Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Bioinformatika Tanszék

Name of subject in Hungarian: Mesterséges intelligencia, mint tanulási segédeszköz
Name of subject in English: Artificial Intelligence as a Learning Tool
Name of subject in German: Künstliche Intelligenz als Lernhilfe

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Credit value of the course: 0
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
14.0	1.0	13.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBIN1271_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Győrffy Balázs
Course coordinator location of work, telephone availability: Bioinformatika Tanszék, 4591500
Course coordinator position: Professor, Dr. sc.
Course coordinator Date and number of habilitation: 2017.03.21., PPKE-J-1/2017 Hab

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Objectives of the course, and its place in the curriculum of the medical training program:

In medical education, it is particularly important to use AI tools for learning that draw on reliable, verifiable sources. The first widely known AI services to appear were not like this. The aim of the course is to introduce students to AI tools that support learning, the use of which guarantees that the problem of hallucinations can be minimized to the greatest extent possible. At the same time, these tools facilitate the active mastery of the course material to an unprecedented degree. The course also paves the way for students to become familiar with AI services and to use these tools critically.

Format of the course (lectures, group work, practical lessons, etc.):

1 lecture (1 class period), 13 online exercises (1 class period each)

Competencies acquired through completion of course:

Students are able to independently locate professionally reliable sources using AI tools and answer academic questions. They are able to independently organize and process the sources they have found in conjunction with the university curriculum. In doing so, they are able to adapt the sources into formats that best suit their own learning needs and use them in active learning.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Computer/tablet, internet connection, and (optionally) a cell phone. SeKA and Google accounts, and basic computer skills.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

obligatory course

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Week 1: Introductory lecture in class

Online exercise: Setting up your own NotebookLM environment, uploading resources, chat

Week 2: Creating a mind map

Week 3: Creating a study guide and other written reports

Week 4: Creating flashcards

Week 5: Creating quiz questions

Week 6: Creating an audio overview (podcast)

Week 7: Creating a slide deck

Week 8: Creating a video overview

Week 9: Creating infographics and data tables

Week 10: Source research (Perplexity, Concensus)

Week 11: Integrating with other AI tools (Gemini, Claude, OpenAI)

Week 12: Overview of other similar systems (Recall, Kortex)

Week 13: Using flashcards in practice (spaced repetition, Anki)

Week 14: Creating student feedback on the course

Lecturer: Dr. Tornóci László

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The course material can be studied independently online; there will be single introductory lecture.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Students will independently indicate in the course whether they have completed each assigned task. There is no external verification.

Number and type of individual assignments to be completed, submission deadlines:

Complete at least 10 online assignments. Deadline: the end of the semester.

Requirements for the successful completion of the course:

Type of assessment:
criterion requirement

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Completing online assignments

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

To pass the course, students must complete all course assignments available in the Moodle system and fill out the end-of-course feedback questionnaire.

The course assignments include self-assessment and administrative components, the completion of which the student indicates on the Moodle platform. The system automatically checks the completion of the final feedback assignment.

The course concludes with a "pass/fail" grade. The requirement for earning a "pass" grade is the complete fulfillment of all required course components.

The minimum requirements for the course and the detailed conditions for completion are published on the department's website and on the Moodle course platform.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

There are no grades; only a pass or fail.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Google NotebookLM, Consensus, Perplexity, Gemini. Also, tangentially: OpenAI, Claude, Recall, Kortex, i10X.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Genetikai, Sejt- és Immunbiológiai Intézet

Name of subject in Hungarian: Sejttan
Name of subject in English: Cell Science
Name of subject in German: Biologie für Mediziner

Credit value of the course: 3
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	1.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKGEN666_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Buzás Edit (Intézet igazgató)
Course coordinator location of work, telephone availability: Genetikai, Sejt- és Immunbiológiai Intézet, 1089, Nagyvárad tér 4, +3612102929
Course coordinator position: intézetvezető egyetemi tanár
Course coordinator Date and number of habilitation: 2009. június 2. Anyakönyvi száma: 273

Objectives of the course, and its place in the curriculum of the medical training program:

The *Cell Science* course is designed for medical students as part of the Basic Module. The course presents the most important aspects of cell morphology and function. It provides a detailed overview of compartmentalization in the eukaryotic cell and highlights the key features of essential cellular functions, including migration, endocytosis, cell-cell communication, division, stem cell differentiation, ageing, and cell death.

The practical sessions introduce students to the microscopic techniques used in the study of cell morphology. The aim of the course is to demonstrate the complexity of the relationship between cell structure and function, as well as to present fundamental methods of *in vitro* cell culturing and their potential medical applications.

Format of the course (lectures, group work, practical lessons, etc.):

45 min lecture / week

90 min practical lesson / week

Competencies acquired through completion of course:

- Understanding of cell morphology and the ability to assign major cellular functions to specific organelles.
- Use of light microscopy (bright-field) for studying biological samples.
- Familiarity with other microscopic techniques, including fluorescence microscopy and electron microscopy
- Knowledge of basic biological sample preparation techniques (e.g., sectioning, smears, monolayers, suspensions).
- Ability to evaluate immunofluorescence images.
- Ability to recognize cellular organelles, macromolecular complexes, and sample preparation methods in electron micrographs.
- Ability to interpret co-localization results.
- Ability to critically and ethically apply generative AI, for example in image and figure analysis and in supporting a deeper understanding of cell biological processes.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

First-semester subject, no prerequisites.
The course is based on high school-level biology knowledge

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

First-semester subject, not relevant

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the current Study and Examination Regulations.

First year students can take the course.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures

1. Cell membrane (Dr. E. Buzás)
2. Structure and function of the nucleus I. (Dr. E. Buzás)
3. Structure and function of the nucleus II. (Dr. E. Buzás)
4. Endoplasmic reticulum (Dr. E. Buzás)
5. Golgi complex, vesicular transport and secretion (Dr. T. Visnovitz)
6. Endocytosis. Autophagy (Dr. T. Visnovitz)
7. Structure and function of mitochondria and peroxisomes (Dr. A. Försönits)
8. Cell adhesion and cell junctions (Dr. H. Hegyesi)
9. Cytoskeleton and Cellular movement (Dr. H. Hegyesi)
10. Cell communication. Extracellular vesicles. (Dr. E. Buzás)
11. Cell cycle and mitosis (Dr. E. Buzás)
12. Cellular aging and cell death (Dr. E. Buzás)
13. Stem cells and differentiation (Dr. E. Lajkó)
14. Tumor cell biology (Dr. Z. Wiener)

Practices:

1. The light microscope (LM)
2. The general cell morphology. Light microscopic microtechnique
3. The electron microscopy (EM). Cell membrane
4. The interphase nucleus. Cyto/Histo-chemistry
5. Immunocytochemistry, Fluorescence Microscopy
6. Endoplasmic reticulum.
7. Golgi complex and secretion
8. Endocytosis and lysosomes, Enzyme cytochemistry
9. Cell and tissue culture and artificial tissues
10. Cell surface differentiation, enzyme-histochemistry
11. Store and supply of energy. Mitochondria. Peroxisome.
12. Mitosis.
13. Cellular senescence and death (necrosis and apoptosis)
14. Consultation

The practical sessions include microscope adjustment of LM (light microscopy) slides related to the given topic, viewing them with the SlideViewer programme, and analysis of EM (electron microscopy) images.

The order of lecture and practical topics may vary.

List of practical teachers:

- Eszter Baricza - research fellow
- András Försönits - assistant research fellow
- László Kőhidai - university professor
- Hargita Hegyesi - associate professor
- Csilla Marianna Holub - associate professor
- Eszter Lajkó - associate professor
- Zsófia B. Szász - reseach fellow
- Tamás Visnovitz - associate professor
- Krisztina V. Vukman - assistant professor
- Dorina Lenzinger - PhD student
- Panna Királyhidi - assistant research fellow
- Barbara M. Érsek - senior research fellow
- Bence Nagy - PhD student
- Szabolcs Hajdó - PhD student
- Xabier Osteikoetxea - senior research fellow
- Kelsey Fletcher - PhD student
- Sayam Ghosal - assistant research fellow
- Meir Brachyahu Kestecher
- Ádám Hampuch - PhD student

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students can only participate in classes if they are in a good mental and physical condition. Absences can be made up during the same academic week in a parallel course after prior consultation with the practical teachers; however, this option is available no more than twice during the semester.

Paragraph 29§ (2) of the Study and Examination Regulations: "meet at least 75% of the attendance and participation requirement in practical sessions and seminars".

A maximum delay of 10 minutes is allowed for practical classes.

There is no possibility to make up missed lectures.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, there will be two midterms (Moodle tests). (The dates and topics will be announced at the beginning of the semester).

Completing the Moodle tests is mandatory.
The missed midterms can be made up either during the same week in another group, with prior approval from the practical instructor and the course administrator, or at a separate time at the end of the semester.

Based on the cumulative performance during the semester, students may receive an offered final examination grade.

(If there is a force majeure situation, the form and content of the midterms may change.)

Number and type of individual assignments to be completed, submission deadlines:

Requirements for the successful completion of the course:

The requirements for obtaining the end-of-semester signature are: (i) attendance at and participation in at least 75% of the practical sessions (a maximum of three absences is permitted [TVSZ §29 (2)]), and (ii) at least 30% of the total points from the two midterms must be achieved.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The written exam is a Moodle test. You will have to study from the presentations and doc files on the homepage and from the Essential Cell Biology book. There will be questions from both lectures and practical material. Figures are just as important as text. You must be able to recognise the TEM figure of cell organelles or cellular processes or light microscopic preparations.

Topics - Theoretical part:

1. The Eukaryotic Cell
2. Structure of the Cell Membrane and Its Appendages: Glycocalyx, Membrane Skeleton
3. Function of the Cell Membrane
4. The Nucleus I: Organization of Chromatin; Nucleosome, Solenoid Fiber
5. The Nucleus II: Transcription and Its Regulation
6. The Nucleus III: Nucleolus and Interchromatin
7. The Nucleus IV: Nuclear Envelope and Nuclear Pores; Nuclear Transport; Lamina Fibrosa
8. Rough Endoplasmic Reticulum
9. Protein Synthesis
10. Smooth Endoplasmic Reticulum

11. Golgi Complex
12. Secretion Mechanisms
13. Vesicular Transport
14. Endocytosis
15. Intracellular Digestion
16. Autophagy
17. Cytoskeleton
18. Cell Adhesion
19. Cell Motility
20. Mitochondrion and Peroxisome
21. Regulation of Cellular Functions (Receptors and Signal Transduction Pathways)
22. Extracellular Vesicles
23. The Cell Cycle and Its Regulation
24. Mitosis
25. Cellular Aging
26. Cell Death
27. Stem Cells and Differentiation
28. Tumor cell biology

Topics - Practical part

1. The Light Microscope
2. Light Microscopy Microtechnique
3. Electron Microscopy
4. Electron Microscopy Microtechniques
5. Cytological Staining (Stains Related to LM Slides)
6. Cytochemical Reactions
7. Affinity Cytochemistry
8. Immunocytochemistry
9. Fluorescence and Confocal Microscopy
10. Enzyme Cytochemistry
11. Cell and Tissue Culture
12. Artificial Tissues – Principles of Regenerative Medicine
13. Interpretation of Light Microscopy Slides Presented in Practical Sessions
14. Identification of Cell Organelles and Sample Preparation Techniques in Electron Micrographs

Figures and images are an integral part of the course material!
Correct interpretation of light microscopy, electron microscopy, and schematic images included in the textbook (e-book), supplementary PDF files, and theoretical/practical presentations is also a requirement.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Theoretical Part:

1. **Eukaryotic cell organization.**
Main differences between pro- and eukaryotic cells. Organelles and other components of eukaryotic cells.

2. **Structure and functions of the plasma membrane.**
Types and the role of lipids, proteins, and carbohydrates in the membranes. Dynamism, fluidity, asymmetry of membranes. Glycocalyx or external coat (glycolipids, glycoproteins, proteoglycans. Lipid rafts

3. **Membrane transport:** simple diffusion, passive transport or facilitated diffusion, active transport: primary and secondary. Transport and channel proteins. Uniport, symport, antiport systems, Na – K pump.

4. **Structure and functions of the cell nucleus.**
Organization of chromatin (facultative and constitutive heterochromatin, euchromatin). Nucleosomal structure (histons).

5. **Characteristics of eukaryotic transcription**.
Types of RNAs. Structure of eukaryotic mRNA, main steps of transcription and its regulation. Structure and function of nucleolus.

6. **Nuclear envelope, Nuclear pores, Gated transport**

7. **Structure and function of the smooth ER**
phospholipid synthesis, Ca++ storage, detoxification, steroid synthesis, glucose metabolism). Transport of membrane lipids.

8. **Structure and function of the rough ER (rER)**. Translation (tRNA and its binding sites, initiation, elongation, and termination). Protein sorting, targeting: role of signals. Protein synthesis in ER bounded ribosomes. Function of SRP and SRP receptor. Cotranslational transmembrane transport. Processing of proteins in the lumen of rER: N-glycosylation; folding, quality control.

9. **Vesicular transport**
Coat proteins (clathrin, COP, caveolin) and their assembly, vesicle budding, trafficking and vesicle docking

10. **Structure and function of Golgi.** The polarity of Golgi apparatus. Golgi subcompartments (CGN, cis, medial, trans-Golgi, TGN). Golgi functions: transport, sorting. M-6 phosphorylation, O-glycosylation, modification of N- oligosaccharide chains and lipids.)

11. **Secretion** (constitutive and regulated secretion, exocytosis)

12. **Endocytosis, Intracellular digestion**
Types of endocytosis: pinocytosis, and phagocytosis. Receptor mediated (clathrin-mediated endocytosis. Autophagocytosis/autophagy. Functions of the endosomal – lysosomal compartment (early and late endosome, lysosome): sorting, degradation. Transcytosis. Stucture and function of the lysosome. Significance os autophagy.

13. **Cytoskeleton**
Microtubules (tubulin, polymerization, depolymerization, polarity of microtubules, motor proteins: dyneins, kinesins). MTOC/centrosome.

Actin or (micro)filaments (polymerization, depolymerisation, polarity). ABP: motor proteins. Organization of actin filaments (microvilli system). Intermediate filaments.

14. **Cell movement**
Structure and function of cilia and flagellum. Basal body. Molecular mechanism of ciliary movement (sliding of microtubules). Amoeboid movement.

15. **Cell adhesion and cell junctions**
Types of adhesion molecules (cadherins, selectins, Ig-like adhesion molecules, integrins). Structure and function of cell - cell junctions: tight junction (zonula occludens), belt desmosome (zonula adherens), spot desmosome (desmosome, macula adherens), and cell – extracellular junctions: focal contact (adhesion plaque), hemidesmosome. Structure and function of gap junction. Extracellular matrix (ECM).

16. **Mitochondria and peroxisomes**
Structure and function of mitochondria. Posttranslational transmembrane transport of protein and lipid transport into mitochondria. Characteristics of mitochondrial genome. Evidences for the origin of mitochondria. Structure and function of peroxisome (oxidative processes, catalase). Comparison of mitochondria and peroxisomes.

17. **Cell communication. Extracellular vesicles**
Regulation of cellular functions (receptors and signal transduction). Forms of cell communication (endocrine, paracrine, autocrine, contact dependent). Types of ligands and receptors. Structure and function of cytosolic/nuclear (steroid) receptors. Types of membrane receptors: ligand gated ion channel, G-protein and enzyme linked receptors (such as receptor tyrosine kinases). Function of trimeric G-protein linked receptors. Main secondary messengers: cAMP, IP3, DAG, Ca2+. Signal amplification.

18. **Cell cycle and mitosis**
Term of cell cycle. Stages of cell cycle: interphase (G1, S, G2) and M-phase (mitosis and cytokinesis). Significance of DNA and centrosome cycle. Cell cycle of multicellular organisms: G0 phase, growth factors and their signal transduction. Checkpoints of cell cycle and regulatory proteins (Cdk-s, cyclins, Cdk inhibitors, phosphatases).. Activation of MPF and its consequences. Main events of mitotic phases (pro-, prometa-, meta-, ana-, telophase). Structure of chromosome (sister chromatids, telomere, centromere, kinetochore). Structure and function of mitotic spindle. Cytokinesis.

19. **Cellular aging and cell death**
Cellular senecence. Telomere theory of cellular aging. Comparison of necrosis and apoptosis. The process of apoptosis and its internal and external regulation (TNF receptor (death receptor) family, death domain, p53, mitochondrial pathway: bcl-2 and bax gene families and proteins). Effector mechanisms of apoptosis: caspases, transglutaminases, endonucleases; formation of apoptotic bodies. Significance of apoptosis (in development, degenerative diseases and tumors).

20. **Stem cells and differentiation**
Definition of stem cells. Cell potency: totipotency, pluripotency, multipotency, unipotency. Different stem cell types. Characteristics of embryonis stem cells (ES cells). Advantages and disadvantages of adult stem cells. iPS (induced pluripotent stem cells). Asymmetric division, and its extrinsic and intrinsic causes.

21. **Tumor cell biology**
Hallmarks of cancer. Proto-oncogenes and tumor suppressor genes. Tumorigenesis. Metastasis formation.

Practical Part:

1. **Light microscope (LM)**
Optical and mechanical parts of LM. Image formation in LM, Abbé's equation. Practice in setting up the microscope, observation: change of information content as a function of magnification.

2. **Light microscopic microtechnique**
Requirements for the LM preparation; types of LM microtechniques (section and smear). Fixation (purpose, principle, methods). The essence of the steps of paraffin embedded section preparation (sampling, fixation, embedding, sectionong, staining, covering). Staining processes (purpose, types, mechanisms of chemical staining: acidophylic, basophylic).
General cell morphology: The size and shape of animal/human cells, and the compartments distinguishable by LM: cytoplasm, nucleus, nucleolus, and the extracellular space.

3. **The electron microscope.**
The principle of operation, resolving power and biomedical applications of transmission electron microscope (TEM) and scanning electron microscope (SEM). TEM microtechniques (ultra-thin section, suspension technique - negative contrast) and their applications.
Semi-thin sectioning (concept and application) and toluidine blue staining.

4. Understanding the light-microscopic preparations presented in the practicals and **their staining methods.**
Pr. 3. Spinal ganglion, Aoyama
Pr. 4. Liver, H
Pr. 5. Leukemic blood smear, MGG
Pr. 7. Kidney, Gömöri
Pr. 8. Liver, HE
Pr. 9. HeLa monolayer, May-Grünwald, Giemsa (MGG)
Pr. 13. Pancreas, Hemathoxylin + eosin (HE)
Pr. 17. NIH 3T3 monolayer, MGG
Pr. 19. Kidney, triPAS
Pr. 18. Spinal cord, Nissl (cresyl violet)
Pr. 20. Fatty liver, H&E - negative lipid detection
Pr. 22. Kidney, H&E
Pr. 29. Liver, Periodic acid-Schiff reaction (PAS)
Pr. 32. Tonsilla PD-L1 indirect immunocytochemistry
Pr. 33(a). Pancreas, semithin, toluidine blue
Pr. 37. Lung anthracosis, H&E
Pr. 38. Breast cancer cell line, MGG (apoptosis)
Pr. 58. Onion root tip, H
Pr. 60. Normal Blood smear, MGG
Tetrahymena - India ink phagocytosis

5. **Cytochemistry/Histochemistry:** DAPI
Light- and electron-microscopic structure (staining characteristics, nuclear envelope, nuclear pores, chromatin) of the nucleus. Non-specific (cytological) and specific (cytochemical) observation of the nucleus.

6. **Immunocytochemistry.** Steps of the direct and indirect reactions; their advantages and disadvantages. Fluorescence microscopy.

7. **Cytoplasmic basophilia and its types**
Meaning and principle of cytoplazmic basophilia. Types of cytoplasmic basophilia: diffuse, granular and polar

8**. Negative and positive lipid detection** (physical staining)

9. **Cell and tissue culturing**
The purpose and reuirements of cell culturing. Main types: suspension and monolayer cell cultures, primary culture, cell line (fibite and immortalized), cell starin.

10. **Enzyme cytochemistry**
Meaning and principle of enzime cytochemistry and its requirements.

11. **Cytochemical reactions** (PAS, triPAS, and Schiff reagent)
Detailed explanation on the basics and requirements of cytochemical reactions

12. **Detection of apoptosis**
Comparison of necrosis and apoptosis. Morphological features of apoptosis - TEM and LM. Methods for detecting apoptosis (Annexin V – affinity cytochemistry); apoptosis markers.

13. **Recognition of cell organelles, stuctures and sample-preparation techniques in electron- and light-microscopic images**

The minimum requirements (topic lists) can be found in the course information guide for the semester on the institute's website and on Moodle.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

There is a written colloquium in Cell Science at the end of the semester, in accordance with the rules of the current Study and Examination Regulations. The exam can be taken after obtaining the end-of-semester signature (i.e., attending at least 75% of the practical sessions and achieving at least 30% of the total points from the two midterms)

The exam is considered passed if the student achieves at least 50% of the total score on the test.

The examination grade will be calculated from the sum of the examination scores if the students obtain at least 50% of the scores.

Percentage of max score	Scores	Grade
0-48,3	0-29	1
50-60%	30-36	2
61,6-71,6%	37-43	3
73,3-83,3%	44-50	4
85-100%	51-60	5
Percentages are primary values.		

(In case of a force majeure situation, the format and content of the assessment may change.)

The written colloquium in Cell Science must be taken in Moodle.

The exam will include questions from both lectures (~66 %) and practical sessions (~ 33 %). The figures are as important as the text. Students will need to be able to recognise TEM images of cell organelles and cellular processes, as well as light microscopy preparations.

The exam test may include short essay questions, simple multiple-choice questions, concept matching, LM and EM images, diagrams, or table-based tasks.

Students who achieve 75% of the points on the midterms will be offered a grade of “Good” (4), and those who achieve 85% will be offered a grade of “Excellent” (5).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Generative artificial intelligence (AI) tools may be used in a controlled and pedagogically guided manner to support learning in Cell Science. Their application includes the interpretation of microscopic images and figures, the facilitation of a deeper understanding of cell biological processes. Students are expected to use AI critically and ethically, particularly for self-directed learning, revision, and concept clarification. AI tools do not replace the main course materials, and they must be used in accordance with the TVSZ.

The use of AI is not permitted during assessments (midterms and exams).

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory

Title	Some chapters of the Practical Notebook
Link	https://gsi.semmelweis.hu/index.php/en/education/2024-25-1/em/1280-cell-science

Printed resources:

Type	Mandatory
Author	Bruce, A.; Bray, D.; Hopkin, K.; Johnson, A.; Lewis, J.; Raff, M.; Roberts, K.; Walter, P.
Title	Essential Cell Biology (5th Edition)
Publisher	Garland Science, Taylor & Francis Group, LLC,
Year of publication	2019

Type	Recommended
Author	Bruce, A.; Heald, R., Johnson, A., Morgan, D.; Raff, M.; Roberts, Keith.; Walter, P.
Title	Molecular Biology of the Cell
Publisher	W. W. Norton & Company, Inc, New York
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sürgősségi Orvostani Klinika

Name of subject in Hungarian: Elsősegély
Name of subject in English: First Aid
Name of subject in German: Erste Hilfe

Credit value of the course: 2
Semester: 1st semester, 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	1.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSGO1092_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fenyves Bánk Gábor (igazgató)
Course coordinator location of work, telephone availability: Department of Emergency Medicine 06 20 666 2060
Course coordinator position: head of department, associate professor
Course coordinator Date and number of habilitation: none

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the course is to enable students to provide basic first aid as follows:

- understand the steps required to ensure scene safety before providing assistance;
- recognize cardiac arrest and initiate layperson basic life support (BLS);
- safely use an automated external defibrillator (AED);
- assess a patient/injured person using the ABCDE approach;

- recognize and provide basic management of immediately life-threatening conditions, including: airway obstruction caused by foreign body, anaphylaxis, severe external bleeding, unconsciousness, and seizures;
- recognize potentially life-threatening conditions, such as: severe respiratory failure, severe circulatory failure, suspected myocardial infarction, suspected stroke, and mental health crisis;
- effectively activate emergency medical services and call for help.

Format of the course (lectures, group work, practical lessons, etc.):

Theoretical lectures
Classroom-based skills training
Classroom-based simulation exercises

Competencies acquired through completion of course:

- assessment of breathing and circulation;
- placing an unconscious patient in the recovery position;
- manual airway management in unconscious patients or in cardiac arrest;
- use of basic airway adjuncts in unconscious patients or in cardiac arrest;
- initiation of layperson basic life support in cardiac arrest (mouth-to-mouth ventilation and effective chest compressions);
- safe use of an automated external defibrillator (AED);
- calling for help and communicating with the patient and surrounding people;
- initial assessment of the patient using the ABCDE approach;
- recognition and management of anaphylaxis using an auto-injectable adrenaline device;
- control of severe bleeding using direct pressure and, in limb injuries, application of a tourniquet;
- immobilization of an injured upper limb using a triangular bandage;
- application of techniques for relieving airway obstruction caused by foreign body.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of

CV is required in all cases!)

