molecular biology I
7. Methods of molecular biology II
8. Methods of molecular biology III
9. Methods of molecular biology IV.
10. Cell nucleus. Genome organisation
11. Chromatin
12. The cell cycle
13. Electron microscopy (demonstration)
14. DNA replication
15. DNA repair.
16. Cell division. Preview of lab cycle II
17. Transcription in prokaryotes
18. Transcription in eukaryotes
19. RNA processing
20. Translation I
21. Translation II
22. Gene regulation I
23. Gene regulation II
24. Rough ER, Golgi complex. Vesicular transport
25. Cell defense mechanisms
26. Mitochondria I
27. Mitochondria II
28. End-of-semester discussion
29. SEMESTER TEST
30. SEMESTER TEST

Exam topics/questions
1. Proteins
2. Lipids
3. Carbohydrates
4. Nucleosides, nucleotides
5. The structure of DNA
6. Experiments proving that DNA is the genetic material
7. The structure and types of RNA
8. Comparison of pro- and eukaryotic cells
9. Methods of immunocytochemistry
10. Restriction endonucleases
11. Southern blotting
12. DNA sequencing
13. DNA chips
14. Genomic libraries
15. Polymerase chain reaction
16. Transgenic organisms
17. Targeted gene inactivation
18. Inhibition of gene expression at the level of mRNA
19. cDNA libraries
20. Northern blotting
21. Immunoprecipitation and Western blotting
22. The structure of cell nucleus
23. The organisation of chromatin
24. Unique and repetitive sequences
25. The chemical composition of chromatin
26. The phases of cell cycle
27. The regulation of cell cycle
28. Mitosis
29. Meiosis
30. General features of replication
31. The mechanism of replication in prokaryotes
32. Eukaryotic replication
33. DNA repair
34. The mechanism of prokaryotic transcription
35. General features of eukaryotic transcription
36. Synthesis and processing of eukaryotic pre-rRNA
38. Pre-mRNA splicing
39. Synthesis of aminoacyl-tRNA
40. The structure and function of ribosomes
41. The genetic code
42. Initiation of translation
43. Elongation and termination of translation
44. General features of translation
45. The lactose operon
46. The tryptophan operon
47. Cloning by nuclear transplantation
48. Regulation of pre-mRNA synthesis and processing in eukaryotes
49. Regulation of mRNA transport, translation and degradation in eukaryotes
50. Regulation of protein activity and degradation in eukaryotes
51. Eukaryotic transcription factors
52. The mechanism of action of steroid hormones
53. Rough endoplasmic reticulum
54. Golgi complex. Protein glycosylation
55. The mechanism of secretion
56. Endocytosis
57. The mechanism of vesicular transport
58. Lyrosomes. Smooth endoplasmic reticulum
59. Oxygen free radicals. Membrane damage. Lipid peroxidation
60. The structure and function of mitochondria
61. The genetic apparatus of mitochondria
62. Mitochondrial diseases

Participants

Varga Judit (VAJFACT.PTE), Balassa Timea (BATNAAT.PTE), Bogdán Ágnes (BOAEAA.T.JPTE), Dr. Ábrahám Hajnalka Gabriella (ABHMAAO.PTE), Dr. Bátor Judit (BAJFAAO.PTE), Dr. Berta Gergely (BEGFADO.PTE), Dr. Fekete Zsuzsanna (FEZAAB.T.JPTE), Dr. Kemény Ágnes (KEAAAA.T.JPTE), Dr. Pap Marianna (PAMFAAO.PTE), Dr. Seress László Antal (SELMAAO.PTE), Dr. Tarjányi Oktávia (TAOGAAO.PTE), Harci Alexandra (HAAGABT.PTE), Horváth Hajnalka (HOHQAAT.PTE), ifj. Dr. Sétáló György (SEGMAAO.PTE), Kiss Katalin (KIKFABO.PTE), Németh Mária (NEMGAAT.PTE), Schipp Renáta (SCRDAAT.T.JPTE)
OAA-MET BIOMETRICS

Course director: Dr. László Pótó, associate professor
Institute of Bioanalysis

2 credit • semester exam • Basic subject • autumn semester • recommended semester: 1

Number of hours/semester: 14 lectures + 14 practices + 0 seminars = total of 28 hours
Course headcount limitations (min.-max.): 1 – 200
Prerequisites: none

Topic
As a first course in statistics it covers the following main blocks: Basic data handling and computer use. Exploring data by graphical and numerical characterization. Basic concepts of probability and statistical inference. The basic methods for statistical inference most frequently used in medicine.
As the main goal it focuses on the power of „statistical thinking” that is new to students and increasingly important at medical field - not only in the science but also in everyday work at the bedside. So we introduce students to the basics of Medical Decision Making.

Conditions for acceptance of the semester
At least two written in-semester test (all passed), no more than two missed classes.
There is a three-steps exam for the grade: an entry-test, a problem to be solved by the computer (using SPSS) and two theory questions. All the three should be completed at least “satisfactory” for a successful exam. Failed at any steps results a failed exam.
The list of the theory questions is attached below.

Mid-term exams
At least two written in-semester test, min 50% result for each is needed for taking the final semester exam.
One in-semester test can be re-taken if failed.

Making up for missed classes
Extra class

Reading material
- Obligatory literature
- Literature developed by the Department
- Notes
- Recommended literature
  and:
  or

Lectures
1. Introduction (Statistics in medicine, models). Probability.
   Dr. Pótó László
2. Variables, Discrete distributions (binomial and Poisson).
   Dr. Pótó László
3. Continuous variables. Histogram, relative frequency density and probability density function.
   Dr. Pótó László
4. Mean and standard deviation. The normal distribution.
   Dr. Pótó László
5. Distribution of the sample mean, standard error.
   Dr. Pótó László
6. Confidence interval for the expected value. The t distribution
   Dr. Pótó László
7. Principle of hypothesis testing. The one sample and the paired samples t tests. The sign test (preview).
   Dr. Pótó László
8  The confidence interval and the hypothesis testing. Type I and type II errors. MDM basics 1.
   Dr. Pótó László
9  The independent samples t test. The F test.
   Dr. Pótó László
10 Linear regression and correlation.
    Dr. Pótó László
11 Contingency tables 1. The chi-squared test.
    Dr. Pótó László
12 The non-parametric tests (sign test, Wilcoxon and Mann-Whitney tests).
    Dr. Pótó László
13 The principle of the ANOVA. Summary of the hypothesis testing methods.
    Dr. Pótó László
14 Medical tests. Sensitivity and specificity. (Contingency tables 2.) MDM basics 2. Summary.
    Dr. Pótó László

Practices
1  Probability examples 1. + Using computers, Windows, SPSS.
2  Probability examples 2 - discrete distributions.
3  The binomial distribution.
5  Exploring data by numbers - descriptive statistics
6  Normal distribution. The distribution of the sample mean.
7  Estimations. The confidence interval of the expected value.
8  The hypothesis testing - the ‘five steps’. The one sample (and the paired samples) t tests. The sign test.
9  Estimation and hypothesis testing. The Type one and Type two errors.
10 The independent samples t test.
11 The linear regression and correlation.
12 Contingency tables - the chi-squares test.
13 Nonparametric tests (Sign test, Wilcoxon tests, Mann-Whitney test)
14 Summary

Seminars

Exam topics/questions

On the main semester exam: A written entry test, one data analysis problem solved by the SPSS and two theory questions from the below list. One of them is out of the MDM questions.

MDM-1  Medical Decision Making - basic principles 1
Demonstrate please the application of statistical decision making terms and principles (Ho, Type-1 and 2 error risks, change the alpha decision borderline, ...) to a simple medical or any everyday life decision making situation.
Use your calculation exam problem or select your own problem for demonstration.
(Mainly from the lecture 8)

MDM-2  Medical Decision Making - basic principles 2
Demonstrate please the application of statistical decision making terms and principles (clinical evidences, probabilities, treatment borderline, further examination options, ...) to a simple medical decision making situation.
Use your calculation exam problem or select your own problem for demonstration.
(Mainly from the lectures 13-14)

1. The main goal of biometrics/biostatistics
   Compare the two models - what are the main differences?
   Relate them and show how they both have its role in the scientific work and in medicine.
   (Mainly from the lectures 1, 3, and 6-7-8)

2. The key feature of the statistical thinking - the probability
   Show this term - use a simple example, please. When can it be (and when can not be) calculated? Illustrate how both ways can be used in practical medical situations - by some examples.
   (Mainly from the lectures 1, 2, 6-7-8 and 12)
3. The idea of the probability distribution - discrete distributions - 1.
Demonstrate on the example of the binomial distribution how the probability calculations (games of chances case) can be used in real life situations. How can you illustrate a distribution (graphically). Trace its role on the decision making.
(Mainly from the lectures 2, 6-7-8 and 12)

4. The idea of the probability distribution - discrete distributions - 2.
Contrast the binomial and the Poisson distributions: similarities and differences - demonstrated by some examples. Show the importance of discrete distributions trough examples. (Which hypothesis testing methods are based on this approximation?)
(Mainly from the lectures 2, 6-7-8 and 12)

5. The basic principles of statistical thinking - from the data to the decision
The way to the decision - and some pitfalls. (Size of the sample, representativity, lurking variables, probability decision, risk of errors, - and handling them)
(Mainly from the lectures 3 and 6-7-8)

6. Types of the data (variables) and displaying them with graphs
The three most frequent types of data and the methods for summarizing and displaying them.
Applications of some diagrams - strength and weaknesses. What specific info can be observed from a given type of graph? When to choose a given type?
(Mainly from the lecture 3 and 10)

7. The population and the sample
Explain both terms in case of some different types of data. How to characterize (by pictures or numbers) the sample and the population in these examples? Discuss the basic role of both terms in the statistical inference and decision making
(Mainly from the lectures 2, 3, 6-7-8 and 12)

8. Numerical description of continuous data
Contrast the “five number” and “three number” descriptions. When to use one and when the other?
Prove and demonstrate by examples the basic role of the two description while selecting the appropriate decision making (or hypothesis testing) method.
(Mainly from the lectures 4, 6-7-8 and 12)

9. The idea of the probability distribution - continuous distributions
Symmetrical and skewed distributions. How the measures of the sample show (mirror) the shape of the distribution? Demonstrate them on the example of the normal and some skewed distributions. Prove the importance of distinction between them (think to the condition of the decision making methods).
(Mainly from the lectures 4, 6-7-8 and 12)

10. The normal distribution 1
Features. Why is it so frequently used in biology and medicine?
Application examples (reference range, ...).
How does the “normal approximation” method demonstrate its importance (application examples) ... and how does the conditions of the hypothesis testing methods?
(Mainly from the lectures 4, 5, 6-7-8 and 12)

11. The normal distribution 2
How the “distribution of the mean” shows its importance? Verify the basic role of the “distribution of the mean” while statistical inference and decision making.
(Mainly from the lectures 4, 5, 6-7-8-9-10)

12. Statistical inference
The statistical inference is the main goal (final step) of the statistical thinking. Contrast the point- and the interval estimation from this point of view. Trace both methods (and the use of them) on the example of the confidence interval for the expected value (the p% CI of the expected value).
(Mainly from the lectures 5 and 6)

13. The confidence interval of the population mean
You can find the “95% CI” on most of the SPSS output (that you learned). What is that and why can you meet it so frequently at statistical analysis? Give examples of results screens (methods): why is it included in the given method - what is the use of it there?
(Mainly from the lectures 5 and 6 - and all the lectures from then)
14. The basic idea of hypothesis testing
Prove the relevance of the “five steps” method - and demonstrate it on everyday and medical examples. What are the simple given steps of the “five” and those that require personal evaluation from case to case? Discuss these later ones on examples.
(Mainly from the lectures 7 - and all the lectures from then)

15. The one sample and the paired t test
At what kind of data (structure) should you use this method? When hypothesis testing? Relate the two methods to each other. What can be done when the application conditions do not fit? Why not use these later methods at all the situations then?
(Mainly from the lectures 6-7-8-9 and 12)

16. The confidence interval and the hypothesis testing
Contrast the two methods: similarities and differences - strength and weaknesses. Demonstrate your evaluation on examples.
(Mainly from the lectures 6-7-8)

17. The risk of errors and the power of a test
Discuss the essential feature of the statistical decisions the risk of errors. How can you handle these risks? When should you handle these risks?
Explain on examples: when can you use the value of the risk of a certain error and when to use the power of the test? (Which questions call for this kind of answers?)
(Mainly from the lectures 8 and 9)

18. The two (independent) samples t test
Contrast the paired and independent samples t tests? What are the typical questions which call for the later method? What is the specific requirement (condition) of this method - and how can you handle this with the help of the F test?
(What should we “pay for” that solution? Why not to use always the solution which has less requirements?)
(Mainly from the lecture 9)

19. Connection between two variables - continuous variables
Contrast the “one variable - two samples” and the “two variables” - paired data (“one sample”)? Cases. What are the typical questions in the two cases?
Use examples to explain the method of the linear regression and correlation analysis. Stress the steps where there is an obvious role of statistical thinking.
Is this method a hypothesis test?
(Mainly from the lecture 10)

20. Connection between two variables - categorical variables
Relate to each other the “two variables” methods for continuous and categorical variables - similarities and differences. Which numbers are to be evaluated in the later case?
Which hypothesis testing method(s) are available for that? Explain the five steps on an example. What are the conditions for applying the method(s) and what to do when those conditions are not valid?
(Mainly from the lectures 11 and 12)

Why the chi-squares test is not applicable in the medical practice frequently? What to do then? When to use the Fisher’s exact test - out of those cases? What the “exact” word means in the name?
(Mainly from the lectures 11 and 12)

How to qualify a diagnostic test? Which questions can be answered by the “sensitivity”, “specificity” and the “predictive value(s)” of the test?
The confidence interval for the proportion. Explain (using the previous term) why the chi-squares test gives “not significant” result at evaluations of medical data frequently.
(Mainly from the lectures 11 and 12)

23. Nonparametric tests - 1.
When to refuse the application of a t test - and when to apply the sign test instead? Demonstrate the “five steps” on an example using the sign test. Contrast this method and the appropriate “parametric” one? What are the strength and weaknesses of this method?
(Mainly from the lectures 2, 7 and 12)
When to refuse the application of a t test - and when to apply the Wicoxon and the Mann-Whitney test instead? Demonstrate the application of both tests on examples. Contrast these methods and the appropriate “parametric” ones? What are the strength and weaknesses of these methods?
(Mainly from the lectures 2, 9 and 12)

25. The principle of the ANOVA
Demonstrate the application of the ANOVA method on an example
What is the basic idea of the evaluation? Illustrate it on the case of comparing several group means simultaneously.
What is the strength of this method in contrast to the several t tests for pairs of groups?
(Mainly from the lectures 2, 8, 9 and 13)

Participants
Dr. Dergez Timea (DETCAAT.T.JPTE), Dr. Kilár Ferenc (KIFGAAO.PTE), Dr. Pótó László (POLGABO.PTE), Kőnigné Péter Anikó (PEAAAB.T.JPTE)
**Topic**

The course helps the students gain sensitivity regarding the ethical aspects of medical practice, and to become aware of the different ethical approaches. The main aim of the course is to assist the students in developing their own ethical attitudes.

**Conditions for acceptance of the semester**

Maximum of 15% absence allowed

**Mid-term exams**

Written test taking place in the last class. To improve the grade, the test can be repeated two times in the first two weeks of the exam period. Oral exam is also an option for that purpose.

**Making up for missed classes**

According to the Code of Studies and Examinations

**Reading material**

- **Obligatory literature**
- **Literature developed by the Department**
  - Course materials: Neptun Meet Street
- **Notes**
- **Recommended literature**

**Lectures**

**Practices**

**Seminars**

1. The differences between traditional medical ethics and modern bioethics
2. The main moral theories
3. The most fundamental ethical principles of healthcare profession. Medical confidentiality
4. The principle of medical informed consent
5. Problems in the care of the terminally ill
6. Problems in the care of the terminally ill
7. The moral status of abortion
8. The ethics of organ and tissue transplantation
9. Ethical issues raised by reproductive medicine
10. Ethical issues raised by reproductive medicine
11. The placebo effect
12. Ethical issues raised by genetic interventions
13. Summarizing discussion
14. Written test

**Exam topics/questions**

Additional materials: Neptun Meet Street

**Participants**

Dr. Szolcsányi Tibor (SZTAAJ.B.JPTE)
OAA-OKG | MEDICAL COMMUNICATION SKILLS
Course director: DR. SÁNDOR BALOGH, professor
Department of Primary Health Care

1 credit • midterm grade • Basic subject • autumn semester • recommended semester: 1
Number of hours/semester: 6 lectures + 8 practices + 0 seminars = total of 14 hours
Course headcount limitations (min.-max.): 5 – 200  Prerequisites: none

Topic

Conditions for acceptance of the semester
Visiting the seminars is compulsory. Every student should join the group which is assigned on the Neptun. Before the end of the semester a students should write online test in NEPTUN.

Mid-term exams
- None

Making up for missed classes
- None

Reading material
- Obligatory literature
  János Pilling: Medical Communication
- Literature developed by the Department
- Notes
- Recommended literature

Lectures
1 Introduction to Physician-Patient Communication, Doctor-Patient Encounter
   Dr. Bán Ildikó
2 Verbal Communication
   Dr. Bán Ildikó
3 Non-verbal Communication
   Dr. Bán Ildikó
4 Difficult situations in Communication (Dr. Heim Szilvia)
   Dr. Bán Ildikó
5 Ethical issues in doctor-patient communication
   Dr. Radványi Ildikó
6 Interviewing patients
   Várbiróéné Dr. Csikós Ágnes

Practices
1 Introduction-Getting to know each other
1 Interviewing patient, Verbal Communication
2 Non verbal communication
3 Difficult patients-difficult situations
4 Breaking Bad news
5 Situations, role plays
6 Difficult patients-difficult situations
7 Non verbal communication

Seminars
Exam topics/questions
None
Participants

(), Dr. Bán Ildikó (BAIFACO.PTE), Dr. Heim Szilvia (HESPAAP.PTE), Dr. Radványi Ildikó (RAIFABO.PTE), Dr. Rinfel József (REJPAAP.PTE), Várbróné Dr. Csikós Ágnes (VACTAB0.PTE)
OAA-ORK  MEDICAL CHEMISTRY
Course director:
DR. ZOLTÁN BERENTE, associate professor
Department of Biochemistry and Medical Chemistry

6 credit • semester exam • Basic subject • autumn semester • recommended semester: 1
Number of hours/semester: 42 lectures + 28 practices + 14 seminars = total of 84 hours
Course headcount limitations (min.-max.): 1 – 300
Prerequisites: none

Topic
Medical chemistry includes the topics of general chemistry which are necessary for medical students. It deals also with the chemistry of organic functional groups in a concise way. Majority of the curriculum deals with the bioorganic chemistry, which means the chemistry and descriptive biochemistry of biomolecules. The purpose of practices is to study some analytical chemistry and the knowledge of materials. Curriculum of medical chemistry contains the basic knowledge that is necessary to understand biochemistry, pharmacology and clinical chemistry.

Conditions for acceptance of the semester
Students are allowed to have a maximum of 3 absences from laboratory practices and a maximum of 3 absences from seminars during the whole semester.

Mid-term exams
Laboratory practices on weeks 3-14 start with a short test paper where students can achieve 1 or 0 exam points. Ten of these 12 test papers must be written and at least 7 points must be collected, otherwise the student will not be allowed to take the semester exam.

Seminars on weeks 3-14 start with a skills assessment test. Three assessment tests must be successful from each expected calculation and formula writing skills, otherwise the student will not be allowed to take the semester exam.

Make-up opportunities for lab tests and skills assessments will be provided in accordance with the Code of Studies and Examinations, during the exam period.

Making up for missed classes
None.

Reading material
- Obligatory literature
  - Textbooks:
    McMurray, Fay: Chemistry, latest edition
    P. Gergely (ed.): Organic and Bioorganic Chemistry for Medical Students, latest edition, Univ. Med. School of Debrecen
- Literature developed by the Department
- Notes
- Recommended literature
  Veronika Nagy (ed.): Laboratory Experiments in Medical Chemistry, Internet edition, Univ. Med. School of Pécs, 2011
  K. C. Timberlake: Chemistry - An Introduction to General, Organic and Biological Chemistry, latest edition

Lectures
1  Introduction to Medical Chemistry, its relationship with medicine.
   Dr. Ohmacht Róbert
2  The periodic table, the electronic structure of atoms.
   Dr. Nagy Veronika
3  Chemical bonds. Ionic, covalent and metallic bond
   Dr. Nagy Veronika
4  Chemical bonds. Basics of MO and VB theories.
   Dr. Nagy Veronika
5  Secondary interactions.
   Dr. Nagy Veronika
6  Chemistry, types and properties of the elements.
   Dr. Berente Zoltán
7  Oxides, hydroxides, acids, bases and salts.
   Dr. Berente Zoltán
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<th>No.</th>
<th>Subject</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>8</td>
<td>States of matter, gas laws.</td>
<td>Dr. Takátsy Anikó</td>
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<tr>
<td>9</td>
<td>Water and aqueous solutions. Colligative properties of dilute solutions. Composition of biofluids</td>
<td>Dr. Takátsy Anikó</td>
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<td>10</td>
<td>Role of electrolytes in living organisms</td>
<td>Dr. Berente Zoltán</td>
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<td>11</td>
<td>Chemical equilibrium, mass action law</td>
<td>Dr. Lóránd Tamás</td>
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<td>12</td>
<td>Heterogeneous equilibria. Solubility product constant. Gallstones and kidney stones</td>
<td>Dr. Lóránd Tamás</td>
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<td>13</td>
<td>Acids and bases</td>
<td>Dr. Lóránd Tamás</td>
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<td>14</td>
<td>Ion product constant of water, pH, pOH</td>
<td>Dr. Lóránd Tamás</td>
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<td>15</td>
<td>Hydrolysis of salts. Buffer solutions</td>
<td>Dr. Lóránd Tamás</td>
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<td>16</td>
<td>Buffer systems in living organisms</td>
<td>Dr. Lóránd Tamás</td>
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<td>17</td>
<td>Structure and formation of complexes</td>
<td>Dr. Takátsy Anikó</td>
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<td>18</td>
<td>Metal complexes in living organisms and in medical diagnosis</td>
<td>Dr. Takátsy Anikó</td>
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<td>19</td>
<td>Colloid systems</td>
<td>Dr. Berente Zoltán</td>
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<td>20</td>
<td>Colloid systems in living organisms</td>
<td>Dr. Dóczi Tamás</td>
</tr>
<tr>
<td>21</td>
<td>Chemical kinetics</td>
<td>Dr. Nagy Veronika</td>
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<tr>
<td>22</td>
<td>Thermodynamics: Energy changes in chemical reactions</td>
<td>Dr. Nagy Veronika</td>
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<td>23</td>
<td>Thermodynamics: spontaneous and non-spontaneous reactions</td>
<td>Dr. Nagy Veronika</td>
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<tr>
<td>24</td>
<td>Photochemistry. Light induced reactions in living organisms</td>
<td>Dr. Nagy Veronika</td>
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<td>25</td>
<td>Electrochemistry</td>
<td>Dr. Berente Zoltán</td>
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<tr>
<td>26</td>
<td>Electron transfer processes in living organisms</td>
<td>Dr. Berente Zoltán</td>
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<tr>
<td>27</td>
<td>Introduction to organic chemistry</td>
<td>Dr. Agócs Attila</td>
</tr>
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<td>28</td>
<td>Reaction types in organic chemistry</td>
<td>Dr. Agócs Attila</td>
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<td>29</td>
<td>Saturated hydrocarbons: Alkanes. Paraffins in medicine</td>
<td>Dr. Lóránd Tamás</td>
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<td>30</td>
<td>Unsaturated hydrocarbons: Alkenes and alkynes</td>
<td>Dr. Lóránd Tamás</td>
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<td>31</td>
<td>Isomerism among alkanes, cycloalkanes and alkenes</td>
<td>Dr. Lóránd Tamás</td>
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<tr>
<td>32</td>
<td>Aromatic hydrocarbons, Organic halides</td>
<td>Gulyás Gergely</td>
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<tr>
<td>33</td>
<td>Optical isomerism. Relative and absolute configuration.</td>
<td>Dr. Agócs Attila</td>
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<tr>
<td>34</td>
<td>Alcohols</td>
<td>Dr. Lóránd Tamás</td>
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<td>35</td>
<td>Phenols</td>
<td>Dr. Lóránd Tamás</td>
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<td>36</td>
<td>Ethers</td>
<td>Dr. Lóránd Tamás</td>
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Organic thio compounds
Dr. Lőránd Tamás

Aldehydes and their derivatives
Dr. Ágocs Attila

Ketones, quinones
Dr. Ágocs Attila

Amines and their biologically relevant derivatives
Dr. Lőránd Tamás

Carboxylic acids
Dr. Lőránd Tamás

Carboxylic esters, phosphate esters and sulphate esters
Dr. Lőránd Tamás

Practices
1 Laboratory regulations. Accident and fire protection
2 Laboratory regulations. Accident and fire protection
3 Introductory discussion
4 Introductory discussion
5 Experiments with compounds of halogens, oxygen-group and nitrogen group elements
6 Experiments with compounds of halogens, oxygen-group and nitrogen group elements
7 Experiments with compounds of carbon-group, aluminium and s-block elements
8 Experiments with compounds of carbon-group, aluminium and s-block elements
9 Discussion
10 Discussion
11 Titration of Betacid solution
12 Titration of Betacid solution
13 Potentiometry. Buffer solutions.
14 Potentiometry. Buffer solutions.
15 Reactions of coordinative (complex) compounds.
16 Reactions of coordinative (complex) compounds.
17 Experiments on colloidal systems, chemical equilibria, and catalysis
18 Experiments on colloidal systems, chemical equilibria, and catalysis
19 Experiments in Electrochemistry
20 Experiments in Electrochemistry
21 Organic chemistry I. Reactions of functional groups I
22 Organic chemistry I. Reactions of functional groups I
23 Organic chemistry II. Reactions of functional groups II
24 Organic chemistry II. Reactions of functional groups II
25 Organic chemistry III. Reactions of functional groups III
26 Organic chemistry III. Reactions of functional groups III
27 Closing remarks, repetition
28 Closing remarks, repetition

Seminars
1 Basic concepts, stoichiometric calculations
2 Stoichiometric calculations
3 Geometry and polarity of molecules. Intermolecular interactions
4 Concentration of solutions
5 Structure of simple organic molecules
6 Naming organic molecules, Isomerism
7 Structure and properties of various types of organic compounds
8 Stereochemistry I. Chirality, enantiomers
9 Stereochemistry II: Diastereomers
10 Reactions in organic chemistry I: Types of reactions
11 Reactions in organic chemistry II: Alkenes and aromatic compounds
12 Reactions in organic chemistry III: Alcohols
13 Reactions in organic chemistry IV: Oxo compounds
14 Reactions in organic chemistry V: Carboxylic acids
Exam topics/questions

Participants
Dr. Agócs Attila (AGAQAAP.PTE), Dr. Bóna Ágnes (BOAR-AAO.PTE), Dr. Böddi Katalin (BOKDAA.T.JPTE), Dr. Lóránd Tamás (LOTGAAO.PTE), Dr. Nagy Veronika (NAVOAA-K.PTE), Dr. Takátsy Anikó (TAAAAA.T.JPTE), Gulyás Gergely (GUGSAAP.PTE), Nagyné Dr. Kiss Gyöngyi (KIGFAFO.PTE), Szilágyi Tamás Gábor (SZTWAO.PTE)
OAR-ELS  
First Aid  

Course director:  

Dr. Lajos Bogár, professor  
Department of Anaesthesiology and Intensive Therapy

0 credit • signature • Criterion requirement subject • autumn semester • recommended semester: 1

Number of hours/semester:  
0 lectures + 14 practices + 0 seminars = total of 14 hours

Course headcount limitations (min.-max.):  
1 – 250  
Prerequisites:  none

Topic

Short description of the curriculum:
The first year students are expected to learn the basic elements of the emergency treatment and the methods of life saving interventions during the 14 class practice. The teaching will provide enough skill training for recognizing the signs of cardiac and breathing arrests and for performing the steps of basic life support interventions. Furthermore, the students are also expected to learn how to avoid life threatening secondary complications in accident victims on the scene and during transportation as well as in the emergency room. They will have to properly diagnose and help patients with acute chest pain, severe poisoning, metabolic disorders and acute central nervous diseases. The students are also expected to properly deal with acute airway obstructions using different first aid maneuvers.

Goals of the course in relation to the medical curriculum:
The discipline has two major goals. First: the students will have to be able to provide first aid to patients in acute illness in out-of-hospital settings. Second: the student at the beginning of their medical curriculum should receive practical information reflecting the importance of the preclinical disciplines. In this way the students’ interest will hopefully rise towards the theoretical subjects and they can understand the scientific connections between basic and applied medical sciences.

Conditions for acceptance of the semester

The maximal absences are 20% of the practice time.

Mid-term exams

- 

Making up for missed classes

The student can join other group for the supplementation.

Reading material

- Obligatory literature
- Literature developed by the Department
- Notes
- Recommended literature


Lectures

Practices

1 1. Principles of basic life support (first aid in life threatening emergencies, ABC of resuscitation, indications, methods of external cardiac compression, skill).
2 1. Principles of basic life support (first aid in life threatening emergencies, ABC of resuscitation, indications, methods of external cardiac compression, skill).
3 2. First workout of the elements of basic life support.
4 2. First workout of the elements of basic life support.
5 3. Acute chest pain syndromes (acute myocardial infarction, etc.)
6 3. Acute chest pain syndromes (acute myocardial infarction, etc.)
9 5. Severe poisoning.
10 5. Severe poisoning.
11 6. Dangerous metabolic abnormalities, airway obstructions, acute central nervous
12 6. Dangerous metabolic abnormalities, airway obstructions, acute central nervous
13 7. Second workout of the elements of basic life support.
14 7. Second workout of the elements of basic life support.
Seminars

Exam topics/questions

- 

Participants

Dr. Bátaí István (BAIMABO.PTE), Dr. Csontos Csaba (CSCSAAP.PTE), Dr. Jáksó Krisztán (JAKFAAO.PTE), Dr. Kiss Tamás (KITFAAO.PTE), Dr. Loibl Csaba (LOCGAAO.PTE), Dr. Molnár Tihomér (MOTAA0.PTE), Dr. Nagy Bálint János (NABGAAO.PTE), Dr. Nagy Judit (NAJFAAO.PTE), Dr. Szabó Péter (SZPFABO.PTE), Dr. Szabó Zoltán (SZZUABO.PTE), Dr. Toldi János (TOJFADO.PTE), Dr. Tóth Ildikó (TOISAAA.PTE), Dr. Tóth Krisztián (TOKFAEO.PTE)
**Course director:**

**Dr. Zoltán Berente**, associate professor
Department of Biochemistry and Medical Chemistry

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**Course: General Chemistry**

- **Credit:** 0
- **Signature:**
- **Criterion requirement subject:**
- **Autumn semester:**
- **Recommended semester:** 1

**Number of hours/semester:**

- 0 lectures + 0 practices + 28 seminars = total of 28 hours

**Course headcount limitations (min.-max.):**

- 1 – 300

**Prerequisites:**

- None

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**Topic**

The goal of the course is to get students more familiar with „chemistry as a foreign language”. In addition to the seminars of the main course „Medical Chemistry”, this course is aimed to provide an additional opportunity to practice and discuss the basic concepts of chemistry. Furthermore, we would like to help to develop the chemical calculation as well as the formula writing and structure drawing skills that will help a lot in their later studies and to some extent in the medical practice also.

The course is especially useful to students who have arrived to the university with less solid chemistry knowledge.

**Conditions for acceptance of the semester**

A startout survey test can be written during the first week. Students achieving more than 50% in the startout survey can get an exemption from attending the course.

Otherwise three absences are allowed.

Accomplishment of the course is a prerequisite of registration for „Medical Chemistry” exam.

**Mid-term exams**

Seminars in weeks 3-14 start with a short Skills Assessment Test (SAT). During the semester students must submit at least three successful SAT’s in each of the required calculation and formula writing/drawing skills.

Make-up opportunities will be provided in accordance with the Code of Studies and Examinations, during the exam period.

**Making up for missed classes**

None.

**Reading material**

- **Obligatory literature**
  - McMurry, Fay: Chemistry
  - P. Gergely: Organic and Bioorganic Chemistry for Medical Students
- **Literature developed by the Department**
- **Notes**
- **Recommended literature**

**Lectures**

**Practices**

**Seminars**

1. Atomic Theory and Periodic Table
2. Importance of inert gas electron configuration, the chemical bond
3. The mol, molar mass of compounds calculation of molar mass
4. The chemical reaction, type of chemical reactions
5. Writing and balancing chemical equations,
6. Understanding and balancing oxidation-reduction equations
7. Writing and balancing oxidation-reduction equations
8. Concentration calculations 1
9. Concentration calculations 2
10. Concentration calculations 3
11. Concentration calculations 4
12. Gas laws, partial pressures
13. Calculations with gas laws
14. Calculations with gas laws
15. Chemical equilibrium, effect of concentration on equilibrium
16. pH calculations 1
17 Dissociation, ionization constants
18 pH calculations 2
19 Basics of Thermochemistry
20 pH calculations 3
21 Definition and classification of organic compounds
22 Buffer pH calculations
23 Molecular structure and physical properties of organic compounds
24 Reactions in organic chemistry 1
25 Reactions in organic chemistry 2
26 Reactions in organic chemistry 3
27 Repetition, summing up
28 Repetition, summing up

Exam topics/questions


Participants

Dr. Agócs Attila (AGAQAAP.PTE), Dr. Bóna Ágnes (BOAR-AAO.PTE), Dr. Böddi Katalin (BOKDAA.T.JPTE), Dr. Lóránd Tamás (LOTGAAO.PTE), Dr. Nagy Veronika (NAVOAA-K.PTE), Dr. Takátsy Anikó (TAAAAA.T.JPTE), Gulyás Gergely (GUGSAAP.PTE), Nagyné Dr. Kiss Gyöngyi (KIGFAFO.PTE), Szilágyi Tamás Gábor (SZTWACO.PTE)
Topic
This subject provides theoretical and practical information for the students to maintain and improve their physical condition and helps to deepen the knowledge in the field of healthy lifestyle.

Theoretical and practical knowledge during different types of exercises e.g. how to improve endurance, muscle force, motor skills and how to prevent the body from injuries.

Conditions for acceptance of the semester
Active participation at least 20 practical lessons provided by the Institute of Human Movement Sciences or regular participation of the trainings of the Medikus Sport Club or PEAC.

Mid-term exams
-
Making up for missed classes
We provide opportunities to attend extra lessons in the first week of the exam period in that case the requirements are not fulfilled till the end of the teaching weeks with agreement of the PE Teacher.

Reading material
- Obligatory literature
- Literature developed by the Department
  Not available.
- Notes
- Recommended literature

Lectures
Practices
1-28 For the list of actual courses please turn to the end of this document

Seminars
Exam topics/questions
Participants
Farkas György (FAGMAAO.PTE), Lepsik Zoltán (LIZIAAT.PTE), Németh Attila Miklós (NEAGAET.PTE), Téczely Tamás (PETLAAT.PTE)
OAA-AA1  Anatomy 1
Course director: DR. BALÁZS GASZNER, associate professor
Department of Anatomy

5 credit • semester exam • Basic subject • spring semester • recommended semester: 2
Number of hours/semester: 14 lectures + 56 practices + 0 seminars = total of 70 hours
Course headcount limitations (min.-max.): 5 – 200
Prerequisites: OAA-SF1 parallel

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
Anatomy-1 is to teach you the macroscopic structure of bones, joints, and muscles of the human body, as well as the regional anatomy of the trunk and limbs including their functional and developmental aspects. This is the first part of a two-semester subject.

Conditions for acceptance of the semester
Presence on at least 85% of course hours is required. Absence (for any reason) is max. 11 teaching hours (= 11x45 min.) including max. 9 practice hours.

Mid-term exams
Making up for missed classes
Exceptionally, students may attend the practice of another group (on the same week). Students are allowed to make up two classes in one semester this way. The teacher of the other group gives the permission to attend the class to the request of the student, however the query may be refused if the group is full.

Reading material
- Obligatory literature
  - Literature developed by the Department
    http://an-server.pote.hu
- Notes
- Recommended literature
  http://an-server.pote.hu

Lectures
1  Introduction to the Anatomy.
   Dr. Reglődi Dóra
2  General osteology and arthrology.
   Dr. Gaszner Balázs
3  The pelvis and the foot. Structures and functions.
   Dr. Tóth Pál
4  Clinical aspects of pelvic diameters. The anatomical background of knee injuries.
   Dr. Tamás Andrea
5  General myology, angiology and neurology. Introduction to the regional anatomy.
   Dr. Csernus Valér
6  Structure and movements of the thorax and vertebral column.
   Dr. Csernus Valér
7  Lymphatic drainage of the limbs and breast. Clinical importance of the primary lymph nodes.
   Dr. Schmidt Erzsébet
8  Bones and structure of the skull. The neurocranium.
   Dr. Kiss Péter
9  Bones and cavities of the viscerocranium.
   Dr. Pethőné Dr. Lubics Andrea
10  Clinical aspects of the muscles of the lower extremity.
    Dr. Than Péter
11  Review of the upper limb I.; Joints, muscles and their functions.
    Dr. Reglődi Dóra
12  Review of the upper limb II; Blood and nerve supply. Frequent injuries and their consequences.
    Dr. Reglődi Dóra
13 Review of the lower limb I.; Joints, muscles and their functions. 
   Dr. Pethőné Dr. Lubics Andrea
14 Review of the lower limb II; Blood and nerve supply. Frequent injuries and their consequences. 
   Dr. Pethőné Dr. Lubics Andrea

Practices
1 Terms of position and direction. The main plains.
2 Bones of the shoulder girdle.
3 Bones of the arm and forearm 1.
4 Bones of the arm and forearm 2.
5 Bones of the hand.
6 Joints of the shoulder girdle.
7 The shoulder joint.
8 The elbow joint.
9 Joints of the hand 1.
10 Joints of the hand 2.
11 The hip bone and sacrum. The skeleton of pelvis.
12 The lesser pelvis.
13 The femur.
14 Bones of the leg 1.
15 The hip joint.
16 The knee joint.
17 The skeleton and joints of the foot 1.
18 The skeleton and joints of the foot 2.
19 Bones and joints of the limbs. Recapitulation 1.
20 Bones and joints of the limbs. Recapitulation 2.
21 Topographic anatomy of the ventral aspect of upper and lower limbs 1.
22 Topographic anatomy of the ventral aspect of upper and lower limbs 2.
23 Topographic anatomy of the ventral aspect of upper and lower limbs 3.
24 Topographic anatomy of the ventral aspect of upper and lower limbs 4.
25 Topographic anatomy of the ventral aspect of limbs. The structure and regions of the abdominal wall 1.
26 Topographic anatomy of the ventral aspect of limbs. The structure and regions of the abdominal wall 2.
27 Topographic anatomy of the ventral aspect of limbs. The structure and regions of the abdominal wall 3.
28 Topographic anatomy of the ventral aspect of limbs. The structure and regions of the abdominal wall 4.
29 Topographic anatomy of the ventral aspect of limbs and abdominal wall 5. The vertebrae, ribs, and thorax 1.
30 Topographic anatomy of the ventral aspect of limbs and abdominal wall 6. The vertebrae, ribs, and thorax 2.
31 Topographic anatomy of the ventral aspect of limbs and abdominal wall 7. The vertebrae, ribs, and thorax 3.
32 Topographic anatomy of the ventral aspect of limbs and abdominal wall 8. The vertebrae, ribs, and thorax 4.
34 Topographic anatomy of the ventral aspect of limbs and abdominal wall 10. Joints of the vertebral column and thorax 2.
35 Topographic anatomy of the ventral aspect of limbs and abdominal wall 11. Joints of the vertebral column and thorax 3.
37 Topographic anatomy of the ventral aspect of limbs and abdominal wall 13. The skull 1.
38 Topographic anatomy of the ventral aspect of limbs and abdominal wall 14. The skull 2.
39 Topographic anatomy of the ventral aspect of limbs and abdominal wall 15. The skull 3.
41 Topographic anatomy of the dorsal aspect of limbs and abdominal wall 1. The skull 5.
42 Topographic anatomy of the dorsal aspect of limbs and abdominal wall 2. The skull 6.
43 Topographic anatomy of the dorsal aspect of upper and lower limbs 3. The skull 7.
44 Topographic anatomy of the dorsal aspect of upper and lower limbs 4. The skull 8.
47 Topographic anatomy of the dorsal aspect of upper and lower limbs 7. Nuchal region & dorsal muscles of trunc. 3. The skull 11.
48 Topographic anatomy of the dorsal aspect of upper and lower limbs 8. Nuchal region & dorsal muscles of trunc. 4. The skull 12.
51 Topographic anatomy of the dorsal aspect of upper and lower limbs 11. Nuchal region & dorsal muscles of trunc. 7. The skull 15.
52 Topographic anatomy of the dorsal aspect of upper and lower limbs 12. Nuchal region & dorsal muscles of trunc. 8. The skull 16.
53 Dorsal and ventral regions of the limbs. Recapitulation 1.
54 Dorsal and ventral regions of the limbs. Recapitulation 2.
55 Dorsal and ventral regions of the limbs. Recapitulation 3.
56 Dorsal and ventral regions of the limbs. Recapitulation 4.

Seminars

Exam topics/questions

http://an-server.pote.hu

Participants

Dr. Csernus Valér (CSVGAAO.PTE), Dr. Czeiter Endre (CZEFAAO.PTE), Dr. Czett András (CZASAAO.PTE), Dr. Dányádi Bence (DABNAAO.PTE), Dr. Farkas Boglárka Anett (FABFADO.PTE), Dr. Farkas József (FAJHAAO.PTE), Dr. Fülöp Balázs Dániel (FUBOA-O.PTE), Dr. Gaszner Balázs (GABFADO.PTE), Dr. Hollósy Tibor (HOTFAAO.PTE), Dr. Horváth Gábor (HGOFNAAO.PTE), Dr. Horváth Judit (HJOJAAO.PTE), Dr. Horváth-Oppe Gabriella (HOGFAO.PTE), Dr. Kardos Dániel József (KADPABO.PTE), Dr. Kiss Péter (KIPFABO.PTE), Dr. Krávik Tímea (KVTOAO.PTE), Dr. László Eszter (LAEOAA-O.PTE), Dr. Mammel Barbara (MABMAAB.PTE), Dr. Nagy András Dávid (NAAFAFO.PTE), Dr. Pethőné Dr. Lubics Andrea (PELMAAO.PTE), Dr. Rékási Zoltán (REZMAAO.PTE), Dr. Tamás Andrea (TAFAAO.PTE), Dr. Tima Lajos (TILGAAO.PTE), Dr. Tóth Pál (TOPMAAO.PTE), Dr. Werling Dóra (WEDNAAT.PTE), Fábián Eszter (FAEGAAT.PTE), Gaszner Tamás (GATRAAO.PTE), Kovács László Ákos (KOLQAAO.PTE), Opper Balázs (OPBFAB.TJPE)
OAA-AED | PUBLIC HEALTH 2 (GENERAL EPIDEMIOLOGY AND DEMOGRAPHY)

Course director: Dr. István Kiss, professor
Department of Public Health Medicine

2 credit • semester exam • Basic subject • spring semester • recommended semester: 2

Number of hours/semester: 14 lectures + 14 practices + 0 seminars = total of 28 hours
Course headcount limitations (min.-max.): 1 – 200
Prerequisites: OAA-MET completed + OAA-BML completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
The subject describes the methodological basis of population level studies on the causative agents and risk factors of diseases. It analyses the criteria of the causality, and the aspects of design, performing and critical analysis of epidemiological studies. It studies the structure of a population, its temporal changes, and the interaction between demographical variables and health.

After Public Health 6 the students must take a public health final exam which includes the material of all the Public Health subjects (Public Health 1 - 6).

Conditions for acceptance of the semester
Participation in practicals is obligatory which is registered.
Absences should not exceed 2x45 min. Otherwise signature of grade book is denied.

Mid-term exams
Making up for missed classes
Students may attend the practical of another group on the same week. Pre-consultation with practical leader is needed.

Reading material
- Obligatory literature
  Bonita-Beaglehole-Kjellström: Basic Epidemiology, 2nd edition, WHO 2006 (selected chapters only): Chapter 2, Chapter 3, Logistic regression and Kaplan-Meier survival curves in Chapter 4, Chapter 5, Screening in Chapter 6 - (you can find a copy of the textbook on CooSpace downloaded from the official WHO website)
  - In the exam the knowledge of every delivered lecture and practice can be asked (also those facts, which are not written on the slides but were mentioned at the lessons!!)
- Literature developed by the Department
  Educational material uploaded on CooSpace.
- Notes
- Recommended literature

Lectures
1. Definition, history, goal and concept of epidemiology.
   Dr. Kiss István
   Dr. Kiss István
3. Epidemiological studies: Descriptive epidemiology.
   Dr. Kiss István
4. Analytical epidemiological studies. I.
   Dr. Kiss István
5. Analytical epidemiological studies. II.
   Dr. Kiss István
6. Experimental epidemiological studies.
   Dr. Kiss Zsuzsanna
7. Clinical epidemiology.
   Dr. Kiss István
8. Bias, confounding.
   Dr. Kiss Zsuzsanna
   Dr. Kiss István
10 Molecular epidemiology.
   Dr. Rákosy Zsuzsa
   Dr. Horváth-Sarródi Andrea
12 Goals and scope of demography. Population structure.
   Dr. Horváth-Sarródi Andrea
13 Changes in population structure and their determinants
   Dr. Horváth-Sarródi Andrea
14 Demographical characteristics of developed and developing countries. Demographic transition.
   Dr. Kiss István

Practices
1 Problem solving in the epidemiology I.
2 Problem solving in the epidemiology II.
3 Epidemiological indicators and their application I.
4 Epidemiological indicators and their application II.
5 Epidemiological calculations: odds ratio, relative risk I.
6 Epidemiological calculations: odds ratio, relative risk II.
7 Epidemiological calculations: confounders, stratified analysis I. (SPSS I.)
8 Epidemiological calculations: confounders, stratified analysis II. (SPSS I.)
9 Epidemiological calculations: sample size, survival curves, logistic regression I. (SPSS II.)
10 Epidemiological calculations: sample size, survival curves, logistic regression II. (SPSS II.)
11 Analysis of an epidemiological study I. (SPSS III.)
12 Analysis of an epidemiological study II. (SPSS III.)
13 Standardization I.
14 Standardization II.

Seminars

Exam topics/questions
- Rely on material from lectures and seminars
- Educational material uploaded on Neptun

Participants
Bérczi Bálint Dániel (BEBIABT.PTE), Dr. Berényi Károly (BEKFABO.PTE), Dr. Horváth-Sarródi Andrea (HOAFALO.PTE), Dr. Szabó István (SZIGABO.PTE)
INTRODUCTION TO BIOCHEMISTRY

Course director: DR. BALÁZS VERES, associate professor
Department of Biochemistry and Medical Chemistry

4 credit • semester exam • Basic subject • spring semester • recommended semester: 2

Course headcount limitations (min.-max.): 1 – 200

The subject can only be registered in case of a PASSED and valid health aptitude test!

Number of hours/semester: 28 lectures + 28 practices + 0 seminars = total of 56 hours

Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

„Introduction to Biochemistry“ includes the topics of organic and bioorganic chemistry along with basic biochemistry which are necessary for medical students. It deals with the structure, chemistry, and cellular degradation of essential biomolecules like proteins, carbohydrates and lipids. The purpose of practices is to study some analytical chemistry and the knowledge of materials. Curriculum of medical chemistry contains the basic knowledge that is necessary to understand biochemistry, pharmacology and clinical chemistry.