Topics of theoretical lectures:

- Purpose and levels of first aid
- Scene safety
- The chain of survival
- Cardiac arrest and basic life support (BLS)
- Recognition of the critically ill patient
- Management of the critically ill patient – ABCDE approach
- Recognition of life-threatening conditions potentially leading to critical illness, including:
    - airway-compromising conditions
    - severe allergic reactions (anaphylaxis)
    - respiratory failure
    - circulatory failure
    - unconsciousness and altered mental status
    - seizure
    - severe external bleeding
    - mental health crisis
- Activation of emergency medical services (calling for help)
- Emergency care system
- Fundamentals of accident scene management and patient care
- Effective communication

Topics of practical training:

1. BLS & AED
2. ABCDE patient assessment
3. Management of the unconscious patient
4. Scene safety and trauma care
5. Revision and skills assessment (examination)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance at 75% of the practical sessions is mandatory. Make-up opportunities are provided by attending the same type of practical sessions in other groups.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

none

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

Attendance at 75% of the practical sessions is mandatory. Make-up opportunities are provided by attending the same type of practical sessions in other groups.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical skills are assessed using the OSCE (Objective Structured Clinical Examination) method, covering the following competencies:

- application of manual airway opening techniques;
- correct use of basic airway adjuncts;
- demonstration of layperson basic life support (BLS) in a simulated setting;
- safe use of an automated external defibrillator (AED);
- management of anaphylaxis;
- control of severe limb bleeding using a tourniquet;
- placing a patient in the recovery position.

Theoretical knowledge is assessed through an online written test, based on the content of the lectures and the provided BOE handbook (open-book examination).

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The above-listed practical skills must each be performed with at least 50% proficiency.

The theoretical online examination must be passed with a minimum score of 90%.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and

conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The condition for entering the final grade into the academic record is achieving at least 90% on the online written test (open-book, 30 questions, up to 10 attempts allowed).

The final grade is based on the assessment of practical skills, which are evaluated using the OSCE (Objective Structured Clinical Examination) method.

The OSCE consists of 2 stations:

- OSCE I: performance of layperson BLS for at least 2 minutes (recognition of cardiac arrest, calling for help, effective chest compressions, and mouth-to-mouth ventilation);
- OSCE II: assessment of two skills selected from the above-listed competencies.

Performance in the OSCE examination is graded as follows:

- 80% and above: grade 5 (excellent)
- 70%–79%: grade 4 (good)
- 60%–69%: grade 3 (satisfactory)
- 50%–59%: grade 2 (pass)
- below 50%: grade 1 (fail)

Students who have previously completed training with at least 75% overlap in content within an officially organized educational program may request recognition of prior learning, no later than the start of the semester.

Recognized qualifications include:

- Emergency Medical Technician qualification;
- Emergency Nursing Specialist qualification;
- Combat Medicine training (no proof of practical hours required);
- ERC BLS diploma not older than 2 years or active ERC BLS instructor activity;
- ERC ILS diploma not older than 2 years or ILS instructor activity;
- outstanding performance in first aid competitions organized by the Hungarian Red Cross, BOE, or the Foundation for First Aid Education (national 1st–3rd place).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	ERC First Aid
Link	https://www.resuscitationjournal.com/article/S0300-9572(25)00264-3/fulltext

Type	Recommended
Title	ERC Basic Life Support
Link	https://www.resuscitationjournal.com/article/S0300-9572(25)00283-7/fulltext

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Megelőző Orvostani és Népegészségtani Intézet

Name of subject in Hungarian: Orvos- és egyetemtörténet
Name of subject in English: History of Medicine and Semmelweis University
Name of subject in German: Geschichte der Medizin und der Semmelweis Universität

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Credit value of the course: 2
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	2.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKNEI1144_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ungvári Zoltán (igazgató)
Course coordinator location of work, telephone availability: Megelőző Orvostani és Népegészségtani Intézet,Tel:06-1-210-2954
Course coordinator position: kutatóprofesszor
Course coordinator Date and number of habilitation: 2020.11.23., 26/2020.

Objectives of the course, and its place in the curriculum of the medical training program:

The history of medical science is considered as a part of the general history of civilization. The study of the history of medicine helps us to describe and understand how people in different times and cultures experienced and dealt with these fundamentals of human existence. This knowledge can inform and help us debate the present and the future of medicine and help us bring medicine and science to a wide audience

Format of the course (lectures, group work, practical lessons, etc.):

Weekly lectures with online audio files and workbook.

Competencies acquired through completion of course:

The students will be able to understand the history and development of medicine and how this affects the medicine of today

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

-

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

-

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:

1. Introduction. What is Medicine? Methods and sources of Medical History. The birth of paleomedicine (bones teeth, mummies).Prehistoric medicine. Far East. (Vince Fazekas-Pongor)
2. Far East Medicine. Chinese civilization, Japan, India. (Vince Fazekas-Pongor)
3. Medicine of ancient civilizations, rivers valley's culture: Mesopotamia, Egypt, and the medicine knowledge. Medicine - in the Bible time - Heritage of the empirical knowledge. Practitioners. Theories of diseases. (Vince Fazekas-Pongor)
4. Greco-Roman Medicine. Homeric medicine. Asclepius, Hippocrates. Corpus Hippocraticum- the concept and doctrine of his theories about the nature and diseases (the four humors). The Oath. Hygiene and health education. Post-Hippocratic schools – the golden heritage in the school of Alexandria. The roman physicians, diseases. Advance of public health. Water supply and sanitation, climate, soil and health, diseases, endemics. The workers' health, provision of medical care. (Celsus, Galenus) (Vince Fazekas-Pongor)
5. Medieval medicine. Byzantine Healers, Arabian Hakims, Monks, Crusaders and medieval „doctors." The Arabian medicine: chemistry, pharmacy, hospitals. Razes, Avicenna, Abulcasis. The medieval Monasteries (Monte Cassino). The growth of European cities, sanitary problems of urban life. The first religious medical school in Salerno. Medieval Universities, medical humanists, and Christian caritas. (Vince Fazekas-Pongor)
6. Medicine in the Renaissance. The Arts and the humanism. The new mentality of medicine: Paracelsus. The revolution of anatomy: Vesalius and his contemporaries. The first step toward the specialization. Botany and mineralogy. The printing of book's role in medicine. Foundation of the administration of Public Health. Epidemic diseases: communicable and non-communicable diseases. Theories, therapies, and medical care, hospital. Quarantine. (Vince Fazekas-Pongor)
7. Experimenters, Teachers and Theoreticians in the Sixteenth and Seventeenth Centuries. Body as machine -old schools: iatrochemical, iatrophysical theories. New schools: animism, tonus, vitalism, stimulation, homeopathy. The circulation of the blood. Harvey's methodology Malpighi. Microscopy. Birth of modern clinical medicine: Sydenham. Boerhaave and his pupils. (Vince Fazekas-Pongor)
8. Industrialism in the Eighteenth Century. Clinical medicine- schools of clinical (French, English, German, and Habsburg). The first Vienna School: van Swieten. surgery (Hunter, Valsalva), pathology (Morgagni, Bichat). Public health and hygiene. Occupational health, prison reform, general health (death rate, statistics), Ramazzini, Frank. Smallpox. Infant mortality. Nursing, dispensaries and hospitals, development of obstetrics. Sanitary conditions – filthy towns. (Vince Fazekas-Pongor)
9. Clinical medicine in the second half of the nighteenth Century. Bacteriology a new science in medicine. Revolution, concepts and theories under the microscope. New discoveries Pasteur, Koch. (Vince Fazekas-Pongor)
10. Social revolution, industrialism, public health. National and international movements and health reforms, and medical care. Period of great epidemics. International health organization. The Red Cross. (Vince Fazekas-Pongor)
11. Development of surgery and gynaecology. The man-midwife (Smellie, Hunter), History of anaesthesia. General and local possibilities. Wells, Morton, Simpson, Jackson). Asepsis and antisepsis. Early efforts to develop aseptic techniques. Semmelweis, Lister. Progress in surgery, Billroth. Cholecystostomy, appendectomies. (Vince Fazekas-Pongor)
12. Emergence of specialism. Logical outgrowth of locality pathology, new instruments. Initially the medical professions: Paediatrics, Psychotherapy, Ophthalmology, Otology, Rhinology and Laryngologist, Dentistry, Neurology and Psychiatry, Dermatology and Venerology. (Vince Fazekas-Pongor)
13. From the black death to the AIDS. The history of epidemics. The theories and therapies. Tropical medicine. The development of epidemics, the bacteriology and immunology. The new medicaments. Ehrlich and the chemotherapy, sulphonamides, antibiotics. Virology. Salk and Sabin. New diseases and screenings methods.

14. Consultation (Vince Fazekas-Pongor)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the prevailing Study and Examination Regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

According to the prevailing Study and Examination Regulations

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Questions and answers are included in the Workbook

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

50% correct answers on written exam

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of artificial intelligence is not allowed during exam and classes.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Családorvosi Tanszék, Aneszteziológiai és Intenzív Terápiás Tanszék

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Name of subject in Hungarian: Bevezetés az orvosi hivatásba és a betegellátásba
Name of subject in English: Introduction to Patient Care
Name of subject in German: Berufsfelderkundung

Credit value of the course: 2
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	0.5	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKCSA1203_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Torzsa Péter (tanszékvezető)
Course coordinator location of work, telephone availability: Faculty of medicine, Dpt. of Family Medicine, (06-1) 355-85-30
Course coordinator position: Head of Department
Course coordinator Date and number of habilitation: 2020.07.21, 11/2020

Objectives of the course, and its place in the curriculum of the medical training program:

An overview of medical profession. Formation of the consciousness of profession, personal careers. The attitude of the medical doctor. Communication with patients, colleagues and the members of the medical staff.
An overview of different levels of health care. The organization and the functional activity of clinical departments and the general practitioner’s office. Characteristics of the clinical work. Overview of the scientific activity of the clinical departments.

Format of the course (lectures, group work, practical lessons, etc.):

7 lectures, 6 clinical practice, 1 skill laboratory, TOTAL: 7 theoretical and 7x3 practical lessons.
Lectures are held in the Basic Medical Science Center or Nagyvárad tér Lecture Halls.
The practicals are held all around the University's different departments and contracted GPs' surgeries in Budapest.
Skill Labor is available at the Simulation Centre of the Anesthesiology and Intensive Care Clinic.

Competencies acquired through completion of course:

Basics of medical interviewing, making a rapport with patients.
Exploring anamnesis and basic communication techniques.
Approach to the physical examination, basic skills.
Introduction to nursing skills: e. g. hand disinfection and blood taking – Skill Laboratory SIM Centre

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum 24, maximum 432 (24x18).

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

LECTURES (7x 1 lessons)
1st semester week: family medicine lecture (Prof. Dr. Torzsa Péter), cardiology lecture (Dr. Németh Balázs)
2nd week: obstetrics and gynecology lecture (Dr. Jankó Árpád), surgery lecture (Dr. Illés Kristóf)
3rd week: pediatrics lecture (Dr. Horváth Klára), psychiatry lecture (Dr. Pulay Attila)
4th week: patient management in primary care (Dr. Becze Ádám)

PRACTICALS (7 x 3 lessons)
6th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,

obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
7th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
8th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
9th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
10th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
11th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
12th week: Skill Lab, neurosurgery, surgery, medical rehabilitation, genomic medicine, pediatrics, psychiatry, neurology,
obstetrics and gynecology, internal medicine, family medicine, cardiology and transplantation department practices
13-14th weeks: makeup class opportunities (Family medicine Dpt.)
During the semester until the 14th week: Skills Lab opportunity: an Introduction to Patient Care – Nursing skills practical class in cooperation with the Clinic of Anaesthesiology and Intensive Care, SIM Centre –
details, application on the MOODLE site of the course.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Completed attendance sheet and/or individual certificates by the tutors are needed uploaded onto MOODLE. It’s compulsory for the students to attend at least 75 percent of all training sessions, but if needed one can join another training group for a makeup class to be able to meet this requirement. Please contact the Department (Tutor) in this case by email.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of

marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

none

Number and type of individual assignments to be completed, submission deadlines:

1 essay until the end of semester

Requirements for the successful completion of the course:

Attending at least 75% of the lessons - they are certified by the completed attendance sheet and/or individual certifications or by QR code attendance. These documents have to be uploaded in MOODLE.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Essay, typed, 1800 characters WITH spaces as the minimum length.
Topic: A report of students' personal experiences of lectures and practices about medical profession with short case reports, impressions, personal situations. Which specialty was attractive, interesting for you and why?
Deadline for upload to MOODLE is the end of 14th week.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Minimum 75% participation of all lessons is required as a minimum condition. Total: (7+21=) 28x 45min study units.

Essay evaluation:
Grade 1: no essay uploaded, missed deadline, number of characters are under 1800;
Grade 2: no personal example or practical experience at all (just theoretical or technical reports of the practicals)

LINK of the course on the Dpt.'s website: semmelweis.hu/csot/en/english-program/english-program-first-year/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grade 1: Deadline missed, number of characters < 1800,
Grade 2: no personal example or practical experience at all (just theoretical or technical reports)
Grade 3: too general drafting without any personal opinion
Grade 4: minor formal mistakes with personal point of view
Grade 5: precise writing with personal examples

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Anatómiai, Szövet- és Fejlődéstani Intézet

Name of subject in Hungarian: Makroszkópos anatómia és fejlődéstan I.
Name of subject in English: Macroscopic Anatomy and Embryology I
Name of subject in German: Makroskopische Anatomie und Embryologie I

Credit value of the course: 8
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
8.0	2.0	6.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANT1089_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Alpár Alán
Course coordinator location of work, telephone availability: Semmelweis University, Department of Anatomy, Histology and Embryology, +36-1-459-1500/53609
Course coordinator position: Professor, Head of Department
Course coordinator Date and number of habilitation: Karolinska Intézet, Svédország, 2012, Honosítva Semmelweis Egyetem, 2014, száma: 13/2014

Objectives of the course, and its place in the curriculum of the medical training program:

Demonstration of the macroscopical composition of the human body specifically to provide the future clinicians/medical doctors with a valid body of information with relevance to clinically significant morphological structures. General Embryology describes the intrautrine development of a human embryo/fetus and introduces the development of the locomotor system. Teaching is done in the form

of lectures and dissection classes.

Format of the course (lectures, group work, practical lessons, etc.):

Teaching is done in the form of lectures and dissection classes. Practical / dissection classes are conducted with a purpose of introducing dissection work to students who could individually work on the cadaver specimen to aid their identification of topographical relations and the position of organs.

Competencies acquired through completion of course:

Understanding the macroscopical composition of the human body together with the position and topographical relation of organs. Clear understanding of structure and function. Ability to perform basic preparatory tasks during dissection. Identification of general directions/landmarks on the cadaver together with the recognition of significant organs/body parts. Acquiring knowledge of surface features and/or sectional anatomy forming basis for clinical diagnostics (palpation, auscultation, etc.) and the use of radiological imaging methods. Clear understanding of the beginning of human development (general embryology) together with the development of the muscukoskeletal system

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

none (the course is offered in the 1st semester)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

In case of an unsuccessful semifinal examination, students may only continue with the 2nd semester in case one of their two midterms was at least a pass (2) AND was taken during the official first midterm date. Retake midterm marks do not count in this respect. If both midterms are unsuccessful (1), and the students cannot pass the semifinal examination during the examination period, they will not be able to register for Macroscopic Anatomy and Embryology II.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Obligatory for all registered students, they have to register for the course within their assigned group in the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered

separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1. week:

1. General introduction, terminology. General arthrology and myology

2. Diagnostic aspects of the locomotor system

2. week:

3. Joints and movements of the shoulder and shoulder girdle

4. Clinical anatomy of the shoulder and the shoulder girdle

3. week:

5. Joints and movements of the elbow and the hand

6. Clinical anatomy of the elbow and hand

4. week:

7. Pelvis. Joints and movements of the hip

8. Clinical anatomy of the hip joint

5. week:

9. Joints and movements of the knee

10. Clinical anatomy of the knee

6. week:

11. Joints and movements of the foot

12. Clinical anatomy of the foot

7. week:

13. Components and movements of the vertebral column

14. Composition of thorax, diaphragm

8. week:

15. Composition of the abdominal wall. Hernia canals. Inguinal and femoral canals

16. General composition of the skull (internal and external cranial bases)

9. week:

17. Cranial spaces (orbit, pterygopalatine fossa, nasal cavity)

18. Temporomandibular joint, muscles of mastication. Neck muscles, cervical fasciae

10. week:

19. General introduction to embryology. Intrauterine development. Gametes.

20. Fertilization, cleavage, preimplantation development of the embryo.

11. week:

21. Implantation, structure of the placenta, placentar circulation. Fetal membranes, yolk sac. Bilaminar embryo.

22. Gastrulation, formation and derivatives of germinal layers. Differentiation of mesoderm.

12. week:

23. Neurulation, neural crest.

24. Development of somites, early development of the cardiovascular system.

13. week:

25. Folding of the embryo. Body axes, cranio-caudal and dorsoventral differentiation.

26. Development of the musculoskeletal system – derivatives of pharyngeal arches, development of the limbs.

14. week:

27. Development of the skull

28. Placenta, umbilical cord, embryologic and fetal periods, parturition

Topics for the dissection classes

1-6. weeks: Bones, joints and muscles of the limbs. Dissection of the limbs

7-9. weeks: Cadaver dissection. Dissection of the superficial layers of the trunk, inspection of the structure of the body wall on prosected specimens (torso).

8-12. weeks: Inspection of the bony skull together with head and neck prosections

13-14. weeks: Embryology consultations, revision

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN

ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation in practical lessons is obligatory. Students should attend at least 75% of the scheduled hours, absences therefore are limited in **25%**. Attendance/absence will be recorded in the dissection room classes.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance is obligatory at the two mid-term tests (held most probably on weeks 7 and 12). Anatomy mid-terms are oral (practical) exams.

Midterm 1 – week 7 – Macroscopy of the upper and lower limbs (bones, joints, muscles, blood supply and innervation)
Midterm 2 – week 12 – Macroscopy of the axial skeletal structures (bones, joints, muscles, blood supply, innervation of the head, neck, trunk)

The actual date and topic list of the midterm tests will be published on the departmental website (http://semmelweis.hu/anatomia) as well as in Moodle.

Number and type of individual assignments to be completed, submission deadlines:

All students are required to demonstrate their knowledge and motivated practical work by the completion and demonstration of a dissected specimen or region during the two semesters of the Academic year.

Requirements for the successful completion of the course:

Active participation in at least 75% of dissection room sessions, including the midterm tests (irrespective of the result) is obligatory for every student.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Semifinal (written and oral) examination, topics: subject matter of the semester.

Semifinal examinations consist of written (theoretical) and oral (practical) parts.
The first part of the semifinal examination is a written test (e-learning module “Moodle”)
The second part of the examination is an oral/practical test in Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevent theoretical questions from the subject matter of the semester.

Topic list

Macroscopic Anatomy I.

Musculoskeletal Anatomy

General osteology, classification of bones

Continuous connections of bones. Classification of joints; components, movements and mechanisms

General myology

Structure of the vertebral column, the gross anatomy of the muscles acting upon it

Movements and muscles of the head&neck (atlantooccipital and atlantoaxial joints)

Joints of the shoulder girdle, the gross anatomy of the muscles acting upon them

Shoulder joint, the gross anatomy of the muscles acting upon it

Axillary fossa, quadrangular and triangular spaces

Muscle compartments and cross section of the arm

Elbow joint, the gross anatomy of the muscles acting upon it. Cubital fossa

Muscles and cross section of the forearm

Structure and movements of the radiocarpal joint, gross anatomy of the muscles acting upon it

Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths

Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb and fingers, the gross anatomy of the muscles concerned with the movements

Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)

Thoracic muscles

Diaphragm

Muscles and spaces of the abdominal wall, rectus sheath

Composition of the pelvis (bones, ligaments and membranes)

Muscles of the buttock, the posterior abdominal wall and the pelvis (external and internal muscles of the hip)

Inguinal canal, femoral canal

Subinguinal hiatus, vascular and muscular compartments; adductor canal, femoral canal

Hip joint and the gross anatomy of the muscles concerned with the movements

Osteofibrous compartments, muscles and cross section of the thigh

Knee joint and the gross anatomy of the muscles concerned with the movements. Popliteal fossa

Osteofibrous compartments, muscles and the cross section of the leg

Ankle joint together with the gross anatomy of the muscles acting upon it

Subtalar and talocalcaneonavicular joints, the muscles acting upon them

Osteofibrous compartments and structure of the foot, arches of the foot

Bones, spaces and connections of the skull, external and internal skull bases

Neurocranium, components and cavities (anterior, middle and posterior cranial fossae)

Viscerocranium, components and cavities (walls and connections of the nasal cavity, orbit, oral cavity, pterygopalatine and infratemporal fossae)

Temporomandibular joint and the gross anatomy of the muscles of mastication

Superficial muscles of the neck, muscle triangles

Deep muscles of the neck and the laminae of the cervical fascia

Muscles of facial expression

Further topics with relevence to the musculoskeletal system

Lymphatic drainage of the thoracic wall including the mamma

Dorsal branches of the spinal nerves, intercostal nerves

Cervical plexus, brachial plexus, lumbar plexus, sacral plexus.

Innervation of limbs

Innervation of the trunk

Cutaneous innervation

Axillary artery and branches. Arteries and veins of the arm, forearm, and hand

Arteries and veins of the lower limb

Lymph nodes and lymphatic drainage of the upper and lower limbs

General Embryology and development of the musculoskeletal system

Spermatogenesis, spermiogenesis

Oogenesis

Fertilization, cleavage of the zygote

Blastocyst formation; the bilaminar embryonic disc

Implantation

Formation of body axes, parts of the early embryo (yolk sac, amnion, chorion, body stalk)

Gastrulation

Formation of the intraembryonic mesoderm; the notochord

Neurulation (neural tube and neural crest)

Derivatives of ectoderm, endoderm and mesoderm

Folding of the embryo

The structure and function of the placenta

Development of the fetal membranes (chorion and amnion), umbilical cord

Twin formation

Membranous and cartilaginous neurocranium and viscerocranium

Development of the limbs and vertebral column

Development of the muscular system

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Minimum requirements of the 1st midterm (week 7) -Identification of the listed structures

Composition of limbs

bones, ligaments, muscles of the limbs and the girdles, including the thoraco- and spinohumeral muscles, internal and external pelvic muscles

Joints of the limbs

Articulating ends, capsule, cavity, synovial membrane, ligaments, accessories, such as discs or menisci, bursae.

Axes and movements, grades.

Muscle groups performing the movements

Muscle compartments

Functional and topographical groups of muscles on the arm, forearm, hand, thigh, leg and foot.

Origin, insertion, action and innervation of muscles.

Fascial layers

Connective tissue laminae wrapping around muscles and muscle groups

Vascular supply of limbs

Deep and superficial vessels of the limbs

Branches of the brachial and femoral arteries;

Tributaries of the brachial and femoral veins, subcutaneous veins;

Somatic nerves

Nerves trunks and bundles innervating the limbs including the cutaneous branches

Borders and content of relevant topographical regions

Axillary fossa, med. and lat. axillary hiatus, cubital fossa, medial and lateral bicipital grooves, carpal tunnel, radial foveola, palmar and dorsal regions of the hand;

Subinguinal hiatus, femoral trigone, adductor canal, gluteal region, supra- and infrapiriform hiatus, popliteal fossa, medial and lateral retromalleolar grooves, dorsal and plantar regions of the foot

Pelvis

Bony components, joints, membranes and ligaments

Minimum requirements of the 2nd midterm (week 12) - Identification of the listed structures

Structure of the body wall (thorax, abdomen)

bones of the axial skeleton - vertebrae, ribs, sternum, sacrum

Ligaments, joints, vessels and nerves

Connections (joints, ligaments etc.) of the vertebral column

Thoracic muscles

Abdominal muscles, rectus sheath, inguinal canal

Back muscles

Separation between the abdomen and thorax

diaphragm, together with the passing structures

Vascular supply

Branches of the axillary artery

Head and Neck morphology

Neck muscles, muscles triangles of the neck

Infra- and suprahyoid muscles

Cervical fascial layers

Atlantooccipital and atlantoaxial joints

Muscles of the nape, suboccipital triangle

Skull

Bones, openings, connections
Facial canal (openings and course, walls)
Cavities of the skull (orbit, nasal cavity, infratemporal and pterygopalatine fossae)
Neurocranium
anterior/middle/posterior cranial fossae
Viscerocranium
temporomandibular joint, muscles of mastication together with their innervation
muscles of facial expression together with their innervation

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The first part of the semifinal examination is a written test (e-learning module “moodle”) composed of simple or multiple choice questions. Passing rate: 60%
The second part of the examination is an oral/practical test in Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevent theoretical questions from the subject matter of the semester.
Students are given separate marks for each part of the examination. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written (40%) and practical (60%)parts.

Evaluation of the written test: passing rate 60% - pass (2), 70% - accepted (3), 80% - good (4) , 90% - excellent (5).

In case the result of the test falls below 60%, the mark is fail (1), but the students may continue with the oral examination.

When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5.

Successful midterms may result in exemptions from part of the semifinal examination (see below)

Exemption from the oral test could be earned from the results of the two midterm tests. If the average of the midterm marks is at least 4,0 (4+4, 3+5, 4+5 or 5+5) a mark 4 (good) or excellent (5) can be earned on the bases of the midterm marks. These students are be exempted from the oral part of the semifinal examination and thus will have to sit only for the written (moodle test) part.