Conditions for acceptance of the semester

Requirement for acceptance of „Introduction to biochemistry“ (i.e. signature) is completing two Test Papers reaching minimum 30% as an average. During weeks 2-12 of the semester there are short tests at the beginning of each practice. Additional requirement for acceptance of „Introduction to biochemistry“ is writing 8 out of these 10 tests, and at least 5 out of them should be correct and accepted by the lab instructor. It is obligatory to write lab-notes. Result of the short test is acknowledged only if the lab-note of the practice is accepted by the lab instructor.

Mid-term exams


Making up for missed classes

None.

Reading material

- Obligatory literature

McMurray, Fay: Chemistry, latest edition
Darrell D. Ebbing (ed.): General Chemistry, latest edition
P. Gergely (ed.): Organic and Bioorganic Chemistry for Medical Students, Univ. Med. School of Debrecen
K. C. Timberlake: Chemistry - An Introduction to General, Organic and Biological Chemistry, latest edition

- Literature developed by the Department

- Notes

Veronika Nagy (ed.): Laboratory Experiments in Medical Chemistry, Internet edition, Univ. Med. School of Pécs, 2011

- Recommended literature

Lectures

1 Other derivatives of carboxylic acids
   Dr. Lóránd Tamás
2 Heterocyclic compounds, carbonic acid derivatives
   Dr. Lóránd Tamás
3 Biologically relevant heterocyclic compounds
   Dr. Lóránd Tamás
4 Alkaloids, pharmacologically active compounds
   Dr. Lóránd Tamás
5 Nucleosides, nucleotides, nucleic acids
   Dr. Nagy Veronika
6 Nucleotide coenzymes, bioenergetics
   Dr. Berente Zoltán
7 Amino acids, peptides
   Dr. Berente Zoltán
8 Proteins, primary structure, sequencing
   Dr. Berente Zoltán

4 credit • semester exam • Basic subject • spring semester • recommended semester: 2

Course headcount limitations (min.-max.): 1 – 200

Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Number of hours/semester: 28 lectures + 28 practices + 0 seminars = total of 56 hours

Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

„Introduction to Biochemistry“ includes the topics of organic and bioorganic chemistry along with basic biochemistry which are necessary for medical students. It deals with the structure, chemistry, and cellular degradation of essential biomolecules like proteins, carbohydrates and lipids. The purpose of practices is to study some analytical chemistry and the knowledge of materials. Curriculum of medical chemistry contains the basic knowledge that is necessary to understand biochemistry, pharmacology and clinical chemistry.

Conditions for acceptance of the semester

Requirement for acceptance of „Introduction to biochemistry“ (i.e. signature) is completing two Test Papers reaching minimum 30% as an average. During weeks 2-12 of the semester there are short tests at the beginning of each practice. Additional requirement for acceptance of „Introduction to biochemistry“ is writing 8 out of these 10 tests, and at least 5 out of them should be correct and accepted by the lab instructor. It is obligatory to write lab-notes. Result of the short test is acknowledged only if the lab-note of the practice is accepted by the lab instructor.

Mid-term exams


Making up for missed classes

None.

Reading material

- Obligatory literature

McMurray, Fay: Chemistry, latest edition
Darrell D. Ebbing (ed.): General Chemistry, latest edition
P. Gergely (ed.): Organic and Bioorganic Chemistry for Medical Students, Univ. Med. School of Debrecen
K. C. Timberlake: Chemistry - An Introduction to General, Organic and Biological Chemistry, latest edition

- Literature developed by the Department

- Notes

Veronika Nagy (ed.): Laboratory Experiments in Medical Chemistry, Internet edition, Univ. Med. School of Pécs, 2011

- Recommended literature

Lectures

1 Other derivatives of carboxylic acids
   Dr. Lóránd Tamás
2 Heterocyclic compounds, carbonic acid derivatives
   Dr. Lóránd Tamás
3 Biologically relevant heterocyclic compounds
   Dr. Lóránd Tamás
4 Alkaloids, pharmacologically active compounds
   Dr. Lóránd Tamás
5 Nucleosides, nucleotides, nucleic acids
   Dr. Nagy Veronika
6 Nucleotide coenzymes, bioenergetics
   Dr. Berente Zoltán
7 Amino acids, peptides
   Dr. Berente Zoltán
8 Proteins, primary structure, sequencing
   Dr. Berente Zoltán

4 credit • semester exam • Basic subject • spring semester • recommended semester: 2

Course headcount limitations (min.-max.): 1 – 200

Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Number of hours/semester: 28 lectures + 28 practices + 0 seminars = total of 56 hours

Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

„Introduction to Biochemistry“ includes the topics of organic and bioorganic chemistry along with basic biochemistry which are necessary for medical students. It deals with the structure, chemistry, and cellular degradation of essential biomolecules like proteins, carbohydrates and lipids. The purpose of practices is to study some analytical chemistry and the knowledge of materials. Curriculum of medical chemistry contains the basic knowledge that is necessary to understand biochemistry, pharmacology and clinical chemistry.

Conditions for acceptance of the semester

Requirement for acceptance of „Introduction to biochemistry“ (i.e. signature) is completing two Test Papers reaching minimum 30% as an average. During weeks 2-12 of the semester there are short tests at the beginning of each practice. Additional requirement for acceptance of „Introduction to biochemistry“ is writing 8 out of these 10 tests, and at least 5 out of them should be correct and accepted by the lab instructor. It is obligatory to write lab-notes. Result of the short test is acknowledged only if the lab-note of the practice is accepted by the lab instructor.

Mid-term exams


Making up for missed classes

None.

Reading material

- Obligatory literature

McMurray, Fay: Chemistry, latest edition
Darrell D. Ebbing (ed.): General Chemistry, latest edition
P. Gergely (ed.): Organic and Bioorganic Chemistry for Medical Students, Univ. Med. School of Debrecen
K. C. Timberlake: Chemistry - An Introduction to General, Organic and Biological Chemistry, latest edition

- Literature developed by the Department

- Notes

Veronika Nagy (ed.): Laboratory Experiments in Medical Chemistry, Internet edition, Univ. Med. School of Pécs, 2011

- Recommended literature

Lectures

1 Other derivatives of carboxylic acids
   Dr. Lóránd Tamás
2 Heterocyclic compounds, carbonic acid derivatives
   Dr. Lóránd Tamás
3 Biologically relevant heterocyclic compounds
   Dr. Lóránd Tamás
4 Alkaloids, pharmacologically active compounds
   Dr. Lóránd Tamás
5 Nucleosides, nucleotides, nucleic acids
   Dr. Nagy Veronika
6 Nucleotide coenzymes, bioenergetics
   Dr. Berente Zoltán
7 Amino acids, peptides
   Dr. Berente Zoltán
8 Proteins, primary structure, sequencing
   Dr. Berente Zoltán
9  Protein 3D structure and function
   Dr. Berente Zoltán
10  Hemoglobin, oxygen transport
    Dr. Takátsy Anikó
11  Basics of enzyme kinetics
    Dr. Berente Zoltán
12  Regulation and inhibition of enzymatic activity, isoenzymes
    Dr. Berente Zoltán
13  Structure and reactivity of carbohydrates
    Dr. Nagy Veronika
14  Medically relevant mono-, di- and oligosaccharides
    Dr. Nagy Veronika
15  Reactions of glycolysis
    Dr. Nagy Veronika
16  Regulation of glycolysis
    Dr. Jakus Péter
17  Metabolic pathways linked to glycolysis
    Dr. Jakus Péter
18  Composition of simple and complex lipids
    Dr. Nagy Veronika
19  Biologically relevant lipids (prostaglandins, terpenoids)
    Dr. Nagy Veronika
20  Biologically relevant lipids (steroids)
    Dr. Lóránd Tamás
21  Characterization of biological membranes
    Dr. Takátsy Anikó
22  Fatty acid oxidation
    Dr. Nagy Veronika
23  Reactions of TCA cycle (PDC included)
    Dr. Nagy Veronika
24  Regulation of TCA cycle
    Dr. Nagy Veronika
25  Respiratory chain and its inhibition
    Dr. Takátsy Anikó
26  ATP synthesis
    Dr. Takátsy Anikó
27  Mitochondrial transport processes, shuttles
    Dr. Takátsy Anikó
28  Supramolecular organization of functionally related enzymes
    Dr. Berente Zoltán

Practices
1  Purification of a drug mimetic compound
2  Purification of a drug mimetic compound
3  Liophilisation, solid-liquid extraction.
4  Liophilisation, solid-liquid extraction
5  Isolation of caffeine
6  Isolation of caffeine
7  Quantitative analysis of nucleic acids
8  Quantitative analysis of nucleic acids
9  Column chromatography, ion exchange chromatography, TLC
10 Column chromatography, ion exchange chromatography, TLC
11 HPLC, MS
12 HPLC, MS
13 Proteins, gel filtration, dialysis
14 Proteins, gel filtration, dialysis
15 Properties of carbohydrates
16 Properties of carbohydrates
17 Enzymatic catalysis
18 Enzymatic catalysis
19 Warburg’s optical test
20 Warburg’s optical test
21 Basics of proteomics
22 Basics of proteomics
23 Properties of lipids
24 Properties of lipids
25 Mitochondrial oxidation (Clark electrode)
26 Mitochondrial oxidation (Clark electrode)
27 Consultation
28 Consultation

Seminars

Exam topics/questions

- 

Participants

Dr. Agócs Attila (AGAQAAP.PTE), Dr. Berente Zoltán (BEZLAAP.PTE), Dr. Bóna Ágnes (BOAR-AAO.PTE), Dr. Böddi Katalin (BOKDAA.T.JPTE), Dr. Jakus Péter (JAPAAA.T.JPTE), Dr. Lóránd Tamás (LOTGAAO.PTE), Dr. Márk László (MALMAAO.PTE), Dr. Petrovics Dóra (PEDIAAT.PTE), Dr. Takátsy Anikó (TAAAAA.T.JPTE), Radó-Turcsi Erika Margit (RAESAAP.PTE)
OAA-BI2  Biophysics 2
Course director: DR. ANDRÁS SZILÁRD LUKÁCS, associate professor
Department of Biophysics

3 credit • final exam • Basic subject • spring semester • recommended semester: 2

Number of hours/semester: 14 lectures + 28 practices + 0 seminars = total of 42 hours

Course headcount limitations (min.-max.): 5 – 200

Prerequisites: OAA-BI1 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
The course, stemming from „Biophysics 1” addresses the foundations of physical and biophysical methods used for exploring biological systems particularly the human body, as well as those of physical diagnostic methods. The latter are discussed briefly with references made to a respective topical pre-clinical course.

Conditions for acceptance of the semester
Completion and proper documentation of each laboratory practice and approval thereof by the course instructor. Maximum 3 absences from practices. Students are not allowed to be late from the practicals. Being late counts as an absence. During the semester the students write mid-term tests. Based on the results the students can be exempted from some parts of the colloquium.

Mid-term exams
Making up for missed classes
Missed practices can be made up during make-up opportunities provided by the department. During each make-up lab, only one missed practice can be made up.

Reading material
- Obligatory literature
- Literature developed by the Department
  1. Damjanovich Sándor, Fidy Judit, Szöllősi János (eds.): Medical Biophysics, Medicina, Budapest, 2008
  2. Biophysics Laboratory Manual, Pécs University Press, Pécs
  3. Online materials on departmental website (http://biofizika.aok.pte.hu)
- Notes
- Recommended literature

Lectures
1  Spectrofotometry
   Dr. Nyitrai Miklós
2  Fluorescence spectroscopy
   Dr. Nyitrai Miklós
3  Fluorescence anisotropy. FRET
   Dr. Nyitrai Miklós
4  Infrared and Raman spectroscopy
   Dr. Nyitrai Miklós
5  NMR
   Dr. Nyitrai Miklós
6  Light and fluorescence microscopy
   Dr. Bugyi Beáta
7  Modern microscopy techniques. FRAP
   Dr. Bugyi Beáta
8  Flow citometry
   Dr. Bugyi Beáta
9  Sedimentation, electrophoresis
   Dr. Bugyi Beáta
10 Mass-spectrometry
    Dr. Bugyi Beáta
11 X-ray diagnostics, CT
    Dr. Grama László
12 Ultrasound
    Dr. Grama László
13 MRI
Dr. Grama László

14 Gamma-camera, SPECT, PET
Dr. Grama László

**Practices**

1 Introduction. Laboratory safety rules
2 Introduction. Laboratory safety rules
3 The Geiger-Müller counter. Radioactive half-life I
4 The Geiger-Müller counter. Radioactive half-life I
5 Gamma-absorption and spectrometry
6 Gamma-absorption and spectrometry
7 Absorption of beta-radiation, dead time. Radioactive half-life II
8 Absorption of beta-radiation, dead time. Radioactive half-life II
9 Scintigraphy
10 Scintigraphy
11 Optics. Illumination
12 Optics. Illumination
13 Make-up lab, seminar
14 Make-up lab, seminar
15 Absorption photometry
16 Absorption photometry
17 Blood pressure measurement. Electrocardiography
18 Blood pressure measurement. Electrocardiography
19 Ultrasound
20 Ultrasound
21 Temperature measurement
22 Temperature measurement
23 Audiometry
24 Audiometry
25 Make-up lab, seminar
26 Make-up lab, seminar
27 Make-up lab, seminar
28 Make-up lab, seminar

**Seminars**

**Exam topics/questions**

Can be found on the departmental website ([http://biofizika.aok.pte.hu](http://biofizika.aok.pte.hu))

**Participants**

Czimbalek Lívia Mária (CZLAAA.T.JPTE), Dr. Bődis Emőke (BOEAAD.T.JPTE), Dr. Bugyi Beáta (BUBEAB.T.JPTE), Dr. Grama László (GRLHAAO.PTE), Dr. Hild Gábor (HIGMAAO.PTE), Dr. Kengyel András Miklós (KEAFACO.PTE), Dr. Lukács Andráss Szilárd (LUATAA0.PTE), Dr. Szabó-Meleg Edina (MEEDAA.T.JPTE), Dr. Talián Csaba Gábor (TACRAAO.PTE), Huber Tamás (HUTEAB.T.JPTE), Huberné Barkó Szilvia (BASFAA.T.JPTE), Kollár Veronika Tünde (KOVGACT.PTE), Leipoldne Víg Andrea Teréz (VIIFAALO.PTE), Tóth Mónika Ágnes (TOMIAAT.PTE), Türmer Katalin Erzsébet (TUKIAAT.PTE), Ujfalusi Zoltán (UJZDAA.T.JPTE)
Molecular Cell Biology 2

Course director: Dr. Hajnalka Gabriella Ábrahám, associate professor
Department of Medical Biology

4 credit • final exam • Basic subject • spring semester • recommended semester: 2

Number of hours/semester: 28 lectures + 12 practices + 16 seminars = total of 56 hours
Course headcount limitations (min.-max.): 1 – 200
Prerequisites: OAA-MB1 completed

Topic
To provide molecular and cellular biological basis for the teaching of anatomy, biochemistry, physiology, pathology, pathophysiology, microbiology and pharmacology. To teach students molecular cell biology facts essential for clinical subjects. Main topics: cell membrane and extracellular matrix; intracellular signal transduction; cellular and molecular mechanisms of carcinogenesis; introduction to medical genetics; molecular medicine.
The detailed list of topics will be available on the first seminar for each group.

Conditions for acceptance of the semester
According to the Code of Studies and Examinations
Mid-term exams
no possibility
Making up for missed classes
Extra lab programs at the end of each practical cycle.

Reading material
- Obligatory literature
- Literature developed by the Department
- Notes
M. Pap (editor): Molecular Cell Biology Laboratory Manual
Szeberényi, J., Komáromy, L.: Molecular Cell Biology Syllabus
- Recommended literature

Lectures
1 Opening lecture. Cell-cell junctions
   Dr. Ábrahám Hajnalka Gabriella
2 Passive transport processes
   Dr. Ábrahám Hajnalka Gabriella
3 Active transport processes
   Dr. Ábrahám Hajnalka Gabriella
4 Extracellular matrix
   Dr. Ábrahám Hajnalka Gabriella
5 Signal transduction mechanisms I: Types of chemical signaling
   Dr. Szeberényi József
6 Signal transduction mechanisms II: The role of G-proteins in signaling
   Dr. Szeberényi József
7 Signal transduction mechanisms III: Growth factor signaling
   Dr. Szeberényi József
8 Signal transduction mechanisms IV: Stress signaling
   Dr. Szeberényi József
9 Signal transduction mechanisms V: Cytokine and integrin signaling
   Dr. Szeberényi József
10 Signal transduction mechanisms VI: General features of signal transduction
   Dr. Szeberényi József
11 The molecular basis of development
   ifj. Dr. Sétáló György
12 Apoptosis
   Dr. Szeberényi József
13 The tumor cell  
   Dr. Ábrahám Hajnalka Gabriella
14 DNA tumor viruses  
   ifj. Dr. Sétáló György
15 RNA tumor viruses  
   ifj. Dr. Sétáló György
16 Retroviral oncogenes  
   ifj. Dr. Sétáló György
17 Cellular oncogenes I  
   ifj. Dr. Sétáló György
18 Cellular oncogenes II  
   Dr. Pap Marianna
19 Cellular oncogenes III  
   Dr. Pap Marianna
20 Tumor suppressor genes I  
   Dr. Pap Marianna
21 Tumor suppressor genes II  
   Dr. Pap Marianna
22 Oncogenes and the cell cycle  
   Dr. Pap Marianna
23 The multistage mechanism of carcinogenesis I: Experimental carcinogenesis  
   Dr. Pap Marianna
24 The multistage mechanism of carcinogenesis II: Tumor invasion and metastasis formation  
   Dr. Pap Marianna
25 Closing lecture of tumor biology  
   Dr. Pap Marianna
26 Molecular diagnostics  
   Dr. Berta Gergely
27 Gene therapy  
   Dr. Bátor Judit
28 Closing lecture  
   Dr. Ábrahám Hajnalka Gabriella

Practices
1 Phase contrast microscopy. Polarisation microscopy
2 Phase contrast microscopy. Polarisation microscopy
3 Histochemistry and cytochemistry of macromolecules
4 Histochemistry and cytochemistry of macromolecules
5 Membrane, transport, extracellular matrix
6 Membrane, transport, extracellular matrix
7 Signal transduction. Functional imaging of the cell
8 Signal transduction. Functional imaging of the cell
9 Tumor biology
10 Tumor biology
11 Apoptosis
12 Apoptosis

Seminars
1 Cytoskeleton
2 Membrane
3 Transport
4 Extracellular matrix
5 Types of chemical signaling. Receptors.
6 Signal transduction mechanism: The cAMP pathway
7 Signal transduction mechanisms; the phospholipase C pathway. Growth factor and cytokine signaling
8 Developmental biology. Apoptosis.
9 The tumor cell
10 Tumor viruses
11 Retroviral oncogenes. Cellular oncogenes
12 Tumor suppressor genes. Oncogenes and the cell cycle.
13 The multistage mechanism of carcinogenesis
14 Molecular medicine
15 SEMESTER TEST
16 SEMESTER TEST

Exam topics/questions

Theoretical examination questions
1. Proteins
2. Lipids
3. Carbohydrates
4. Nucleosides, nucleotides
5. The structure of DNA
6. Experiments proving that DNA is the genetic material
7. The structure and types of RNA
8. Comparison of pro- and eukaryotic cells
9. Methods of immunocytochemistry
10. Restriction endonucleases
11. Southern blotting
12. DNA sequencing
13. DNA chips
14. Genomic libraries
15. Polymerase chain reaction
16. Transgenic organisms
17. Targeted gene inactivation
18. Inhibition of gene expression at the level of mRNA
19. cDNA libraries
20. Northern blotting
21. Immunoprecipitation and Western blotting
22. The structure of cell nucleus
23. The organisation of chromatin
24. Unique and repetitive sequences
25. The chemical composition of chromatin
26. The phases of cell cycle
27. The regulation of cell cycle
28. Mitosis
29. Meiosis
30. General features of replication
31. The mechanism of replication in prokaryotes
32. Eukaryotic replication
33. DNA repair
34. The mechanism of prokaryotic transcription
35. General features of eukaryotic transcription
36. Synthesis and processing of eukaryotic pre-rRNA
38. Pre-mRNA splicing
39. Synthesis of aminoacyl-tRNA
40. The structure and function of ribosomes
41. The genetic code
42. Initiation of translation
43. Elongation and termination of translation
44. General features of translation
45. The lactose operon
46. The tryptophan operon
47. Cloning by nuclear transplantation
48. Regulation of pre-mRNA synthesis and processing in eukaryotes
49. Regulation of mRNA transport, translation and degradation in eukaryotes
50. Regulation of protein activity and degradation in eukaryotes
51. Eukaryotic transcription factors
52. The mechanism of action of steroid hormones  
53. Rough endoplasmic reticulum  
54. Golgi complex. Protein glycosylation  
55. The mechanism of secretion  
56. Endocytosis  
57. The mechanism of vesicular transport  
58. Lysosomes. Smooth endoplasmic reticulum  
59. Oxygen free radicals. Membrane damage. Lipid peroxidation  
60. The structure and function of mitochondria  
61. The genetic apparatus of mitochondria  
62. Mitochondrial diseases  
63. Microtubules  
64. Microfilaments  
65. Intermediate filaments  
66. The cell membrane  
67. Cell junctions  
68. Passive transport  
69. Active transport  
70. The extracellular matrix  
71. Types of chemical signaling  
72. cAMP-mediated signal transduction  
73. Phospholipid-derived second messengers  
74. Growth factor signaling  
75. Cytokine signaling  
76. Stress signaling  
77. Cell-matrix connections. Integrin signaling  
78. TGF-beta, Wnt, Notch, Hedgehog signaling  
79. The role of protein kinases in cell regulation  
80. Signal amplification. Signal termination. Signaling networks  
81. Molecular basis of development  
82. The physiological and pathological role of apoptosis  
83. The mechanism of apoptosis  
84. General features of the tumour cell  
85. Oncogenic DNA viruses  
86. Retroviruses  
87. Retroviral oncogenes  
88. Identification of cellular oncogenes by gene transfer  
89. Oncogenesis by weakly transforming retroviruses  
90. Mechanisms of cellular oncogene activation  
91. General features of tumour suppressor genes  
92. Rb and p53 proteins  
93. The role of tumour suppressor genes in Wilms tumour, neurofibromatosis, colon and breast cancer  
94. The role of oncogenes in cell cycle regulation  
95. Phases of experimental carcinogenesis  
96. Steps of carcinogenesis in naturally occurring tumors  
97. Molecular diagnosis of inherited diseases  
98. Molecular diagnosis of tumors and infectious diseases  
99. Methods of gene transfer  
100. Human gene therapy

Participants

Varga Judit (VAJFACT.PTE), Balassa Timea (BATNAAT.PTE), Bogdán Ágnes (BOAEAA.T.JPTE), Dr. Ábrahám Hajnalka Gabriella (ABHMAAO.PTE), Dr. Bátor Judit (BAJFAAO.PTE), Dr. Berta Gergely (BEGFADO.PTE), Dr. Fekete Zsuzsanna (FEZAAB.T.JPTE), Dr. Kemény Ágnes (KEAAAA.T.JPTE), Dr. Pap Marianna (PAMFAAO.PTE), Dr. Tarjányi Oktávia (TAOGAAO.PTE), Harci Alexandra (HAAGABT.PTE), Horváth Hajnalka (HOHQAAT.PTE), ifj. Dr. Sétáló György (SEGMAAO.PTE), Kiss Katalin (KIKFABO.PTE), Németh Mária (NEMGAAT.PTE), Schipp Renáta (SCRDAAT.JPTE)
OAA-SF1  
**HISTOLOGY AND EMBRYOLOGY 1**  
*Course director:* DR. JUDIT HORVÁTH, associate professor  
*Department of Anatomy*

4 credit • semester exam • Basic subject • spring semester • recommended semester: 2

**Course director:** DR. JUDIT HORVÁTH, associate professor  
*Department of Anatomy*

**Course headcount limitations (min.-max.):** 5 – 260  
**Prerequisites:** OAA-MB1 completed + OAA-AA1 parallel

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Number of hours/semester:** 28 lectures + 28 practices + 0 seminars = total of 56 hours

**Conditions for acceptance of the semester**

In the histology practices, the students must prepare a histology notebook (Histology 1 notebook) with the drawings of every slide studied during the semester. The notebook will be double-checked and signed by the practice leader at the end of the semester. Presence on at least 85% of course hours is required. Absence (for any reason) is max. 8 teaching hours (= 8x45 min.) including max. 5 practice hours.