Exemptions are solely based on the result of the marks earned from the official (first) midterms, but not from the retakes.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Mandatory
Author	M. Réthelyi and J. Szentágothai
Title	Functional Anatomy, Histology and Embryology for medical and dental students
Publisher	Medicina
Year of publication	2018

Type	Mandatory
Author	TW Sadler
Title	Langmann’s Medical Embryology,
Publisher	Wolters Kluwer, ISBN 9781469897806,
Year of publication	2014

Type	Mandatory
Author	R. Drake, A. W. Vogl, A. Mitchel,
Title	Gray’s Anatomy for students
Publisher	Elsevier; ISBN 9780702051319
Year of publication	2014

Type	Recommended
Author	T Tömböl
Title	Regional Anatomy
Publisher	Medicina ISBN 963 242 186 8
Year of publication	2008

Type	Recommended
Author	KL Moore, TVN Persaud and M Torchia,
Title	The Developing Human – Clinically Oriented Embryology
Publisher	Saunders, ISBN 9780323313384
Year of publication	2015

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Anatómiai, Szövet- és Fejlődéstani Intézet

Name of subject in Hungarian: Makroszkópos Anatómia és fejlődéstan II.
Name of subject in English: Macroscopic Anatomy and Embryology II
Name of subject in German: Makroskopische Anatomie und Embryologie II.

Credit value of the course: 10
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
10.0	4.0	6.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANT1089_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Alpár Alán
Course coordinator location of work, telephone availability: Semmelweis University, Department of Anatomy, Histology and Embryology, +36-1-459-1500/53609
Course coordinator position: Professor, Head of Department
Course coordinator Date and number of habilitation: Karolinska Intézet, Svédország, 2012, Honosítva Semmelweis Egyetem, 2014, száma: 13/2014

Objectives of the course, and its place in the curriculum of the medical training program:

Demonstration of the macroscopical composition of the human body specifically to provide the future clinicians/medical doctors with a valid body of information with relevance to clinically significant morphological structures. Development of internal organs – this part describes the intrauterine differentiation and growth of internal organs with relevance to the general medical curriculum.

Teaching is done in the form of lectures and dissection classes

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Format of the course (lectures, group work, practical lessons, etc.):

Teaching is done in the form of lectures and dissection classes

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Competencies acquired through completion of course:

Understanding the macroscopical composition of the human body together with the position and topographical relation of organs. Clear understanding of structure and function. Ability to perform basic preparatory tasks during dissection. Identification of general directions/landmarks on the cadaver together with the recognition of significant organs/body parts. Acquiring knowledge of surface features and/or sectional anatomy forming basis for clinical diagnostics (palpation, auscultation, etc.) and the use of radiological imaging methods. Understanding of human development in order to draw parallels with macroscopical anatomy.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Macroscopic Anatomy and Embryology I

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Students may request "*registration without passing the prerequisite*" only in case one of the midterm marks earned at the official midterms is successful (at least a 2). So the exam course (Macroscopic Anatomy and Embryology I) will be running parallel with Macroscopic Anatomy and Embryology II, therefore the semifinal examination will be postponed to the summer exam period. However, students may only register for a final examination once the postponed '*cv*' semifinal examination is successfully passed.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Obligatory for all registered students, on the basis of registration via the NEPTUN system

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Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lecturers

Dr Alpár Alán, Dr Ádám Ágota, Dr Székely Andrea Dorottya, Dr Barna János, Dr Zsiros Viktória, Dr Katz Sándor, Dr Horváth András, Dr Dóra Dávid, Dr Csáki Ágnes, Szászné Dr Kocsis Katalin, Dr Kozsurek Márk, Dr Hanics János, Dr Rácz Éva, Dr Puskár Zita, Dr Várnainé Dr Tóth Zsuzsanna, Dr Nagy Nándor, Dr Adorján István, Dr Vereczki Viktória

List of lectures

1. week

1. Nasal cavity, paranasal sinuses

2. Oral cavity, tongue, palate, salivary glands, faucial isthmus

3. Morphology and development of teeth

4. Pharynx, esophagus

2. week:

5. Larynx

6. Development of the face, malformations

7. Development of the pharyngeal arches, development of the foregut

8. Thoracic cavity, mediastinum. Chambers of the heart, external features. Structure of heart wall, valves, fibrous skeleton. Pericardium.

3. week

9. Cardiac vessels and nerves, conducting system. Surface projection. Auscultation points.

10. Clinical anatomy of the thorax

11. Development of the heart

12. Development of arteries

4. week

13. Development of veins

14. Morphology of trachea and the lung. Pleura

15. Development of the respiratory system.

16. Stomach

5. week

17. Small intestines (duodenum, jejunum, ileum), pancreas, spleen

18. Liver, gall bladder

19. Large intestine, rectum

20. Development of the midgut and hindgut

6. week

21. Peritoneal relations of abdominal organs. Development of the peritoneum, separation of body cavities

22. Clinical anatomy of the abdominal cavity. Retroperitoneum

23. Morphology of the kidney, capsules of the kidney, ureter, urinary bladder.

24. Morphology and coats of the testicle

7. week

25. Morphology of the epididymis, spermatic cord, seminal vesicle and prostate

26. Morphology of penis and male urethra. Male perineum

27. Consultational lecture I. (interactive case presentation, clinical anatomical relevances)

28. Consultational lecture II. (interactive case presentation, clinical anatomical relevances)

8. week

29. Ovary, Fallopian tube and uterus

30. Vagina, female perineum, external genital organs

31. Clinical anatomy of the male urogenital tract 1.

32. Clinical anatomy of the female urogenital tract 2.

9. week:

33. Development of the urinary system

34. Development of genital organs

35. Topographical divisions of the central nervous system, developmental units

36. Meninges, epidural and subarachnoideal spaces, ventricles, choroidal plexus, CSF

10. week

37. Lobes of the cerebral cortex, topographical subdivisions, structure and function of the medial,

lateral and basal cortical fields

38. Topography and components of the basal ganglia and the diencephalon (thalamus, hypothalamus), the 3rd ventricle.

39. Topography and components of the brainstem (midbrain, pons and medulla oblongata), the 4th ventricle.

40. Arterious, venous and lymphatic circulation of the brain

11. week

41. Cranial nerve nuclei

42. Oculomotor nerve (CN 3), ophthalmic and maxillary branches of the trigeminal nerve (CN 5/1, CN 5/2),

43. Mandibular branch of the trigeminal nerve (CN 5/3), facial nerve (CN 7)

44. Clinical anatomy of the oculomotor, trigeminal and facial nerves

12. week

45. Glossopharyngeal nerve (CN 9), hypoglossal nerve (CN 12)

46. Vagus nerve (CN 10), accessory nerve (CN 11),

47. Clinical anatomy of the glossopharyngeal, vagus, accessory and hypoglossal nerves

48. General composition of cranial nerves (summary). Consultational lecture (Q&A)

13. week

49. Spinal cord, spinal ganglia, spinal segment. Spinal nerves, nerve plexuses

50. Intracranial topography, orbit

51. The autonomic nervous system. Sympathetic nervous systems

52. The autonomic nervous system. Parasympathetic nervous systems

14. week

53. Lymphatic system. Regional lymphatic drainage of organ, lymph nodes.

54. Topographical relations of the thoracic cavity

55. Topographical relations of the abdominal cavity

56. Topographical relations of the pelvis

Topics of dissection classes

1-2. weeks: Dissection of the head and neck organs.

3-6. weeks: Opening of the thoracic and abdominal cavities, dissection of thoracic and abdominal organs

7-9. weeks: Dissection of the retroperitoneal region and perineum together with organs of the lesser pelvis.

10-12. weeks: Dissection/ inspection of the brain and spinal cord. Intracranial topography.

13-14. weeks: Cranial nerve branches. Cross sections of the trunk. Revision

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation in practical lessons is obligatory. Students should attend at least 75% of the scheduled hours, absences therefore are limited in **25%**. Attendance/absence will be recorded in the dissection room classes. In case students are not prepared or are being late from class their names will be recorded. According to the Study and Examination Policy 28/12 three such occasions will be converted into an absence. Arriving late more than 5 minutes is considered an absence.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance is obligatory at the two mid-term tests (held on weeks 7 and 13). Anatomy mid-terms are oral (practical) exams.
Midterm 1 – week 7 – Anatomy of the internal organs of the head, neck, thorax and abdomen (together with their development, topography, blood supply and innervation)
Midterm 2 – week 13 – Anatomy of the retroperitoneum and the pelvis (urinary system, external and internal genital organs, pelvic floor, perineum (together with their development, topography, blood supply and innervation). Morphology of the central nervous system, intracranial topography (but not that of the orbit).

One of the midterms should be successfully passed (with at least a 2), at the officially announced timepoint, to gain acceptance of the semester. Two retake occasions are offered to those who were not successful at either of the midterms and/or were absent from the midterm tests.

Valid marks, earned at the official midterm, cannot be upgraded or corrected on the retake midterms which are solely offered to those being absent.

Number and type of individual assignments to be completed, submission deadlines:

All students are required to *demonstrate their knowledge and motivated practical work* by the completion and demonstration of a dissected specimen or region once during the two semesters, but latest before the 13th study week of the second semester of the Academic year.

Requirements for the successful completion of the course:

Active participation in at least 75% of dissection room sessions, including the midterm tests, and passing one of the midterms with at least a 2 are required to gain acceptance of the semester.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Final examinations consist of written (theoretical) and oral (practical) parts

Topics: subject matter of the subjects Macroscopic Anatomy and Embryology I-II.

Topic list for Macroscopic Anatomy and Embryology I. *(see there)*

Topic list for Macroscopic Anatomy and Embryology II.

Internal organs of the head & neck region (morphology and development)

Oral cavity (divisions, boundaries)

Floor of mouth, sulcus lateralis linguae

Macroscopy of the tongue

Types and morphology of teeth, blood supply and innervation

Tooth development

Salivary glands together with topography

Faucial isthmus, palate. Tonsils

Pharynx and parapharyngeal spaces

Blood supply and innervation of pharynx

Pharyngeal muscles

Nose, nasal cavity (boundaries, nasal meatus, vessels)

Paranasal sinuses (connections, vessels)

Larynx (shape, position, muscles, vessels, nerves)

Skeleton and joints of larynx together with the fibroelastic membranes, mucous membrane

Common and external carotid arteries and their branches. Maxillary artery and its branches

Venous drainage of face and neck

Lymph nodes and lymphatic vessels of the head&neck

Development of the face, including the developemnt of the oral and nasal cavities

Development and differentiation of the foregut

Derivatives of the branchial arches

Derivatives of the branchial pouches and grooves

Development of the teeth and tongue

Circulatory system (morphology and development)

Shape, external features of heart

Chambers of heart

Endocardium, ostia, valves of heart

Skeleton of heart, anuli fibrosi

Structure of heart wall

Pulse generating and conducting system of heart

Pericardium

Position and surface projections of heart

Percussion and auscultation (area of cardiac dullness, heart sounds)

Radiology of heart

Early circulation (formation of vessels, basis vascular systems of the embryo/fetus)

Heart development

Pulmonary circulation

Ascending aorta, arch of aorta and its branches

Subclavian artery and its branches

Thoracic aorta and its branches

Abdominal aorta and its branches

Development of arteries (aorta, branchial arterious arches, umbilical arteries)

Celiac trunk and its branches

Superior mesenteric artery and its branches

Inferior mesenteric artery and its branches

External and internal iliac arteries and their branches

Internal pudendal artery and its branches

Superior vena cava and its tributaries

Inferior vena cava and its tributaries

Azygos and hemiazygos veins and their tributaries

Portal vein and its tributaries, portocaval anastomoses

Development of veins (inferior v. cava, portal v., superior v. cava, azygos and hemiazygos veins)

Fetal circulation

Lymphatic drainage of the abdominal and pelvic organs

Thoracic duct, right lymphatic trunk

Morphology and development of the thoracic, abdominal and pelvic organs

Trachea and bronchial tree

Lung (shape, parts, surfaces, hilum)

Lung (position, topography, vessels, nerves)

Surface projection of pleura and lung

Pleura, pleural cavity

Mediastinum (divisions and content)

Development of the lower airways including the lung

Description and topography of the esophagus

Stomach (shape, position, parts, blood supply and innervation). Peritoneal relations

Duodenum (shape, position, divisions, vessels)

Jejunum-ileum (shape, position, vessels)

Large intestine (shape, position, vessels)

Rectum, anal canal (shape, position, vessels)

Liver (shape, position, peritoneal relations, vessels)

Gall bladder and biliary passages (anatomy)

Pancreas (shape, position, vessels)

Peritoneum, greater and lesser omentum, mesentery, omental bursa

Formation and differentiation of the midgut

Formation and differentiation of the hindgut

Development of liver and pancreas

Development of the peritoneum

Formation of body cavities, development of the diaphragm

Kidney (shape, position, hilum, sinus, capsules, vascular architecture)

Renal pelvis and calyces. Ureter

Urinary bladder (shape, position, muscles, vessels)

Female urethra

Male urethra, bulbourethral gland

Development of kidneys

Development of urinary passages

Testis (shape, position, vessels). Scrotum, coats of testis

Epididymis, vas (ductus) deferens, spermatic cord

Seminal vesicle, prostate

Penis (shape, position, mechanism of erection, vessels, nerves)

Pelvic floor, male perineum (connective tissue spaces)

Hernia canals (inguinal and femoral)

Ovary (shape, position, vessels)

Uterine tube (shape, position, vessels)

Uterus (shape, parts, position, supporting structures, vessels) Broad ligament

Vagina, female perineum (connective tissue spaces)

External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)

Development of gonads, formation and migration of primordial germ cells

Development of male genital system

Development of female genital system

Development of the external genital organs

Macroscopy of the nervous system

Intracranial topography Dura mater, dural sinuses

Arachnoid mater, pia mater, cisterns, CSF circulation

Description and meninges of the spinal cord

Brain stem (medulla oblongata, pons, midbrain)

Cerebellum

Diencephalon (parts, blood supply). Thalamus, hypothalamus

Lateral ventricles, III. ventricle, IV. ventricle

Hemispheres

Internal carotid artery (course, parts and branches)

Vertebral artery (course and branches)

Circle of Willis

Veins of the brain

Cranial nerve nuclei, macroscopy of cranial nerves together with the brain, dural and skull exits

Branches of cranial nerves (CN 3, CN 4, CN 5, CN 6, CN 7, CN 9, CN 10, CN 11, CN 12)

General composition of the autonomic nervous system

Sympathetic nervous system (cranial, cervical, thoracic and lumbar parts)

Sympathetic trunk

Parasympathetic system (cranial and sacral parts)

Topography of the orbit. Extraocular muscles. Eye movements.

Eyelids, conjunctiva, fasciae of the orbit, lacrimal apparatus

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Minimum requirements for Midterm 1 (7th week) - Identification of structures listed below

· components, borders, divisions and content of the cavities of the head and neck region (bones, cartilages, muscles, glands together with blood supply and innervation – nasal cavity, oral cavity, lingual sulci with content, pharynx/esophagus, larynx, trachea)
· para- and retropharyngeal spaces
· cervical fascial layers, content of the cervical triangles,
· parotid nest
· branches of the external carotid artery
· content and borders of the carotid sheeth,
· nerves and veins of the neck,
· visceral branches of the subclavian artery
· development of the face, palate, nasal cavity, tongue, pharyngeal apparatus
· components, borders, divisions and content of the thoracic cavity (surface projections of organs and serous membranes, auscultation points,
· divisions of the mediastinum (with content), pleural cavities
· trachea, bronchi, lungs, pleural relations
· pericardium, heart, heart conducting system, together with blood supply and innervation, public and private vessels, parts and branches of the aorta, large veins)
· development of the respiratory system,
· development of the heart, arteries and veins
· divisions of the abdominal cavity;
· position, morphology, blood supply, innervation, peritoneal duplications, ligaments of

abdominal organs (liver, pancreas, spleen, esophagus, stomach, duodenum, jejunoileum, colon, rectum)

· branches of the abdominal aorta- celiac trunk, superior and inferior mesenteric arteries,

· tributaries to the inferior vena cava, portal system, developmental relevances of the arterious anastomoses

· peritoneal relations of abdominal organs, greater and lesser omentum, lesser sac

· development of abdominal organs, derivatives of foregut, midgut and hindgut,

· development of serous membranes, separation of body cavities

Minimum requirements for Midterm 2 (13th week) - Identification of structures listed below

- Macroscopy of the kidney, ureter and urinary bladder. Development of the urinary system
- Retroperitoneum – major structures (paired visceral branches of the abdominal aorta, tributaries to the IVC) branches of the lumbar plexus)
- Internal iliac artery (branches)
- Testicle, scrotal layers
- Vas deferens, seminal vesicle, prostata, penis, male urethra (divisions)
- Ovary, Fallopian tube, uterus, broad ligament (position and divisions)
- Vagina, external female genitals
- Pelvic floor, muscles, topography of the male&female lesser pelvis
- Urogenital diaphragm, male&female perineum
- Development of the genital system
- Differentiation of the neural tube, primary&secondary brain vesicles, divisions of the CNS
- Membranes of the brain, spaces
- Dura mater – infoldings, sinuses, blood supply and innervation
- Cavernous sinus, position and content
- Intra- and extracerebral CSF spaces (including the cisterns with content), CSF - formation, circulation, drainage
- Blood vessels of the brain; circle of Willis
- Gyri and sulci of the brain/hemispheres
- Structures on the mediansagittal surface
- Lateral ventricle – parts and borders / walls of the horns
- Diencephalon
- 3rd ventricle, borders and recesses, communications with the lateral ventricle
- Deep gray matter nuclei - basal ganglia and the internal capsule (Flechsig's section)
- Large white matter commisures (parts and position)
- Parts and position of the brainstem
- 4th ventricle, rhomboid fossa
- Cerebellum (parts, developmental divisions, peduncles, deep nuclei)
- Frontal sections of the brain
- Cranial nerve exits (brain, dural, skull)
- Morphology, blood supply, position and parts of the spinal cord
- Membranes of the spinal cord with special reference to the epidural space
- Intracranial topography (content of the canals in the skull)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final examinations are composed of written theoretical and oral practical parts. The written theoretical examination is done using an e-learning module while the practical examination is conducted in the dissection room on real prosected cadaver specimen.

The second part of the examination is an oral/practical test in Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevent theoretical questions from the subject matter of the semester.

Students are given separate marks for each part of the examination. Upon the termination of the examination the Chairman of the Examination Committee composes the final mark from the partial marks earned in the written (40%) and practical (60%) parts.

Evaluation of the written test: passing rate 60% - 2, 70% -3, 80% - 4, 90% - 5.

In case the result of the test falls below 60%, the mark is fail (1), but the students may continue with the oral examination.

When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5.

In case students fail the final examination, their exemption is not lost until the end of the actual exam period including the EAOY/August exam period, however, they will expire beyond that time and will not be counted in CV examinations.

Bonus dissection mark - Students may earn a bonus dissection mark (4 or 5 only) from the average of the two oral tests (only the official, first, midterm dates matter). A mark 4 (good) can be earned if the midterm average is 4,00 (4+4 or 3+5); while a mark 5 (excellent) will be earned if the average of the midterm marks is at least 4,50 (4+5 or 5+5). This bonus mark will be added to the marks of the practical part of the final examination in case it positively influences the final mark.

Exemptions from the written test may be earned from the result of the annual competition. All students with an average of 4,0 from the two midterms (only first marks are counted in) are invited to participate in a written (moodle) competition from the topics of the 2 semesters of the subject held on Weeks 13/14. Students achieving good marks (4 or 5, i.e., at least 80%) at the test may be exempted from the written part of the final examination and thus will have to sit only for the oral/dissection part.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Mandatory
Author	M. Réthelyi and J. Szentágothai
Title	Functional Anatomy, Histology and Embryology for medical and dental students
Publisher	Medicina
Year of publication	2018

Type	Mandatory
Author	TW Sadler
Title	Langmann’s Medical Embryology
Publisher	Wolters Kluwer, ISBN 9781469897806, 2014
Year of publication	2016

Type	Mandatory
Author	R Waschke & F Paulsen
Title	Sobotta Atlas of Human Anatomy, 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy,
Publisher	Elsevier ISBN-13: 9780702052507
Year of publication	2013

Type	Recommended
Author	T Tömböl
Title	Regional Anatomy
Publisher	Medicina ISBN 963 242 186 8
Year of publication	2008

Type	Recommended
Author	R. Drake, A. W. Vogl, A. Mitchel
Title	Gray’s Anatomy for students with STUDENT CONSULT Online Access,
Publisher	Elsevier; ISBN 9780702051319
Year of publication	2014

Type	Recommended
Author	KL Moore, TVN Persaud and M Torchia
Title	The Developing Human – Clinically Oriented Embryology
Publisher	Saunders, ISBN 9780323313384
Year of publication	2015

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Biokémiai Tanszék

Name of subject in Hungarian: Orvosi Biokémia I.
Name of subject in English: Medical Biochemistry I
Name of subject in German: Medizinische Biochemie I

Credit value of the course: 4
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	2.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBMT1099_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Csanády László
Course coordinator location of work, telephone availability: Tel.: H-1094 Budapest, Tűzoltó u. 37-47. tel: +36-1-459-1500#60010 E-Mail: csanady.laszlo@semmelweis.hu
Course coordinator position: intézetigazgató
Course coordinator Date and number of habilitation: 2013/341

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the course is to explore the most important relationships between the structure and function of biologically relevant molecules—amino acids, carbohydrates, lipids, and nucleotides, as well as proteins and enzymes—and to provide a comprehensive molecular-level description of metabolic processes occurring in the human body, with particular emphasis on their medical relevance.

The enzymology module introduces the fundamental principles underlying the efficiency and regulation of chemical processes in biological systems, with special emphasis on the general principles of enzyme kinetics, as well as the structure and regulation of metabolic pathways.

The bioenergetics module addresses the relationships of energy and matter turnover characteristic of the human organism, with particular emphasis on nutritional aspects, and establishes a thermodynamic perspective on intermediary metabolism.

The first intermediary metabolism module presents the major elements of carbohydrate and lipid metabolism, the understanding of which is essential for interpreting the physiological and pathological functioning of the human body.

During the practical sessions, biochemical methods are applied that enable the experimental investigation of metabolic processes. In seminars, students apply the theoretical knowledge acquired during lectures in case-oriented discussions, thereby laying the foundation for the molecular-level interpretation of clinical situations.

Format of the course (lectures, group work, practical lessons, etc.):

lectures and practices

Competencies acquired through completion of course:

Knowledge of the structure, interactions, and reactions of biologically important molecules of particular medical relevance, as well as an understanding of inter-organ interactions and the higher-level integrated regulatory functions of the human body, are essential for comprehending physiological and pathological processes and, consequently, for making well-founded medical decisions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Chemistry (AOKMBT829_1A)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Completion of Medical Biochemistry I is a prerequisite for enrollment in Medical Biochemistry II.

The number of students required to start the course (minimum, maximum), method of selecting participants:

obligatory subject

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Proteins. Structure and Function

Lecturer: Prof. László Csanády

1. Chemical structure of amino acids constituting proteins. Formation and spatial structure of the peptide bond. Primary structure of proteins.
2. Hierarchical organization of proteins: secondary and tertiary structures. Protein folding and denaturation.
3. Quaternary structure and post-translational modifications of proteins. Structure of collagen. Structural basis of protein–nucleic acid interactions.
4. Structure–function relationships of hemoglobin and myoglobin.

Enzymes

Lecturer: Prof. László Csanády

1. General properties of enzymes. Chemical nature of enzymes. Thermodynamics of catalysis. Role of activation energy. Isoenzymes. Role of coenzymes and vitamins. Molecular mechanisms of enzyme catalysis. Effects of pH and temperature on enzyme activity.
2. Equilibrium and non-equilibrium reactions. Steady state and its approximation by initial reaction velocity. Kinetic models of enzyme action. Michaelis–Menten kinetics. The Michaelis constant (Km) and its significance. Two-step reactions, two-substrate reactions, cooperativity. Units of enzyme activity.
3. Regulation of enzyme reactions: reversible ligand binding, reversible and irreversible covalent modification, regulation of protein synthesis and degradation. Kinetics of enzyme inhibition. Importance of inhibition types in drug design.
4. Structure and kinetics of metabolic pathways. Regulation of metabolic flux direction and rate. Rate-limiting steps. Strategies for identifying enzymes as drug targets. Network adaptation, negative and positive feedback.

Bioenergetics

Lecturer: Dr. Christos Chinopoulos and Prof. László Tretter

1. Thermodynamics of biochemical processes. Reversible and irreversible reactions. Compounds with high group transfer potential. Central role of ATP in cellular energy metabolism. Reducing equivalents.
2. Substrate-level phosphorylation as a mechanism of ATP synthesis. Reactions and regulation of the citric acid cycle. Sources of acetyl-CoA for the citric acid cycle.
3. Mechanism of ATP synthesis in mitochondria: oxidative phosphorylation. Terminal oxidation

(respiratory chain) redox reactions and enzyme complexes involved.
4. Transfer of energy released during exergonic redox reactions to ATP synthesis. Function and reversibility of ATP synthase. Respiratory control and P/O ratio. Inhibitors of oxidative phosphorylation. Physiological role of uncoupling.

Carbohydrate Metabolism

Lecturer: Dr. Beáta Törőcsik

1. Dietary carbohydrates, their digestion and absorption in the gastrointestinal tract. General overview of membrane transporters. Glucose transporters: tissue distribution and regulation.
2. Glycolysis: pathway and regulation.
3. Metabolism and molecular pathology of fructose, galactose, and lactose.
4. Gluconeogenesis and its regulation. Ethanol metabolism.
5. Glycogen degradation and synthesis.
6. Regulation of blood glucose levels: glycogen mobilization in liver and muscle. Phosphorylation cascade. Enzymes regulated by glucagon.
7. Regulation of blood glucose levels: hyperglycemia. Insulin secretion, receptor, and its effects in different organs.

Lipid Metabolism

Lecturer: Dr. Erzsébet Komorowicz

1. Dietary lipids, their digestion, absorption, and chylomicron metabolism. Essential fatty acids.
2. Mobilization of fatty acids from adipose tissue and its regulation. Transport in circulation: free fatty acids, VLDL, IDL.
3. Fatty acid oxidation and its regulation. Formation and utilization of ketone bodies.
4. Fatty acid synthesis and its regulation. Saturated and unsaturated fatty acids. Synthesis of triglycerides and phospholipids and regulation of these processes.

Cholesterol and Bile Acid Metabolism

Lecturer: Prof. Kraszimir Kolev

1. Cholesterol metabolism and its transport in circulation.
2. Synthesis and metabolism of bile acids and their role in fat digestion. Cholesterol uptake and release in cells.

Biotransformation

Lecturer: Dr. Tamás Kardon

1. Characterization and classification of biotransformation reactions: Phase I reactions (microsomal cytochrome P450 isoenzymes), Phase II reactions (glucuronidation, glutathione conjugation). Regulation of biotransformation processes.

Steroid Hormones and Eicosanoid Metabolism

Lecturer: Dr. Erzsébet Komorowicz

1. Synthesis of steroid hormones in the adrenal cortex. Biochemical basis of adrenal cortex zonation. Mineralocorticoid synthesis and prereceptor specificity. Types of steroid receptors and their signal transduction: classical and non-genomic mechanisms.
2. Glucocorticoid synthesis, effects of cortisol, and regulation of cortisol synthesis. Synthesis of sex hormones. Progesterone and estradiol synthesis in the placenta. Testosterone synthesis in the testes, formation and significance of dihydrotestosterone.

Practical Sessions

1. Structural and chemical properties of amino acids in relation to physiological function (pH-dependent properties).
2. Protein diagnostic and structural analysis methods and their medical applications. LDH isoenzyme gel electrophoresis. Interpretation of pathologies related to protein structure.
3. Determination of kinetic parameters of trypsin using BAPNA substrate.
4. Determination of kinetic parameters of enzymes.
5. Identification of metabolic pathways.
6. Structure of carbohydrates. Novel carbohydrate components in the diet. Dietary fibers and additives. Demonstration I (proteins, enzymes).
7. Experimental determination of the P/O ratio.
8. Lactic acidosis.
9. Measurement of blood glucose levels using OGTT. Non-enzymatic glycation of hemoglobin.
10. Structural and bioenergetic roles of major lipids in the body and diet.
11. Role of lipoprotein lipase in determining metabolic profiles of organs. Lipoprotein lipase deficiency.
    Demonstration II (bioenergetics, carbohydrate metabolism)
12. Role of insulin in metabolism and its signal transduction
13. Determination of cholesterol and triglycerides (medical relevance of plasma cholesterol levels)
14. Membrane lipids. Precursors of signaling molecules

The practical sessions are conducted by the teaching staff of the Department of Biochemistry.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance at at least 75% of the practical sessions during the semester is mandatory. Missed practicals may be made up within the same week (in justified cases) by attending another group on up to two occasions.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):

(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, written and oral assessments are conducted, the results of which provide an advantage when determining the final exam grade.

1. A maximum of 30–30 points can be obtained in the two midterm tests (demonstrations).
2. A maximum of 10 points may be awarded during the practical sessions, based on criteria specified by the seminar instructors (e.g., presentations, measurement reports, and responses to oral or written questions).

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

During the semester, attendance at at least 75% of the practical sessions (maximum 3 absences) is required, and a minimum of 40 points must be achieved in total from the two midterm tests (maximum 60 points) and the seminar points earned during the semester (maximum 10 points).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

During the semester, attendance at at least 75% of the practical sessions (maximum 3 absences) is required, and a minimum of 40 points must be achieved in total from the two midterm tests (maximum 60 points) and the seminar points earned during the semester (maximum 10 points).

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The questions for assessment are selected from the test database published in the Moodle system. If the student scores less than 30 points (50%, or the percentage defined by the current Study and Examination Regulations), the result is a fail (1), and the student is not admitted to the oral examination. During the oral exam, the examiner selects questions from the test completed by the student. As a minimum requirement, the student must be able to justify their answers for at least three correctly answered questions.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The questions for assessment are selected from the test pool published in the Moodle system. During the oral part of the examination, the student must explain their answers and demonstrate the biochemical relationships related to the questions.

The semester examination consists of a written and an oral part.

Written Part
60 multiple-choice questions in the Moodle system, to be completed within 60 minutes.
The questions are selected from the test pool published in Moodle.
If the student scores less than 30 points (50%), the result is a fail (1), and the student is not admitted to the oral examination.
The purpose of the written part is to verify the minimum level of knowledge; it does not result in a separate grade.

Oral Part

The examiner selects questions from the test completed by the student, with at least one question from each of the three topic areas. The student must: explain the correct answers, and present the biochemical relationships related to the questions.
Topic Areas
Proteins/enzymes
Bioenergetics/carbohydrates
Lipids

The examiner may select questions from both correctly and incorrectly answered items, in order to assess the student’s professional competence.

The final grade (1–5) is determined by the examiner based on the student’s performance in the oral examination.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Artificial intelligence systems may be used as supplementary learning tools in the teaching of the subject. The use of AI should, however, comply with academic integrity standards and must not replace independent learning.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating

which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Lecture, seminar, and practical materials
Link	https://itc.semmelweis.hu/

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Biofizikai és Sugárbiológiai Intézet

Name of subject in Hungarian: Orvosi biofizika I.
Name of subject in English: Medical Biophysics I
Name of subject in German: Medizinische Biophysik I.

Credit value of the course: 4
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	1.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKFIZ1090_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kellermayer Miklós (Intézet igazgató)
Course coordinator location of work, telephone availability: SE Biofizikai és Sugárbiológiai Intézet, 06-1-4591500/60200
Course coordinator position: egyetemi tanár, igazgató
Course coordinator Date and number of habilitation: 2004 PTE ÁOK 7/2004/habil

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Objectives of the course, and its place in the curriculum of the medical training program:

Aim is to give the knowledge and way of thinking necessary for exact and quantitative understanding of working mechanism of biological systems and the human organism.

Format of the course (lectures, group work, practical lessons, etc.):

lectures + practical lessons

Competencies acquired through completion of course:

Understanding the physical background of life processes and the environmental factors influencing the organism (radiations). Doing and evaluation of measurements individually, production of laboratory reports.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

We do not give permission for any reasons to take medical biophysics II, only if the exam is passed in medical biophysics I.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum: the number of students in the 1st year.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Introduction. Radiations in medicine. Quantities and laws for characterization of common properties of radiations	
Phenomena related to light and geometrical optics. Fermat principle. Light reflection and refraction on planar and curved surfaces, medical optical devices, geometrical optics of the human eye.	
Wave optics as a model. Huygens–Fresnel-principle. the most simple experiment for light interference and its consequences. Resolving power. Light polarization. Color mixing, color vision. Light as electromagnetic wave and as particle. How these two completely different properties can be proven?	
Structure of matter, matter wave, atomic and molecular interactions. Atomic force microscopy.	

Boltzmann distribution, examples. Structural categories of many-particle materials: gas-, liquid-, solid (crystalline)-state of matter, general characteristics. Liquid crytalline (mesomorphous) materials.	
Electronic states in (crystalline) solid materials. Insulators, conductors, semi-conductors. Electric, thermal and optical properties, electro-optical applications.	
Interactions of light with matter. Light scattering, light absorption. Basic principles of absorption spectrometry.	
Laws of thermal radiation and luminescence. Examples for application of them.	
Fundamentals of light amplification. Laser oscillator and its conditions. Properties and medical applications of laser radiation	
Atomic nucleus, radioactivity, nuclear radiations. Interactions of nuclear radiations with matter. Radioactive isotopes, physical basis of radioisotope tracing.	
Dosimetry, radiation protection. Nuclear measurement techniques	
Main problems of nuclear medicine. Radioactive radiations in medical practice. Diagnostic and therapeutic applications of ionizing radiations. Gamma camera.	
Signal processing. Classification of signals. Fourier decomposition. Basic electronic circuits. Semiconductor elements in the circuits. Signal conversion and selection, displays.	

Practices

1	Introduction	
2	Light emission	
3	Resonance	
4	Microscopy I.	
5	Refractometry	
6	Light absorption	
7	Skin impedance	
8	Optics of the eye	
9	Nuclear medicine	
10	Polarimetry	
11	Amplifier	
12	Dosimetry	
13	Gamma absorption	

14. Repetition

Teachers: Dr. Agócs Gergely, Dr. Balog Erika, Dr. Balogh-Molnár Andrea, Dr. Bérces Attila, Dr. Bozó Tamás, Dr. Bőcskei-Antal Barnabás, Dr. Budavári Bálint, Dr. Czigléczki Janka Zsófia, Dr. Csányi

Csilla, Dr. Fehér Bence, Dr. Ferenczy György, Dr. Forgách László, Dr. Galántai Rita, Dr. Gál-Somkuti Judit, Dr. Gresits Iván, Dr. Haluszka Dóra, Dr. Jedlovszky-Hajdú Angéla, Juhász Ákos György, Dr. Juriga Dávid, Halmóczki Sarolta, ,Dr. Herényi Levente, Dr. Kellermayer Miklós Sándor Zoltán, Dr. Kis-Petik Katalin, Dr. Kiss Balázs, Dr. Kiss Bálint, Dr. Kósa Nikolett, Dr. Liliom Károly, Matkovicsné Dr. Varga Andrea, Dr. Mártonfalvi Zsolt, Dr. Molnár Kristóf, Dr. Molnárné Dr. Krisch Enikő, Dr. Orosz Ádám, Dr. Padányi Rita, Pálos veronika Teréz, Dr. Schay Gusztáv, Sipos Evelin, Dr. Simonné Dr. Nagy Krisztina, Dr. Smeller László, Dr. Sziklai Dominik, Dr. Török György, Dr. Veres Dániel Sándor, Dr. Voszka István, Dr. Zolcsák Ádám.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students may be absent in a maximum of 3 practical sessions during the semester in their own group (according to their Neptun registration). A labreport must be prepared based on the material covered in the practical session, and uploading it to the appropriate platform is a condition for confirming attendance. Missed practical sessions can be made up within the 4–6 week measurement cycle (even in advance) in another group, after prior consultation with the instructors. Completing a practical session in another group does not count as attendance, i.e., it does not reduce the number of absences. Absences from practical sessions do not need to be justified. Any deviation from the above is only possible with the permission of the head of the department or by higher university directive.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, two midterm tests are held: in the week following the 1st and 2nd practical cycles. Each student takes them in their own group (according to Neptun registration) at the scheduled time.

The tests cover both the theoretical background and practical material (representation, evaluation) of the given cycle, in the form of a Moodle test (single-choice, multiple-choice, figures, calculations). The test questions (including partial scores) are made available on the course Moodle page, where students can also practice and learn the correct answers. For calculation tasks, numbers are randomly generated, so the exact numerical result may vary, but correct problem-solving can still be determined.

The midterm tests are considered successful if their average reaches at least 50%.

Missed tests can be made up, and results can be improved in the last week (in the student's own group, during class time), in a similar format, covering the material of both tests. A minimum of 50% must be achieved on this test to pass. If necessary (i.e., if the result is below 50%), further improvement is possible in a similar format during an additional opportunity scheduled in the first week of the exam period.

If the average of the 1st and 2nd midterm tests reaches 80%, the student is exempt from the written part of the exam.

Students who do not need to take a retake or improvement test may take a competitive exam in the last week, through which they can earn a recommended grade of 5 (excellent). This competitive exam includes both similar (but slightly more difficult) closed questions and open-ended questions.

Number and type of individual assignments to be completed, submission deadlines:

A report must be prepared on the material covered in the practical session, and uploading it to the appropriate platform is a condition for confirming attendance. There are no other individual assignments.

Requirements for the successful completion of the course:

A maximum of 3 absences from practical sessions (see point 24) and successful completion of the midterm tests (see point 25).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1. **Radiations:** Definition of radiation, possibilities of classification. The concepts and units of radiant power, radiant emittance, and intensity. Dependence of irradiance on the distance from the radiation source. Point, line, and planar radiators. Examples of the application of radiations in diagnostics and therapy.
2. **Light:** General properties of visible light. Physical quantities describing waves and their relationships (speed of light, frequency, wavelength, phase). The electromagnetic spectrum. Examples of the interaction of light with matter, and its significance in medicine.
3. **Geometric optics:** Fundamental principles of geometric optics. The concept of the light ray. Fermat's principle. Laws of refraction and reflection (illustration). Applications of reflection, refraction and dispersion (optical fiber, refractometry).
4. **Optical imaging:** Refraction at a curved surface. Types of lenses and their imaging (with

illustration). Optical power. Lens equation. Properties of the formed image.

5. **Light microscopy:** Image formation in the compound light microscope (figure). Magnification and resolving power. The Abbe principle and Abbe formula. Special light microscopes.
6. **Light as a wave:** Wave motion, types of waves. The Huygens–Fresnel principle. Diffraction of light on an optical grating. The principle of superposition, interference. Spectral decomposition of white light. The limiting effect of diffraction on optical imaging (Airy disk).
7. **Polarization of light:** Linearly and circularly polarized light and their relationship. Optical activity. Polarimetry and Biot's law. The polarizing microscope.
8. **Light as a particle:** The photoelectric effect. The concept of the photon. Practical applications of the photoelectric effect (CCD camera, PMT).
9. **Matter as a wave:** The wave nature of the electron. The de Broglie formula. The Davisson–Germer experiment. Application of matter waves (TEM, cryo-EM).
10. **Classical atomic models:** Early atomic models (Dalton, Thomson). The Rutherford experiment and model. The Franck–Hertz experiment. The Bohr atomic model and its theoretical significance (light emission, spectrum of the H atom).
11. **The quantum mechanical atomic model:** The bound electron as a wave. Heisenberg's uncertainty principle. Quantum numbers. The Pauli principle and Hund's rule. The conceptual structure of the periodic table.
12. **Atomic interactions:** Electronegativity. Potential energy of interactions between atoms as a function of the distance between them. Primary and secondary bonds. Operation and resolution of atomic force microscopy (AFM).
13. **The Boltzmann distribution:** Theoretical foundations of the Boltzmann distribution, its temperature dependence and significance. The Nernst equation. Rate and equilibrium of chemical reactions (Arrhenius plot). The barometric height formula. Electrical conductivity of semiconductors.
14. **Gases:** The ideal gas: kinetic gas theory, origin of gas pressure, Maxwell velocity distribution. The real gas. Equations of state of gases.
15. **Liquids and liquid crystals:** Characteristics of the liquid state. Classification of liquid crystals based on molecular order. Significance and applications of liquid crystals in medicine (thermotropic and lyotropic liquid crystals).
16. **Solids:** Characteristics of the crystalline state. The concept and types of the unit cell. Crystal defects. Energy band structure of electrical conductors and insulators, adaptation of the Pauli principle to crystals. Optical properties of conductors and insulators.
17. **Semiconductors:** Energy band structure of structural semiconductors. Types and applications of doped semiconductors (semiconductor diode, semiconductor dosimeter).
18. **Radiation attenuation:** The law of attenuation of radiation intensity and its mathematical description. Factors influencing the extent of attenuation. Half-value layer, mean penetration depth, attenuation coefficient. Definition of the mass attenuation coefficient and its dependence on photon energy. Examples of medical applications of the attenuation law.
19. **Light absorption:** The general attenuation law. Absorbance and transmittance. Mechanism of light absorption. The Lambert–Beer law. The absorption spectrum (with illustration). Spectrophotometry.
20. **Light scattering:** Definition of light scattering. Rayleigh and Mie scattering. Factors influencing the intensity of scattered light. Applications of light scattering in medicine (dynamic light scattering, turbidimetry, nephelometry).
21. **Thermal radiation:** Definition and energy source of thermal radiation. Kirchhoff's law of radiation. Concept and emission spectrum of the absolute black body. The Stefan–Boltzmann law. Wien's displacement law. Practical applications of thermal radiation (light sources, body

temperature measurement, thermography).

22. **Basics of luminescence:** Definition of luminescence, its types, ant its source of energy. Emission spectra of atoms and molecules. Jablonski diagram, Kasha's rule, Stokes shift. Luminescence lifetime and quantum yield.
23. **Applications of luminescence:** FRAP, FRET, FACS. Fluorescence, confocal and super-resolution microscopies. Flame photometry, germicidal lamp.
24. **Basics of lasers:** Concept of light amplification. Stimulated emission, population inversion, energy pumping, optical resonator.
25. **Applications of lasers:** Properties of laser light. Types of lasers. Medical applications (surgery, dermatology, ophthalmology).
26. **Radioactivity, nuclear radiations:** Composition and stability of the atomic nucleus. Mass defect. The concept of isotopes. Types of radioactive decay, mechanisms of nuclear transformations with examples. Energy spectra of radioactive radiations.
27. **Physical quantities of radioactivity:** Concept and unit of activity. The law of radioactive decay (with graph). Half-life, mean lifetime, decay constant. Medical applications of radioactive isotopes (diagnostics, therapy).
28. **Interaction of nuclear radiations with atomic systems:** Interaction of alpha, beta and gamma radiation with atoms, their maximum ranges in air and in tissue. Neutron and proton radiation, Bragg peak (figure). Dependence of the mass attenuation coefficient on photon energy.
29. **Dosimetry:** Direct and indirect ionization with examples. Direct and indirect radiation effects with examples. Deterministic and stochastic radiation effects with examples. Dose concepts and their units: absorbed dose, exposure, equivalent dose, effective dose, dose rate. Structure, operation, voltage/current characteristic and regions of the ionization chamber (figure).
30. **Radiation protection:** Principles of radiation protection, ALARA principle, some characteristic doses (median lethal and lethal dose; dose of decrease in hematopoiesis, doses of X-ray and CT imaging). Dose rate limit (natural background radiation). Public and occupational dose limits. Structure and operation of the personal dosimeter (thermoluminescent dosimeter).
31. **Isotope diagnostics:** The radioactive tracer method. Criteria of isotope selection. Structure and operation of the technetium generator. Isotope diagnostic procedures: static and dynamic measurements. Typical isotope accumulation curve (figure) and the diagnostic information obtained from it.
32. **Imaging procedures in isotope diagnostics:** Structure and operation of the gamma camera and SPECT. Physical principles of PET imaging.
33. **Radiotherapy:** Physical principles of radiotherapy. Direct and indirect ionization. Types of applied radiation, typical doses, irradiation techniques (teletherapy, brachytherapy, gamma knife).
34. **Medical signal processing:** Concept of signal and information, definition and unit of information content. Types of signals in medicine with examples. Analog and digital signal. Digitization of analog signals, Shannon–Nyquist theorem. Fourier theorem. Fourier transformation in case of periodic and non-periodic signals.
35. **Electrical signal amplification:** Structure of the amplifier. Concepts and mathematical relations of power gain, voltage gain and gain level. Frequency transfer characteristic of the amplifier. Thetransfer band. Positive and negative feedback amplifiers. Structure and operation of low-pass and high-pass filter circuits. Typical voltage amplitude and frequency ranges of medical signals.

The written part of the exam is similar to the midterm tests (see above), but it covers the material of all practical sessions from the entire semester.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirement is that the weighted average of the test exam (see point 29) reaches 50%. If it is below 50%, there is an opportunity for an oral explanation of the answers, with assistance, which may modify the original result based on the examiner's judgment. The minimum requirement for the oral part is a passing grade (2) as determined by the examiner. Standardization of examination is supported by the institute's "Teaching the Teachers" project. Students may ask the examiner—during both the study and exam periods—for a subjective estimate of the theoretical weight of concepts and calculations through specific examples.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is the weighted average of the written exam and two oral exam topics, in a 3:2 ratio.

The final grade is the weighted average of the written exam and two oral exam topics, in a 3:2 ratio.

If the average of the 1st and 2nd midterm tests reaches 80% (see point 25), the written exam part is counted as a grade of 5.

Based on the competitive exam (see point 25).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

During teaching and learning, both instructors and students may use artificial intelligence systems with careful consideration and reservations. During exams, only pre-specified AI systems related to the given task may be used. Any non-approved system is not allowed during the exam.

Printed resources:

Type	Mandatory
Author	Damjanovich, Fidy, Szöllősi
Title	Medical biophysics
Publisher	Medicina
Year of publication	2009

Type	Mandatory
Author	Kellermayer et al.
Title	Medical biophysics practices
Publisher	Semmelweis
Year of publication	2015

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Biofizikai és Sugárbiológiai Intézet

Name of subject in Hungarian: Orvosi biofizika II.
Name of subject in English: Medical Biophysics II
Name of subject in German: Medizinische Biophysik II.

Credit value of the course: 3
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	1.0	2.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKFIZ1090_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kellermayer Miklós (Intézet igazgató)
Course coordinator location of work, telephone availability: SE Biofizikai és Sugárbiológiai Intézet, 06-1-4591500/60200
Course coordinator position: egyetemi tanár, igazgató
Course coordinator Date and number of habilitation: 2004 PTE ÁOK 7/2004/habil

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Objectives of the course, and its place in the curriculum of the medical training program:

Aim is to give the knowledge and way of thinking necessary for exact and quantitative understanding of working mechanism of biological systems and the human organism.

Format of the course (lectures, group work, practical lessons, etc.):

lectures + practical lessons

Competencies acquired through completion of course:

Understanding the physical background of life processes and the environmental factors influencing the organism (radiations). Doing and evaluation of measurements individually, production of laboratory reports.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biophysics I

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

We do not give permission for any reasons, only if the exam is passed in medical biophysics I.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum: the number of students in the 1st year.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures

1. Generation and properties of X-ray (Dr. Kellermayer)
2. Fundamentals of X-ray diagnostics (Dr. Kellermayer)
3. Thermodynamics: equilibrium, change, laws (Dr. Zrínyi)
4. Transport processes I: Diffusion, Brownian motion. Osmosis (Dr. Veres)
5. Transport processes II: Flow of fluids and gases. Blood as fluid (Dr. Kellermayer)
6. Bioelectric phenomena (Dr. Csík)
7. Sound, ultrasound (Dr. Kellermayer)

8. Biophysics of sensory organs. Vision, hearing. (Dr. Kellermayer)

9. Building blocks of life: water, macromolecules, supramolecular systems (Dr. Kellermayer)

10. Biological motion. Biomechanics, molecular and tissue mechanics (Dr. Mártonfalvi)

11. Methods of investigating biomolecular structure and dynamics. X-ray diffraction, mass spectrometry, infrared spectroscopy (Dr. Kellermayer)

12. Methods of investigating biomolecular structure and dynamics. Radiospectroscopic methods, fundamentals of MRI. (Dr. Kellermayer)

13. Blood circulation and cardiac function (Dr. Kellermayer)

14. Biophysics of pulmonary function. Physical examination (Dr. Kellermayer)

Practices

1	Blood pressure measurement, dataprocessing.	
2	Coulter counter	
3	X-ray measurement	
4	Microscopy II.	
5	Gamma energy	
6	Electrocardiography	
7	Pulse generator	
8	Sensory function	
9	Isotope diagnostics	
10	Diffusion	
11	Audiometry	
12	Fluid flow	
13	CAT scan	

14. Repetition

Teachers: Dr. Agócs Gergely, Dr. Balog Erika, Dr. Balogh-Molnár Andrea, Dr. Bérces Attila, Dr. Bozó Tamás, Dr. Bőcskei-Antal Barnabás, Dr. Budavári Bálint, Dr. Czigléczki Janka Zsófia, Dr. Csányi Csilla, Dr. Fehér Bence, Dr. Ferenczy György, Dr. Forgách László, Dr. Galántai Rita, Dr. Gál-Somkuti Judit, Dr. Gresits Iván, Dr. Haluszka Dóra, Dr. Jedlovszky-Hajdú Angéla, Juhász Ákos György, Dr. Juriga Dávid, Halmóczki Sarolta, ,Dr. Herényi Levente, Dr. Kellermayer Miklós Sándor Zoltán, Dr. Kis-Petik Katalin, Dr. Kiss Balázs, Dr. Kiss Bálint, Dr. Kósa Nikolett, Dr. Liliom Károly, Matkovicsné Dr. Varga Andrea, Dr. Mártonfalvi Zsolt, Dr. Molnár Kristóf, Dr. Molnárné Dr. Krisch Enikő, Dr. Orosz Ádám, Dr. Padányi Rita, Pálos veronika Teréz, Dr. Schay Gusztáv, Sipos Evelin, Dr. Simonné Dr. Nagy Krisztina, Dr. Smeller László, Dr. Sziklai Dominik, Dr. Török György, Dr. Veres Dániel

Sándor, Dr. Voszka István, Dr. Zolcsák Ádám.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students may be absent in a maximum of 3 practical sessions during the semester in their own group (according to their Neptun registration). A labreport must be prepared based on the material covered in the practical session, and uploading it to the appropriate platform is a condition for confirming attendance. Missed practical sessions can be made up within the 4–6 week measurement cycle (even in advance) in another group, after prior consultation with the instructors. Completing a practical session in another group does not count as attendance, i.e., it does not reduce the number of absences. Absences from practical sessions do not need to be justified. Any deviation from the above is only possible with the permission of the head of the department or by higher university directive.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, two midterm tests are held: in the week following the 1st and 2nd practical cycles. Each student takes them in their own group (according to Neptun registration) at the scheduled time.

The tests cover both the theoretical background and practical material (representation, evaluation) of the given cycle, in the form of a Moodle test (single-choice, multiple-choice, figures, calculations). The test questions (including partial scores) are made available on the course Moodle page, where students can also practice and learn the correct answers. For calculation tasks, numbers are randomly generated, so the exact numerical result may vary, but correct problem-solving can still be determined.

The midterm tests are considered successful if their average reaches at least 50%.