**Mid-term exams**

Making up for missed classes

Exceptionally, students may attend the class of another group (strictly on the same week, twice in a semester).

**Reading material**

- **Obligatory literature**
  [http://an-server.pote.hu/INFO/eIrod.htm](http://an-server.pote.hu/INFO/eIrod.htm)

- **Literature developed by the Department**
  [http://an-server.pote.hu](http://an-server.pote.hu)

- **Notes**

- **Recommended literature**

**Lectures**

1. Introduction to histology. Microscopic techniques. Basic tissue types.  
   Dr. Horváth Judit

2. Epithelial tissues.  
   Dr. Csernus Valér

3. Surface epithelia  
   Dr. Csernus Valér

4. Glandular epithelia  
   Dr. Csernus Valér

5. Connective tissue cells  
   Dr. Tamás Andrea

6. Fibers and ground substance of connective tissue.  
   Dr. Tamás Andrea

7. Types of connective and supportive tissues.  
   Dr. Tamás Andrea

8. Histology of the cartilages  
   Dr. Csernus Valér

9. Bone tissues. Intramembranous bone formation  
   Dr. Csernus Valér

10. Intracartilaginous bone formation  
   Dr. Csernus Valér

11. Muscle tissues 1  
   Dr. Csernus Valér

12. Muscle tissues 2  
   Dr. Csernus Valér
13 Progenesis I
   Dr. Horváth Judit
14 Nerve tissue I
   Dr. Gaszner Balázs
15 Progenesis II
   Dr. Horváth Judit
16 Nerve tissue II
   Dr. Gaszner Balázs
17 Fertilization, cleavage. Homebox genes.
   Dr. Horváth Judit
18 Blood and blood cells
   Dr. Reglődi Dóra
19 Blastocyst formation, implantation.
   Dr. Horváth Judit
20 Haematopoiesis
   Dr. Reglődi Dóra
21 Gastrulation and neurulation. Determination of the body axes
   Dr. Horváth Judit
22 Histology of blood vessels
   Dr. Reglődi Dóra
23 Differentiation of the mesoderm, development of the muscular system.
   Dr. Horváth Judit
24 Review of basic tissues.
   Dr. Horváth Judit
25 Flexion of the embryo. The umbilical cord
   Dr. Horváth Judit
26 Fetal membranes, decidua, placenta
   Dr. Horváth Judit
27 The external appearance of the embryo. Development of the skull.
   Dr. Horváth Judit
28 Malformations and twinnings.
   Dr. Horváth Judit

Practices
1 Basic histological techniques. Use of the microscope.
2 Basic histological techniques. Use of the microscope.
3 Simple epithelia
4 Simple epithelia
5 Columnar epithelia
6 Columnar epithelia
7 Stratified epithelia, transitional epithelium, pigmented epithelium
8 Stratified epithelia, transitional epithelium, pigmented epithelium
9 Glandular epithelia
10 Glandular epithelia
11 Cells and fibers of the connective tissue
12 Cells and fibers of the connective tissue
13 Types of the connective tissues
14 Types of the connective tissues
15 Histology of the cartilage and the bone
16 Histology of the cartilage and the bone
17 Bone formation
18 Bone formation
19 Histology of the muscle tissues
20 Histology of the muscle tissues
21 Nerve tissue
22 Nerve tissue
23 Blood cells. Haemopoiesis
24 Blood cells. Haemopoiesis
25 Histology of the blood vessels
26 Histology of the blood vessels
27 Embryology seminar
28 Embryology seminar

Seminars

Exam topics/questions

http://an-server.pote.hu

Participants

Dr. Csernus Valér (CSVGAAO.PTE), Dr. Gaszner Balázs (GABFADO.PTE), Dr. Hollósy Tibor (HOTFAAO.PTE), Dr. Horváth Gábor (HOGNAAO.PTE), Dr. Horváth Judit (HOJIAAO.PTE), Dr. Kiss Péter (KIPFABO.PTE), Dr. Kvárik Timea (KVTOAAO.PTE), Dr. Mammel Barbara (MABMAAB.PTE), Dr. Pethőné Dr. Lubics Andrea (PELMAAO.PTE), Dr. Reglődi Dóra (REDMAAO.PTE), Dr. Rékási Zoltán (REZMAAO.PTE), Dr. Sétáló György (SEGGAAO.PTE), Dr. Tamás Andrea (TAAFAAO.PTE), Dr. Tima Lajos (TILGAAO.PTE), Kovács László Ákos (KOLQAAO.PTE), Opper Balázs (OPBFAB.TJPTE)
**OAR-APG**

**SUMMER PRACTICE IN HOSPITAL CARE**

**Course director:** DR. **ANDRÁS OLÁH**, associate professor

**Faculty of Health Sciences - Institute of Health Science, Department of Public Health**

<table>
<thead>
<tr>
<th>0 credit • signature • Criterion requirement subject • spring semester • recommended semester: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of hours/semester:</strong> 0 lectures + 90 practices + 0 seminars = total of 90 hours</td>
</tr>
<tr>
<td><strong>Course headcount limitations (min.-max.):</strong> 1 – 200</td>
</tr>
<tr>
<td><strong>Prerequisites:</strong> none</td>
</tr>
</tbody>
</table>

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

Within the framework of the course students learn the fundamental nursing skills, which can be utilized by them during training and their later work. They get insight into the fundamentals of nursing science, into the various functions performed by nurses with various qualifications. They learn the functioning of hospitals, the course of patient care, the framework for care, they can acquire the theoretical and practical fundamentals of daily non-invasive and invasive procedures that are essential to the skill level of the knowledge of patient care.

**Conditions for acceptance of the semester**

No absences allowed

**Mid-term exams**

**Making up for missed classes**

None

**Reading material**

- **Obligatory literature**
  

- **Literature developed by the Department**

- **Notes**

- **Recommended literature**
  
  Potter, Perry: Fundamentals of Nursing, 2001

  Elkin, Perry, Potter: Clinical Nursing Skills and Techniques, 2002


**Lectures**

**Practices**

1-90 Nursing practice at an adult inpatient care unit.

**Seminars**

**Exam topics/questions**

**Participants**

Dr. Oláh András (OLAGAAE.PTE)
OAR-PI

NURSING SKILLS THEORY - HOSPITAL CARE

Course director: DR. ANDRÁS OLÁH, associate professor
Faculty of Health Sciences - Institute of Health Science, Department of Public Health

0 credit • signature • Criterion requirement subject • spring semester • recommended semester: 2
Number of hours/semester: 7 lectures + 7 practices + 0 seminars = total of 14 hours
Course headcount limitations (min.-max.): 5 – 200
Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

Within the framework of the course students learn the fundamental nursing skills, they learn the functioning of hospitals, the course of patient care, the framework for care, they can acquire the theoretical and practical fundamentals of daily non-invasive and invasive procedures that are essential to the skill level of the knowledge of patient care. The course emphasis is placed during the demonstration classroom environments using mulage-s demonstration and practice.

Conditions for acceptance of the semester

Maximum of 25% absence

Mid-term exams

Written test, its result has to be min. 60%

Making up for missed classes

With an other group if the increase of the group’s size is no more than 10%

Reading material

- Obligatory literature

- Literature developed by the Department

- Notes

- Recommended literature
  Potter, Perry: Fundamentals of Nursing, 2001
  Elkin, Perry, Potter: Clinical Nursing Skills and Techniques, 2002

Lectures

1. Vital signs: blood pressure (blood pressure measurement devices, steps of the blood pressure measurement), temperature (nursing aspects of the care of hypothermia, hyperthermia and fever, physical fever reduction methods, types of thermometers, areas of temperature measurement), breathing (determination of the breathing and its main aspects), pulse (pulse rate determination, qualities of the pulse, sites of the pulse determination, monitoring systems)
   Fullér Noémi

2. Infusion therapy (types of the i.v. catheters, nursing interventions related to canules, main features of the active and passive safety systems, infusion tubing systems, infusion pumps)
   Fullér Noémi

3. Basics of medication (forms of medicine, per oral administration, otological treatment, vaginal treatment, nasal administration, ophthalmologic treatment, rectal treatment, transdermal patches; parenteral administration, equipment for the injection, features of the intracutaneous, subcutaneous, intramuscular and intravenous injections)
   Fullér Noémi

4. Oxygen therapy (oxygen delivery devices, low flow devices, high flow devices, oxygen resources, inhalation therapy). The need to urinate (general observational duties, urine sampling forms, types of the bladder catheters, promoting urine capture)
   Fullér Noémi

5. The general structure of hospitals, the set-up of in-patient departments, their operating schedule, presentation of primary care tools. Nutritional needs, nutritional support (main aspects of enteral and parenteral nutritional support, applying nasogastric feeding tube); Blood sampling
   Fullér Noémi

6. Defecation (general observational duties, stool sampling forms, types of enema and their main features). Hygienic nursing, Immobilization, decubitus-prevention and care
   Fullér Noémi

7. Written test
   Fullér Noémi

49
Practices

1. Measurement of vital parameters, Hygienic hand disinfection, alcoholic hand scrub, Tools of taking blood pressure, definition of blood pressure with auscultation method, definition of systolic pressure with palpation.

2. Invasive interventions during care, Blood collection process (needed equipment, closed sampling system, features of the specimen tubes, process of vein selection, the process of the puncture, care of puncture site).

3. Peripheral short catheter insertion, process of the vein selection, care of the puncture site, observational and caring duties, i.v. injection via short catheter, rinse of the catheter.

4. Injection: Subcutaneous injection; related tools (pre and not-pre-filled syringes; definition of sites of administration, the injection technique; intramuscular injection: associated tools, definition of sites of administration (ventrogluteal and dorsogluteal region, delta muscle, rectus femoris, vastus lateralis), advantages disadvantages, injection technique; Intravenous injection associated tools, definition of sites of administration, process of vein selection, injection technique.

5. Infusion therapy: venting the infusion tubing, administration of infusion, administration of medicines to a basic solution.

6. Other interventions: Bladder catheterization process (male and female), the proper usage of the needed tools, the weaning process.

7. Other interventions: provide evacuant enema, skyballum removal, performing 12-lead ECG (knowledge of the leads, points of the placements).

Seminars

Exam topics/questions

Participants

Fullér Noémi (FUNNAE.PTE)
OAR-OKG  SUMMER PRACTICE IN MEDICAL COMMUNICATION SKILLS

Course director: DR. SÁNDOR BALOGH, professor
Department of Primary Health Care

0 credit • signature • Criterion requirement subject • spring semester • recommended semester: 2
Number of hours/semester: 0 lectures + 30 practices + 0 seminars = total of 30 hours
Course headcount limitations (min.-max.): 1 – 1  Prerequisites: OAA-OKG parallel

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
The practice with a GP (5 days/week x 6 hours/day x 1 week= 30 hours) can be completed in the praxis of the doctors.

Conditions for acceptance of the semester
After its completion, we require feedback both from the mentors and the students. Students need to complete 2 interview questionnaires.
The practice can be spent in a foreign country, but the student is required to speak the language of the host country.
1) The Doctor-Patient Communication Practice is one week PRACTICE during the summer holiday (either in July or August)
2) It is very advisable to spend it in your country (you should be able to speak to the patients)
3) It is better to do it right after the first year (later it is more complicated)
4) We also send a short letter about the practice to the doctors who accept you.
5) The aim is to give you some impression about Doctor-Patient Encounter (try to speak, to ask, to conform patients, maybe do some simple examination if it’s permitted and also watch, how other doctors do it)
6) You’ll have 2 interviewing forms, what you have to fill out and send back to our office with the feedbacks both from you and from your doctor
7) This will prove that you did the practice so the department can accept your semester.
8) 1 doctor can teach 1 student at the same time.

Mid-term exams
Making up for missed classes
None

Reading material
- Obligatory literature
  - János Pilling: Medical Communication, Medicina Publishing House, 2011
- Literature developed by the Department
- Notes
- Recommended literature

Lectures
Practices
1  Introduction of the praxis
2  Introduction of the team
3  The Role and the Place of the Student in the Practice
4  Methods of the Administration
5  Administration in Practice
6  Introduction of the praxis
7  The role and the place of the students in the office
8  The most Common Problems of the Patients
9  Different Situations in the Office
10  Interviewing Patients
11  Collecting Present Complaints
12  About Past Medical History
13  The Patient’s Living Circumstances
14  Risk Factors
15 Collecting Data from the Patients
16 Basic physical examinations
17 Practicing Basic Physical Examinations
18 Collecting main Symptoms
19 Evaluating Symptoms
20 Making Conclusion and Offering a Plan to the Patients
21 Different Situations with Different Patients
22 Different Situations with Different Patients
23 Difficult Patients
24 Visit the Patient at Home
25 Making the first Interview
26 Evaluation of the First Interview
27 Making the Second Interview
28 Evaluation of the Second Interview
29 Evaluation of Experiences
30 Evaluation and Summary of the Program, Feedback

Seminars

Exam topics/questions

Participants

Dr. Bán Ildikó (BAIFACO.PTE), Dr. Somogyi Lászlóné (Dr. Végh Mária) (SOLTAE0.PTE), Várbríné Dr. Csikós Ágnes (VACTAB0.PTE)
**ATT2 PHYSICAL EDUCATION 2**

**Course director:** Tamás Téczely, physical education teacher

UP MS Sports Facilities

| 0 credit • signature • Criterion requirement subject • both semesters semester • recommended semester: 2 |
| Number of hours/semester: 0 lectures + 28 practices + 0 seminars = total of 28 hours |
| Course headcount limitations (min.-max.): 2 – 50 |
| Prerequisites: ATT1 completed |

**The subject can only be registered in case of a PASSED and valid health aptitude test!**

**Topic**

This subject provides theoretical and practical information for the students to maintain and improve their physical condition and helps to deepen the knowledge in the field of healthy lifestyle.

Theoretical and practical knowledge during different types of exercises e.g. how to improve endurance, muscle force, motor skills and how to prevent the body from injuries.

**Conditions for acceptance of the semester**

Active participation at least 20 practical lessons provided by the Institute of Human Movement Sciences or regular participation of the trainings of the Medikus Sport Club or PEAC.

**Mid-term exams**

- **Making up for missed classes**

We provide opportunities to attend extra lessons in the first week of the exam period in that case the requirements are not fulfilled till the end of the teaching weeks with agreement of the PE Teacher.

**Reading material**

- **Obligatory literature**

- **Literature developed by the Department**

  Not available.

- **Notes**

- **Recommended literature**

**Lectures**

**Practices**

1–28 For the list of actual courses please turn to the end of this document

**Seminars**

**Exam topics/questions**

**Participants**

Farkas György (FAGMAAO.PTE), Lipcsik Zoltán (LIZIAAT.PTE), Németh Attila Miklós (NEAGAET.PTE), Téczely Tamás (PETLAAT.PTE)
OAA-AA2  Anatomy 2
Course director: Dr. Andrea TAMÁS, associate professor
Department of Anatomy

5 credit • semester exam • Basic subject • autumn semester • recommended semester: 3
Number of hours/semester: 14 lectures + 56 practices + 0 seminars = total of 70 hours
Course headcount limitations (min.-max.): 5 – 200
Prerequisites: OAA-AA1 completed + OAA-SF2 parallel

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
Anatomy-2 involves the macroscopic structure of the human body including its functional aspects. This is the second part of a two-semester subject. Students get insight into the macroscopic structure of viscera. Anatomy-2 is completed by a semester exam.

Conditions for acceptance of the semester
Presence on at least 85% of course hours is required. Absence (for any reason) is max. 11 teaching hours (= 11x45 min.) including max. 9 practice hours.

Mid-term exams
http://an-server.pote.hu

Making up for missed classes
Exceptionally, students may attend the lab of another group (on the same week), maximum two labs in a semester.

Reading material
- Obligatory literature
  http://an-server.pote.hu
- Literature developed by the Department
  http://an-server.pote.hu
- Notes
  http://an-server.pote.hu
- Recommended literature
  http://an-server.pote.hu

Lectures
1 Oral cavity: tongue, teeth, oropharyngeal isthmus. Pharynx.
   Dr. Tóth Pál
2 Respiratory system. Larynx and phonation.
   Dr. Rékási Zoltán
3 Lungs and pleura. Anatomy of breathing.
   Dr. Rékási Zoltán
4 Gross anatomy of the heart, cardiac cavities and valves.
   Dr. Gaszner Balázs
5 Vascular supply and conducting system of the heart. Clinical considerations.
   Dr. Gaszner Balázs
   Dr. Tamás Andrea
7 Topography and vascular supply of the liver and spleen. Biliary tree.
   Dr. Csernus Valér
8 Topography, section and structure of the kidneys.
   Dr. Csernus Valér
9 Retroperitoneum.
   Dr. Rékási Zoltán
10 Gross anatomy of the male reproductive system.
   Dr. Tamás Andrea
11 Gross anatomy of the male reproductive system.
   Dr. Rékási Zoltán
Muscles and fasciae of the pelvic floor. Perineum.  
Dr. Kiss Péter

Clinical aspects of the anatomy of nasal- and oral cavity, larynx and pharynx  
Dr. Lujber László

Vascular supply and lymphatic drainage of the gastrointestinal tract. The vascular anastomoses and their clinical importance.  
Dr. Szántó Zalán János

Practices

1. Oral cavity and teeth 1.
2. Oral cavity and teeth 1.
5. Pharynx; Retro- and parapharyngeal spaces 1.
6. Pharynx; Retro- and parapharyngeal spaces 2.
7. Larynx 1.
8. Larynx 2.
10. Structure of the chest wall. Intercostal nerves and vessels 2.
13. Term and division of the mediastinum.
15. Anterior mediastinum 2.
17. Cavities, valves and vascular supply of the heart 1.
18. Cavities, valves and vascular supply of the heart 2.
19. Lungs and bronchi 1.
20. Lungs and bronchi 2.
22. Posterior mediastinum 2.
23. Posterior mediastinum 3.
25. Structure of the abdominal wall (repetition).
27. Hepatoduodenal ligament 1.
29. Coeliac trunk.
30. Topography, vascular supply and lymphatic drainage of the stomach.
31. Topography, vascular supply and lymphatic drainage of duodenum and spleen.
32. Topography, surfaces, and peritoneal relations of liver.
33. Topography and vascular supply of pancreas 1.
34. Topography and vascular supply of pancreas 2.
35. Vascular supply and lymphatic drainage of the small and large intestines 1.
36. Vascular supply and lymphatic drainage of the small and large intestines 2.
37. Topography of kidneys.
38. Section of the kidney.
40. Removal of the bowels 2.
41. Retroperitoneum.
42. Paired branches of the abdominal aorta.
43. Lumbar plexus.
44. Diaphragm.
45. Topography of the true pelvis.
46. Branches of the internal iliac artery. Sacral plexus.
47. Male and female reproductive organs 1.
49. Median sagittal sections of the male and female pelvis 1.
50. Median sagittal sections of the male and female pelvis 2.
51  Perineum, external genital organs 1.
52  Perineum, external genital organs 2.
53  Recapitulation 1.
54  Recapitulation 2.
55  Recapitulation 3.
56  Recapitulation 4.

Seminars

Exam topics/questions

http://an-server.pote.hu

Participants

Dr. Csernus Valér (CSVGAO.PTE), Dr. Farkas József (FAJHAAO.PTE), Dr. Gaszner Balázs (GABFADO.PTE), Dr. Hollósy Tibor (HOTFAAO.PTE), Dr. Horváth Gábor (HOGNAAO.PTE), Dr. Horváth Judit (HOJIAAO.PTE), Dr. Horváth-Opper Gabriella (HOGFAFO.PTE), Dr. Jüngling Adél (JUARAAO.PTE), Dr. Kiss Péter (KIPFABO.PTE), Dr. Kvrík Timea (KVTOAAO.PTE), Dr. Nagy András Dávid (NAAFAF.O.PTE), Dr. Pethőné Dr. Lubics Andrea (PELMMAO.PTE), Dr. Reglődi Dóra (REDMAAO.PTE), Dr. Rékási Zoltán (REZMAAO.PTE), Dr. Tamás Andrea (TAFAAIPTE), Dr. Tima Lajos (TILGAAO.PTE), Dr. Tóth Pál (TOEMAAPTE), Fábián Eszter (FAEGAAT.PTE), Gaszner Tamás (GATRAAO.PTE), Kovács László Ákos (KOLQAAO.PTE)
**OAA-BKA - Biochemistry**

**Course director:**

**DR. BALÁZS VERES, associate professor**

**Department of Biochemistry and Medical Chemistry**

- **5 credit • semester exam • Basic subject • autumn semester • recommended semester: 3**
- **Number of hours/semester:** 42 lectures + 28 practices + 0 seminars = total of 70 hours
- **Course headcount limitations (min.-max.):** 5 – 200
- **Prerequisites:** OAA-BITZ completed + OAA-ORK completed + OAA-BEB completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

The subject gives an overview of the molecular processes occurring in living organisms from two major aspects.

On the one hand, following the subject „Introduction to Biochemistry”, it describes the metabolism of the four major types of biomolecules (carbohydrates, lipids, amino acids/proteins and nucleotides/nucleic acids) along with the indirect enzymatic regulation of these processes.

On the other hand, built on the subject „Molecular Cell Biology”, accounts for the molecular processes responsible for the transmission of information within the living organisms from molecular biological (DNA-RNA-protein-metabolite) as well as hormonal point of view.

The subject lies down the foundations of the subjects Medical Biochemistry, Pharmacology and Clinical Chemistry.

**Conditions for acceptance of the semester**

Requirements of the acceptance of Biochemistry course are the following:

- No more than three absences from the laboratory practices
- Submission of at least 10 out of 12 short tests held in the first 10 minutes of the practices
- Achieving satisfactory level in at least seven of the 12 short tests

**Mid-term exams**


**Making up for missed classes**

Permission should be asked from the course director to make up the practice with another group. Permission will be given maximum 2 times.