Missed tests can be made up, and results can be improved in the last week (in the student’s own group, during class time), in a similar format, covering the material of both tests. A minimum of 50% must be achieved on this test to pass. If necessary (i.e., if the result is below 50%), further improvement is possible in a similar format during an additional opportunity scheduled in the first week of the exam period.

If, **in both semester**, the average of the 1st and 2nd midterm tests reaches 80%, the student is exempt from the written part of the exam.

Students who do not need to take a retake or improvement test may take a competitive exam in the last week, through which they can earn a recommended grade of 5 (excellent). This competitive exam includes both similar (but slightly more difficult) closed questions and open-ended questions.

Number and type of individual assignments to be completed, submission deadlines:

A report must be prepared on the material covered in the practical session, and uploading it to the appropriate platform is a condition for confirming attendance. There are no other individual assignments.

Requirements for the successful completion of the course:

A maximum of 3 absences from practical sessions (see point 24) and successful completion of the midterm tests (see point 25).

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

I. Semester

1. **Radiations:** Definition of radiation, possibilities of classification. The concepts and units of radiant power, radiant emittance, and intensity. Dependence of irradiance on the distance from the radiation source. Point, line, and planar radiators. Examples of the application of radiations in diagnostics and therapy.
2. **Light:** General properties of visible light. Physical quantities describing waves and their relationships (speed of light, frequency, wavelength, phase). The electromagnetic spectrum. Examples of the interaction of light with matter, and its significance in medicine.
3. **Geometric optics:** Fundamental principles of geometric optics. The concept of the light ray. Fermat’s principle. Laws of refraction and reflection (illustration). Applications of reflection, refraction and dispersion (optical fiber, refractometry).
4. **Optical imaging:** Refraction at a curved surface. Types of lenses and their imaging (with illustration). Optical power. Lens equation. Properties of the formed image.
5. **Light microscopy:** Image formation in the compound light microscope (figure). Magnification and resolving power. The Abbe principle and Abbe formula. Special light microscopes.
6. **Light as a wave:** Wave motion, types of waves. The Huygens–Fresnel principle. Diffraction of light on an optical grating. The principle of superposition, interference. Spectral decomposition of white light. The limiting effect of diffraction on optical imaging (Airy disk).

7. **Polarization of light:** Linearly and circularly polarized light and their relationship. Optical activity. Polarimetry and Biot's law. The polarizing microscope.
8. **Light as a particle:** The photoelectric effect. The concept of the photon. Practical applications of the photoelectric effect (CCD camera, PMT).
9. **Matter as a wave:** The wave nature of the electron. The de Broglie formula. The Davisson–Germer experiment. Application of matter waves (TEM, cryo-EM).
10. **Classical atomic models:** Early atomic models (Dalton, Thomson). The Rutherford experiment and model. The Franck–Hertz experiment. The Bohr atomic model and its theoretical significance (light emission, spectrum of the H atom).
11. **The quantum mechanical atomic model:** The bound electron as a wave. Heisenberg's uncertainty principle. Quantum numbers. The Pauli principle and Hund's rule. The conceptual structure of the periodic table.
12. **Atomic interactions:** Electronegativity. Potential energy of interactions between atoms as a function of the distance between them. Primary and secondary bonds. Operation and resolution of atomic force microscopy (AFM).
13. **The Boltzmann distribution:** Theoretical foundations of the Boltzmann distribution, its temperature dependence and significance. The Nernst equation. Rate and equilibrium of chemical reactions (Arrhenius plot). The barometric height formula. Electrical conductivity of semiconductors.
14. **Gases:** The ideal gas: kinetic gas theory, origin of gas pressure, Maxwell velocity distribution. The real gas. Equations of state of gases.
15. **Liquids and liquid crystals:** Characteristics of the liquid state. Classification of liquid crystals based on molecular order. Significance and applications of liquid crystals in medicine (thermotropic and lyotropic liquid crystals).
16. **Solids:** Characteristics of the crystalline state. The concept and types of the unit cell. Crystal defects. Energy band structure of electrical conductors and insulators, adaptation of the Pauli principle to crystals. Optical properties of conductors and insulators.
17. **Semiconductors:** Energy band structure of structural semiconductors. Types and applications of doped semiconductors (semiconductor diode, semiconductor dosimeter).
18. **Radiation attenuation:** The law of attenuation of radiation intensity and its mathematical description. Factors influencing the extent of attenuation. Half-value layer, mean penetration depth, attenuation coefficient. Definition of the mass attenuation coefficient and its dependence on photon energy. Examples of medical applications of the attenuation law.
19. **Light absorption:** The general attenuation law. Absorbance and transmittance. Mechanism of light absorption. The Lambert–Beer law. The absorption spectrum (with illustration). Spectrophotometry.
20. **Light scattering:** Definition of light scattering. Rayleigh and Mie scattering. Factors influencing the intensity of scattered light. Applications of light scattering in medicine (dynamic light scattering, turbidimetry, nephelometry).
21. **Thermal radiation:** Definition and energy source of thermal radiation. Kirchhoff's law of radiation. Concept and emission spectrum of the absolute black body. The Stefan–Boltzmann law. Wien's displacement law. Practical applications of thermal radiation (light sources, body temperature measurement, thermography).
22. **Basics of luminescence:** Definition of luminescence, its types, ant its source of energy. Emission spectra of atoms and molecules. Jablonski diagram, Kasha's rule, Stokes shift. Luminescence lifetime and quantum yield.
23. **Applications of luminescence:** FRAP, FRET, FACS. Fluorescence, confocal and super-resolution microscopies. Flame photometry, germicidal lamp.

24. **Basics of lasers:** Concept of light amplification. Stimulated emission, population inversion, energy pumping, optical resonator.
25. **Applications of lasers:** Properties of laser light. Types of lasers. Medical applications (surgery, dermatology, ophthalmology).
26. **Radioactivity, nuclear radiations:** Composition and stability of the atomic nucleus. Mass defect. The concept of isotopes. Types of radioactive decay, mechanisms of nuclear transformations with examples. Energy spectra of radioactive radiations.
27. **Physical quantities of radioactivity:** Concept and unit of activity. The law of radioactive decay (with graph). Half-life, mean lifetime, decay constant. Medical applications of radioactive isotopes (diagnostics, therapy).
28. **Interaction of nuclear radiations with atomic systems:** Interaction of alpha, beta and gamma radiation with atoms, their maximum ranges in air and in tissue. Neutron and proton radiation, Bragg peak (figure). Dependence of the mass attenuation coefficient on photon energy.
29. **Dosimetry:** Direct and indirect ionization with examples. Direct and indirect radiation effects with examples. Deterministic and stochastic radiation effects with examples. Dose concepts and their units: absorbed dose, exposure, equivalent dose, effective dose, dose rate. Structure, operation, voltage/current characteristic and regions of the ionization chamber (figure).
30. **Radiation protection:** Principles of radiation protection, ALARA principle, some characteristic doses (median lethal and lethal dose; dose of decrease in hematopoiesis, doses of X-ray and CT imaging). Dose rate limit (natural background radiation). Public and occupational dose limits. Structure and operation of the personal dosimeter (thermoluminescent dosimeter).
31. **Isotope diagnostics:** The radioactive tracer method. Criteria of isotope selection. Structure and operation of the technetium generator. Isotope diagnostic procedures: static and dynamic measurements. Typical isotope accumulation curve (figure) and the diagnostic information obtained from it.
32. **Imaging procedures in isotope diagnostics:** Structure and operation of the gamma camera and SPECT. Physical principles of PET imaging.
33. **Radiotherapy:** Physical principles of radiotherapy. Direct and indirect ionization. Types of applied radiation, typical doses, irradiation techniques (teletherapy, brachytherapy, gamma knife).
34. **Medical signal processing:** Concept of signal and information, definition and unit of information content. Types of signals in medicine with examples. Analog and digital signal. Digitization of analog signals, Shannon–Nyquist theorem. Fourier theorem. Fourier transformation in case of periodic and non-periodic signals.
35. **Electrical signal amplification:** Structure of the amplifier. Concepts and mathematical relations of power gain, voltage gain and gain level. Frequency transfer characteristic of the amplifier. Thetransfer band. Positive and negative feedback amplifiers. Structure and operation of low-pass and high-pass filter circuits. Typical voltage amplitude and frequency ranges of medical signals.

II. Semester

1. **X-ray radiation:** Definition of X-ray radiation. Structure and operation of the X-ray tube. Mechanisms of X-ray production: spectra of bremsstrahlung and characteristic radiation (figure). The Duane–Hunt law. Power and efficiency of X-ray radiation. Formation of a summation image.

2. **Interaction of X-ray radiation with matter:** Mechanisms of X-ray attenuation and their role in diagnostic X-ray imaging (diagnostic photon energy range, dependence of the photoelectric effect on atomic number). Improvement of X-ray imaging (use of contrast agents, their types). The X-ray image intensifier, DSA technique.
3. **Computed tomography (CT):** Principle of tomography, definition of voxel and elementary density. The Hounsfield scale. Contrast modification, windowing. Photon-counting CT. Medical applications (X-ray densitometry, radiotherapy, generation of high-energy X-rays).
4. **Mechanical waves:** Definition of mechanical waves, its frequency ranges. Speed of sound propagation. Sound pressure, sound intensity and intensity level. Acoustic impedance, reflectivity, reference intensity. The phon and sone scale. Hearing threshold curve. Audiometry, hearing impairment.
5. **Ultrasound:** Definition, generation and detection of ultrasound. Properties of ultrasound: propagation, attenuation, refraction, reflection, and their role in diagnostic applications.
6. **Ultrasound diagnostics:** The pulse–echo principle (distance measurement). Axial resolution. Ultrasound diagnostic modes (A-, B-, and M-), 3D and 4D ultrasound imaging.
7. **The Doppler effect and its application:** The definition of ultrasound. The pulse–echo principle. The Doppler effect and Doppler shift. Measurement of blood flow velocity based on the Doppler effect. Basics of the therapeutic application of ultrasound.
8. **Thermodynamics I:** Concept of the thermodynamic system, its types, characterization with extensive and intensive quantities, with examples. Zeroth and first laws of thermodynamics. Types of energy, contributions to internal energy and its change. The human body as a thermodynamic system.
9. **Thermodynamics II:** The second and third laws of thermodynamics. Definition and unit of entropy. Macrostate and microstate in thermodynamics. Thermodynamic probability. Boltzmann definition of entropy. Direction of spontaneous processes in an isolated system.
10. **Thermodynamics III:** Characteristics of isobaric, isothermal, isothermal–isobaric systems. Direction of thermodynamic processes in isothermal and isothermal–isobaric systems. Condition of equilibrium in different thermodynamic systems. Thermodynamic potentials.
11. **Transport processes:** Intensive and extensive quantities with examples. Unified description of transport processes: Onsager equation. Examples of irreversible thermodynamic processes. Thermodiffusion.
12. **Osmosis:** Definition of osmosis. The Van’t Hoff law. Concept and unit of osmolarity. Medical significance of osmotic pressure: tonicity.
13. **Material transport by diffusion:** Concept of diffusion. Phenomenon and mechanism of Brownian motion. Definition of matter flow density and concentration gradient. Fick’s first and second laws. Concept and unit of the diffusion coefficient. Einstein–Stokes equation. Gas exchange in the lungs based on Fick’s first law.
14. **Viscosity:** Newton’s law of friction. Concept and units of viscosity. Types of fluids according to viscosity with examples. Blood as a non-Newtonian fluid. Determinants of blood viscosity.
15. **Flow of fluids:** Concept and unit of volumetric flow rate, stationary flow, continuity equation. Stokes’ law. Laminar and turbulent flow, Reynolds number, critical flow velocity. Change of flow velocity in the systemic circulation (figure).
16. **Volumetric flow in tubes:** Hagen–Poiseuille law, flow resistance. Factors influencing the resistance of blood circulation. Concepts of static, dynamic and hydrostatic pressure, Bernoulli’s law. Medical significance of fluid flow laws (aneurysm, vasodilation, vasoconstriction). Blood pressure and vessel cross-section characteristics in different parts of the systemic circulation (figure).
17. **Material transport across the cell membrane:** Types of transport across the cell

membrane, permeability constant. Electrochemical potential, Nernst equation. Passive and active transport, facilitated diffusion (with examples).

18. **Membrane potential and its changes:** Electrochemical potential. Donnan equilibrium, transport model, Goldman–Hodgkin–Katz equation. Formation of the action potential. Ion currents during the action potential. The refractory period. Propagation of the action potential. Concept of space constant and time constant.
19. **Electrocardiography I:** Origin of the ECG signal. Measurement of the ECG signal: different and indifferent electrodes, unipolar and bipolar leads. Typical ECG signal shape (in lead II), characteristic amplitudes and durations.
20. **Electrocardiography II:** Electrical activity of the heart (the cardiac cycle). Classification and characterization of the standard 12 leads. The Einthoven triangle. Determination of the electrical axis of the heart (figure). Differential amplifier in the ECG device.
21. **Pulse generators:** Definition of monostable, astable and bistable multivibrators. The most important related physical quantities: time constant, duty cycle, pulse charge and pulse energy. Examples of medical applications: operation of the defibrillator, modeling of pacemaker impulses.
22. **The process of sensation:** Types of receptor cells. Modalities of sensation. Receptor potential, action potential and their relation to stimulus intensity. Types of information coding in sensation. The process of sensation from stimulus to perception. Sensory adaptation.
23. **Basics of psychophysics:** Concept of stimulus, sensation and perception. Examples of stimulus–sensation pairs. Absolute and relative threshold stimulus. Dependence of sensation intensity on stimulus intensity. Threshold curve, rheobase, chronaxie. Psychophysical laws. Expansive and compressive perception with examples.
24. **Biophysics of vision:** Simplified structure of the eye and its refractive boundaries. Optical power of the eye. Properties of the image formed on the retina. Structure of the retina, cell types and their characteristics. Molecular process of light perception, color vision. Concept and measurement of accommodation, limiting angle and visual acuity.
25. **Biophysics of hearing:** Simplified structure of the hearing organ. Role of the outer, middle and inner ear in the process of hearing. Audible range, process of frequency perception. Generation of excitation and positive feedback in hair cells.
26. **Methods for studying biomolecular structure:** Diffraction of X-rays on crystals, the Bragg equation. Steps of X-ray diffraction in structure analysis and examples of biomolecular structures obtained this way. Steps of mass spectrometry and its medical applications, the gamma knife.
27. **Radiospectroscopic methods:** The Stern–Gerlach experiment, resultant nuclear spin of atomic nuclei. Magnetic spin resonance, resonance condition, T1 and T2 relaxation. NMR and ESR spectroscopy.
28. **Magnetic resonance imaging:** Nuclear spins in a magnetic field, magnetic field strength used in MRI, the Zeeman effect. MRI contrast, spatial encoding, slice selection. Contrast agents used in MRI. Dangers and contraindications of MRI.
29. **Structure and properties of water:** Structure and properties of the water molecule, interactions between water molecules. Phase diagram of water, anomalous properties of water. Definition and unit of surface tension.
30. **Structure and properties of biopolymers:** Parameters describing the shape of biopolymers, entropic elasticity with examples. Structural hierarchy of proteins, interactions stabilizing protein structure. Protein folding, the Levinthal paradox. Examples of protein folding diseases.
31. **Motor proteins:** Structure and classification of motor proteins. Duty ratio, processivity, typical force and displacement range of motor proteins. Examples of motor proteins. Working

cycle of skeletal muscle myosin.

32. **Biophysics of muscle function:** Basic phenomena of muscle function, types of contraction, muscle work, power and force–velocity relationship (figure). Energetics of muscle function (the Fenn effect). The sliding filament model, muscle force–sarcomere length graph.
33. **Biophysics of cardiac function and circulation:** Pressure and volume changes during the cardiac cycle (figure). Work of the heart. Systolic and diastolic blood pressure in the aorta and the left ventricle. Auxiliary forces of blood circulation: the Windkessel effect. Laminar and turbulent flow in the systemic circulation.
34. **Biomechanics:** Concept of stress and strain, stress–strain diagram, Hooke's law. Tissue biomechanics: collagen, biomechanics of elastic arteries, Laplace–Frank equation. Concept of viscoelasticity with physiological examples.
35. **Biophysics of respiration:** Ideal gas law, partial pressure of gases, concepts of intrapulmonary, intrapleural and transmural pressures. Respiratory volumes and capacities (with volume values). Lung compliance, definition of work of breathing.
36. **Biophysical foundations of physical examination:** Basic elements and steps of classical physical examination, and their connection with basic biophysical phenomena.

The written part of the exam is similar to the midterm tests (see above), but it covers the material of <u>all practical sessions from both semesters.</u>

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirement is that the weighted average of the test exam (see point 29) reaches 50%. If it is below 50%, there is an opportunity for an oral explanation of the answers, with assistance, which may modify the original result based on the examiner's judgment. The minimum requirement for the oral part is a passing grade (2) as determined by the examiner. Standardization of examination is supported by the institute's "Teaching the Teachers" project. Students may ask the examiner—during both the study and exam periods—for a subjective estimate of the theoretical weight of concepts and calculations through specific examples.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is the weighted average of the written exam and four oral exam topics, in a 3:2 ratio.

The final grade is the weighted average of the written exam and four oral exam topics, in a 3:2 ratio.

If, **in both semesters**, the average of the results of the 1st and 2nd midterm tests reaches 80% (see point 25), the written exam component is counted as a grade of 5.

Based on the competitive exam (see point 25).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

During teaching and learning, both instructors and students may use artificial intelligence systems with careful consideration and reservations. During exams, only pre-specified AI systems related to the given task may be used. Any non-approved system is not allowed during the exam.

Printed resources:

Type	Mandatory
Author	Damjanovich, Fidy, Szöllősi
Title	Medical biophysics
Publisher	Medicina
Year of publication	2009

Type	Mandatory
Author	Kellermayer et al.
Title	Medical biophysics practices
Publisher	Semmelweis
Year of publication	2015

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Molekuláris Biológiai Tanszék

Name of subject in Hungarian: Orvosi kémia
Name of subject in English: Medical Chemistry
Name of subject in German: Chemie für Mediziner

Credit value of the course: 6
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
6.0	3.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMBT829_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Csala Miklós
Course coordinator location of work, telephone availability: Department of Molecular Biology, 20/666-0100
Course coordinator position: full professor
Course coordinator Date and number of habilitation: 07/06/2010, 293

Objectives of the course, and its place in the curriculum of the medical training program:

The principal aim of the course is to prepare students for the understanding of the subjects of Biochemistry, Molecular cell biology, Physiology and Pharmacology. This requires a firm knowledge of the foundations of general, organic and inorganic chemistry.

The role of the subject in the preclinical studies is to summarize that basic knowledge, which is fundamental for understanding molecular biological and biochemical processes in humans under

physiological and pathological conditions.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practical courses with small group work in the practical lessons. These practical lessons introduce students to some of the modern molecular biology procedures of clinical relevance and develop their manual skills essential for a medical doctor.

Competencies acquired through completion of course:

Students having completed this course possess the basic knowledge which is essential in the following semesters for molecular biology, physiology, biochemistry and pharmacology.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

There are no prerequisites as this is a compulsory subject in the very first semester.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

n/a

The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject for year 1 medical students; maximum number of participants: 480, there is no student selection.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

General chemistry:

1. Atomic structure; periodic table of elements (Miklós Csala)
2. Chemical bonds, hybrid states (Miklós Csala)

3. Secondary bonds and interactions (Miklós Csala)
4. Chemical equilibria (Miklós Csala)
5. Acid-base theories, pH (Miklós Csala)
6. pH of strong or weak acids and bases (Miklós Csala)
7. The theory of buffers (Veronika Zámbó)
8. Buffers of physiological importance, cation and anion hydrolysis, pH of salt solutions (Gábor Bőgel)
9. Solubility of salts and bases, the solubility product (Farkas Sarnyai)
10. Laws of dilute solutions. Specific and equivalent conductivity (Gergely Keszler)
11. Thermodynamics 1 – Enthalpy (Miklós Csala)
12. Thermodynamics 2 – Entropy (Miklós Csala)
13. Thermodynamics 3 – Direction of reactions (Miklós Csala)
14. Electrochemistry 1 (Miklós Csala)
15. Electrochemistry 2 (Miklós Csala)
16. Electrochemistry 3 (Miklós Csala)
17. Reaction kinetics (Miklós Csala)
18. Complex compounds, reactive oxygen species (Péter Szelényi)

Organic chemistry:

19. Principles of organic chemistry (Zsolt Rónai)
20. Nomenclature of organic compounds, constitution of organic compounds (Zsolt Rónai)
21. Configuration and conformation of organic compounds (Zsolt Rónai)
22. Saturated and unsaturated hydrocarbons (Szilvia Nagy)
23. Reactions of alkyl halides and aromatic compounds (Szilvia Nagy)
24. Classification and reactions of hydroxyl compounds (Gergely Keszler)
25. Classification and reactions of oxo compounds (Gergely Keszler)
26. Structure, function and reactions of organic acids (Szabolcs Sipeki)
27. Nitrogen-containing organic compounds (Szabolcs Sipeki)

28. Sulfur or phosphorus-containing organic compounds (Szabolcs Sipeki)

Practices:

1. Introduction, acid-base titration 1 (titration of strong acids) *(4×45 Min)*

2. Concentration, pH, problems *(2×45 Min)*

3. Acid-base titration 2 (titration of weak acids) *(4×45 Min)*

4. Salts *(2×45 Min)*

5. Titration curves, consultation (buffers) *(4×45 Min)*

6. Physiological buffer systems *(2×45 Min)*

7. Electrochemistry, consultation *(4×45 Min)*

8. Thermochemistry, thermodynamics *(2×45 Min)*

9. Permanganometry *(4×45 Min)*

10. Electrochemistry *(2×45 Min)*

11. Determination of the ionization constant of phenol red by photometry *(4×45 Min)*

12. Structure of organic compounds *(2×45 Min)*

13. Complexometry. Precipitation titration *(4×45 Min)*

14. Isomers, molecule models *(2×45 Min)*

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance in at least 75% of the practical classes is obligatory.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

A compulsory midterm theoretical assessment will be organized, details (date, time, topics) will be

announced at the beginning of the semester.

Optional written midterm test (30 min) will be in week 14 about the laboratory measurements during the semester. Performance at the laboratory work during the whole semester is also taken into account at the evaluation.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

To obtain the signature, students must attend at least 75% of the practical classes and pass the compulsory midterm exam. (In exceptional cases, a delay of up to 5 minutes is acceptable at the practical classes.)

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The current topic list of the written and oral exam is available in Moodle in the beginning of the semester.

I. General chemistry

1. The periodic table of the elements, quantum numbers

2. The covalent bond, the molecular geometry of inorganic molecules (e.g. carbon monoxide, carbon dioxide, ammonia). Ionization energy, electron affinity, electronegativity. The ionic bond, hydroxylapatite and fluoroapatite

3. The structures of polyatomic ions, the complexes

4. The secondary bonds and intearctions between molecules

5. Laws of dilute solutions: vapor pressure, freezing point depression, boiling point elevation

6. The phenomenon of osmosis, its biological significance, isotonic, hypotonic and hypertonic solutions

7. Chemical equilibria, the equilibrium constant and the degree of dissociation, their correlation. The Le Châtelier principle (example: formation, properties, salts, practical use of hypochlorous acid.)

8. Gas mixtures: partial pressure, volume %. The composition of the air. Dissolution of gases in

liquids, Henry's law, the decompression sickness

9. The structure and dissociation of water. Acid-base theories. The pH and pOH concept, calculation of the pH of strong acids or bases, and their titration curves. Acid-base indicators

10. The dissociation of weak acids and bases, the concept of specific and equivalent conductivity, their correlations with the dissociation. Titration curves of weak acids

11. Types of salts and their reactions with water. pH of salt solutions

12. The buffers: principle, mechanism of action, calculation of the pH. The titration curves of polyprotic acids (phosphoric acid)

13. Buffers of physiological importance

14. The solution equilibria of solid substances, the solubility product

15. The first law of thermodynamics. Heat of reaction, combustion heat, heat of formation. Hess' law

16. The second law of thermodynamics. The direction of the chemical reactions, Gibbs free energy

17. Oxidation, reduction, oxidation number, standard reduction potential

18. The galvanic cells: arrangement, reactions, calculation of the electromotive force

19. Types of electrodes, redox systems of biological importance

20. The concentration cells, the principle of measuring the pH

21. Reaction rate, order and molecularity, factors influencing the reaction rate

II. Organic chemistry

22. The electronic structure of the carbon atom, its hybrid states, structure of organic compounds

23. The concept of isomerism, types of structural isomerism, nomenclature of organic compounds

24. Geometric isomerism in unsaturated and cyclic compounds

25. Stereoisomerism, chiral compounds, optical activity, D–L and R–S nomenclature

26. Conformations of organic compounds, examples with open chain and cyclic molecules

27. Reaction types and mechanism in organic chemistry

28. Properties and reactions of alk<u>a</u>nes

29. Properties and reactions of alk<u>e</u>nes

30. Characteristics, reactions and biological roles of aromatic compounds

31. Alcohols, enols, phenols

32. Oxo compounds: aldehydes and ketones. Their chemical reactions, the mechanism of the nucleophilic addition. Oxo-enol tautomerism

33. Properties and reactions of compounds containing a carboxyl group

34. Substituted carboxylic acids (Halogenated, oxo-, hydroxy-; aromatic; mono-, di- and tricarboxylic acids)

35. Organic compounds containing sulfur or phosphorus

36. Nitrogen-containing organic compounds: classification and properties of amines

37. Carboamides, amides of the carbonic acid, imines

III. Laboratory

38. Principle of concentration determination by volume measurement: titrations

39. Titration of strong acids and bases

40. Titration of weak acids and bases

41. Conductivity measurement, determination of weak acid dissociation

42. Titration of gastric juice

43. Titration curves of mono- and polyprotic acids

44. Titration based on redox reaction: permanganometry

45. Complexometry: determination of copper concentration

46. Electrochemical measurements: the Daniell cell, concentration cell, redox and non-polarizable electrodes

47. Principle and application of spectrophotometry: determination of the *K*d of the phenol red indicator

48. Precipitation titration

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Knowledge of all topics and concepts listed in the topic list – at least at satisfactory level – which are covered in the lectures and practical courses, as well as in the course materials available on the

Moodle page (itc.semmelweis.hu), including lecture slides and recordings, textbooks, practical notes, and supplementary materials.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The oral and written exam is based on the topic list announced in the beginning of the semester, and it takes place before a committee of two (examiner and co-examiner). Students pick 3 questions (general chemistry, organic chemistry, laboratory practice) and a calculation problem to be solved in writing. The exam can be passed if all topics are sufficiently answered. Students, who achieve at least 12 points at the practical midterm and at the labs during the semester, get exempted from picking the practical question. The bonus is valid during the whole exam period (in case of an unsuccessful exam).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle

Printed resources:

Type	Mandatory
Author	Darrell Ebbing
Title	General Chemistry
Publisher	Cengage Learning
Year of publication	2016

Type	Mandatory
Author	Hrabák A, Csermely P, Bauer P
Title	Principles of Organic Chemistry
Publisher	Semmelweis
Year of publication	2007

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Magatartástudományi Intézet

Name of subject in Hungarian: Orvosi kommunikáció
Name of subject in English: Medical Communication
Name of subject in German: Medizinische Kommunikation

Credit value of the course: 3
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	10.0	18.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMAG1091_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Purebl György (intézet igazgató)
Course coordinator location of work, telephone availability: SE Institute of Behavioural Sciences, +36-1-210-2953
Course coordinator position: Professor, Director
Course coordinator Date and number of habilitation: 2019.06.06. 5/2019

Objectives of the course, and its place in the curriculum of the medical training program:

Proper communication is an essential element of effective healing. Good communication helps to form a trusting relationship between the physician and the patient, it allows the doctor to gather effectively the information that underpins the diagnosis, and it improves the patient’s cooperation and adherence with treatments. The aim of education is partly to teach communication techniques that can make the daily tasks of doctors more effective: listening to, interviewing, informing and promoting cooperation of the patients. The subjects of education are also elements of the everyday

doctor-patient relationship, which have recently come to the fore, such as e.g shared decision making, suggestive effects of medical communication, communication aspects of patient safety.

In addition to describing the general regularities of medical communication, the course also presents the specialities of communication in various areas of the health care. Thus, we deal with the peculiarities of communication with children or the elderly, discussion about sexual topics and the cultural competence of the doctor. In our education, we place great emphasis on the difficult issues of the doctor-patient relationship, so we deal with the communication of bad news and the prevention and management of aggression.

The main goal of the course is to teach special communication knowledge to medical students that can help them create proper doctor-patient relationship and improve their effectiveness in medical practice.

Format of the course (lectures, group work, practical lessons, etc.):

10 hours of lecture, 18 hours of practice. The lectures provide an overview of the most relevant theoretical basis and of the basic technics of medical communication. During the practices, the focus is on the development of communication skills via exercises in pairs, in small groups and in whole group. The technics used are analysis of educational videos, role plays, interview with a teaching patient, discussion of the experiences of the role plays, of field observations and of every day practice of the communication skills.

Competencies acquired through completion of course:

Upon successful completion of the subject, the students will be able to

• effectively gather information to make a diagnosis by using appropriate questioning techniques;

• use communication techniques that facilitate the understanding and remembering during patient information;

• know and apply specific communication techniques to express their attention and empathy;

• use several communication techniques to improve the patient's therapeutic cooperation;

• inform the patient about the possible risks of the treatments in accordance with the legal regulation, in an objective, yet non-alarming way;

• can activate the patient in order to become a partner in his own treatment as much as possible, and empower the patient himself to contribute as much as possible to his own recovery or improvement of his condition;

• have effective methods to facilitate lifestyle change;

• be aware of the suggestive effects that doctor's communication can have; be able to use communication methods that put the positive effects of the doctor's words at the service of cooperation and healing;

• be able to communicate in a way that suits the individual characteristics of the patient (age, different social and cultural backgrounds, different levels of health understanding, possible mental disorders or disabilities);

• be able to communicate on intimate issues without embarassment;

• know and be able to use communication methods to manage tensions and conflicts;

• breaking bad news in a compassionate way (eg news of incurable disease, news of death, news of congenital malformation);

• can effectively use modern technology for the purposes of medical communication;

• know and be able to use communication tools that increase patient safety.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical communication knowledge and skills are of fundamental importance in all clinical areas. They are particularly important for the following subjects: internal medicine propedeutics, internal medicine, pediatrics, psychiatry, oncology, family medicine

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not relevant

The number of students required to start the course (minimum, maximum), method of selecting participants:

The completion of the course is compulsory for all students. Course is taught only in the first semester of the academic year, all students can register for the course. The recommended maximum number of students for practice is 15 students per group.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

LECTURES: Week 1-5 (5x2 hours)

Lecture 1: Introduction. Communication difficulties and possible solutions in the everyday medical practice.

Lecture 2.: Promoting behavior change. The development of the patient-physician collaboration.

Lecture 3.: Communication about functional complaints.

Lecture 4.: Communicating risks of treatments. Suggestive communication in medical practice.

Lecture 5.: Breaking bad news. Disclosing medical errors.

Practice: 6x3 hours Weeks 2-7 or 8-13 (times, venues and teachers to be announced)

Practice 1. Communication in everyday life and in the medical practice. The active listening. Communication aspects in empathy.

Practice 2.: Patient information, patient education. Communicating with patients with low health literacy.

Practice 3.: Promoting lifestyle change: motivational interview, shared decision-making.

Practice 4.: Seminar. Communicating bad news (practice). Suggestive communication techniques. Communicating about complementary and alternative therapies.

Practice 5.: Seminar. Communication with tense, hostile patients, strategies to prevent violence. Assertive communication.

Practice 6.: Seminar. Cultural competence of the doctor. Communicating with different age groups (eg. children, elderly).

Lecturers: Dr. Stauder Adrienne, Dr. Kollár János, Dr. Tóth Mónika Ditta, who are employees of Semmelweis University

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

It is possible to make up for ONE absence by participating in another seminar group the same week (only once in a semester, upon agreement with both teachers!)

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no assessment during the term time.

Number and type of individual assignments to be completed, submission deadlines:

No special study work required

Requirements for the successful completion of the course:

The participation at minimum 75% of the practice seminars is the prerequisite of the signature.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The oral exam is based on the course text book and the lecture handouts posted on the website.

Course text book:

Pilling, János: Medical Communication in practice. Medicina, Budapest, 2020.

Exam topics list A:

1. The significance of medical communication. Misconceptions and facts about medical communication.

(source: Pilling, J: Medical Communication in practice. Medicina, Budapest, 2020. pp.15-22.)

2. Doctor-patient consultation. (25-44.)

3. Promoting lifestyle change: the 5A and 5R methods; the transtheoretical model of behavior change. (47-52 and 58-62.)

4. Promoting lifestyle change: motivational interviewing. (52-57 and 61-62.)

5. Communication options for developing health literacy. (65-74.)

6. Communicating risks of treatments. (77-85.)

7. Shared decision making. (87-95.)

8. Suggestive communication in medical practice. (97-107.)

9. Communication with children. (109-118.)

10. Communication with older people. Communication with elderly having age-related mental disorders. (118-123 and 213-214)

11. Cultural competence of the physician. (127-135.)

Exam topics list „B”

12. Communication with patients using complementary and alternative treatments. (137-146.)

13. Communication about functional symptoms (149-164.)

14. Communicating about intimate issues. (167-183)

15. Communication with tense, hostile people. (185-196.)

16. Communication with depressed patients. Recognizing the risk of suicide. (200-207)

17. Communication with patients having anxiety symptoms or addictions. (207-213)

18. Breaking bad news. (221-237.)

19. Communication aspects of patient safety. (239-254)

20. Communication with people living with disabilities. (257-272)

21. Communication with the victims of abuse. (273-290)

22. E-health: use of technological tools in health communication. (291-307.)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

https://semmelweis.hu/magtud/files/2026/03/Tetelsor-alapfogalmakkal-es-kerdesekkel_ENG.pdf

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final mark is based on an oral exam. Two topics – one from A list and one from B list should be reported on, at least at satisfactory (2) level. The average of the marks given for each topic gives the final mark.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Artificial Intelligence Systems are not used in the teaching of the subject hence they are not applied.

Printed resources:

Type	Mandatory
Author	Pilling, János
Title	Medical Communication in practice
Publisher	Medicina, Budapest
Year of publication	2020

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szaknyelvi Intézet

Name of subject in Hungarian: Magyar orvosi szaknyelv I.
Name of subject in English: Medical Hungarian I.
Name of subject in German: Medizinische Fachsprache Ungarisch I.

Credit value of the course: 2
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	0.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKNYE906_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fogarasi Katalin (igazgató)
Course coordinator location of work, telephone availability: 06206701330
Course coordinator position: director, habilitated associate professor
Course coordinator Date and number of habilitation: 06.02.2023. 02. 06. 11/2023/habil.

Objectives of the course, and its place in the curriculum of the medical training program:

This is the first semester of a 4-semester medical language course. The aim of the course is to enable students to take anamnesis, to be informed about past illnesses and present complaints, and to have appropriate strategies for understanding the patient in clinical practice.

Students will get familiar with the instructions used in the examination of patients, be able to examine patients independently, and be able to give relevant instructions (examination of the thoracic organs, circulation, abdomen, musculoskeletal system, nervous system - based on the

medical chart)

Students will get familiar with the forms of medical documentation (fever chart, chart, etc...)

Students will be able to understand the symptoms of diseases – according to the list proposed by the clinics – in Hungarian and ask the patients relevant questions about their illness.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson, groupwork

Competencies acquired through completion of course:

Students will be able to communicate independently with patients, have appropriate strategies to understand patients' responses, and be able to ask relevant questions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

-

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum number of students: 5

Maximum number of students: 20

Anyone who meets the prerequisites can take the course.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Introduction, the alphabet, formal greetings.

Introduction. What would you like to drink?

What languages do you speak? Where are you from?

General personal information.

Numbers.

Time and date.

Oral test.

The human body; body parts.

Present complaints.

At the pharmacy.

Location of the pain. Where does it hurt?

Timing of the pain. When does it hurt?

At the clinic. Basics of history taking in Hungarian.

Oral test.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another group (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29). For more than the allowed number of absences, a medical certificate of long-term illness or hospitalization is required.

According to the Study and Examination Regulations (§ 28), three tardies count as one absence. Arriving 15 minutes later than the start of the lesson is considered tardiness.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two oral tests in weeks 7 and 14

Topic: the material covered

make-up and upgrade opportunities: to be arranged outside of class with the instructor, at the latest by the end of the first week of the examination period.

The two oral tests will be weighted equally, 50-50% of the term-grade.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Attendance at both oral tests and class attendance.

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another class (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29).

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

(There is no exam.)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum

requirements of the course.

Minimum requirement: Completing both oral interviews with a passing mark of at least 50%. This includes the ability to ask questions and understand answers related to the topics covered in the syllabus (based on English keywords).

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The average of the oral tests (including the test(s) for an upgrade) is the basis for the final semester grade, which may be modified by the assessment of class work. A minimum of 50% (pass) must be achieved in both oral tests. Tests for an upgrade may be made by the end of the first week of the examination period at a time arranged with the instructor.

Assessment of the two oral tests:

0-49% = fail (1)

50-59% = pass (2)

60-74% = fair (3)

75-89% = good (4)

90-100% = excellent (5)

-

as indicated above

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of artificial intelligence is neither relevant nor permitted in this course, as we focus on improving communication skills and do not employ AI in class, primarily for patient safety reasons.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student

consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szaknyelvi Intézet

Name of subject in Hungarian: Magyar orvosi szaknyelv II.
Name of subject in English: Medical Hungarian II.
Name of subject in German: Medizinische Fachsprache Ungarisch II.

Credit value of the course: 2
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	0.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNYE906_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fogarasi Katalin (igazgató)
Course coordinator location of work, telephone availability: 06206701330
Course coordinator position: director, habilitated associate professor
Course coordinator Date and number of habilitation: 06.02.2023. 11/2023/habil.

Objectives of the course, and its place in the curriculum of the medical training program:

This is the second semester of a 4-semester medical language course. The aim of the course is to enable students to take anamnesis, to be informed about past illnesses and present complaints, and to have appropriate strategies for understanding the patient in clinical practice.

Students will get familiar with the instructions used in the examination of patients, be able to examine patients independently, and be able to give relevant instructions (examination of the

thoracic organs, circulation, abdomen, musculoskeletal system, nervous system - based on the medical chart)

Students will get familiar with the forms of medical documentation (fever chart, chart, etc...)

Students will be able to understand the symptoms of diseases – according to the list proposed by the clinics – in Hungarian and ask the patients relevant questions about their illness.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson, groupwork

Competencies acquired through completion of course:

Students will be able to communicate independently with patients, have appropriate strategies to understand patients' responses, and be able to ask relevant questions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Hungarian I. [redacted]

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Students who did not obtain a grade in AOKNYE906_1A in the previous semester but have a signature, may take the exam-only course of AOKNYE906_1A and, in parallel, AOKNYE906_2A. They will be required to give an account of their knowledge and obtain a term grade in AOKNYE906_1A by the end of the academic term, at a date arranged with the instructor.

Students who did not obtain a grade in AOKNYE906_1N in the previous semester but have a signature, may take the exam-only course of AOKNYE906_1N and, in parallel, AOKNYE906_2N. They will be required to give an account of their knowledge and obtain a term grade in AOKNYE906_1N by the end of the semester at a date arranged with the instructor.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum number of students: 5

Maximum number of students: 20

Anyone who meets the prerequisites can take the course.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

weeks	*Topics: Hungarian language competencies in taking medical history in the following topics:*
1	Structure of the anamnesis. Why were you hospitalized?
2	Complaints and present symptoms. How do you feel? (abdominal pain, diarrhea, stool)
3	Complaints and past symptoms (dizziness, shortness of breath, swollen legs, cough)
4	Internal organs
5	Known diseases (diabetes, hypertension, asthma, allergies)
6	Known diseases (heart, lung, liver, biliary, kidney and thyroid problems)
7	Oral test
8	Medications (what, when, how much)
9	Medications and past surgeries. Allergies, intolerance, surgical complications
10	Past surgeries (what kind, when), transfusion
11	Smoking, alcohol, present occupation
12	Smoking, alcohol, past occupation
13	Revision, practice
14	Oral test

Instructors: Bor Gyöngyvér, Borda Szandra, Kovács Ildikó, Tick Vera.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another group (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29). For more than the allowed number of absences, a medical certificate of long-term illness or hospitalization is required.

According to the Study and Examination Regulations (§ 28), three tardies count as one absence. Arriving 15 minutes later than the start of the lesson is considered tardiness.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two oral tests in weeks 7 and 14

Topic: the material covered

Make-up and upgrade opportunities: to be arranged outside of class with the instructor, at the latest by the end of the first week of the examination period.

The two oral tests will be weighted equally, 50-50% of the term grade.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Attendance at both oral tests and class attendance.

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another class (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29).

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

(There is no exam.)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as

an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Minimum requirement: Completing both oral interviews with a passing mark of at least 50%. This includes the ability to ask questions and understand answers related to the topics covered in the syllabus (based on English keywords).

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The average of the oral tests (including the test(s) for an upgrade) is the basis for the final semester grade, which may be modified by the assessment of class work. A minimum of 50% (pass) must be achieved in both oral tests. Tests for an upgrade may be made by the end of the first week of the examination period at a time arranged with the instructor.

Assessment of the two oral tests:

0-49% = fail (1)

50-59% = pass (2)

60-74% = fair (3)

75-89% = good (4)

90-100% = excellent (5)

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see above

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of artificial intelligence is neither relevant nor permitted in this course, as we focus on improving communication skills and do not employ AI in class, primarily for patient safety reasons.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:

Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szaknyelvi Intézet

Name of subject in Hungarian: Orvosi terminológia
Name of subject in English: Medical Terminology
Name of subject in German: Medizinische Terminologie

Credit value of the course: 2
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	0.0	28.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNYE1125_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fogarasi Katalin (igazgató)
Course coordinator location of work, telephone availability: +36206701330
Course coordinator position: director, habilitated associate professor
Course coordinator Date and number of habilitation: 2023. 02. 06. 11/2023/habil.

Objectives of the course, and its place in the curriculum of the medical training program:

Medical Terminology is a course designed for medical students to ease their everyday studies by providing them with linguistic and terminological knowledge. The material is closely built on the terminology of Anatomy and the clinical terminology of the Musculoskeletal system.

Format of the course (lectures, group work, practical lessons, etc.):

group work, practical lesson

Competencies acquired through completion of course:

Students get familiarized with the most sufficient grammatical rules governing medical terminology and become able to decode anatomical names and formulate both Latin and Greek diagnostic phrases.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Min. 5 students required – max. 20 students allowed.
Obligatory for all registered students. Application via Neptun. Groups are announced to each course group of first-year students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1 Latin nouns in Anatomy
2 The dictionary form of Latin nouns
3 Latin possessive phrases in Anatomy
4 The plural form of Latin nouns
5 The dictionary form of Latin adjectives and their agreement to nouns
6 The dictionary form of Latin adjectives and their agreement to nouns
7 test 1
8 Anatomical adjectives from nouns
9 Anatomical adjectives from nouns
10 Muscle names
11 Muscle names
12 Diagnostic terminology - musculoskeletal disorders
13 Diagnostic terminology - musculoskeletal disorders
14 test 2

Instructors: Bakó Alexandra, Gonda Attila, Sipos Ferenc Norbert, Balázsné Hulyák Edit, Báthory

Orsolya, Liczek Barnabás Erik, Páczelt Ádám Ferenc, Preisendorf Renáta Mária

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

A maximum of 3 absences is allowed (3x90 minutes); making up the material of the missed classes is possible via assignments or taking the class in a parallel group covering the missed material (maximum two times).

According to the Study and Examination Regulations (Article 29), the instructor may refuse to sign or provide a term grade, if the student exceeds their absence over 25% of all of the practical sessions. For more than the allowed number of absences, a medical certificate of long-term illness or hospitalization is required.

According to the Study and Examination Regulations (Article 28), three late arrivals count as one absence. Arriving 15 minutes later than the start of the lesson is considered late arrival.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Midterm tests (7th, 14th week)
Topic: Based on the curriculum
Making up for the missed 1st test and retake (max. 2 times) must be scheduled with the course instructor.

Number and type of individual assignments to be completed, submission deadlines:

Moodle homeworks (deadline: last day of the term time)

Requirements for the successful completion of the course:

Attendance at lessons and written tests is obligatory. Students are allowed to have three absences per semester. Students who miss more than 25% of the practical classes cannot receive a signature (Study and Examination Regulations Article 29.2a).

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Based on the curriculum

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Student performance is assessed as follows:
0–49% = 1 (fail)
50–60% = 2 (pass)
61–75% = 3 (fair)
76–89% = 4 (good)
90–100% = 5 (excellent)

Students may receive an offered grade if, based on the two midterm exams and the Moodle assignments, they achieve a grade of good (4) or excellent (5).

Practical exam (60%). The minimum pass mark for the practical examination to be taken during the examination period is 50%.

Practical exam (60%), midterm (30%), moodle homeworks (10%)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI tools is not permitted during assessments.

Printed resources:

Type	Mandatory
Author	Alexandra Bakó
Title	Medical Terminology
Publisher	manuscript (available on the moodle course of the subject in pdf)
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Anatómiai, Szövet- és Fejlődéstani Intézet

Name of subject in Hungarian: Mikroszkópos Anatómia és Fejlődéstan I.
Name of subject in English: Microscopic Anatomy and Embryology I.
Name of subject in German: Mikroskopische Anatomie und Embryologie I.

Credit value of the course: 5
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	1.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANT854_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Alpár Alán
Course coordinator location of work, telephone availability: Semmelweis University, Department of Anatomy, Histology and Embryology, +36 1 459 1500 / 53609
Course coordinator position: Professor, Head of Department
Course coordinator Date and number of habilitation: Karolinska Intézet, Svédország, 2012, Honosítva Semmelweis Egyetem, 2014, száma: 13/2014

Objectives of the course, and its place in the curriculum of the medical training program:

Demonstration of the fine structure of cells and tissues composing the organs of the human body specifically to provide the future clinicians/medical doctors with a valid body of information describing the microscopical elements of clinically significant morphological structures (including cell biology, general histology and the histology of organs).

Format of the course (lectures, group work, practical lessons, etc.):

Teaching is done in the form of lectures and histology laboratory classes

Competencies acquired through completion of course:

Understanding the microscopical composition of the human body in order to draw parallels with macroscopical anatomy. Clear understanding of histological structure and function. Ability to identify basic structural elements within the tissue specimen. Identification of general directions/landmarks within digitized tissue slide.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Cell Science

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

In case the semifinal examination is unsuccessful, registration for Microscopic Anatomy and Embryology II. without fulfilling the prerequisite is not possible. The prerequisite for registration is a successful (at least a mark 2) from Microscopic Anatomy and Embryology I.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Obligatory for all registered students, on the basis of registration via the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lecturers

Dr Alpár Alán, Dr Ádám Ágota, Dr Székely Andrea Dorottya, Dr Barna János, Dr Zsiros Viktória, Dr Katz Sándor, Dr Horváth András, Dr Dóra Dávid, Dr Csáki Ágnes, Szászné Dr Kocsis Katalin, Dr Kozsurek Márk, Dr Hanics János, Dr Rácz Éva, Dr Puskár Zita, Dr Várnainé Dr Tóth Zsuzsanna, Dr

Nagy Nándor, Dr Adorján István, Dr Vereczki Viktória

List of lectures

1. week: Epithelial tissues, cell contacts, intercellular connections. Glandular epithelium

2. week: Connective tissue cells and fibres. Extracellular matrix

3. week: Supporting tissues (cartilage, bone)

4. week: Ossification, bone remodelling. Blood, erythropoiesis, leukopoesis

5. week: Muscle tissues

6. week: Histology of lymphatic organs. Cellular components of lymphatic tissue. Thymus, tonsils, MALT. Structure and circulation of lymph nodes and spleen

7. week: Histology of the tongue and teeth. Histology of the esophagus

8. week: Histology of the stomach. Microscopical anatomy of the small and large intestines

9. week: Histology of the liver, gall bladder and pancreas

10. week: Histology of the airways

11. week: Miscroscopical anatomy of urinary organs

12. week: Histology of the male genital system

13. week: Histology of the female genital system I.

14. week: Histology of the female genital system II. Placenta, mammary gland

Histology laboratories

1. week: Introduction, epithelial tissues

2. week: Connective tissue cells and fibres.

3. week: Blood . Cartilage, bone

4. week: Bone formation. Nerve tissue

5. week: Smooth, skeletal and cardiac muscle types. Histology of vessels

6. week: Lymph nodes, tonsils, thymus, spleen

7. week: Lip, tongue, lingual papillae. Tooth bud

8. week: Esophagus, stomach. Duodenum, jejunum, ileum, colon

9. week: Liver, gall bladder, pancreas

10. week: Larynx, trachea, lung

11. week: Urinary system

12. week: Male genital system

13. week: Female genital system

14. week: Placenta, revision

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation in histology laboratory classes is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**. Attendance/absence will be recorded in the histology laboratory classes.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The knowledge of students will be checked in written (electronic) midterm tests. Histology midterms are written examinations organised as e-learning type (Moodle) examination composed of images and theory questions, where a valid SeKa account (including user name&password) is required. Passing rate: 50%
Midterm 1 – week 5 (basic tissues); Midterm 2 – week 11 (histology of internal organs)

Attendance is obligatory at the two midterm tests. Students absent from the tests should reattend at one of the offered retakes (2 occasions). (One of the midterm tests should be a pass to gain acceptance of the semester)

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Active participation in at least 75% of histology laboratory sessions, including the midterm tests and the successful passing (with at least a 2) of one of the two midterm tests is obligatory for every student. Students absent from the tests or having two failed tests should reattend the offered retakes (2 occasions).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Topic list for the semifinal examination:

Microscopic Anatomy and Embryology I.