**Reading material**

- **Obligatory literature**
  

- **Literature developed by the Department**
  
  See Neptun

- **Notes**

- **Recommended literature**


**Lectures**

1. **Introduction**
   
   Dr. Veres Balázs

2. **The pentose phosphate pathway**
   
   Dr. Veres Balázs

3. **Gluconeogenesis in animal cells**
   
   Dr. Kovács Krisztina

4. **Glycogen synthesis and degradation**
   
   Dr. Veres Balázs

5. **Regulation of glycogen synthesis and degradation**
   
   Dr. Veres Balázs

6. **Regulation and disorders of carbohydrate metabolism**
   
   Dr. Kovács Krisztina

7. **Fatty acid synthesis (with elongation and desaturation)**
   
   Dr. Gallícs Ferenc
8  Synthesis of complex lipids  
   Dr. Gallyas Ferenc
9  Structure and biological activities of steroids  
   Dr. Gallyas Ferenc
10 Synthesis of cholesterol and ketone bodies  
   Dr. Gallyas Ferenc
11 Regulation and disorders of lipid metabolism  
   Dr. Gallyas Ferenc
12 Amino acid metabolism; the fate of the amino group  
   Dr. Debreceni Balázs
13 Urea cycle  
   Dr. Debreceni Balázs
14 Amino acid metabolism; the fate of the carbon skeleton  
   Dr. Debreceni Balázs
15 Synthesis of non-essential amino acids  
   Dr. Debreceni Balázs
16 Enzymopathies of amino acid metabolism  
   Dr. Debreceni Balázs
17 Synthesis of biologically active molecules from amino acids  
   Dr. Debreceni Balázs
18 Synthesis of purine and pyrimidine nucleotides  
   Marquettené Dr. Bock Ildikó
19 Degradation of purine and pyrimidine nucleotides  
   Marquettené Dr. Bock Ildikó
20 Genes and chromosomes  
   Dr. Sümegi Balázs
21 DNA replication  
   Dr. Sümegi Balázs
22 DNA repair  
   Dr. Sümegi Balázs
23 RNA metabolism 1  
   Dr. Veres Balázs
24 RNA metabolism 2  
   Dr. Veres Balázs
25 Short RNA molecules  
   Dr. Veres Balázs
26 Retroviruses  
   Dr. Veres Balázs
27 Protein synthesis 1. Participants and mechanism  
   Dr. Berente Zoltán
28 Protein synthesis 2. Regulation, posttranslational modifications  
   Dr. Berente Zoltán
29 Protein folding, chaperones  
   Dr. Berente Zoltán
30 Protein targeting and vesicular transport of proteins  
   Dr. Berente Zoltán
31 Intracellular proteolysis  
   Dr. Sümegi Balázs
32 Regulation of gene expression 1  
   Dr. Sümegi Balázs
33 Regulation of gene expression 2  
   Dr. Sümegi Balázs
34 Mitochondrial protein synthesis, mitochondrial genome  
   Dr. Sümegi Balázs
35 Recombinant DNA technologies  
   Dr. Debreceni Balázs
36 Hormones 1  
Dr. Tapodi Antal

37 Hormones 2  
Dr. Tapodi Antal

38 Cell signalling and kinases I  
Dr. Veres Balázs

39 Cell signalling and kinases II  
Dr. Veres Balázs

40 Cell signalling, CO and NO as signals, transcription factors  
Dr. Veres Balázs

41 Water soluble vitamins  
Marquettené Dr. Bock Ildikó

42 Lipid soluble vitamins  
Marquettené Dr. Bock Ildikó

 Practices

1 Preparation of buffer solutions
2 Preparation of buffer solutions
3 Basic biochemical laboratory techniques
4 Basic biochemical laboratory techniques
5 Inorganic phosphate requirement of glycolysis
6 Inorganic phosphate requirement of glycolysis
7 Concerted regulation of carbohydrate metabolism
8 Concerted regulation of carbohydrate metabolism
9 Exploration of the contents of a cell, subcellular fractionation
10 Exploration of the contents of a cell, subcellular fractionation
11 Concerted regulation of lipid metabolism
12 Concerted regulation of lipid metabolism
13 Determination of protein concentration
14 Determination of protein concentration
15 Mitochondrial oxidation; Clark electrode
16 Mitochondrial oxidation; Clark electrode
17 Affinity chromatography; Study of Complex I and III
18 Affinity chromatography; Study of Complex I and III
19 Inborn Errors of Metabolism I
20 Inborn Errors of Metabolism I
21 Student presentations
22 Student presentations
23 Inborn Errors of Metabolism II
24 Inborn Errors of Metabolism II
25 Study of chaperone function
26 Study of chaperone function
27 Consultation, student presentations
28 Consultation, student presentations

 Seminars

Exam topics/questions

The list of topics of the exam questions will be uploaded to Neptun. The exams, including the retaken exams are written exams of 27 open questions. Failure to answer more than two of the first 7 questions will automatically result in „failed” grade.

Further exam points can be achieved by oral presentations during the semester.

Participants

Dr. Berente Zoltán (BEZLAAP.PTE), Dr. Debreceni Balázs (DEBFAAO.PTE), Dr. Farkas Viktória (FAVSAAP.PTE), Dr. Jakus Péter (JAPAAA.T.JPTE), Dr. Lengyel Anna (LEAFABO.PTE), Dr. Takátsy Anikó (TAAAAA.T.JPTE), Dr. Tapodi Antal (TAAAAB.T.JPTE), Dr. Veres Balázs (VEBAAB.T.JPTE), Hocsák Enikő (HOEFAB.T.JPTE), Marquettené Dr. Bock Ildikó (MABUAAP.PTE), Nagyné Dr. Kiss Gyöngyi (KIGFAFO.PTE)
OAA-EL1

PHYSIOLOGY 1

Course director: DR. ZOLTÁN KARÁDI, professor
Institute of Physiology

Course director: DR. ZOLTÁN KARÁDI, professor
Institute of Physiology

9 credit • semester exam • Basic subject • autumn semester • recommended semester: 3

Number of hours/semester: 70 lectures + 56 practices + 0 seminars = total of 126 hours

Course headcount limitations (min.-max.): 5 – 200

Prerequisites:
OAA-BI2 completed + OAA-MB2 completed + OAA-BEB completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

The most important mission of the Physiology Course in medical education is to familiarize students with the attributes of healthy functions of the living organism.

While acquiring knowledge about the most important functional characteristics of the human body the students can rely on their prior studies in biology, biophysics, chemistry-biochemistry and anatomy.

During the semester we introduce the most important elements of functioning of the organs and organ systems, as well as their cooperation also required to adapting to the environment, and the factors affecting these processes.

Special emphasis is placed on the neural and humoral regulatory processes of these life-functions, which are vital to maintain and preserve the homeostasis of the organism.

With the transfer of all this knowledge we would like to mould a holistic attitude and thinking of students, which will enable them to better understand the functions of the now healthy, however, later dysfunctional human organism.

Conditions for acceptance of the semester

Maximum of 15 % absence allowed

Mid-term exams

Written test on the 11th week’s Friday at 16:00.

Making up for missed classes

The missed lab practice is advised to be covered by joining another group while the same topic is on schedule.

Reading material

- Obligatory literature

- Literature developed by the Department
  Figures of the lectures given are available on the homepage of Institute of Physiology and on the Neptun Meet Street.
  Important messages on new information will be announced at the lectures and will be sent to you by course mails.
  Please always find the current updated information and study materials on the homepage of the Institute of Physiology (physiology.aok.pte.hu).

- Notes
  Homepage of PTE ÁOK Institute of Physiology: Physiology Lab Practices 1, internet study material, printable notebook, 2014
  Homepage of PTE ÁOK Institute of Physiology: Physiology Lab Practice Worksheets 1, internet study material, printable notebook, 2014

- Recommended literature
  Fonyó: Principles of Medical Physiology, Medicina Publishing, 2002
  J.B. West (ed.): Best and Taylor’s Physiological Basis of Medical Practice, Williams and Wilkins, 1998

Lectures

1 Introduction. The significance of physiology in medicine. The concept of homeostasis. Homeostatic regulation.
   Dr. Környei József László
2 Cellular transport mechanisms.
   Humoral regulatory processes.
   Dr. Környei József László
<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>Elementary mechanisms of excitable tissue actions I. Membrane potential.</td>
<td>Dr. Jandó Gábor</td>
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<tr>
<td>Elementary mechanisms of excitable tissue actions II. Action potential.</td>
<td>Dr. Jandó Gábor</td>
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<tr>
<td>Muscle functions. The electromechanical coupling.</td>
<td>Dr. Ábrahám István Miklós</td>
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<td>The autonomic nervous system I.</td>
<td>Dr. Környei József László</td>
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<td>Fluid compartments of the body. The blood.</td>
<td>Dr. Zelena Dóra</td>
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<tr>
<td>Anorganic and organic blood constituents</td>
<td>Dr. Ollmann Tamás</td>
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<td>Structure and metabolism of hemoglobin.</td>
<td>Metabolism of iron.</td>
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<td>Physiological role of leukocytes.</td>
<td>Péczely László Zoltán</td>
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<tr>
<td>Mechanism of blood coagulation I.</td>
<td>Dr. Környei József László</td>
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<tr>
<td>Mechanism of blood coagulation II.</td>
<td>Dr. Környei József László</td>
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<tr>
<td>AB0 and Rh blood types.</td>
<td>Dr. Környei József László</td>
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<tr>
<td>The cardiac cycle: Generators and conductors of impulses in the heart.</td>
<td>Dr. Szokodi István</td>
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<tr>
<td>Electrocardiogram I.</td>
<td>Dr. Lénárd László I</td>
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<tr>
<td>Electrocardiogram II.</td>
<td>Dr. Lénárd László I</td>
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<tr>
<td>Mechanical activity of the heart. Heart sounds.</td>
<td>Dr. Környei József László</td>
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<td>Cardiac output and cardiac work.</td>
<td>Dr. Környei József László</td>
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<tr>
<td>Principles of hemodynamics</td>
<td>Dr. Környei József László</td>
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<td>Blood pressure. Arterial pulse.</td>
<td>Dr. Környei József László</td>
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<td>Circulation through the capillaries I.</td>
<td>Dr. Jandó Gábor</td>
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<tr>
<td>Circulation through the capillaries II.</td>
<td>Dr. Jandó Gábor</td>
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<tr>
<td>Circulation in the veins. The formation, pressure and flow of lymph.</td>
<td>Dr. Jandó Gábor</td>
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<tr>
<td>Neural and humoral regulatory mechanisms of the cardiovascular system.</td>
<td>Dr. Lénárd László I</td>
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<tr>
<td>Homeostatic regulation of the cardiovascular system.</td>
<td>Dr. László Kristóf</td>
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<tr>
<td>Pulmonary circulation, cerebral circulation.</td>
<td>Dr. Karádi Zoltán</td>
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<tr>
<td>Circulation through skin and skeletal muscle.</td>
<td>Dr. Ábrahám István Miklós</td>
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<tr>
<td>Splanchnic circulation. Coronary circulation.</td>
<td>Dr. Ábrahám István Miklós</td>
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<tr>
<td>Mechanics of respiration. Intrathoracic pressure changes. Functions of airways.</td>
<td>Dr. Környei József László</td>
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</tbody>
</table>
29 Compliance. Respiratory volumes and capacities.
The work of respiration.
Dr. Környei József László
30 Gaseous exchange in the lungs and tissues.
Dr. Lénárd László I
31 O2 and CO2 transport mechanism and pH regulation.
Dr. Lénárd László I
32 Chemical control of respiration.
Dr. Lénárd László I
33 Neural regulatory mechanisms of respiration.
Dr. Lénárd László I
34 Mechanisms of acclimatization.
Dr. Lénárd László I
35 The gastrointestinal tract.
Function and control of salivary secretion.
Dr. Lénárd László I
36 The stomach. Gastric secretion.
Dr. Környei József László
37 Duodenal processes. Biliary secretion.
Dr. Környei József László
38 Secretion and absorption in the small intestine.
Dr. Buzásné Dr. Telkes Ildikó
39 Liver functions I
Dr. Lengyel Ferenc
40 Liver functions II
Dr. Lengyel Ferenc
41 Secretion and absorption in the large intestine.
Formation of the feces.
Dr. Környei József László
42 Humoral and neural control of the gastrointestinal system.
Dr. László Kristóf
43 The fate of foodstuffs in the body. Vitamins.
Dr. Környei József László
44 Dynamics of glomerular filtration. Plasma clearance.
Dr. Környei József László
Dr. Környei József László
46 Renal circulation.
Dr. Környei József László
47 The renin-angiotensin system.
Dr. Környei József László
48 Tubular processes I.
Dr. Ábrahám István Miklós
49 Tubular processes II.
Dr. Ábrahám István Miklós
50 Concentrating and diluting mechanisms. Osmoregulation.
Dr. Ábrahám István Miklós
51 Fluid volume regulation of the body.
The mechanisms of urination.
Dr. Ábrahám István Miklós
52 Acid-base regulation I.
Dr. Jandó Gábor
53 Acid-base regulation II.
Dr. Jandó Gábor
54 Energy balance. Metabolism.
Dr. Környei József László
55 Principles of nutrition and body mass regulation.
Kovács Anita
56 Body temperature of man. Hyperthermia, fever.
   Kertes Erika
57 Peripheral and central control mechanisms of body temperature.
   Kertes Erika
58 The hypothalamo-hypophyseal system.
   Dr. Ábrahám István Miklós
59 Anterior pituitary hormones.
   Dr. Ábrahám István Miklós
60 Cellular mechanisms of hormone action.
   Dr. Ábrahám István Miklós
61 Hormonal regulation of female sexual functions.
   Dr. Ábrahám István Miklós
62 Pregnancy.
   Dr. Ábrahám István Miklós
63 Parturition and lactation.
   Dr. Ábrahám István Miklós
64 Hormonal regulation of male sexual functions.
   Dr. Ábrahám István Miklós
65 Puberty. Climacteric
   Dr. Ábrahám István Miklós
66 Functions of posterior lobe of pituitary gland.
   Dr. Lénárd László I
67 Thyroid physiology I.
   Dr. Környei József László
68 Thyroid physiology II.
   Dr. Környei József László
69 Integrative regulatory mechanisms.
   Dr. Lénárd László I

**Practices**
1 Getting acquainted with the laboratory. General information, schedules. Personal- and equipment safety rules. Animal care regulations.
3 Blood I
4 Blood I
5 Blood II
6 Blood II
7 Blood II
8 Blood II
9 Blood III
10 Blood III
11 Blood III
12 Blood III
13 Blood IV
14 Blood IV
15 Blood IV
16 Blood IV
17 Seminar: Blood (Discussion of the topics covered by the lectures and student labs)
18 Seminar: Blood (Discussion of the topics covered by the lectures and student labs)
19 Test on the chapter
20 Test on the chapter
21 The heart and circulation I
22 The heart and circulation I
23 The heart and circulation I
24 The heart and circulation I
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<td>25</td>
<td>The heart and circulation II</td>
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<td>37</td>
<td>Seminar: The heart and circulation</td>
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<td>Test on the chapter</td>
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<td>41</td>
<td>Respiration</td>
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<td>43</td>
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<tr>
<td>44</td>
<td>Gastrointestinal tract</td>
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<td>45</td>
<td>Gastrointestinal tract</td>
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<td>46</td>
<td>Gastrointestinal tract</td>
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<td>48</td>
<td>Gastrointestinal tract</td>
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<tr>
<td>49</td>
<td>Examination of the urine</td>
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<td>50</td>
<td>Examination of the urine</td>
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<td>51</td>
<td>Examination of the urine</td>
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<td>52</td>
<td>Examination of the urine</td>
</tr>
<tr>
<td>53</td>
<td>Measurement of the actual metabolic rate in human</td>
</tr>
<tr>
<td>54</td>
<td>Measurement of the actual metabolic rate in human</td>
</tr>
<tr>
<td>55</td>
<td>Measurement of the oxygen consumption in the rat</td>
</tr>
<tr>
<td>56</td>
<td>Measurement of the oxygen consumption in the rat</td>
</tr>
</tbody>
</table>

**Seminars**

**Exam topics/questions**

Topics of questions for the theoretical examination

1. Describe the body fluid compartments and explain the methods used for measurement of body fluid volumes
2. Describe the major plasma proteins and the other non-electrolytic constituents of blood and explain their function in the body
3. Describe the intra-and extracellular ionic components and explain their physiological functions
4. The structure, function and origin of erythrocytes
5. Characterize the various leukocytes indicating their origins and functions
6. Origin and function of blood platelets
7. The basic structure and metabolism of haemoglobin and the metabolism of iron
8. Describe the two pathways involved in the initiation of blood coagulation
9. Specific mechanism of clot formation
10. Describe the mechanism of fibrinolysis. Explain the significance of anticoagulation mechanism
11. Regulation of H+ ion concentration in the blood
12. A-B-0 blood groups. The Rh blood types
13. The role of leukocytes in the defence mechanism
14. Mechanical activity of the heart and the three-component model of heart muscle. Calcium ion movements within the cardiac muscle cell
15. Generators and conductors of impulses in the heart. Refractory periods
16. The sequence of events in the cardiac cycle
17. The human electrocardiogram (ECG). Electrocardiography: bipolar and unipolar leads
18. The heart sounds. Phonocardiography (PCG)
19. Cardiac output: measurement, normal standards and physiological variations
20. Metabolism and energetics of cardiac muscle
21. Ventricular wall tension and the Laplace relationship
22. The heart-lung preparation (Starling’s laws)
23. Arterial blood pressure: determinants of normal arterial blood pressure
24. The arterial and the venous pulse. Basic principles of hemodynamics.
25. Circulation through the capillaries
26. The properties, production and the movement of lymph
27. Circulation in the vein. Effect of gravity on circulation
28. The pulmonary circulation. Control of lung vessels
29. The coronary circulation
30. Cerebral circulation. The concept of “blood-brain barrier”
31. Splanchnic circulation
32. Skeletal muscle circulation. Cutaneous circulation
33. Nervous control of the heart
34. Control mechanisms of the circulatory system: general considerations
35. Local control of the vascular smooth muscle
36. Autoregulation of blood flow in tissues and organs
37. The function and importance of baroreceptors in the regulation of circulation
38. Reflex control mechanisms of circulation
39. Mechanisms of vasoconstriction and vasodilatation
40. Mechanics of respiration (functions of respiratory muscles, compliance, intrathoracic pressures, respiratory volumes)
41. Alveolar air, alveolar ventilation, dead spaces. Function of the respiratory passageways
42. Gaseous exchange in the lungs and tissues
43. O2 and CO2 transport in the body
44. Peripheral and central regulatory mechanisms of respiration. Respiratory reflexes
45. Chemical control of respiration. Acidosis, alkalosis
47. Describe the origin, composition, function and control of salivary secretion
48. Describe the origin, nature and function of gastric secretion indicating the mechanisms of regulation
49. Mechanism and regulation of gastrointestinal movements
50. Identify the pancreatic secretions, their components, their action and the substrates on which they act. Control mechanism of pancreatic secretion
51. Describe the basic ingredients and functions of the bile indicating the origin and fate of the components and the factors controlling bile secretions and gall bladder functions
52. Identify the components and functions of the intestinal system
53. Describe how carbohydrate is digested and absorbed indicating the enzymes involved
54. Describe how fat is digested and absorbed indicating the enzymes and secretions involved
55. Describe how protein is digested and absorbed indicating the enzymes and secretions involved
56. Dynamics of glomerular filtration. Glomerular filtration rate. Plasma clearance
57. Renal blood flow. Clearance of PAH. Extraction ratio. Filtration fraction
58. Regulation of renal blood flow and pressure. Renin-angiotensin system
59. Reabsorption and secretion of different substances in the renal tubule. Methods for their investigation
60. Concentrating and diluting mechanisms of the kidney
61. Fluid volume regulation of the body
62. Regulation of concentrations of ions in the extracellular fluid. Regulation of osmolality of the body fluids
63. Basal metabolic rate. Describe factors influencing the basal metabolism
64. Define metabolic rate explaining those factors influencing the total expenditure of energy by the body
65. Describe the necessary elements of normal diet
66. The normal body temperature and its physiological variations. Hyperthermia, fever, hypothermia
67. Chemical regulation of body temperature, changes of regulation at low and high environmental temperature
68. Physical regulation of body temperature, changes of regulation at low and high environmental temperature
69. Central regulatory mechanisms of heat production and heat loss
70. Mechanisms of hormone action (receptors, intracellular mediators, cAMP, Ca2+ and diacylglycerol, protein kinases)
71. Mechanism of hormonal regulation. Negative and positive feedback controls in the endocrine system
72. The anterior pituitary hormones. Regulation of pituitary hormone secretions. Pituitary dysfunction
73. Function of growth hormone during development and after adolescence
74. Abnormalities of thyroid secretion. Goitrogens
75. Function of the thyroid gland. Iodine metabolism in the body
76. Hormonal changes during menstrual cycle
77. Hormonal changes during pregnancy. Role of placenta in pregnancy. Foeto-placental unit
78. Hormones of lactation
79. Mechanism of erection and ejaculation. The sexual act (coitus)
80. The function of testis, epididymis, seminal vesicle and prostate
81. Regulation of the sexual behaviour. Maternal behaviour
82. Physiological changes at puberty and climacteric
83. Vasopressin and oxytocin. Function of ANH (atrionatriuretic hormone)
84. The effects of prostaglandins

Questions for the student lab report:
1. Hematocrit
2. Red blood cell counting
3. Mean size of red blood cells
4. Estimation of platelet count
5. White blood cell counting
6. Differential leukocyte count
7. Reticulocyte counting
8. Erythrocyte sedimentation rate
9. Determination of osmotic resistance
10. Determination of hemoglobin concentration
11. Examination of hemoglobin spectra
12. MCV, MCH, MCHC values
13. Bleeding time
14. Clotting time
15. Prothrombin time
16. Blood group determination (AB0 and Rh typing)
17. How to use work stations for electrophysiological registrations
18. Recording of heart beats of the frog or fish “in situ”
19. Electrocardiography (ECG)
20. Electric stimulation of heart (demonstr. of extrasystole)
21. Phonocardiography (PCG)
22. Effect of thermal stimulations
23. Examination of the arterial pulse
24. Ligatures of Stannius
25. Measurement of blood pressure in human
26. Investigation of Bowditch’s “All or nothing” law
27. Investigation of summation
28. Effect of vagal stimulation on the heart
29. Direct measurement of blood pressure in cat
30. Isolated frog’s heart preparing by Straub cannula
31. Exercise physiology, Physical fitness index
32. Effect of ions on the isolated heart
33. Effect of adrenalin on isolated frog’s heart
34. Effect of acethylcholin on isolated frog’s heart
35. Discussion of neurohumoral transmission (Loewi-experiment)
36. Spirometry, dynamic parameters of respiration.
37. Volumes and capacities of the lungs.
38. Circulation in the peripheral blood vessels (Trendelenburg)
39. The circulation through capillaries of frog’s tounge.
40. Measurement of maximal respiratory pressures (The experiments of Müller and Valsalva)
41. Percussion and auscultation
42. Demonstration of basic respiratory movements and pressure/volume changes (Donders model)
43. Measurement of compliance
44. Examination of the saliva
45. Measurement of the actual metabolic rate in human
46. Gastric juice: Determination of BAO, MAO, PAO
47. Measurement of the oxigen consumption in rat.
49. Bile: detection of bile pigments
50. Feces: Detection of blood (Guajac-, benzidin-, Hematest)
51. Specific gravity and pH of urine.
52. Examination of the urine sediment
53. Urine examination with reagent strip methodology
54. Examination of the urine components with tests in tubes: protein, glucose, keton bodies, blood, ubg, bilirubin, pus detections

Study material for the semester exam is the sum total of information covered in the obligatory textbook, on the homepage of the Institute, as well as knowledge given at the lectures and lab practices.

Participants
Dr. Jandó Gábor (JAGMAAP.PTE), Dr. Környei József László (KOJNAAP.PTE), Dr. László Kristóf (LAKFABO.PTE), Dr. Lengyel Ferenc (LEFAAA.T.JPTE), Dr. Szabó István (SZIGAAO.PTE), Dr. Varga Csaba (VACWAAP.PTE), Dr. Vértess Zsuzsanna (VEZHAAE.PTE), Kertes Erika (KEERAAO.PTE), Kóbor Péter (KOPSAAO.PTE), Péczely László Zoltán (PELHAAO.PTE)
**OAA-HUG    BASICS OF HUMAN GENETICS**

**Course director:**

**Prerequisites:**

- OAA-MB2 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

The goal of this course is to delineate the structure and variations of the human genome, to foster the formation of an approach that will aid the acquisition of preclinical and later clinical subjects with the possession of a molecular knowledge. The further goal is to discuss the molecular basics associated with human heredity and to introduce diagnostic methods relevant to the understanding of heritable disorders.

**Conditions for acceptance of the semester**

The grades will be established by a written test at the end of the semester. The written test can be replaced by two successful midterm tests.

**Mid-term exams**

none

**Making up for missed classes**

none

**Reading material**

- **Obligatory literature**
- Literature developed by the Department
- Notes
- **Recommended literature**
  
The basis is the topics of the lectures.
  