General Histology

Concept of basic tissues

Definition and classification of epithelial tissue

Simple epithelia

Stratified epithelia

Membrane specializations of epithelia

Glandular epithelia

Pigment epithelium, sensory neuroepithelium

Cells of connective tissue

Ground substance and fibres of connective tissue

Types of connective tissue

Blood and the corpuscular elements of blood

Histology of the bone marrow, maturation of erythrocytes and platelets

Differentiation of granulocytes, lymphocytes and monocytes

Histology of cartilage

Histology of the bone tissue

Intramembranous ossification

Endochondral ossification

Growth and remodeling of bone

Smooth muscle and myoepithelial cells

Skeletal muscle tissue

Cardiac muscle tissue

Nervous tissue (peripheral nerves)

Histology of organs

Histological structure of arteries and arterioles

Composition of capillaries and veins

Lymphatic tissues in general, cellular components

Histological structure of lymph nodes

Spleen (fine structure and circulation)

Thymus

Tonsils, MALT

Wall structure of hollow organs

Histology of the lip, tongue and teeth

Structure of the esophagus

Histology of the airways (epiglottis, larynx, trachea, lung)

Histology of the stomach

Structure of the small and large intestines

Histology of the liver and biliary passages including the gall bladder

Histology of the pancreas

Histology of the kidney and the urinary passages (ureter, urinary bladder)

Histology of the testicles togeteher with the epididymis

Histology of the prostate, seminal vesicle, spermatic cord

Histology of the penis

Histology of the ovary, uterine tube; corpus luteum

Histology of the uterus

Histology of the vagina

Placenta, umbilical cord

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Identification and general features of the cells and tissues / organs illustrated on the slides listed below:

Simple epithelial tissues

1. Simple sqamous epithelium (pancreas, Toluidine blue (TB)

2. Simple cuboidal + columnar epithelium (biliary vesicle, human, HE)

3. Pseudostratified simple columnar epithelium - Trachea (human, HE)

Simple and stratified epithelial tissues

4.a Transitional epithelium - Urinary vesicle (monkey, HE)

5. Stratified non-keratinizing squamous epithelium - Esophagus: upper and middle portions (human, HE)

6. Stratified keratinizing squamous epithelium - Plantar skin (human, HE)

7.a Stratified columnar epithelium - Penis (human, HE)

Glandular epithelium

3 Goblet cells (Trachea HE)

10.a. Merocrine secretion (seromucous) - Submandibular gland (human, HE)

11. Apocrine secretion - Axillary skin (human, HE)

12. Holocrine secretion - Hairy skin (HE)

Connective tissues cells, fibres

20a. Umbilical cord (newborn human, HE)

6. Plantar skin (human, HE)

21. Lymph node (semithin section; rat, toluidine blue

24. Liver (human, silver nitrate impregnation)

25.b Aorta (resorcin-fuchsin)

Types of connective tissue

20a Umbilical cord (newborn human, HE)

6. Plantar skin (human, HE)

26. Tendon (human, HE)

10.a. Submandibular gland (human, HE)

27 Uterus (human, HE)

28. Blood smear (May-Grünwald-Giemsa = MGG)

Supporting tissues (cartilage, bone)

30. Hyaline cartilage (human costal cartilage, HE)

32. Auricule (human, Verhoeff's stain)

33. Meniscus (human, HE vertebra+intervertebral disc)

34. Cross section of a long bone (human ulna, unstained

35. Compact bone (cross section, Schmorl's picrothionin stain)

36. Compact bone (longitudinal section, Schmorl's stain)

37. Trabecular bone, bone marrow, fibrocartilage (body of vertebra, HE)

Types of ossification, bone restructuring

38.b Intramembranous ossification (calvary, human, AZAN)
39. Endochondral ossification (Week 17 human fetus, longitudinal section of developing foot, HE)

Nerve tissue

40. Peripheral nerve (sciatic nerve, longitudinal and cross sections, human, HE)

41. Multipolar nerve cell (celiac ganglion, human, Bielschowsky's impregnation)

Smooth, skeletal and cardiac muscle types

50. Skeletal muscle (iron hematoxylin)

5. Smooth muscle and visceral striated muscle (esophagus: upper and middle portions, human, HE)

51. Cardiac muscle (human, HE)

Histology of blood vessels

25a. Large artery of elastic type (aorta, human, HE)

60. Medium size artery and vein (femoral vessels, Movat)

61. Small arteries, arterioles and small veins, venules (tongue, human, HE)

1. Capillaries (pancreas, semithin section, rat, toluidine blue)

Lymphatic organs

100a Thymus (HE)

101. Palatine tonsil (HE)

102. Lingual tonsil (HE)

103. Pharyngeal tonsil (HE)

Gastrointestinal tract

110. Lip (Krutsay trichrome)

61. Tongue: *filiform and fungiform papillae* (HE)

111. Tongue; foliate papillae (human + monkey or rabbit, HE)

112. Tongue: *circumvallate papillae* (HE)

120.a, b Ground tooth (unstained)

121. Developing tooth (AZAN)

10c. Submandibular gland (Movat pentachrom)

51. Parotid gland (HE)

122. Sublingual g+ submandibular glands (HE)

5. Esophagus: upper and middle portions (human, HE)

130a. Stomach, fundus (HE)

131. Gastro-esophageal junction - cardia (HE)

134. Pylorus (gastroduodenal junction, HE**)**

132.a Duodenum (HE)

135a Jejunum (HE*)*

136a Ileum (Peyer's patches, human, HE)

137. Colon (human, HE)

138a. Vermiform appendix (human, HE)

140.a,b Liver (human, HE)

141 Liver (human, trichrome)

70. Pancreas (HE)

24. Liver (human, silver impregnation)

2. Biliary vesicle: fundus & neck (human, HE)

Respiratory system

150. Epiglottis (HE)

151. Larynx (HE)

3. Trachea (HE)

152. Lung (HE)

153. Lung (toluidine blue)

Urinary system

160. Kidney (HE)

161. Kidney (semithin, toluidine blue)

162. Ureter (HE)

4.a,b Urinary vesicle (monkey, HE)

Male genital system

170.a, b Testicle (human,HE)

171.c Epididymis (human, HE)

172. Spermatic cord (human, trichrome)

173. Prostate (aged, human, HE)

174.a,b Seminal vesicle (HE)

Female genital tract

180. Ovary (rabbit, HE)

181.a, b Corpus luteum (human, HE)

182. Fallopian tube, isthmus and ampulla (human, HE)

27. Uterus, proliferation's phase (human, HE)

183. Uterus, secretory phase (human, HE)

23a. Vagina (human, trichrome)

20a. Umbilical cord of a newborn (human, HE)

186a. Placenta (mature (delivered), human, HE)

184. Mamma non-lactans (HE)

185. Mamma Lactans (HE)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Semifinal examinations are composed of written theoretical and oral practical parts. :

1. Written pretest (e-learning module – 40 simple and multiple choice theory questions, passing rate: 60%)
2. Microscopic Anatomy - identification of structures on digitized tissue slides - including relevent theoretical questions from the subject matter of the semester

Evaluation of the written test: passing rate 60% - pass (2), 70% - accepted (3), 80% - good (4), 90% - excellent (5).

In case the result of the test falls below 60%, the mark is fail (1), but the students may continue with the oral examination.

Students are given separate marks for each part of the examination. When failing at the practical part, the written test will not have to be repeated in case the result was a 4 or a 5 only. Upon the termination of the examination the Head of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

Students may earn an exemption from the written part of the semifinal examination if the average of the midterm marks is at least 4,00. They may be exempted with a 4 or a 5 calculated from the two written tests (4+4, 3+5, 4+5, 5+5). These students will have to sit only for the oral part of the semifinal examination.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory
Author	MH Ross and W Pawlina

Title	Histology: A Text and Atlas: With Correlated Cell and Molecular Biology
Publisher	Wolters Kluwer , ISBN 9781451187427
Year of publication	2015

Type	Recommended
Author	M. Réthelyi and J. Szentágothai
Title	unctional Anatomy, Histology and Embryology for medical and dental students
Publisher	Medicina
Year of publication	2018

Type	Mandatory
Author	Á. Nemeskéri, V Zsiros
Title	Histology laboratory manual I.
Publisher	Apáthy István Alapítvány
Year of publication	2024

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés I.
Name of subject in English: Physical Education (PE) I
Name of subject in German: Körpererziehung (Sport) I

Credit value of the course: 1
Semester: 1st semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI1093_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

-

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 1. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 25 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st Week: General information

Health and Safety, Fire and Environmental protection. The mid-year adoption requirements, the construction of the classes and the presentation of the university recreational and sports opportunities for extra – curricular activities. Heart rate measurements, Ruffier test and evaluation of the results.

2nd Week: Athletic

Exercises to improve stamina..Preferably outdoors, on grass ground running, with the aim of developing good running and breathing techniques.

3rd Week: Flying disc

Introduction the basic of frisbee rules and practicing the basic technical elements in pairs and game situation.

4th Week: Core traning

Postural correction exercises using the own bodyweight especially to strenghten the core muscles to prevent the health of the vertebrae.

5th Week: Agility ladder

Introducing different running, skipping techniques using agility ladder.

6th Week: Football

Introducing the basic technical elements of football. Single exercises and exercises in pairs to improve the ball skill development.

7th Week: Skipping rope

Endurance and coordination developing exercises at different levels using skipping rope.

8th Week: Circuit training

Bodyweight exercises and exercises with basic equipment to learn the correct functional movement pattern.

9th Week: Ball skill developing exercises

Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention.

10th Week: Meta

Introducing the game and the basic rules. Aim to improve the ball skill development, improve reaction time, speed and explosiveness.

11th Week: Obsticle course

To complete a built up obsticle course using differend creepping- climbing,hovering, pulling,skipping, throwing techniques for general skill developement.

12th Week: Tennis

Introducing the basis technical elements of tennis (forehand and backhand shot), improving hand-eye coordination.

13th Week: Badminton

Introducing the basic technical and tactical elements of badminton. Introducing the basic rules and game.

14th Week: Dumbbell exercises

Strenghtening exercises with dumbbells.

Other courses with overlapping topics (obligatory, optional, or elective courses) in

interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics

accepted as an exam)

completion of a practical exercise

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Rating 5 grades

A student can earn an excellent (5) practical grade if they compete in an event at the EUSA or MEFOB competitions, or the Medical Cup.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés II.
Name of subject in English: Physical Education (PE) II
Name of subject in German: Körpererziehung (Sport) II

Credit value of the course: 1
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI1093_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lesson

Competencies acquired through completion of course:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 2. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 25 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st. week: General information: Information on the semester acceptance requirements, the criteria for obtaining a practical grade, the structure of the classes, and the university's extracurricular sports opportunities.

2nd. week: Basketball: Dribbling, passing and shooting drills in order to improve fine motor skills.

3rd.week: Bench exercises: Using the dimensions of the sport bench by running, skipping, jumping, lifting etc. exercises.

4th.week: Rubber band exercises: Strength and coordination training by taking advantage of the elastic features of the object.

5th.week: Floorball: Introducing the sport to the Students by exposing the major rules, proper technique of stick

handling. Passing and shooting drills.

6th.week: "Double-trouble": Strength and stretch training in pairs by applying different starting positions. Functional movements executed in pairs.

7th.week: Volleyball: Introducing the fundamental elements of the game (serves, hits, digs etc.) Exposing the major rules and techniques.

8th.week: Frisbee: Taking the next step into the game by applying tactical elements in match situations.Passing and catching drills in different moving forms.

9th.week: Ruffier test and ball skill developing exercises: Compare the results with the previous test to bring the importance of the health of the cardiovascular system to the attention. Sport games on the side (Dodge-ball, King of the court etc.)

10th.week: Circuit training: General strengthening drills at each stations. Applying different intensity level, regarding the various conditions of the Students.

11th.week: Tennis: Involving the new strokes into the learning process: form of serves, the volleys, the smash etc.

12th.week: Badminton: Introducing the new technical and tactical elements of the game (drop shots, lobs, smash etc.) Exposing the rules of doubles.

13th.week: Core exercises: Relative (own body) weight exercises applying different equipment (hand weights, rubber band etc.) with the aim of postural correction, by strengthening the core muscles in order to avoid spinal deformations.

14th.week: Box exercises: Applying the sport box by jumping, lifting, slaloming, carrying (etc) it.By this enhance the level of strength and stamina.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men's and women football, handball, basketball, volleyball, waterpolo)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

completion of a practical exercise

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum

requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Rating 5 grades

A student can earn an excellent (5) practical grade if they compete in an event at the EUSA or MEFOB competitions, or the Medical Cup.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Urológiai Klinika

Name of subject in Hungarian: Nyári gyakorlat
Name of subject in English: Summer Practice - Nursing
Name of subject in German: Praktikum im Sommer

Credit value of the course: 3
Semester: 2nd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
168.0	0.0	168.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKNSG1127_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Nyirády Péter (Klinika igazgató)
Course coordinator location of work, telephone availability: Urológiai Klinika 20/825-8762
Course coordinator position: egyetemi tanár, klinika igazgató
Course coordinator Date and number of habilitation: 283/2009

Objectives of the course, and its place in the curriculum of the medical training program:

To introduce and familiarize the students with the organizational structure of the clinic/hospital and the functioning of the department. To learn the process of patient care and nursing through practical training. To acquire basic skills in everyday nursing interventions that will be used during further practice placements and after graduation.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Students learn how to do surgical scrubbing and hand disinfection in daily practice.

They learn the importance of patient identification and apply the procedure properly.

They learn and apply nursing admission of the patient. Students are aware of the details of care documentation and their significance.

Students are able to work in a team.

They master communication skills with patients and colleagues and apply them in practice; assess the basic nursing needs of the patient, and meet the patient’s needs.

Students can detect, monitor and document patient parameters (pulse, blood pressure, respiration, temperature).

Students learn to administer subcutaneous and intramuscular injections, to take blood samples, to determine bedside blood glucose, and to secure venous access under supervision. They learn to recognize possible complications.

They get a basic knowledge of CPR and ability to start basic CPR.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

-

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

The number of students determined by the practice placement site in the NEPTUN system. Valid Occupational Health Aptitude Test Certificate, Occupational Fire and Environmental Safety Training Certificate.

Nursing practice is only available in the University's Clinical units and in the departments of hospitals accredited by the University.

For international students from training sites not accredited by the University, a letter of acceptance must be submitted to the course coordinator for practice placement authorization. The letter of acceptance must include the name of the institution, as well as the name and position of the person responsible for the training. All documents must be submitted in a clear and legible format.

Nursing practice can only be completed in a clinical or hospital ward by international students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Week 1: Ward operation. Observation of nursing activities, assessing and documenting nursing needs. Learning about the contents of nursing documentation, how to complete the patient observation chart and the nursing chart, how to use marking methods. Learning to create a safe environment for the patient. Active involvement in the daily care of patients with the help of nurses. Observation and mastering of the communication with patients.

Observation of laboratory and other examination procedures, observation of patient preparation for examination/surgery. Use of personal protective equipment in the ward, hygiene and disinfectant hand washing, learning aseptic and antiseptic techniques.

Week 2: Nursing patient admission, Independent performance of body weight, height, blood pressure, pulse, temperature, breath rate, and blood glucose measurement, needs assessment and documentation. Assessment of nutritional and fluid intake needs. Learning to create proper environment for a new patient. Observation and marking of the patient's secretions. Assistance at ECG examinations. Administering medication, collecting blood samples, administering injections, securing an IV line, preparing for and monitoring infusion and transfusion therapy, and recognizing possible complications. Administering subcutaneous and intramuscular injections, determining bedside blood glucose under nursing supervision.

Week 3: Blood collection, injections and securing an IV line under nursing supervision. Continued practice of the tasks learned in weeks one and two. Learning the process, the protocol and the tools available of basic CPR.

Week 4: Continued practice of the tasks learned in the first three weeks.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of

absence justification:

Two days of absence are allowed, no further absences can be made up.

Conditions for exemption from the practice placement:

Minimum 6-month work experience as a nursing assistant or nurse.

Completed training at a healthcare vocational school, or proof of successful completion of a sectoral professional basic examination. Proof of successful completion of the basic examination of studies at the Faculty of Health Sciences.

Written confirmation of a completed nursing practice placement if the student transfers from another medical university.

Required documents:

Application for admission to a compulsory subject, a certificate of employment, or a certificate of a basic examination/qualification, or proof of completed practice placement.

The required documents must be sent to the course coordinator

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Regular attendance during the practice placement.

Completion of the checklist signed by the trainer.

Medical Students' Activities List

Activity	Observed	Executed with assistance	Executed independently (compulsory element)

Patient admission / taking nursing history	X	X	
Understanding and keeping patient documentation	X	X	X
Introducing and organizing the patient’s environment	X	X	
Measurement of vital parameters	X	X	X
Taking samples of the patient’s secretions (urine, stool, sputum, blood)	X	X	X
Preparing the patient for a local examination	X	X	
Preparing the patient for an off-site examination	X	X	
Meeting the basic care needs of a patient	X	X	
Bedding – empty bed	X	X	X
Bedding – bed occupied by an inpatient	X	X	
Moving the patient	X	X	
Hygiene and disinfectant hand washing	X	X	X
Adherence to the rules of asepsis and antisepsis	X	X	X
Use of sterile and non-sterile protective gloves	X	X	X
Patient assessment	X	X	
Carrying out ECG examinations	X	X	X
Determining bedside blood glucose	X	X	X
Preparing and administering SC injections	X	X	X
Preparing and administering IM injections	X	X	X
Administering medication to the patient	X	X	
Preparing infusion therapy	X	X	
Securing an IV line	X	X	
Preparing oxygen therapy	X	X	
Transfusion procedure	X	X	
Resuscitation BLS, AED	X	X	X
Pain assessment, pain relief	X	X	
Handling drains and tubes	X	X	

Preparation for bladder catheterization	X	X	X
Preparing a cleansing enema	X	X	X
Enteral feeding	X	X	
Perform wound care and wound dressing	X	X	
Decubitus risk assessment, prevention and treatment	X	X	
Preparing the patient for a surgery	X	X	
Post-operative patient monitoring	X	X	
Getting involved in teamwork	X	X	X
Communication with the patient	X	X	X
Patient education, healthy lifestyle education	X		

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

A topic is randomly selected from the list of examination topics. The student performs the task specified in the selected topic. The student assesses the patient's nursing needs, detects, observes and documents the patient's parameters (pulse, blood pressure, temperature, respiration) in relation to the selected topic.

EXAMINATION TOPICS

gatekeeper questions (these obligatory questions assess fundamental knowledge; an appropriate answer will qualify the candidate for taking the examination):

1. Describe the procedure of antiseptic handwashing and scrub yourself.

2. Explain the importance and procedure of patient identification.

1. Describe the disinfection methods used for general and basic care instruments and instruments in a hospital environment and explain the concepts of asepsis and

antisepsis.

2. Describe the daily workflow in a hospital ward and the content of the nursing documentation. Task: A new patient is admitted to the ward. Place the patient in the ward, and record the patient's nursing history and any additional procedure on admission.

3. Do the preparations for bedding for a bedridden patient and for washing the patient. Clean and tidy the bed and its environment. Describe the patient's needs in terms of hygiene, comfort and safety.

4. Prepare to meet the toileting needs of a bedridden patient and carry out the related nursing task. Describe the tasks regarding quantitative and qualitative monitoring of the secretions, and record these on the nursing chart and in the nursing documentation.

5. When admitting a new patient, measure the weight and height of the patient (BMI). Take the temperature, breath and pulse count. Prepare to monitor the patient’s blood pressure, do the measurement, and record the readings of all the above tests on the nursing chart and in the nursing documentation.

6. Describe the options for meeting the patient's nutritional and fluid intake needs. Describe nursing tasks related to enteral nutrition and adequate fluid intake. Explain the management of the fluid chart.

7. Prepare to administer subcutaneous and intramuscular injections. Explain how to properly do the injection and complete the related documentation.

8. Describe the options for mobilizing the bedridden patient in bed. Do the mobilization while respecting the comfort and safety needs of the patient.

9. Prepare the patient for an invasive intervention that requires anesthesiology.

10. Describe the aspects of pre- and post-operative patient observation.

11. Place an elastic bandage on the patient's body and complete the related documentation.

12. Prepare for blood sampling and perform the procedure under the supervision of a nurse. Explain the possible complications of blood draw, possible sampling errors, the handling of the blood sample and the relevant documentation. Describe the sampling equipment necessary for the procedure.

13. Prepare the patient for venipuncture (cannulation). Describe the method of fixing the cannula, monitoring, and possible complications. Insert the cannula under the supervision of the nurse and complete the related documentation.

14. Prepare to administer the prescribed intravenous infusion. Assemble the infusion set. Complete the related documentation.

15. Prepare for blood glucose monitoring at the bedside. Explain the readings of the device that indicate low or high values. Enter the readings in the nursing chart and the nursing documentation.

16. Prepare to insert a permanent catheter. Explain the rules and the possible complications. Complete the related documentation.

17. Describe the general and specific diagnostic procedures of the relevant hospital ward and the necessary preparations for them. Do a 12-lead ECG on a patient with standard and chest leads. Explain the rules for placing the electrodes on the patient’s body.

18. Describe the options and methods for Risk assessment of pressure ulcers. Do the risk assessment and complete the related documentation. Describe the options for prevention.

19. Prepare for wound management and for changing the dressing. Assess the condition of the wound. Complete the related documentation.

20. Describe the rules governing dosage, and the related tasks of the nursing staff regarding sorting and administration. Explain specified methods of administration (e.g. drops or inhalation) and describe how to do them. Administer the medication and complete the related documentation.

21. Describe the personal protective equipment used in the clinical environment and how to use it. Explain hazardous waste management. Explain the importance and possibilities of preventing nosocomial infections. Demonstrate the use of sterile and disposable rubber gloves.

22. Describe the symptoms and signs of circulatory and respiratory arrest. Prepare to start CPR, and describe the steps of Basic Life Support.

23. Prepare to determine the patient's blood group and to administer transfusion. Describe the related nursing tasks.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Completion of the tasks listed in the checklist, certified by the practice instructor. Preparation of the appropriate tools for the items listed in the specified practical topics, knowledge of the intervention process, and the practical execution of activities that can be performed independently. Knowledge and use of the professional terminology acquired during the practice. Full understanding and

precise execution of the hand hygiene procedure.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Regular attendance at the practice is a prerequisite for signature, and the practical execution of the selected topic is graded with a mark of excellent (5) – pass (3) – fail (1). When grading, the student's proactive behavior, diligence and attitude during the practice placement may be taken into account.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Virginia Allum, Patricia McGarr
Title	Cambridge english for nursing
Publisher	Cambridge University Pres
Year of publication	2008

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Családorvosi Tanszék

Name of subject in Hungarian: Bevezetés a klinikai orvoslásba
Name of subject in English: Introduction to Clinical Medicine
Name of subject in German: Einführung in die klinische Medizin

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Credit value of the course: 2
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
30.0	12.0	18.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKCSA1202_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Torzsa Péter (tanszékvezető)
Course coordinator location of work, telephone availability: SE Faculty of medicine, Dpt. of Family Medicine +36-1-355-8530
Course coordinator position: Tanszékvezető egyetemi tanár
Course coordinator Date and number of habilitation: 2020.07.21, 11/2020

Objectives of the course, and its place in the curriculum of the medical training program:

Presenting patients. Case reports. Referral of patients.
The medical consultation. Communication with the patient and his/her relatives. Effective cooperation with patients. Means to improve compliance.
Differential diagnostics. Using basic diagnostic means and tools and assessing test results.
Most frequent diseases in the clinical department and the general practitioner’s office. Care of frequent chronic illnesses.

Preventive approach, screening procedures. The importance of prevention.
Holistic patient care, managing complex bio-psycho-social-health problems.
Development of professional consciousness. Teamwork in medicine.
Overview of the research activity at the clinical department. Raising interest in participating.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures are held in the Basic Medical Science Center (EOK Tűzoltó utca) or at Nagyvárad tér (NET) Lecture Halls.
The practicals are held all around the University's different departments and contracted GPs' surgeries in Budapest.

Competencies acquired through completion of course:

Basics of medical interviewing, making a rapport with patients.
Exploring anamnesis and basic communication techniques.
Approach to the physical examination, basic skills.
Key aspects of differential diagnostics and clinical decision making.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Introduction to Patient Care (AOKCSA1203_1A)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum 24, maximum 432 (24x18).

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1-6th week LECTURES (6x 2 lessons):
Internal medicine (Prof. Igaz Péter), public health (Terebessy András), dermatology (Tóth Veronika), orthopedics (Stubnya Bence), pulmonology (Horváth Gábor and Hidvégi Edit) and neurology (Tóth Adrián).

8-13th week PRACTICALS (6x 3 lessons):
family medicine, internal medicine, surgery, transplantation, psychiatry, obstetrics and gynecology, orthopedics-traumatology, cardiology, dermatology, urology, pulmonology, neurology, neurosurgery, medical rehabilitation, genomic medicine, ORL and public health practicals according to the schedule.
Week 14: Makeup classes and consultation.
Essay work and attendance papers is required uploaded on MOODLE platform by end of semester.

TUTORS of Family Medicine Department - Becze Ádám, Cserti Árpád, Eörsi Dániel, Prof. Kalabay László, Karai Gábor,
Lakó-Futó Zoltán, Makkos András, Nemcsik János, Perjés Ábel, Vörös Krisztián, Prof. Torzsa Péter, Xantus Gábor, Zsuffa János.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

It’s compulsory for the student to attend 75 percent of the training sessions. If needed, the student can join another training group to meet this requirement. Extra makeup classes are available on Week 14.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

One short case study of a patient whom the student have met during the practicals, conjured and uploaded until the last day of
the semester.

Requirements for the successful completion of the course:

Certified attendance: It’s compulsory for the student to attend at least 75 percent of the training sessions.
Uploaded essay on MOODLE that meets the course criteria.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Short case study (essay, typed, at least 2400 characters without spaces) of a specific patient mentioned OR whom the student met chosen from any practice. An own, personal opinion and experience, impression must be added about meeting, contacting the patient, about the case /the disease presented.

Recommended form of a case study:
Patient's personal data is NOT required, NOT allowed, please use just monograms, or fake names.
Age, gender, social background (family, status: student/job type/retired).
Anamnesis – previous surgeries, hospital cares, chronic diseases known.
Current complaints, observable signs of illness.
Diagnostic tests, methods done and/or planned.
Diagnosis or illness(es) considered.
Basic/short plan of further patient care – e.g. medication, surgery, other therapies, followup.
+ ADD OPINION: Personal impression and reflective thoughts about the patient as a person who is in this condition, who lives with the disease!