  Further readings:
  
  Tom Strachan and Andrew P. Read: Human Molecular Genetics (4th Edition)

**Lectures**

1. Introduction: history of genetics, the Human Genome Project, the postgenom era, ENCODE project  
   Dr. Melegh Béla
2. Construction of pedigree, basics of mendelian inheritance, characteristics of mendelian and non-mendelian inheritance I  
   Dr. Hadzsiev Kinga
3. Construction of pedigree, basics of mendelian inheritance, characteristics of mendelian and non-mendelian inheritance II  
   Dr. Hadzsiev Kinga
4. Organization of the human genome I. From the nuclear and mitochondrial genome to organization of the chromosomes  
   Dr. Kövesdi Erzsébet
5. Organization of the human genome II: Special elements of the human genome: organization and function of coding and non-coding regions; LINE, SINE, Alu sequence elements, SNP, CNV.  
   Dr. Melegh Béla
6. Organization of the human genome III: Basics of cytogenetics, FISH, CGH, array techniques  
   Dr. Hadzsiev Kinga
7. Examination methods I. Hybridization methods (blot, PCR and modifications, RFLP, Sanger, NGS, MLPA)  
   Dr. Berenténé Dr. Bene Judit Ágnes
8. Examination methods II. Biochemical diagnostics, enzyme diagnostics, determination of metabolites  
   Dr. Berenténé Dr. Bene Judit Ágnes
9. Examination methods III: Cytogenetic diagnostics  
   Dr. Czakó Mártá
10. Basics of pharmacogenetics, concept of personalised medicine  
    Dr. Melegh Béla
11. Mutations, SNPs, haplotypes, genetic drift  
    Dr. Kövesdi Erzsébet
12  Linkage, genetic mapping, Hardy-Weinberg rule, GWAS  
    Dr. Berenténé Dr. Bene Judit Ágnes

13  Epigenetics, imprinting  
    Dr. Hadzsiev Kinga

14  Studying gene function, proteomics, bioinformatics  
    Dr. Berenténé Dr. Bene Judit Ágnes

Practices
Seminars
Exam topics/questions
Neptun Meet Street system.
Participants
Course director: DR. CSABA VARGA, associate professor
Department of Public Health Medicine

1 credit • semester exam • Basic subject • autumn semester • recommended semester: 3

Number of hours/semester: 7 lectures + 7 practices + 0 seminars = total of 14 hours

Course headcount limitations (min.-max.): 1 – 200

Prerequisites: OAA-AED completed + OAA-BI2 completed + OAA-BEB completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
The aim of the course is the introduction into the environmental related health impacts and with a particular focus on the prevention.

Conditions for acceptance of the semester
Absence of 2x45 minutes from practical is acceptable. Above this the semester cannot be accepted.

In the 8th semester students have to do a final exam of Public Health, for it they need completed courses, which are the followings: The basics of Disease Prevention (OAA-BMA), General Epidemiology and Demography (OAA-AED), Environmental Health (OAA-KET), Preventive Medicine (OAP-NEO), Detailed Epidemiology (OAK-REP), Occupational Hygiene and Occupational Medicine (OAK-MFO).

Mid-term exams
Making up for missed classes
Students may attend the practical of another group on the same week. Pre-consultation with practical leader is needed.

Reading material
- Obligatory literature
- Literature developed by the Department
  Educational material uploaded on Neptun.
- Notes
- Recommended literature

Lectures
   Dr. Varga Csaba
2 Natural and artificial environment. Health effects of the indoor environment. Environmental monitoring, environmental protection.
   Dr. Varga Csaba
   Dr. Varga Csaba
4 Health impacts of contaminants in water. Sewage and waste waters.
   Dr. Varga Csaba
5 Health impacts of soil contamination.
   Dr. Varga Csaba
6 Chemical safety.
   Dr. Varga Csaba
7 Physical exposures: Noise and vibration.
   Dr. Varga Csaba

Practices
1 Water chemistry laboratory practical I.
2 Water chemistry laboratory practical II.
3 Water microbiology laboratory practical I.
4 Water microbiology laboratory practical II.
5 Health effects of physical exposures I: Radiations, electromagnetic fields.
6 Radiation hygienic laboratory practical
7 Aerobiology.
Seminars

Exam topics/questions
- Rely on material from lectures and seminars
- Educational material uploaded on Neptun

Participants
Bérczi Bálint Dániel (BEBIABT.PTE), Dr. Gyöngyi Zoltán (GYZMAAO.PTE), Dr. Szendi Katalin (SZKFAP.O.PTE)
**OAA-SF2  HISTOLOGY AND EMBRYOLOGY 2**

Course director: **DR. JUDIT HORVÁTH**, associate professor  
Department of Anatomy

<table>
<thead>
<tr>
<th>credit • semester exam • Basic subject • autumn semester • recommended semester: 3</th>
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<tr>
<td>Number of hours/semester: 28 lectures + 28 practices + 0 seminars = total of 56 hours</td>
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<tr>
<td>Course headcount limitations (min.-max.): 5 – 260</td>
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<tr>
<td>Prerequisites: OAA-SF1 completed + OAA-AA2 parallel</td>
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The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

Histology of the organs. Formation of organs and organ-systems and their further development in the embryonal and fetal period. This is the second part of a two-semester subject.

Histology is important to understand normal physiological processes on microscopic level and to explain pathological changes in diseases. Embryology helps to explain the normal anatomical situs and certain malformations, syndromes.

**Conditions for acceptance of the semester**

In the histology practices, the students must prepare a histology notebook (Histology-2 notebook) with the drawings of every slide studied during the semester. The notebook will be double-checked and signed by the practice leader at the end of the semester. Presence on at least 85% of course hours is required. Absence (for any reason) is max. 8 teaching hours (= 8x45 min.) including max. 5 practice hours.

**Mid-term exams**

Making up for missed classes

Exceptionally, students may attend the lab of another group on the same week (maximum twice in a semester).

**Reading material**

- **Obligatory literature**  
  [http://an-server.pote.hu/INFO/eIrod.htm](http://an-server.pote.hu/INFO/eIrod.htm)

- Literature developed by the Department  
  [http://an-server.pote.hu/](http://an-server.pote.hu/)

- **Notes**

- **Recommended literature**

**Lectures**

1. Histology of the oral cavity, tongue and salivary glands.  
   Dr. Rékási Zoltán
2. Histology and development of the teeth.  
   Dr. Tóth Pál
3. Lymphatic tissues and their functions.  
   Dr. Gaszner Balázs
4. Histology of lymphatic organs.  
   Dr. Gaszner Balázs
5. Histology of the respiratory system.  
   Dr. Rékási Zoltán
6. Development of the respiratory system.  
   Dr. Rékási Zoltán
   Dr. Tóth Pál
   Dr. Horváth Judit
9. Histology of the esophagus and the stomach.  
   Dr. Pethőné Dr. Lubics Andrea
10. Histology of the intestines.  
    Dr. Pethőné Dr. Lubics Andrea
11. Early development of the heart; Development of sinus venosus and the atrial septum.  
    Dr. Tamás Andrea
    Dr. Tamás Andrea
Histology of the liver and pancreas.
Dr. Csernus Valér

Development of the intestinal system, liver and pancreas.
Dr. Tamás Andrea

Histology of the kidney.
Dr. Csernus Valér

Histology of ureter and urinary bladder. Development of the kidney.
Dr. Csernus Valér

Histology of the ovary. Follicular development.
Dr. Reglődi Dóra

The uterine tube, uterus, and vagina. Cyclic changes of the endometrium.
Dr. Reglődi Dóra

The pregnant uterus, the placenta and the mammary gland.
Dr. Reglődi Dóra

Development of the arterial and venous system. Aortic arches and their derivatives.
Dr. Tamás Andrea

Fetal circulation.
Dr. Tóth Pál

Histology of the male reproductive system I.
Dr. Rékási Zoltán

Histology of the male reproductive system II.
Dr. Rékási Zoltán

Development of the reproductive organs I.
Dr. Horváth Judit

Development of the reproductive organs II.
Dr. Horváth Judit

Development of the peritoneum. Separation of the body cavities.
Dr. Horváth Judit

Recapitulation of organ histology. Recognition of histological slides.
Dr. Tóth Pál

Parallelly developing organ systems. (Recapitulation of embryology)
Dr. Horváth Judit

Practices

1  Histology of the lip and the salivary glands.
2  Histology of the lip and the salivary glands.
3  Histology and development of the teeth.
4  Histology and development of the teeth.
5  Histology of the tongue. Tonsils.
6  Histology of the tongue. Tonsils.
7  Histology of the lymphatic organs.
8  Histology of the lymphatic organs.
9  Histology of the respiratory system.
10 Histology of the respiratory system.
11 The esophagus and the stomach.
12 The esophagus and the stomach.
13 Small and large intestine.
14 Small and large intestine.
15 Histology of the rectum, liver, gall bladder and pancreas.
16 Histology of the rectum, liver, gall bladder and pancreas.
17 Histology of the kidney, ureter, and urinary bladder.
18 Histology of the kidney, ureter, and urinary bladder.
19 Histology of the female reproductive organs I. (Ovary, corpus luteum, uterine tube).
20 Histology of the female reproductive organs I. (Ovary, corpus luteum, uterine tube).
21 Histology of the female reproductive organs II. (Uterus prolif./secr., cervix, vagina).
22 Histology of the female reproductive organs II. (Uterus prolif./secr., cervix, vagina).
23 Histology of the pregnant uterus, the placenta, the umbilical cord and the mammary gland.
24 Histology of the pregnant uterus, the placenta, the umbilical cord and the mammary gland.
25 Histology of the male reproductive organs I.
26 Histology of the male reproductive organs I.
27 Histology of the male reproductive organs II.
28 Histology of the male reproductive organs II.

Seminars

Exam topics/questions

http://an-server.pote.hu/

Participants

Dr. Csernus Valér (CSVGAAO.PTE), Dr. Czeiter Endre (CZEFAAO.PTE), Dr. Farkas Boglárka Anett (FABFADO.PTE), Dr. Farkas József (FAJHAAO.PTE), Dr. Gaszner Balázs (GABFADO.PTE), Dr. Hollósy Tibor (HOTFAAO.PTE), Dr. Horváth Judit (HOJIAAO.PTE), Dr. Horváth-Opper Gabriella (HOGFAFO.PTE), Dr. Jüngling Adél (JUARAAO.PTE), Dr. Kiss Péter (KIPFABO.PTE), Dr. Kvárik Timea (KVTOAAO.PTE), Dr. Pethőné Dr. Lubics Andrea (PELMAAO.PTE), Dr. Reglőd Dóra (REDMAAO.PTE), Dr. Rékási Zoltán (REZMAAO.PTE), Dr. Sétáló György (SEGGAOO.PTE), Dr. Tamás Andrea (TAAFAAO.PTE), Dr. Tima Lajos (TILGAAO.PTE), Dr. Tóth Pál (TOPMAAO.PTE), Fábián Eszter (FAEAAAT.PTE), Gaszner Tamás (GATRAAO.PTE), Kovács László Ákos (KOLQAAO.PTE), Opper Balázs (OPBFAB.T.JPTE)
ATT3 PHYSICAL EDUCATION 3
Course director: TAMÁS TÉCZELY, physical education teacher
UP MS Sports Facilities

0 credit • signature • Criterion requirement subject • both semesters semester • recommended semester: 3
Number of hours/semester: 0 lectures + 28 practices + 0 seminars = total of 28 hours
Course headcount limitations (min.-max.): 2 – 50 Prerequisites: ATT2 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
This subject provides theoretical and practical information for the students to maintain and improve their physical condition and helps to deepen the knowledge in the field of healthy lifestyle.
Theoretical and practical knowledge during different types of exercises e.g. how to improve endurance, muscle force, motor skills and how to prevent the body from injuries.

Conditions for acceptance of the semester
Active participation at least 20 practical lessons provided by the Institute of Human Movement Sciences or regular participation of the trainings of the Medikus Sport Club or PEAC.

Mid-term exams
-

Making up for missed classes
We provide opportunities to attend extra lessons in the first week of the exam period in that case the requirements are not fulfilled till the end of the teaching weeks with agreement of the PE Teacher.

Reading material
- Obligatory literature
- Literature developed by the Department
  Not available.
- Notes
- Recommended literature

Lectures
Practices
1-28 For the list of actual courses please turn to the end of this document

Seminars
Exam topics/questions
Participants
Farkas György (FAGMAAO.PTE), Lipcsik Zoltán (LIZIAAT.PTE), Németh Attila Miklós (NEAGAET.PTE), Téczely Tamás (PETLAAT.PTE)
OAA-EL2 PHYSIOLOGY 2

Course director: DR. ZOLTÁN KARÁDI, professor
Institute of Physiology

9 credit • final exam • Basic subject • spring semester • recommended semester: 4

Number of hours/semester: 70 lectures + 56 practices + 0 seminars = total of 126 hours

Course headcount limitations (min.-max.): 5 – 200

Prerequisites: OAA-NEA parallel + OAA-EL1 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

The most important mission of the Physiology Course in medical education is to familiarize students with the attributes of healthy functions of the living organism.

While acquiring knowledge about the most important functional characteristics of the human body the students can rely on their prior studies in biology, biophysics, chemistry-biochemistry and anatomy.

During the semester we introduce the most important elements of functioning of the organs and organ systems, as well as their cooperation also required to adapting to the environment, and the factors affecting these processes.

Special emphasis is placed on the neural and humoral regulatory processes of these life-functions, which are vital to maintain and preserve the homeostasis of the organism.

With the transfer of all this knowledge we would like to mould a holistic attitude and thinking of students, which will enable them to better understand the functions of the now healthy, however, later dysfunctional human organism.

**Conditions for acceptance of the semester**

Maximum of 15 % absence allowed

**Mid-term exams**

Written test on the 11th week Friday at 16:00.

**Making up for missed classes**

The missed lab practice is advised to be covered by joining another group while the same topic is on schedule.

**Reading material**

- **Obligatory literature**
  

- **Literature developed by the Department**
  
  Figures of the lectures given are available on the homepage of Institute of Physiology and on the Neptun Meet Street.

  Important messages on new information will be announced at the lectures and will be sent to you by course mails.

  Please always find the current updated information and study materials on the homepage of the Institute of Physiology (physiology.aok.pte.hu).

- **Notes**

  Homepage of PTE ÁOK Institute of Physiology: Physiology Lab Practices 2, internet study material, printable notebook, 2015

  Homepage of PTE ÁOK Institute of Physiology: Physiology Lab Practice Worksheets 2, internet study material, printable notebook, 2015

- **Recommended literature**


  Fonyó: Principles of Medical Physiology, Medicina Publishing, 2002

  J.B. West (ed.): Best and Taylor’s Physiological Basis of Medical Practice, Williams and Wilkins, 1998

**Lectures**

1. Endocrinology of the adrenal cortex I.
   Dr. Környei József László

2. Endocrinology of the adrenal cortex II.
   Dr. Környei József László

3. Endocrinology of the adrenal cortex III.
   Dr. Környei József László

4. The adrenal medulla.
   Dr. Zelena Dóra
Endocrinology of stress.  
Dr. Zelena Dóra

Hormonal control of calcium homeostasis.  
Dr. Környei József László

The endocrine pancreas.  
Dr. Lengyel Ferenc

Hormonal control of intermediary metabolism I. Diabetes m.  
Dr. Lengyel Ferenc

Hormonal control of intermediary metabolism II.  
Dr. Környei József László

Special problems of neonatal physiology. Physiology of ageing  
Dr. Környei József László

Introduction to the physiology of the nervous system, general concepts.  
Dr. Jandó Gábor

Membrane potential. Action potential and its propagation.  
Dr. Jandó Gábor

Electrophysiology of interneuronal synapses.  
Dr. Jandó Gábor

Neurochemical basis of neurotransmission.  
Dr. Jandó Gábor

Function of the neuromuscular junction.  
Dr. Jandó Gábor

Molecular mechanism of muscle contraction.  
Dr. Ábrahám István Miklós

Mechanical characteristics of muscle. The source of energy for muscle contraction. Heat production.  
Dr. Ábrahám István Miklós

Electromyography. Control of muscle contraction, muscle tone, fatigue.  
Dr. Ábrahám István Miklós

Contraction of smooth muscle.  
Dr. Ábrahám István Miklós

The motor unit. Peripheral neural mechanism of muscle control  
Dr. Jandó Gábor

Principles of sport physiology  
Dr. Szokodi István

Functional importance of mechanoreceptors.  
Dr. Jandó Gábor

Spinal cord functions I.  
Dr. Jandó Gábor

Spinal cord functions II.  
Dr. Jandó Gábor

The spinal shock  
Kovács Anita

Decerebrate rigidity  
Kovács Anita

Postural coordination  
Kertes Erika

Locomotion.  
Kertes Erika

Extrapyramidal system I.  
Péczely László Zoltán

Extrapyramidal system II.  
Péczely László Zoltán

Physiology of the vestibular system  
Dr. Ollmann Tamás

Cerebellar control of motor functions.  
Dr. Ollmann Tamás

Cortical control of motor functions. The pyramidal system.  
Dr. Lénárd László I
34 Somaesthetic mechanisms. Somatotopic representations in the sensory systems.
   Dr. Lénárd László I
35 Thalamocortical somatosensory functions. The sensory cortex.
   Dr. Lénárd László I
36 Pain mechanism.
   Dr. Lénárd László I
37 Optics of vision. Refractory errors of the eye.
   Dr. Jandó Gábor
38 Retinal mechanisms.
   Dr. Jandó Gábor
39 Visual pathways, midbrain mechanism of vision.
   Dr. Jandó Gábor
40 Central mechanism of vision.
   Dr. Jandó Gábor
41 Eye movements and their control.
   Dr. Jandó Gábor
42 Physiology of hearing I.
   Dr. Bauer Miklós
43 Physiology of hearing II.
   Dr. Buzásné Dr. Telkes Ildikó
44 Central auditory mechanisms.
   Dr. Buzásné Dr. Telkes Ildikó
45 The chemical senses I. Olfaction.
   Dr. Szabó István
46 The chemical senses II. Taste
   Dr. Szabó István
47 The autonomic nervous system I.
   Dr. Környei József László
48 The autonomic nervous system II.
   Dr. Környei József László
49 Electroencephalography.
50 Neural control mechanism of sleep I.
51 Neural control mechanism of sleep II.
52 Regulation of biological rhythms
   Dr. Varga Csaba
53 Clinical importance of the evoked potential technique.
   Dr. Nemes Vanda
54 The diencephalon (hypothalamus). Its motor, autonomic and hormonal regulatory functions.
   Dr. László Kristóf
55 The concept of drive and motivation.
   Dr. László Kristóf
56 Homeostatic drives. Central neural regulation of hunger and thirst.
   Dr. Karádi Zoltán
57 The limbic system I.
   Dr. Lénárd László I
58 The limbic system II.
   Dr. Lénárd László I
59 Monoaminergic systems and their functions.
   Dr. Lénárd László I
60 Emotions and their central nervous mechanism.
   Kertes Erika
61 Mechanism of learning I.
   Dr. László Kristóf
62 Mechanism of learning II.
   Dr. László Kristóf
<table>
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<th>Course Title</th>
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<tr>
<td>63</td>
<td>Types and disorders of memory functions I.</td>
<td>Dr. László Kristóf</td>
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<tr>
<td>64</td>
<td>Types and disorders of memory functions II.</td>
<td>Dr. László Kristóf</td>
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<tr>
<td>65</td>
<td>Plasticity of the peripheral and central nervous system.</td>
<td>Dr. Varga Csaba</td>
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<td>66</td>
<td>Intrinsic cortical mechanism. Functions of the frontal lobe.</td>
<td>Dr. Lénárd László I</td>
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<tr>
<td>67</td>
<td>The parieto-temporal lobe. Cerebral hemisphere dominance.</td>
<td>Dr. Lénárd László I</td>
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<td>68</td>
<td>Neurophysiological mechanisms of speech. Speech disorders.</td>
<td>Dr. Lénárd László I</td>
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<td>69</td>
<td>Integrative mechanisms. I.</td>
<td>Dr. Lénárd László I</td>
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<td>70</td>
<td>Integrative mechanisms. I.</td>
<td>Dr. Lénárd László I</td>
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**Practices**

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<td>1</td>
<td>The endocrine pancreas</td>
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<td>21</td>
<td>Experiments on muscles</td>
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<td>Electromyography, Examination of fatigue</td>
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79
Sensory organs I
Sensory organs I
Sensory organs I
Sensory organs I
Sensory organs II
Sensory organs II
Sensory organs II
Sensory organs II
Electroencephalography in humans
Electroencephalography in humans
Electroencephalography in humans
Electroencephalography in humans
Student lab
Student lab
Student lab
Student lab

Exam topics/questions

1. Describe the body fluid compartments and explain the methods used for measurement of body fluid volumes
2. Describe the major plasma proteins and the other non-electrolytic constituents of blood and explain their function in the body
3. Describe the intra- and extracellular ionic components and explain their physiological functions
4. The structure, function and origin of erythrocytes
5. Characterize the various leukocytes indicating their origins and functions
6. Origin and function of blood platelets
7. The basic structure and metabolism of haemoglobin and the metabolism of iron
8. Describe the two pathways involved in the initiation of blood coagulation
9. Specific mechanism of clot formation
10. Describe the mechanism of fibrinolysis. Explain the significance of anticlotting mechanism
11. Regulation of H+ ion concentration in the blood
12. A-B-0 blood groups. The Rh blood types
13. The role of leukocytes in the defence mechanism
14. Mechanical activity of the heart and the three-component model of heart muscle. Calcium ion movements within the cardiac muscle cell
15. Generators and conductors of impulses in the heart. Refractory periods
16. The sequence of events in the cardiac cycle
17. The human electrocardiogram (ECG). Electrocardiography: bipolar and unipolar leads
18. The heart sounds. Phonocardiography (PCG)
19. Cardiac output: measurement, normal standards and physiological variations
20. Metabolism and energetics of cardiac muscle
21. Ventricular wall tension and the Laplace relationship
22. The heart-lung preparation (Starling’s laws)
23. Arterial blood pressure: determinants of normal arterial blood pressure
24. The arterial and the venous pulse. Basic principles of hemodynamics.
25. Circulation through the capillaries
26. The properties, production and the movement of lymph
27. Circulation in the vein. Effect of gravity on circulation
28. The pulmonary circulation. Control of lung vessels
29. The coronary circulation
30. Cerebral circulation. The concept of „blood-brain barrier”
31. Splanchnic circulation
32. Skeletal muscle circulation. Cutaneous circulation
33. Nervous control of the heart
34. Control mechanisms of the circulatory system: general considerations
35. Local control of the vascular smooth muscle
36. Autoregulation of blood flow in tissues and organs
37. The function and importance of baroreceptors in the regulation of circulation
38. Reflex control mechanisms of circulation
39. Mechanisms of vasoconstriction and vasodilatation
40. Mechanics of respiration (functions of respiratory muscles, compliance, intrathoracic pressures, respiratory volumes)
41. Alveolar air, alveolar ventilation, dead spaces. Function of the respiratory passageways
42. Gaseous exchange in the lungs and tissues
43. O2 and CO2 transport in the body
44. Peripheral and central regulatory mechanisms of respiration. Respiratory reflexes
45. Chemical control of respiration. Acidosis, alkalosis
47. Describe the origin, composition, function and control of salivary secretion
48. Describe the origin, nature and function of gastric secretion indicating the mechanisms of regulation
49. Mechanism and regulation of gastrointestinal movements
50. Identify the pancreatic secretions, their components, their action and the substrates on which they act. Control mechanism of pancreatic secretion
51. Describe the basic ingredients and functions of the bile indicating the origin and fate of the components and the factors controlling bile secretions and gall bladder functions
52. Identify the components and functions of the intestinal system
53. Describe how carbohydrate is digested and absorbed indicating the enzymes involved
54. Describe how fat is digested and absorbed indicating the enzymes and secretions involved
55. Describe how protein is digested and absorbed indicating the enzymes and secretions involved
56. Dynamics of glomerular filtration. Glomerular filtration rate. Plasma clearance
57. Renal blood flow. Clearance of PAH. Extraction ratio. Filtration fraction
58. Regulation of renal blood flow and pressure. Renin-angiotensin system
59. Reabsorption and secretion of different substances in the renal tubule. Methods for their investigation
60. Concentrating and diluting mechanisms of the kidney
61. Fluid volume regulation of the body
62. Regulation of concentrations of ions in the extracellular fluid. Regulation of osmolality of body fluids
63. Basal metabolic rate. Describe factors influencing the basal metabolism
64. Define metabolic rate explaining those factors influencing the total expenditure of energy by the body
65. Describe the necessary elements of normal diet
66. The normal body temperature and its physiological variations. Hyperthermia, fever, hypothermia
67. Chemical regulation of body temperature, changes of regulation at low and high environmental temperature
68. Physical regulation of body temperature, changes of regulation at low and high environmental temperature
69. Central regulatory mechanisms of heat production and heat loss
70. Mechanisms of hormone action (receptors, intracellular mediators, cAMP, Ca2+ and diacylglycerol, protein kinases)
71. Mechanism of hormonal regulation. Negative and positive feedback controls in the endocrine system
72. The anterior pituitary hormones. Regulation of pituitary hormone secretions. Pituitary dysfunction
73. Function of growth hormone during development and after adolescence
74. Abnormalities of thyroid secretion. Goitrogens
75. Function of the thyroid gland. Iodine metabolism in the body
76. Hormonal changes during menstrual cycle
77. Hormonal changes during pregnancy. Role of placenta in pregnancy. Foeto-placental unit
78. Hormones of lactation
79. Mechanism of erection and ejaculation. The sexual act (coitus)
80. The function of testis, epididymis, seminal vesicle and prostate
81. Regulation of the sexual behaviour. Maternal behaviour
82. Physiological changes at puberty and climacteric
83. Vasopressin and oxytocin. Function of ANH (atrionatriuretic hormone)
84. The effects of prostaglandins
85. The endocrine pancreas
86. Function of insulin in the body. Diabetes mellitus
87. Hormonal control of carbohydrate metabolism
88. Hormonal control of calcium and phosphor homeostasis
89. Hormonal function of the adrenocortical system. Hypophyseal regulation of the adrenocortical system. Stress and the adaptation syndrome
90. Function and regulation of mineralocorticoids
91. Function and regulation of glucocorticoids
92. Consequences of hypo- and hyperfunction of the adrenal cortex. Androgens and oestrogens of the adrenal cortex.
93. Hormones of the adrenal medulla. Importance of the sympathoadrenal system
94. Physiology of ontogenesis and ageing.
95. Molecular mechanism of muscle contraction. The regulatory role of calcium ion
96. Mechanical characteristics of muscle. Differentiation of fast and slow twitch muscle fibres. Role of the connective tissue in the function of muscles
97. Mechanism of fatigue
98. Electromyography (EMG)
99. The source of energy for muscle contraction (aerobe and anaerobe processes). Heat production during contraction-relaxation cycle
100. The neuromuscular junction
101. Structural and functional differences between skeletal and smooth muscles. Mechanism of smooth muscle contraction
102. Membrane potential and action potential: explain their ionic mechanisms. Membrane properties of CNS neurons
103. The compound action potential. Conductive properties of various nerve fibres
104. Neurochemistry of synapses, neurotransmitters, postsynaptic receptors and neuromodulators. EPSP, IPSP
105. The myotatic (stretch) reflex. Gamma motoneurons
106. The motor units. Central control of muscle contractions
107. Types of mechanoreceptors and their role in motor control
108. How do cutaneous mechanoreceptors help to explore, learn and know our environment?
109. Somatosensory mechanisms of spinal cord and brain stem
110. Pain mechanisms, central and peripheral components
111. Descendent control (gating) of nociception and of pain reactions
112. Organisation of primary somatosensory cortex, thalamocortical projection and somatotopy
113. The human electroencephalogram (EEG). Evoked potential (EP) technique
114. Neural mechanisms of sleep and correlated somatic, autonomic and bioelectrical phenomena. The role of reticular formation in the sleep-wakefulness cycle
115. The diencephalon (hypothalamus), its motor, autonomic and hormonal regulatory function
116. Hunger and thirst. Central regulatory processes of food and water intake
117. Central mechanisms of locomotion
118. Decerebration rigidity and spinal shock (symptoms and mechanisms)
119. Postural and righting reflexes, their central mechanisms and localisation within the spinal cord, brain stem and neocortex
120. Structure and function of the extrapyramidal system
121. Symptoms after damages of different extrapyramidal structures. Role of neurotransmitters in the extrapyramidal functions
122. Importance of the cerebellum in co-ordination of movements
123. Cerebellar cortical mechanisms
124. Structure and function of the vestibular system
125. Functions of the autonomic nervous system. Autonomic reflexes
126. Humoral mediators in the autonomic nervous system. Adrenergic, cholinergic and opioid receptors
127. Structures, connections and functions of the limbic system
128. Functions of the motor cortex. Symptoms following its damage
129. Corticospinal (pyramidal) system. Consequences of lesions of the pyramidal pathways and the peripheral motoneuron
130. The concept of drive and motivation. Their integrated neural mechanisms. Reticular activating system
131. Emotions and their central nervous mechanisms
132. The phenomena of operant (instrumental) and classical (Pavlovian) conditioning. Mechanism of reinforcement
133. Electrical and chemical self-stimulation. Rewarding (positive) and punishing (negative) reinforcement. Simple learning processes. Exceptional forms of conditioning
134. Types and disorders of memory functions
135. Cerebral dominance. Lateralisation of functions in the hemispheres. Split-brain examinations
136. Functions of the parietal and temporal association (intrinsic) areas of the neocortex. Symptoms after damages (apraxia, agnosia)
137. Neurophysiological mechanisms of speech. Speech disorders
138. Functions of the frontal lobe (prefrONTAL intrinsic area)
139. Functions of the temporal lobe (Kluver-Bucy syndrome)
140. Central monoaminergic systems and their functional significance
141. Peripheral auditory mechanisms (conductive apparatus and cochlea)
142. Central auditory pathways, acoustic cortex and related mechanisms
143. Physiological optics
144. The retina. Photoreceptors and neuronal functions in the retina
145. Central visual pathways, the visual cortex and their functions
146. Colour vision. Stereoscopic vision
147. Peripheral and central mechanisms of olfaction
148. Peripheral and central mechanisms of sensation of taste
149. Plasticity in the nervous system. Consequences of sensory deprivation in the visual cortex. Ageing. Transplantation
Questions for the student lab report:
1. Examination of estrus cycle in rat
2. Different tests of pregnancy
3. Determination of human blood glucose level, and experimental manipulation of blood glucose level in the rabbit
4. Effects of chemical stimuli on striated muscle (Sartorius preparation)
5. Direct and indirect stimulation of nerve-muscle preparation; Effect of curare
6. Recording of a twitch contraction; Superposition, Effects of repetitive stimulation of muscles (complete and incomplete tetanus)
7. Effect of load on muscular contraction
8. Examination of fatigue in nerve-muscle preparation and on humans
9. Electromyographic registration methods (surface and deep electrodes)
10. Examination of smooth muscle functions
11. Measurement of conduction velocity of peripheral nerve trunks
12. Recording of a compound action potential of peripheral nerve trunks
13. Measurements of refractory period of peripheral nerve trunks
14. Demonstration of electrotonus and polarizing currents on a nerve-muscle preparation
15. Demonstration of the Pflüger’s law on a nerve-muscle preparation
16. Measurement of rheobase and chronaxy on humans and on peripheral nerve trunks of the frog
17. Effect of narcosis on peripheral nerves
18. Examination of reflexes in frog (intact and spinal animal)
19. The law of Bell and Magendie
20. Examination of reflexes in the human
21. Stereotaxic technique
22. Reflex time, reaction time and action time
23. Electroencephalogram (EEG)
24. Measurement of visual acuity
25. Refractive errors and their corrections
26. Examination of visual accommodation
27. Measurement of astigmatism
28. Examination of pupil reactions
29. Ophthalmoscopy
30. Perimetry
31. Examination of color weakness and color blindness
32. Tests of binocular vision
33. Examination of afterimages, color-mixing and contrast effects
34. Laryngoscopy and otoscopy
35. Audiometry
36. Tests on air- and bone conduction;
37. Examination of the taste and olfactory senses
38. Examination of balance

Study material for the final exam is the sum total of information covered in the obligatory textbook, on the homepage of the Institute, as well as knowledge given at the lectures and lab practices.

Participants
Dr. Jandó Gábor (JAGMAAP.PTE), Dr. Környei József László (KOJNAAP.PTE), Dr. László Kristóf (LAKFABO.PTE), Dr. Lengyel Ferenc (LEFAAA.T.JPTE), Dr. Szabó István (SZIGAAO.PTE), Dr. Varga Csaba (VACWAAP.PTE), Dr. Vértes Zsuzsanna (VEZHAAE.PTE), Kertes Erika (KEERAAO.PTE), Kőbor Péter (KOPSAAO.PTE)
**OAA-IMM  BASIC IMMUNOLOGY**

Course director: **DR. Péter NÉMETH**, professor  
Department of Immunology and Biotechnology

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<th>4 credits • semester exam • Basic subject • spring semester • recommended semester: 4</th>
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**Number of hours/semester:** 28 lectures + 28 practices + 0 seminars = total of 56 hours  
**Course headcount limitations (min.-max.):** 5 – 200  
**Prerequisites:** OAA-EL2 parallel + OAA-MB2 completed + OAA-SF2 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

### Topic


### Conditions for acceptance of the semester

Prepared attendance on lectures and practices. No more absence as 3 in practices.

### Mid-term exams

One chance to make up a small test during the practices.

### Making up for missed classes

Practice performed with another group on the same week.

### Reading material

- **Obligatory literature**
- Literature developed by the Department  
  See on website [www.immbio.hu](http://www.immbio.hu)
- **Notes**
- **Recommended literature**
  Abul K. Abbas: Cellular and Molecular Immunology  
  Janis Kuby: Immunology  
  Jan Klein: Immunology

### Lectures

0 The role of adhesion molecules and cytokines in the Th1-Th2 differentiation and isotype expression.  
  Dr. Berki Timea  
0 Primary B cell development: maturation stages and environmental regulators  
  Dr. Balogh Péter  
0 Immunity against tumors  
  Dr. Németh Péter  
0 Cell mediated immunity (CMI): Cytotoxicity (NK cells, cytotoxic T cells) TH cell mediated macrophage activation (delayed type hypersensitivity = DTH.)  
  Dr. Berki Timea  
0 The central phase of the immune response: cellular interactions, T-B cell cooperation, antibody production. Signal transduction following Ag-recognition  
  Dr. Boldizsár Ferenc  
0 Introduction, historical overview, main aspects and perspectives in the theoretical and practical immunology - immunobiology  
  Dr. Németh Péter  
0 The central phase of the immune response: cellular interactions, T-B cell cooperation, antibody production.  
  Dr. Balogh Péter  
0 Immunological aspects of organ transplantation  
  Dr. Németh Péter  
0 Cellular and molecular mechanism of allergies. T cell mediated macrophage activation, delayed type hypersensitivity (DTH)  
  Dr. Németh Péter  
0 Hypersensitivity reactions  
  Dr. Németh Péter
0 Miss-regulation of immune system: development of organ-specific and systemic autoimmune diseases
   Dr. Németh Péter

0 Immunological tolerance: Cellular and molecular mechanisms of the immunological tolerance
   Dr. Németh Péter

0 Systemic and local immunity: Mucosa and skin associated immune system
   Dr. Németh Péter

0 Suppression of immune response. Role of the antigen, antigen presenting cells, T and B lymphocytes. Immunoglobulin-
   immunoglobulin interactions, idiotype network.
   Dr. Balogh Péter

0 Acquired and hereditary immunodeficiencies
   Dr. Najbauer József

1 Introduction. Molecular components of the immune system.
   Dr. Németh Péter

2 Introduction. Molecular components of the immune system.
   Dr. Németh Péter

3 Recognition molecules. Recognition by MHC. Antigen presentation and MHC restriction.
   Dr. Németh Péter

4 Recognition molecules. Recognition by MHC. Antigen presentation and MHC restriction.
   Dr. Németh Péter

5 Communication between the cellular components of the immune system. Adhesion molecules, co-receptors, cytokines, cytokine
   receptors.
   Dr. Németh Péter

6 Communication between the cellular components of the immune system. Adhesion molecules, co-receptors, cytokines, cytokine
   receptors.
   Dr. Németh Péter

7 The complement system.
   Dr. Berki Timea

8 Innate immunity: inflammation, leukocyte migration.
   Dr. Engelmann Péter András

9 Organization and rearrangement of the antigen receptor genes. Primary B cell development: developmental stages and
   checkpoints.
   Dr. Balogh Péter

10 Organization and rearrangement of the antigen receptor genes. Primary B cell development: developmental stages and
    checkpoints.
    Dr. Balogh Péter

11 T-cell development in the thymus. Stages of maturation and the role of environmental factors. Beginning of the immune response:
    early stages of T/B cell interaction, CD3 complex and signal transduction, BcR signal transduction. Co-stimulation. T-dependent
    Dr. Boldizsár Ferenc

12 T-cell development in the thymus. Stages of maturation and the role of environmental factors. Beginning of the immune response:
   early stages of T/B cell interaction, CD3 complex and signal transduction, BcR signal transduction. Co-stimulation. T-dependent
   Dr. Boldizsár Ferenc

13 Components of the humoral immune response: extrafollicular reaction and germinal center. Immunological memory.
   Dr. Balogh Péter

14 Components of the humoral immune response: extrafollicular reaction and germinal center. Immunological memory.
   Dr. Balogh Péter

15 Effector functions of immunoglobulins. Antigen-antibody reactions. IgE mediated immunereactions.
   Dr. Berki Timea

16 Effector mechanisms of cell-mediated immune responses: 1. Cytotoxicity, 2. Th cell-mediated macrophage activation (Delayed
   type hypersensitivity=DTH)
   Dr. Berki Timea

17 Allergies and hypersensitive reactions.
   Dr. Boldizsár Ferenc

18 Allergies and hypersensitive reactions.
   Dr. Boldizsár Ferenc

19 Systemic and local immunity (SALT, MALT), Suppression of the immune response.
   Dr. Németh Péter

20 Systemic and local immunity (SALT, MALT), Suppression of the immune response.
   Dr. Németh Péter

21 Immunological tolerance. Autoimmunity and autoimmune diseases.
   Dr. Németh Péter
Immunological tolerance. Autoimmunity and autoimmune diseases.
Dr. Németh Péter
23 Primary immunodeficiencies.
Dr. Balogh Péter
24 Acquired immunodeficiencies, pathomechanism and progression of AIDS, diagnostic and therapeutic possibilities.
Dr. Najbauer József
25 Immunity against tumors.
Dr. Németh Péter
26 Immunological aspects of organ transplantation.
Dr. Németh Péter
27 Immuno-based therapies.
Dr. Németh Péter
28 Protein therapies. Recombinant cytokines. Vaccine development.
Dr. Najbauer József

Practices
1 Introduction, structure of lymphoid organs.
2 Introduction, structure of lymphoid organs.
3 Immune defense against viruses, bacteria and fungi, diagnostic possibilities.
4 Immune defense against viruses, bacteria and fungi, diagnostic possibilities.
5 Vaccines.
6 Vaccines.
7 Autoantibody diagnostics
8 Autoantibody diagnostics
9 HLA typing.
10 HLA typing.
11 Consultation.
12 Consultation.
13 Cells of the immune system, CD markers.
14 Cells of the immune system, CD markers.
17 Immunocytochemistry, immunohistochemistry. Fluorescent microscopy.
18 Immunocytochemistry, immunohistochemistry. Fluorescent microscopy.
19 Flow cytometry. CD marker analysis. Isolation of white blood cells.
20 Flow cytometry. CD marker analysis. Isolation of white blood cells.
21 Immunoserology I.-II. Immunoprecipitation, immundiffusion, immunELFO, agglutination, haemagglutination, Coombs-test.
22 Immunoserology I.-II. Immunoprecipitation, immundiffusion, immunELFO, agglutination, haemagglutination, Coombs-test.
23 Seminar
24 Seminar
25 Immunoserology III. ELISA, Dot-blot, Western-blot.
26 Immunoserology III. ELISA, Dot-blot, Western-blot.

Seminars

Exam topics/questions
See on web site www.immbio.hu. The written exam test might contain minimum requirement questions where the wrong answers could mean failure on the exam.

Participants
Dr. Balogh Péter (BAPOAGP.PTE), Dr. Berki Timea (BETMABO.PTE), Dr. Boldizsár Ferenc (BOFFAAO.PTE), Dr. Engelmann Péter András (ENPAAA.T.JPTE), Dr. Kellermayer Zoltán (KEZMACO.PTE), Dr. Najbauer József (NAJVAAP.PTE), Dr. Németh Péter (NEPGAAO.PTE)
OAA-NEA  ANATOMY, HISTOLOGY, EMBRYOLOGY AND NEUROANATOMY

Course director: DR. ZOLTÁN RÉKÁSI, associate professor
Department of Anatomy

9 credit • final exam • Basic subject • spring semester • recommended semester: 4
Number of hours/semester: 42 lectures + 84 practices + 0 seminars = total of 126 hours
Course headcount limitations (min.-max.): 5 – 200
Prerequisites: OAA-AA2 completed + OAA-SF2 completed + OAA-AA1 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
Macroscopic and microscopic anatomy, and development of the central nervous system. Morphological basis of neuroendocrine integration. Regional anatomy of the head and the neck.
Macroscopic, microscopic and ultrastructural composition of the central nervous system including functional and developmental aspects. Regions of the head and neck with particular reference to those structures innervated by the cranial nerves. Macroscopic and microscopic anatomy of the endocrine organs, as well as sensory organs, and the development of these systems. The course is to give basic morphological knowledge to further clinical studies, including neurology, neurosurgery, ophthalmology, craniofacial surgery, etc.

Conditions for acceptance of the semester
In the histology practices, the students must prepare a histology notebook with the drawings of every slide studied during the semester. The notebook will be double-checked and signed by the practice leader at the end of the semester. Presence on at least 85% of course hours is required. Absence (for any reason) is max. 18 teaching hours (= 18x45 min.) including max. 13 practice hours.

Mid-term exams
Making up for missed classes
Individual study on the consecutive practices of the group (max. three times).

Reading material
- Obligatory literature
  http://an-server.pote.hu
- Literature developed by the Department
  http://an-server.pote.hu
- Notes
  http://an-server.pote.hu
- Recommended literature
  http://an-server.pote.hu

Lectures
1  Histology of the skin.  
   Dr. Rékási Zoltán
2  Development of the nervous system, molecular-genetical background.  
   Dr. Gaszner Balázs
3  Circulation of the cerebrospinal fluid, blood supply of the brain, meninges: clinical implications.  
   Dr. Tóth Pál
4  Methods for studying the nervous system.  
   Dr. Gaszner Balázs
5  Basic neurohistology. The neuron 1.  
   Dr. Gaszner Balázs
6  Basic neurohistology. The neuron 2.  
   Dr. Gaszner Balázs
   Dr. Tóth Pál
8  Basic neurohistology. Axon terminals 2. Receptors.  
   Dr. Tóth Pál
9  Basic neurohistology. The glia.  
   Dr. Tóth Pál
10 Blood supply and meninges of the spinal cord, clinical aspects.
   Dr. Tóth Pál
11 Microscopic organization of the spinal cord.
   Dr. Tóth Pál
12 Spinal reflexes.
   Dr. Tóth Pál
13 Ascending pathways of the spinal cord.
   Dr. Reglődi Dóra
14 Descending pathways of the spinal cord.
   Dr. Reglődi Dóra
15 The structural organization of the rhombencephalon and the mesencephalon.
   Dr. Rékási Zoltán
16 Nuclei of the cranial nerves.
   Dr. Rékási Zoltán
17 The reticular formation.
   Dr. Reglődi Dóra
18 Anatomical bases of brainstem reflexes.
   Dr. Reglődi Dóra
19 The general structure of the cerebellar cortex.
   Dr. Rékási Zoltán
20 Connections and functions of the cerebellum.
   Dr. Rékási Zoltán
21 The diencephalon. The thalamus.
   Dr. Rékási Zoltán
22 Basal ganglia.
   Dr. Reglődi Dóra
23 Cerebral cortex.
   Dr. Rékási Zoltán
24 Structure and connections of the hippocampus.
   Dr. Gaszner Balázs
25 The hypothalamus and the hypothalamo-hypophyseal system.
   Dr. Rékási Zoltán
26 Endocrine organs 1.
   Dr. Nagy András Dávid
27 Endocrine organs 2.
   Dr. Nagy András Dávid
28 The eye.
   Dr. Tóth Pál
29 The eye and its development.
   Dr. Tóth Pál
30 The external muscles of the eye, movements of the eye and their central mechanisms.
   Dr. Tóth Pál
31 The retina.
   Dr. Lázár Gyula
32 Visual pathway.
   Dr. Lázár Gyula
33 The tympanic cavity, its contents and their development.
   Dr. Tamás Andrea
34 The bony and membranous labyrinth and their development.
   Dr. Tamás Andrea
35 The auditory pathways.
   Dr. Tóth Pál
36 The vestibular system.
   Dr. Tóth Pál
37 Neural basis for the movement-coordination.
   Dr. Csernus Valér
38 The somatosensory systems.
   Dr. Csernus Valér
39 Autonomous nervous system 1.
   Dr. Csereus Valér
40 Autonomous nervous system 2.
   Dr. Csereus Valér
41 Clinical implications of the central nervous system.
   Dr. Reglődi Dóra
42 Closing lecture.
   Dr. Reglődi Dóra

Practices
1 Dissecting room: The skull.
3 Dissecting room: Dissection of the brain.
5 Histology: The skull.
7 Dissecting room: Dissection of the brain.
9 Dissecting room: Dissection of the brain.
11 Histology: The integument.
13 Dissecting room: Dissection of the brain.
15 Dissecting room: Dissection of the brain.
17 Histology: Neurons, peripheral nerves.
19 Dissecting room: Sections of the brain.
21 Dissecting room: Sections of the brain.
23 Histology: Nerve terminals, glia.
25 Dissecting room: The spinal cord.
27 Dissecting room: The spinal cord.
29 Histology: Histology of the spinal cord.
31 Dissecting room: Regions of the head and neck.
33 Dissecting room: Regions of the head and neck.
35 Histology: The spinal cord and the brainstem (seminar).
37 Dissecting room: Regions of the head and neck.
39 Dissecting room: Regions of the head and neck.
41 Histology: The cortex of the cerebellum.
43 Dissecting room: Regions of the head and neck.
45 Dissecting room: Regions of the head and neck.
47 Histology: Cerebellum and diencephalon (seminar).
49 Dissecting room: Regions of the head and neck.
51 Dissecting room: Regions of the head and neck.
53 Histology: Cerebral cortex.
55 Dissecting room: Dissection of the brain in situ.
57 Dissecting room: Dissection of the brain in situ.
59 Histology: Endocrine organs 1.
61 Dissecting room: Dissection of the brain in situ.
63 Dissecting room: The orbita.
65 Histology: Endocrine organs 2.
67 Dissecting room: The orbita.
69 Dissecting room: The inner ear.
71 Histology: The eye.
73 Dissecting room: The inner ear.
75 Dissecting room: X-ray, MR/CT pictures of the brain and brain vessels.
77 Histology: The inner ear.
79 Dissecting room: Recapitulation, preparation for the exam.
81 Dissecting room: Recapitulation, preparation for the exam.
83 Histology: Recapitulation, preparation for the exam.

Seminars

Exam topics/questions
http://an-server.pote.hu
Participants

Dr. Csernus Valér (CSVGAAO.PTE), Dr. Hollósy Tibor (HOTFAAO.PTE), Dr. Nagy András Dávid (NAFAFO.PTE), Dr. Reğlődi Dóra (REDMAAO.PTE), Dr. Rékási Zoltán (REZMAAO.PTE), Dr. Tamás Andrea (TAAFAAO.PTE), Dr. Timá Lajos (TILGAAO.PTE), Dr. Tóth Pál (TOPMAAO.PTE), Gaszner Tamás (GATRAAO.PTE)
The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

The final exam in „Medical Biochemistry” covers the material of subjects of four semesters (Medical Chemistry, Introduction to Biochemistry, Biochemistry, Medical Biochemistry). The material of the four semesters present the metabolic processes and the molecular events of biological information transmission with special respect to the properties and functions of the participating biomolecules. Thus, students are supposed to gain a molecular level insight into the processes by which living organisms sustain their life functions or react to various stimuli, physiological or pathological conditions.

Within these four semesters the subject „Medical Biochemistry”, based on previously acquired knowledge, presents the molecular level alterations appearing under various physiological and pathological circumstances with special respect to organ and organelle specific issues. Moreover, the biochemical background of related disorders and diseases will be also mentioned.

The material of the final exam is direct prerequisite of higher year subjects Pharmacology, Pathophysiology, Microbiology and Clinical Biochemistry. In addition, the material covers the introduction to certain chapters of Internal Medicine and Paediatrics also.

**Conditions for acceptance of the semester**

No more than three absences from the laboratory practices

**Mid-term exams**

- Submission of at least 10 out of 12 short tests held at the first 10 minutes of the practices in weeks 3-14
- At least seven of the 12 short tests must reach the satisfactory level

**Making up for missed classes**

Permission should be asked from the course director to do the practice with an other group. Permission will be given maximum twice in a semester.

**Reading material**

- **Obligatory literature**
- **Literature developed by the Department**
- **Notes**
- **Recommended literature**

**Lectures**

1. **Introduction**
   Dr. Berente Zoltán
2. **Interorgan division of metabolic labour**
   Dr. Berente Zoltán
3. **Nutrition 1: Macro- and micronutrients, caloric balance**
   Dr. Berente Zoltán
4. **Nutrition 2: digestion fluids and digestion enzymes**
   Dr. Berente Zoltán
5. **Metabolic changes when switching from fed to fasting state**
   Dr. Gallyas Ferenc
6. **Serum lipoproteins**
   Dr. Debreceni Balázs
7 Special functions of the liver  
   Dr. Veres Balázs
8 Molecular events following alcohol ingestion  
   Dr. Kovács Krisztina
9 Trace elements, deficiencies  
   Dr. Berente Zoltán
10 Iron metabolism  
   Dr. Kovács Krisztina
11 Structural variants of hemoglobin  
   Dr. Kovács Krisztina
12 Proteins in blood, blood clotting, biochemistry of the blood vessels  
   Dr. Kovács Krisztina
13 Molecular mechanisms of water and electrolyte household  
   Dr. Berente Zoltán
14 Molecular mechanisms of blood pressure regulation  
   Dr. Sümegi Balázs
15 Molecular mechanisms of cardiac function  
   Dr. Sümegi Balázs
16 Biochemistry of the senses  
   Dr. Tapodi Antal
17 Nervous system I  
   Dr. Tapodi Antal
18 Nervous system II  
   Dr. Gallyas Ferenc
19 Nervous system III  
   Dr. Gallyas Ferenc
20 Biochemical background of the pH regulation  
   Dr. Berente Zoltán
21 Biochemical background of diabetes  
   Dr. Sümegi Balázs
22 Molecular mechanisms of glucose uptake  
   Dr. Sümegi Balázs
23 Oxidative stress induced signalling pathways  
   Dr. Sümegi Balázs
24 Biochemistry of the inflammatory processes  
   Dr. Veres Balázs
25 Molecular mechanisms of the synovial function  
   Dr. Kovács Krisztina
26 Mechanisms of cell death  
   Dr. Sümegi Balázs
27 The cell cycle and its regulation  
   Dr. Debreceni Balázs
28 Oncogenes and oncogenesis  
   Dr. Debreceni Balázs
29 Tumor suppressors and cancer  
   Dr. Debreceni Balázs
30 Structure of the extracellular matrix  
   Dr. Tapodi Antal
31 Matrix metalloproteinases  
   Dr. Gallyas Ferenc
32 Biochemical features of the plasma membrane  
   Dr. Berente Zoltán
33 Biochemistry of the cytoskeletal function  
   Dr. Gallyas Ferenc
34 Molecular features of ER and Golgi  
   Dr. Gallyas Ferenc
35 Biochemical functions of lysosomes and peroxisomes  
   Dr. Tapodi Antal
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**Practices**

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<td>Consultation</td>
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**Seminars**

**Exam topics/questions**

Exam requirements can be found:

Further exam points can be achieved by oral presentations or extra work during the semester.

**Participants**

Dr. Berente Zoltán (BEZLAAP.PTE), Dr. Debreceni Balázs (DEBFAAO.PTE), Dr. Farkas Viktória (FAVSAAP.PTE), Dr. Jakus Péter (JAPAAA.T.JPTE), Dr. Lengyel Anna (LEAFABO.PTE), Dr. Takátsy Anikó (TAAAAA.T.JPTE), Dr. Tapodi Antal (TAAAAB.T.JPTE), Dr. Veres Balázs (VEBAAB.T.JPTE), Fekete Katalin (FEKHAAT.PTE), Hocsák Enikő (HOEFAB.T.JPTE), Marquettené Dr. Bock Ildikó (MABUAAP.PTE), Nagyné Dr. Kiss Gyöngyi (KIGFAFO.PTE)
OAA-SZO  BEHAVIOURAL SCIENCE 3 (MEDICAL SOCIOLOGY)
Course director: DR. ZSUSZANNA FÜZESI, professor
Department of Behavioural Sciences

2 credit • semester exam • Basic subject • spring semester • recommended semester: 4
Number of hours/semester: 28 lectures + 0 practices + 0 seminars = total of 28 hours
Course headcount limitations (min.-max.): 1 – 150
Prerequisites: OAA-ANT completed + OAA-OET completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic

Medical sociology deals with the sociological and behavioural factors influencing the health status and health care. Acquiring the theoretical and practical basis of sociology at this course, students will be able to realize and understand the basic patterns of behaviour in maintenance of health, in the development of illness, and in the process of treatment and care in the context of the society. Main research issues of sociology: epidemiology of chronic diseases; health and illness behaviour; sociological-economical aspects of health care; models of development in health care; alternative medicine.

Conditions for acceptance of the semester

According to Code of Studies and Examinations.

Mid-term exams

- Making up for missed classes

- Reading material

- Obligatory literature

- Literature developed by the Department

- Notes

- Recommended literature

Lectures

1  Introduction. Sociological approaches to health and medicine
   Dr. Füzesi Zsuzsanna
2  Introduction. Sociological approaches to health and medicine
   Dr. Füzesi Zsuzsanna
3  Measuring health and illness. Social causes of illness.
   Dr. Varga József
4  Measuring health and illness. Social causes of illness.
   Dr. Varga József
5  Models of health and illness.
   Dr. Varga József
6  Models of health and illness.
   Dr. Varga József
7  Labelling behaviour, illness as a deviance.
   Dr. Füzesi Zsuzsanna
8  Labelling behaviour, illness as a deviance.
   Dr. Füzesi Zsuzsanna
9  Illness behaviour
   Dr. Varga József
10 Illness behaviour
    Dr. Varga József
11 Coping with illness
   Dr. Varga József
12 Coping with illness
   Dr. Varga József
Models of doctor-patient relationship.
Dr. Varga József

Models of doctor-patient relationship.
Dr. Varga József

Doctor-patient communication.
Dr. Füzesi Zsuzsanna

Doctor-patient communication.
Dr. Füzesi Zsuzsanna

Professional socialization of medical students. The hidden curriculum.
Dr. Varga József

Professional socialization of medical students. The hidden curriculum.
Dr. Varga József

Clinical autonomy
Dr. Varga József

Clinical autonomy
Dr. Varga József

Inequalities in health, types of health care
Dr. Füzesi Zsuzsanna

Inequalities in health, types of health care
Dr. Füzesi Zsuzsanna

Delivering and evaluating health care
Dr. Füzesi Zsuzsanna

Delivering and evaluating health care
Dr. Füzesi Zsuzsanna

Social basis of disease, social role of medicine.
Dr. Füzesi Zsuzsanna

Social basis of disease, social role of medicine.
Dr. Füzesi Zsuzsanna

Summary, overview.
Dr. Füzesi Zsuzsanna

Summary, overview.
Dr. Füzesi Zsuzsanna

Practices
Seminars
Exam topics/questions
Semester exam:
Written multiple choice test, 50-60 questions. Bettering the exam grade: oral exam.

Study materials for the exam:

Questions of oral exam: titles and subtitles of the lectures and the reference book.
Further details about the exam can be found on Neptun.
Participants
**ATT4 PHYSICAL EDUCATION 4**

**Course director:** TAMÁS TÉCZELY, physical education teacher

UP MS Sports Facilities

<table>
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<tr>
<th>0 credit</th>
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<th>both semesters semester</th>
<th>recommended semester: 4</th>
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**Number of hours/semester:**

- 0 lectures + 28 practices + 0 seminars = total of 28 hours

**Course headcount limitations (min.-max.):**

- 2 – 50

**Prerequisites:** ATT3 completed

The subject can only be registered in case of a PASSED and valid health aptitude test!

**Topic**

This subject provides theoretical and practical information for the students to maintain and improve their physical condition and helps to deepen the knowledge in the field of healthy lifestyle.

Theoretical and practical knowledge during different types of exercises e.g. how to improve endurance, muscle force, motor skills and how to prevent the body from injuries.

**Conditions for acceptance of the semester**

Active participation at least 20 practical lessons provided by the Institute of Human Movement Sciences or regular participation of the trainings of the Medikus Sport Club or PEAC.

**Mid-term exams**

- 

**Making up for missed classes**

We provide opportunities to attend extra lessons in the first week of the exam period in that case the requirements are not fulfilled till the end of the teaching weeks with agreement of the PE Teacher.

**Reading material**

- **Obligatory literature**
- Literature developed by the Department
  - Not available.
- **Notes**
- **Recommended literature**

**Lectures**

**Practices**

1–28 For the list of actual courses please turn to the end of this document

**Seminars**

**Exam topics/questions**

**Participants**

Farkas György (FAGMAAO.PTE), Lipcsik Zoltán (LIZIAAT.PTE), Németh Attila Miklós (NEAGAET.PTE), Téczely Tamás (PETLAAT.PTE)
## ATT1-2-3-4-5 Physical Education Courses 1-2-3-4-5

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<td>Aerobics</td>
<td>Monday</td>
<td>18:00</td>
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<td>SPO-SOR Sőrház 2nd floor (Kavér u. 19.)</td>
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<td>Dr. Szilárdné Kordély Erika</td>
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<td>Aerobics</td>
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<td>SPO-SOR Sőrház 2nd floor (Kavér u. 19.)</td>
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<td>Tuesday</td>
<td>20:00</td>
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<td>SPO-PSM &quot;Pécsi Sasok&quot; Sportscenter (Búza tér 6/b.)</td>
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<td>Athletics</td>
<td>Monday</td>
<td>17:00</td>
<td>18:30</td>
<td>SPO-ATP Faculty of Sciences - Athletics field (ffőváros út 6.)</td>
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<td>Hajduné Dr. László Zita</td>
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<td>Wednesday</td>
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<td>16:30</td>
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<td>Dancing University Project - Ballroom Dancing</td>
<td>Thursday</td>
<td>19:00</td>
<td>20:30</td>
<td>SPO-IST Dance room (ffőváros út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés Beatrix</td>
<td>Dr. Papp Judit</td>
</tr>
<tr>
<td>Dancing University Project - Ballroom Latin Dances</td>
<td>Tuesday</td>
<td>20:30</td>
<td>22:00</td>
<td>SPO-IST Dance room (ffőváros út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés Beatrix</td>
<td>Józsa János</td>
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<tr>
<td>Dancing University Project - Belly Dance</td>
<td>Thursday</td>
<td>17:30</td>
<td>19:00</td>
<td>SPO-IST Dance room (ffőváros út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés Beatrix</td>
<td>Indzsi Deniz</td>
</tr>
<tr>
<td>Dancing University Project - Body Shaping Dance Aerobics</td>
<td>Tuesday</td>
<td>16:00</td>
<td>17:30</td>
<td>SPO-IST Dance room (ffőváros út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés Beatrix</td>
<td>Szalai Kata</td>
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<tr>
<td>Dancing University Project - Croatian, Serbian and Macedonian Dances</td>
<td>Tuesday</td>
<td>17:30</td>
<td>19:00</td>
<td>SPO-IST Dance room (ffőváros út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés Beatrix</td>
<td>Vélin Veszna</td>
</tr>
<tr>
<td>Sport</td>
<td>day</td>
<td>from</td>
<td>to</td>
<td>place</td>
<td>min. head-count</td>
<td>max. head-count</td>
<td>supervisor</td>
<td>trainer</td>
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<tr>
<td>Dancing University Project - Cuban Salsa</td>
<td>Wednesday</td>
<td>17:45</td>
<td>19:15</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Vágásí Barbara, Kutni Balázs</td>
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<tr>
<td>Dancing University Project - Hip-hop</td>
<td>Monday</td>
<td>18:30</td>
<td>20:00</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Horváth Tamás</td>
</tr>
<tr>
<td>Dancing University Project - Latin Freestyle Aerobics</td>
<td>Monday</td>
<td>17:00</td>
<td>18:30</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Szabó Adrienn</td>
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<tr>
<td>Dancing University Project - Pole Fitness</td>
<td>Tuesday</td>
<td>18:01</td>
<td>19:30</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>2</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Dombai Szilvia</td>
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<tr>
<td>Dancing University Project - Self-defence</td>
<td>Friday</td>
<td>13:00</td>
<td>14:15</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Lenkei Zsolt</td>
</tr>
<tr>
<td>Dancing University Project - Yoga</td>
<td>Wednesday</td>
<td>15:00</td>
<td>16:30</td>
<td>SPO-I6T Dance room (Ifjúság út 6.)</td>
<td>1</td>
<td>4</td>
<td>Bánkyné Perjés, Beatrix</td>
<td>Gyenis Boglárka</td>
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<tr>
<td>Football</td>
<td>Friday</td>
<td>13:30</td>
<td>15:00</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>6</td>
<td>15</td>
<td>Téczely Tamás</td>
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<tr>
<td>Football</td>
<td>Friday</td>
<td>15:00</td>
<td>16:30</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>6</td>
<td>15</td>
<td>Téczely Tamás</td>
<td></td>
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<tr>
<td>Handball (men) (Student Sports Club)</td>
<td>Wednesday</td>
<td>19:30</td>
<td>21:00</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>Lipcsik Zoltán</td>
</tr>
<tr>
<td>Handball (women) (Student Sports Club)</td>
<td>Monday</td>
<td>17:30</td>
<td>19:00</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>Lipcsik Zoltán</td>
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<tr>
<td>Hiking</td>
<td>weekends</td>
<td></td>
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<td>Mecsek</td>
<td>2</td>
<td>10</td>
<td>Farkas György</td>
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<tr>
<td>Horse Riding (six times)</td>
<td>Saturday</td>
<td>9:00</td>
<td>13:00</td>
<td>SPO-APL &quot;Apró Paták&quot; Riding School (Siklós, Postaszálás u. 11.) (transportation is provided)</td>
<td>1</td>
<td>2</td>
<td>Téczely Tamás</td>
<td>Bohár Áron</td>
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<tr>
<td>Karate advanced (Student Sports Club)</td>
<td>Tuesday</td>
<td>20:00</td>
<td>21:30</td>
<td>SZEA-EDZ Main Building training room</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>József Kristóf</td>
</tr>
<tr>
<td>Karate advanced (Student Sports Club)</td>
<td>Thursday</td>
<td>20:00</td>
<td>21:30</td>
<td>SZEA-EDZ Main Building training room</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>József Kristóf</td>
</tr>
<tr>
<td>Kick-box</td>
<td>Friday</td>
<td>19:00</td>
<td>20:30</td>
<td>SZE-EDZ Main Building training room</td>
<td>2</td>
<td>12</td>
<td>Horváth László</td>
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<tr>
<td>Lacross</td>
<td>Friday</td>
<td>19:00</td>
<td>20:30</td>
<td>SPO-V13 UP Sports fields (Verseny u. 13.)</td>
<td>2</td>
<td>10</td>
<td>Dr. Rugási Endre</td>
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<tr>
<td>Nordic Walking</td>
<td>Wednesday</td>
<td>17:30</td>
<td>19:00</td>
<td>SPO-ATP Faculty of Sciences - Athletics field (Ifjúság út 6.)</td>
<td>1</td>
<td>8</td>
<td>Hajduné Dr. László Zita</td>
<td></td>
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<tr>
<td>Operational Medicine Training Program (functional skill development)</td>
<td>Tuesday</td>
<td>16:15</td>
<td>17:30</td>
<td>SZEA-EDZ Main Building training room</td>
<td>1</td>
<td>6</td>
<td>Lipcsik Zoltán</td>
<td></td>
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<tr>
<td>Sport</td>
<td>day</td>
<td>from</td>
<td>to</td>
<td>place</td>
<td>min. head-count</td>
<td>max. head-count</td>
<td>supervisor</td>
<td>trainer</td>
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<tr>
<td>Other sports clubs from Pécs (with permission)</td>
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<tr>
<td>PTE - PEAC (Sport Club) (with permission)</td>
<td>Monday</td>
<td>19:00</td>
<td>20:30</td>
<td>SPO-EP8 Elementary School &quot;Éttes Múdiú&quot; (Építők u. 8.)</td>
<td>2</td>
<td>20</td>
<td>Téczely Tamás</td>
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<tr>
<td>Shaolin Kung Fu</td>
<td>Monday</td>
<td>16:30</td>
<td>18:00</td>
<td>SPO-SOR Sórház 2nd floor (Xavér u. 19.)</td>
<td>2</td>
<td>4</td>
<td>Téczely Tamás</td>
<td>Bomernissza Gergely</td>
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<tr>
<td>Squash</td>
<td>Friday</td>
<td>12:00</td>
<td>13:30</td>
<td>SZEA-USZ Main Building swimming pool</td>
<td>1</td>
<td>4</td>
<td>Dr. Karsai István</td>
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<tr>
<td>Swimming</td>
<td>Tuesday</td>
<td>18:00</td>
<td>19:30</td>
<td>SPO-UIF Faculty of Sciences Swimming pool (Ifjúság út 6.)</td>
<td>1</td>
<td>6</td>
<td>Dr. Karsai István</td>
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<tr>
<td>Swimming</td>
<td>Friday</td>
<td>13:30</td>
<td>15:00</td>
<td>SZEA-USZ Main Building swimming pool</td>
<td>3</td>
<td>15</td>
<td>Farkas György</td>
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<tr>
<td>Table Tennis</td>
<td>Friday</td>
<td>13:30</td>
<td>15:00</td>
<td>SZEA-EDZ Main Building training room</td>
<td>2</td>
<td>8</td>
<td>Finak Gáborné Gombosi Eszter Györgyi</td>
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<tr>
<td>Table Tennis</td>
<td>Thursday</td>
<td>13:30</td>
<td>15:00</td>
<td>SZEA-EDZ Main Building training room</td>
<td>4</td>
<td>16</td>
<td>Finak Gáborné Gombosi Eszter Györgyi</td>
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<tr>
<td>Table Tennis</td>
<td>Thursday</td>
<td>15:00</td>
<td>16:15</td>
<td>SZEA-EDZ Main Building training room</td>
<td>4</td>
<td>16</td>
<td>Farkas György</td>
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<tr>
<td>Tennis</td>
<td>Monday</td>
<td>18:00</td>
<td>19:00</td>
<td>SPO-MAT Makár Tanya (Középmakár dűlő 4.)</td>
<td>2</td>
<td>6</td>
<td>Daróczi Balázs</td>
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<tr>
<td>Tennis</td>
<td>Tuesday</td>
<td>17:00</td>
<td>18:00</td>
<td>SPO-MAT Makár Tanya (Középmakár dűlő 4.)</td>
<td>2</td>
<td>3</td>
<td>Daróczi Balázs</td>
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<tr>
<td>Track and Field training</td>
<td>Friday</td>
<td>17:00</td>
<td>18:30</td>
<td>SPO-JSK Jakabhegy street outdoor handball field (Jakabhegyi út 6.)</td>
<td>1</td>
<td>5</td>
<td>Dr. Karsai István</td>
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</tr>
<tr>
<td>Training in the Gym</td>
<td>Wednesday</td>
<td>12:00</td>
<td>13:30</td>
<td>SPO-GYM Professors' Gym (Megyeri út 4.)</td>
<td>2</td>
<td>10</td>
<td>Lipcsik Zoltán</td>
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<tr>
<td>Training in the Gym</td>
<td>Friday</td>
<td>12:00</td>
<td>13:30</td>
<td>SPO-GYM Professors' Gym (Megyeri út 4.)</td>
<td>4</td>
<td>20</td>
<td>Lipcsik Zoltán</td>
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<tr>
<td>Training in the Gym</td>
<td>Friday</td>
<td>13:30</td>
<td>15:00</td>
<td>SPO-GYM Professors' Gym (Megyeri út 4.)</td>
<td>4</td>
<td>20</td>
<td>Németh Attila Miklós</td>
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<tr>
<td>VitalFUN</td>
<td>Tuesday</td>
<td>19:15</td>
<td>20:30</td>
<td>SPO-RSG Faculty of Sciences rhythmic gymnastics room (Ifjúság út 6. Building A)</td>
<td>1</td>
<td>2</td>
<td>Dr. Dudás Anna</td>
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<tr>
<td>Volleyball (women) (Student Sports Club)</td>
<td>Tuesday</td>
<td>16:30</td>
<td>18:00</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>Schrauff Júlia</td>
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<tr>
<td>Volleyball (women) (Student Sports Club)</td>
<td>Wednesday</td>
<td>16:30</td>
<td>18:00</td>
<td>SPO-TCS Sportshall at Jakabhegyi út (Jakabhegyi út 6.)</td>
<td>2</td>
<td>7</td>
<td>Farkas György</td>
<td>Balla Robert</td>
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<tr>
<td>Yoga</td>
<td>Sunday</td>
<td>18:00</td>
<td>20:00</td>
<td>SPO-SOR Sórház 2nd floor (Xavér u. 19.)</td>
<td>2</td>
<td>10</td>
<td>Kiföldi-Szabó Ágnes</td>
<td></td>
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<tr>
<td>Zumba (fee payment necessary)</td>
<td>Wednesday</td>
<td>18:00</td>
<td>19:00</td>
<td>SPO-FOR Fordan Dance Center (Batthyány u. 9/a.)</td>
<td>2</td>
<td>16</td>
<td>Varga Zsuzsanna</td>
<td></td>
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</tbody>
</table>
OAR-HUF-O  Final Examination in Medical Hungarian - Oral

Course director:  DR. GÁBOR RÉBÉK-NAGY, associate professor
Department of Languages for Specific Purposes

0 credit • signature • Criterion requirement subject • both semesters semester • recommended semester: 4

Number of hours/semester: 0 lectures + 0 practices + 0 seminars = total of 0 hours

Course headcount limitations (min.-max.): 1 – 400  Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
Exam of Medical Hungarian language skills required for the clinical studies.

Conditions for acceptance of the semester
Maximum of 25 % absence allowed

Mid-term exams
-

Making up for missed classes
-

Reading material
- Obligatory literature
- Literature developed by the Department
- Notes
- Recommended literature

Lectures
Practices
Seminars

Exam topics/questions
-

Participants
OAR-HUF-W  FINAL EXAMINATION IN MEDICAL HUNGARIAN - WRITTEN

Course director: DR. GÁBOR RÉBÉK-NAGY, associate professor
Department of Languages for Specific Purposes

0 credit • signature • Criterion requirement subject • both semesters semester • recommended semester: 4
Number of hours/semester: 0 lectures + 0 practices + 0 seminars = total of 0 hours
Course headcount limitations (min.-max.): 1 – 400  Prerequisites: none

The subject can only be registered in case of a PASSED and valid health aptitude test!

Topic
Exam of Medical Hungarian language skills required for the clinical studies.

Conditions for acceptance of the semester
-

Mid-term exams
-

Making up for missed classes
-

Reading material
- Obligatory literature
- Literature developed by the Department
- Notes
- Recommended literature

Lectures
Practices
Seminars

Exam topics/questions
-

Participants