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

75% participation of all training sessions. Total: (12+18=)30x 45 min class.

Essay evaluation:
Grade 1: failing to hand in the essay on deadline, the number of characters is under 2400, absence of a certain patient's case study, plagiarism
Grade 2: there is a proper case study, but the formal requirements are missing

LINK of the course on the Dpt.'s website: semmelweis.hu/csot/en/english-program/english-program-second-year/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grading is based on the essay according to the following criteria:

Grade 1: failing to hand in the essay on deadline, the number of characters is under 2400; absence of a certain patient's case study, plagiarism

Grade 2: there is a proper case study, but the formal requirements are missing
Grade 3: case study with too general drafting, without any personal experience
Grade 4: a proper case study with 1-2 not too significant professional or formal mistake
Grade 5: proper case study with precise and accurate wording, personal opinion about the patient’s case

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Biokémiai Tanszék

Name of subject in Hungarian: Orvosi Biokémia II
Name of subject in English: Medical Biochemistry II
Name of subject in German: Medizinische Biochemie II

Credit value of the course: 5
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	3.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBMT794_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Csanády László
Course coordinator location of work, telephone availability: H-1094 Budapest, Tűzoltó u. 37-47. tel: +36-1-459-1500#60010 E-Mail: csanady.laszlo@semmelweis.hu
Course coordinator position: intézetigazgató
Course coordinator Date and number of habilitation: 2013/341

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the course is to provide a comprehensive molecular-level description of metabolic processes occurring in the human body, with particular emphasis on their medical relevance. The main topic of the semester is intermediary metabolism, namely the metabolism of amino acids and nucleotides following the carbohydrate and lipid metabolism covered in Medical Biochemistry I, including the integration of these processes within individual organs and in the organism as a whole.

The course also aims to develop skills in medical students that enable them to interpret physiological processes in the human body at a complex, molecular level. During practical sessions, students acquire clinical biochemical methods through case-oriented diagnostic approaches, while also addressing rapidly developing and promising areas (“the medicine of tomorrow”). The medical biochemical focus of the course derives from presenting the molecular basis of diseases that represent significant public health challenges (cardiovascular, neurodegenerative, and oncological diseases), with particular emphasis on potential molecular targets for therapy.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and Practices

Competencies acquired through completion of course:

Knowledge of the structure, interactions, and reactions of biologically important molecules of particular medical relevance, as well as an understanding of inter-organ interactions and the higher-level integrated regulatory functions of the human body, are essential for understanding physiological and pathological processes and, consequently, for making well-founded medical decisions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biochemistry I (AOKBMT1099_1A)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

obligatory subject

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures

1. Nitrogen balance. Protein digestion. Function and regulation of proteases. Absorption of amino

acids, amino acid transporters.
Prof. Kraszimir Kolev

2. Amino acid degradation. Ammonia elimination. Reactions and regulation of the ornithine cycle.
Prof. Kraszimir Kolev
3. Amino acid degradation: fate of the carbon skeleton. Role of vitamins in amino acid metabolism.
Prof. Kraszimir Kolev
4. Heme biosynthesis and degradation. Iron homeostasis.
Prof. Kraszimir Kolev
5. Structure and function of nucleotides. Fate of dietary nucleotides. Formation and elimination of uric acid, its biological role in the human body. Molecular basis of gout.
Prof. Kraszimir Kolev
6. Synthesis and degradation of purine and pyrimidine nucleotides. Effects of cytostatics on nucleotide metabolism.
Prof. Kraszimir Kolev
7. Integration of metabolism. Metabolism of red blood cells and enzymeopathies affecting metabolism. Intermediary metabolism of the kidney. Metabolic characteristics of the renal cortex and medulla.
Prof. László Tretter
8. Metabolism of skeletal muscle and cardiac muscle. Metabolic adaptation to physical exertion, fasting, and acidosis. Comparison of gluconeogenesis in the kidney and liver.
Prof. László Tretter
9. Metabolic characteristics of the brain and adipose tissue. Metabolism of intestinal epithelial cells and lymphocytes.
Prof. László Tretter
10. Fed–fasting cycle and its regulation; metabolic processes in the liver. Inter-organ communication in fed and fasting states.
Prof. László Tretter
11. General characteristics of ion channels. Methods for studying ion channels. Molecular mechanisms of gating and permeation. Structure of K^+ channels.
Prof. László Csanády
12. Ion channel families. Voltage-gated and ATP-sensitive K^+ channels. Voltage-gated Cl^- channels. CFTR Cl^- channel. Nicotinic acetylcholine receptor.
Prof. László Csanády
13. Membrane transporters. Na^+/K^+-ATPase isoforms. Secondary active transport. Na^+/H^+ exchanger.
Dr. Beáta Törőcsik
14. Molecular basis of nerve impulse transmission. Acetylcholine synthesis, receptors, acetylcholinesterase. Key proteins involved in synaptic vesicle exocytosis.
Prof. Veronika Ádám
15. Synthesis and metabolism of adrenaline and noradrenaline. Transporters in neurons.
Prof. Veronika Ádám
16. Adrenergic receptors. Molecular mechanisms of adrenaline and noradrenaline effects in different organs.
Prof. Veronika Ádám
17. Synthesis and metabolism of dopamine and serotonin. Molecular properties of transporters and receptors. Biochemical basis of Parkinson’s disease.
Prof. Veronika Ádám

18. Synthesis, metabolism, transporters, and receptor properties of glutamate and GABA.
    Prof. Veronika Ádám
19. Overview of blood clot formation and dissolution. Fibrinogen and fibrin. Regulation of thrombin. Activation of prothrombin. Initiation and amplification of coagulation signals.
    Prof. Kraszimir Kolev
20. Inhibitor systems of blood coagulation and negative feedback mechanisms.
    Prof. Kraszimir Kolev
21. Fibrinolysis. Activation of plasminogen. Plasmin inhibitor systems.
    Prof. Kraszimir Kolev
22. Cellular components of clot formation and dissolution. Platelets and von Willebrand factor.
    Prof. Kraszimir Kolev
23. Role of neutrophils and endothelial cells in hemostasis. Hemodynamic and biochemical interactions in hemostasis.
    Prof. Kraszimir Kolev
24. Pattern recognition receptors (TLRs, scavenger receptors): function and role in the vessel wall. Molecular basis of cholesterol-induced pyroptosis.
    Prof. Kraszimir Kolev
25. Role of diet-derived regulation at the level of gene expression in metabolic control.
    Prof. László Tretter
26. Regulatory and adaptive signals driven by the metabolic state of the cell and their mechanisms. Biochemical effects of thyroid hormones.
    Prof. László Tretter
27. Key molecules and drug targets of proliferation, differentiation, survival, angiogenesis, and metastasis I.
    Dr. Beáta Törőcsik
28. Key molecules and drug targets of proliferation, differentiation, survival, angiogenesis, and metastasis II.
    Dr. Beáta Törőcsik

Practical Sessions

1. Enzymes as diagnostic tools. Measurement of creatine kinase activity and its medical relevance.
2. Biological significance of transamination. Measurement of transaminase activity and its medical relevance.
3. Ammonia elimination in the human body.
4. Metabolic role and medical significance of vitamin B12 and tetrahydrofolate.
5. Metabolic characteristics of rapidly dividing cells and tumors.
6. Biochemical and bioenergetic aspects of muscle work. *Demonstration I*
7. Role of the liver in metabolism. Metabolic alterations in liver diseases.
8. Risk factors related to cholesterol homeostasis in atherosclerosis (diabetes, hypertriglyceridemia).
9. Biochemical basis of atherosclerosis prevention.
10. Extracellular matrix: changes in physiological and pathological conditions.
11. Molecular background of inherited thrombophilias. APTI, PTI tests.
12. Molecular background of acquired thrombophilias. Fibrin stabilization and analysis of soluble fibrin monomers.
13. Relationship between metabolism and nervous system function. *Demonstration II*

14. Molecular basis of energy utilization in the body and its dysregulation in metabolic syndrome.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance at at least 75% of the practical sessions during the semester is mandatory. Missed practicals may be made up within the same week (in justified cases) by attending another group on up to two occasions.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, written and oral assessments are conducted, the results of which provide an advantage when determining the final exam grade.

1. A maximum of 30–30 points can be obtained in the two midterm tests (demonstrations).
2. A maximum of 10 points may be awarded during the practical sessions, based on criteria specified by the seminar instructors (e.g., presentations, measurement reports, and responses to oral or written questions).

Number and type of individual assignments to be completed, submission deadlines:

per request of the practice teacher

Requirements for the successful completion of the course:

Attendance at at least 75% of the practical sessions during the semester is mandatory. Missed practicals may be made up within the same week (in justified cases) by attending another group on up to two occasions.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Topic Areas

- Protein structure, enzymology, bioenergetics
- Carbohydrates, lipids
- Amino acids, nucleotides, integration, signal transduction

- Blood coagulation, ion channels, membranes, neurobiochemistry

The questions for assessment are selected from the test database published in the Moodle system. The examination consists of a written and an oral part.

During the oral part of the examination, the student must explain their answers and demonstrate the biochemical relationships related to the questions.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The questions for assessment are selected from the test database published in the Moodle system. If the student scores less than 30 points (50%, or the percentage defined by the current Study and Examination Regulations), the result is a fail (1), and the student is not admitted to the oral examination. During the oral exam, the examiner selects questions from the test completed by the student. As a minimum requirement, the student must be able to justify their answers for at least four correctly answered questions.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Method and Type of Grading

The questions for assessment are selected from the test database published in the Moodle system. During the oral part of the examination, the student must explain their answers and demonstrate the biochemical relationships related to the questions.

The examination consists of a written and an oral part.

Written Part

- 60 multiple-choice questions in the Moodle system, to be completed within 60 minutes.
- The questions are selected from the test database published in Moodle.

- If the student scores less than 30 points (50%), the result is a fail (1), and the student is not admitted to the oral examination.
- The purpose of the written part is to verify the minimum requirements; it does not result in a separate grade.

Oral Part

The examiner selects questions from the test completed by the student, with at least one question from each of the four main topic areas.

The student must:

- explain the correct answers, and
- present the biochemical relationships related to the questions.

Topic Areas

- Protein structure, enzymology, bioenergetics
- Carbohydrates, lipids
- Amino acids, nucleotides, integration, signal transduction
- Blood coagulation, ion channels, membranes, neurobiochemistry

The examiner may select questions from both correctly and incorrectly answered items in order to comprehensively assess the student's professional competence.

The final grade (1–5) is determined by the examiner based on the student's performance in the oral examination.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Artificial intelligence systems are not explicitly integrated into the teaching of the subject. However, students are encouraged to use such tools to support their learning, including preparation for assessments and examinations, in accordance with academic integrity guidelines.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Lecture and practical materials published in the university's e-learning system
Link	its.semmelweis.hu

Printed resources:

Type	Mandatory
Author	Peter J. Kennelly, Kathleen M. Botham, Owen P. McGuinness, P. Anthony Weil
Title	Harper's Illustrated Biochemistry
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Genetikai, Sejt- és Immunbiológiai Intézet

Name of subject in Hungarian: Orvosi Genetika és Immunológia I.
Name of subject in English: Medical Genetics and Immunology I.
Name of subject in German: Medizinische Genetik und Immunologie I.

Credit value of the course: 3
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	2.0	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKGEN1102_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Buzás Edit (Intézet igazgató)
Course coordinator location of work, telephone availability: Semmelweis University, Department of Genetics, Cell- and Immunobiology, H-1089 Budapest, Nagyvárad tér 4., +36-1-210-2929 / 56241
Course coordinator position: Professor and Chairman
Course coordinator Date and number of habilitation: 2009/273

Objectives of the course, and its place in the curriculum of the medical training program:

Medical Genetics: Introductory course in classical and molecular genetics and functional genomics, as well as basic course for the clinical module. It addresses the types, general laws of human inheritance, characteristics, organization and structure of the human genome, and the most important methods.

A pre-clinical course for medical students that introduces the essentials of the immune system, natural and adaptive immune responses. It discusses the structure of the human immune system: organs, cellular and molecular components involved in the immune response; the development of genetic diversity of antigen receptors, and the role of diversity in an efficient immune response. In related practices, students will be introduced to the basic methods required to test the functionality of the immune system, to the immunological assays and immunologically relevant procedures used in current diagnostics.

Format of the course (lectures, group work, practical lessons, etc.):

lectures and practices

Competencies acquired through completion of course:

Basics of cytogenetics. Setting up and interpreting pedigrees. Basic knowledge of human genetics and human genomics. Background of monogenic and multifactorial diseases.

Understanding the relationships between immunological processes and the role of the immune system. Theoretical knowledge of basic immunological diagnostic techniques.

Course outcome (names and NEPTUN ID of related subjects):
AOKGEN666_1A, AOKMBT829_1A

Prerequisites for course registration and completion: (NEPTUN ID):

Macroscopic Anatomy and Embryology II. AOKANT1089_2A

Medical Biochemistry I. AOKBMT1099_1A

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Study and Examination Regulations

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest

lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Genetics Lectures:

1. Introduction to human genetics Dr Hargita Hegyesi

2. Genetic variations Dr Tamás Visnovitz

3. Chromosomal aberrations Dr Eszter Lajkó

4. Autosomal inheritance I. Nyitrayné Dr.Pap Erna

5. Autosomal inheritance II Nyitrayné Dr.Pap Erna

6. Role of sex in inheritance Dr Hargita Hegyesi

7. Epigenetics Dr Kristóf Fülöp

*The order of the sessions may change.

Practices:

1. Genetic aspects of cell cycle and atypical mitosis

2. Meiosis and meeiotic errors

3. Cytogenetics I.

4. Cytogenetics II.

5. Cytogenetics III.

6. Introduction to pedigree analysis

7. Methods in Genetics

Lectures:

8. The role, processes, organs and cells of the immune system - Dr. Edit Buzás

9. Principles of natural immunity - Dr. Edit Buzás

10. The complement system; inflammation and acute phase reaction - Dr. Edit Buzás

11. Antigen, antigen presentation and MHCs - dr Marianna Holub

12. Antigen receptors and their formation - dr Marianna Holub

13. T lymphocytes and cell-mediated immune response - dr Marianna Holub

14. B lymphocytes and humoral immune response - Dr. Edit Buzás

The order of the lectures may change. In case Dr. Edit Buzás is unavailable, Dr. András Falus, Dr. Marianna Holub, Dr. Zsolt Komlósi, and Dr. Éva Pállinger may also be lecturers.

Practices:

8. The immune system in the laboratory. The importance of immune organs and immune cells, and the possibilities for examining their deviations.

9. Basic concepts related to diagnostic antibody

10. Methods based on antigen-antibody interactions I. Immunoserology

11. Methods based on antigen-antibody interactions II:immuno-assays

12. Methods based on antigen-antibody interactions III Flow cytometry

13. Laboratory testing of complement

14. An overview of immunological methods used in diagnostics with examples.

*The order of the sessions may change. The teachers of the practical groups will teach all practical topics: Dr. Marianna Holub, Dr. Szilvia Bősze, Dr. Evelin Orsó, Dr. Éva Pállinger, Dr. Zsolt Komlósi, Dr. Eszter Tóth, Dr. Krisztina Vukman Visnovitzné, Panna Királyhidi, Júlia Opra, Bence Nagy.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance of a minimum of 75% of the practices is necessary for the end-term signature. The presence at the seminars (practices) are registered weekly, more than three absences from the seminars invalidate the semester as well. The sessions can be attended in an appropriate mental and health condition. In cases of documented absence from a practical session, it is possible to make up the session during the given academic week in a parallel class, following prior consultation with the instructors and the course coordinator.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two mid-term written tests – one on genetics and one on immunology – will be given during the semester, based on the material covered in the lectures and practical sessions up to that week. A score of 30% on each of the midterms is required to obtain the signature. If the result of the first

midterm (in the genetics module) reaches 75%, it will be counted in the final exam score. If the results of both midterms reach the 75% level, the student may receive an offered exam grade. The midterm cannot be postponed or retaken. Students who are absent with a valid reason or who fail the midterm will be given two additional opportunities.

Number and type of individual assignments to be completed, submission deadlines:

Requirements for the successful completion of the course:

Attendance of a minimum of 75% of the practices, and both midterm results must achieve at least a 30% for the end-term signature.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Literature: Medical Genetics and Genomics e-book (MGGe) and Power Point presentations of the lectures and practices

1.) Introduction to human genetics and genomics.

MGGe: Chapter 1, pages 9-21; Lecture: Introduction to human genetics

Basic genetic terms, e.g.: genome, genetics, genomics, homologous chromosomes, gene, locus, allele, wild type allele, genotype, phenotype, homozygote, heterozygote, hemizygote, dominant, recessive, cytogenetics; Mendel's laws, Model organisms in genetics; DNA: structure, function, amount, organization (chromatin, chromosome). Replication, transcription, mRNA maturation (splicing, alternative splicing), types of RNA-s, features of genetic code. Translation and posttranslational modifications. Human genome: nuclear and mitochondrial. Structure of eukaryotic gene. Intergenic DNA; Specific sequences of nuclear genome. Repetitive sequences. Human Genome Project, ENCODE Project

2.) Transmission of genetic information from cell to cell in an organism.

MGGe: Chapter 2, pages 22- 41, Practice presentation: Atypical mitosis

Features of mitotic phases. Functional parts of chromosomes (telomere, centromere, kinetochore, sister chromatids. Cytokinesis. Changes of DNA amount and chromosome number during cell cycle. Types, causes and consequences of atypical mitosis.

3.) Transmission of genetic information from generation to generation.

MGGe: Chapter 2, pages 41-51; Practice presentation: Typical and atypical meiosis

Significance and source of genetic variability. Significance of meiosis. Stages of meiosis: meiosis I. and II. Features of phases of first prophase (leptotene, zygotene, pachytene, diplotene, diakinesis; synapsis, crossing over, chiazma). Random alignment and assortment of homologous chromosomes in meiosis I anaphase. Atypical meiotic process: non-disjunction. Change of DNA amount and chromosome number during meiotic process.

4.) Pedigree analysis

Practice: Introduction to pedigree analysis

Mendelian or monogenic inheritance, Construction of pedigree: main symbols that are used in pedigrees. Pedigree analysis (characteristics pedigree patterns of monogenic inheritances: AD, AR, XD, XR, Y-linked, mitochondrial). Disease examples for monogenic inheritances (AD, AR, XD, XR, mitochondrial); ***Important terms****:* gene, genome, locus, allele, multiple allelism, wild type (normal) allele, genotype: homozygote, heterozygote, complex heterozygote, hemizygote, phenotype: dominant, codominant, recessive.

5.) Mendelian Inheritance: autosomal inheritance

MGGe: Chapter 6, pages 102 -121; Lecture: Monogenic inheritance (Autosomal inheritance);

Properties and disease examples of autosomal inheritance: AD (osteogenesis imperfecta, achondroplasia, Marphan syndrome, familial hypercholesterolemia, Huntington disease, Polycystic kidney disease). Eco genetic diseases (porphyria, malignant hyperthermia). AR (albinism, phenylketonuria, xeroderma pigmentosum, deafness, cystic fibrosis, sickle cell anemia, thalassemia's). ***Important terms****:* gene, genome, locus, allele, multiple allelism, wild type (normal) allele, genotype: homozygote, heterozygote, complex heterozygote, hemizygote, phenotype: dominant, codominant, recessive. Genetic heterogeneity (locus heterogeneity, allele heterogeneity), Factors affecting pedigree patterns: reduced penetrance, variable expressivity, pleiotropy, heterogeneity (locus and allele), phenocopy, anticipation, „de novo", new mutation, Influence of the age, Lethal/sublethal genes, „Modifier genes", Epistasis; Heterozygote advantage, The influence of the environment,

6.) Role of sex in inheritance

MGGe: Chapter 7, pages 122-131; Lecture: Role of sex in inheritance

Properties and disease examples of Sex-linked inheritance: XR (hemophilia A and B; Duchenne and Becker muscular dystrophy), XD (hypophosphatemia, incontinentia pigmenti, Fragile X). Y-linked inheritance; Sex influenced inheritance (e.g. boldness). Sex limited inheritance (e.g. precocious puberty). Genomic imprinting, X-chromosome inactivation. Mitochondrial inheritance (homoplasmy, heteroplasmy) Genetics of sex: sex determination, male sex determination. Causes of maldevelopment.

7.) Cytogenetics

Practice: Cytogenetics I

Structure and types of eukaryotic chromosome. Karyotyping (chromosome preparation, principle, significance and types of banding techniques, principle and significance of multicolor-FISH, and M-banding); X inactivation. Study of sex chromosomes in interphase. Characteristics of human karyotype. Chromosome territories.

Light microscopic slides: 54, 60, 64

a.) Structural chromosome mutations

MGGe: Chapter 4, pages 69-80; Lecture: Chromosomal aberrations; Practice: Cytogenetics II

Structural chromosome aberrations. Types of structural aberrations: deletion (terminal, interstitial), duplication, translocation (reciprocal, Robertsonian), inversion (paracentric, pericentric), ring chromosome, isochromosome. Balanced and unbalanced mutations. Chromosomal translocations in leukemia. Consequence of structural aberrations.

b.) Numerical chromosome mutations

MGGe: Chapter 4, pages 80-90; Lecture: Chromosomal aberrations; Practice: Cytogenetics II-III

Numerical chromosome aberrations: euploidy, polyploidy, aneuploidy, mixoploidy (mosaicism, chimerism). Possible cause of aneuploidy (non-disjunction in meiosis I and II). Autosomal (Patau, Edwards and Down syndromes) trisomy's. Numerical aberrations of sex chromosomes (Klinefelter, XYY, triplo X, Turner syndromes). Cause and consequence of of polyploidy and mixoploidy (mosaicism and chimerism).

8.) Mutations and polymorphisms

MGGe: Chapter 3, pages 52-68; Lecture: Genetic variations

Different meanings of mutation and polymorphism. Significance of mutation. Classification of mutations: by cause (spontaneous, induced, different DNA repair mechanisms, consequence of their failure), by site (in the organism: somatic, germline, in the gene), by function (loss-of-function, gain-of-function, dominant negative, lethal, back), by fitness (neutral, beneficial, harmful), by size (genome, chromosome, gene: insertions, deletions, substitutions). Repetitive insertions, triplet repeat: polyglutamine and polyalanine disorders. inDel mutations: frame shift and in frame mutations. Nucleotide substitutions: transition, transversion, sense (synonymous) missense and nonsense (non-synonymous) mutations. Types, size and significance of genetic polymorphism.

9.) Epigenetics

MGGe: Chapter 5, pages 91-101; Lecture: Epigenetics

Meaning of epigenetics. Relationship of genome, epigenome and phenotype. Epigenetic

mechanisms: transcriptional (DNA methylation, histone modifications), posttranscriptional (RNAi, miR). X chromosome inactivation, role of XIST. Autoimmunity and X inactivation. Genomic imprinting, evidence of nonequivalence of parental genome. Mechanism of genomic imprinting. Uniparental disomy (UDP). Causes of Prader Willi and Angelman syndromes. Possible role of genomic imprinting. Relationship between genomic imprinting and cancer. Position effect. Epigenetic changes caused by aging and by in vitro fertilization. Transgenerational effects.

Practical questions/tasks:

Family trees (drawing a family tree, symbols, family tree analysis: identifying inheritance patterns, genotypes and phenotypes of family tree members, drawing a family tree based on a case study)

Light Microscope Preparations: mitotic abnormalities, chromosomal preparation

Preparations Demonstrated in Class Chromosomes: Chromosome preparation, banding techniques, principles of karyotyping, FISH, CAM, array CGH, Optical genom mapping,

Karyogram Analysis: Chromosomal sex; recognition of structural and numerical mutations.

Interphase cytogenetics: methods for observing female and male sex chromatin, interpretation of interphase FISH images.

Hybridization methods: microarray methods (oligonucleotide and expression), CGH PCR-based methods: PCR, allele-specific PCR, multiplex PCR, RT-PCR, Q-PCR, MLPA.

Significance of nucleic acid sequencing: conventional and NGS (biochemical details are not required), reading chromatograms

Introduction to Immunology: The concept of immunity, Components (primary, secondary immune organs, cells, molecules) of the immune system. Principles of the immune response: antigen specificity, sensitivity, memory, clonal selection based operation. Features of innate and adaptive, cell-mediated and humoral, primary and secondary response.

The natural immunity: Fc-receptors; PAMP, DAMP, Pattern recognition receptors. Phagocytes and phagocytosis. Role of neutrophils, eosinophils and basophils/mast cells. Types and role of dendritic cells. Inflammasome/inflammasomopathies. Innate lymphoid cells.

The complement system: The activation pathways and the regulation of the complement system; Complement receptors; Complement genetics; the biological role of complement activation**.**

Inflammation and the acute phase reaction: The local and systemic inflammation, parainflammation and the acute phase response, The provoking factors and mechanisms, periods; The acute phase plasma proteins and their role.

Antigen presentation, MHC: The major histocompatibility complex; The ways of antigen processing and presentation. Special forms of antigen presentation: CD1, cross-presentation, cross-dressing, superantigens.

Antigen receptors and their formation: Types and structures of antigen receptors; The immunoglobulin and TCR genes, the sources of antigen receptor diversity; Somatic gene-rearrangement¸ Expression and production of antigen receptors.

T cells and the cell mediated immunity: Differentiation and activation of T cells, types of the T cells, Role of the different T-cell subtypes in immune response, the cell mediated immunity.

B cells and the humoral immunity: The activation and differentiation of B cells, types of the B-cells, the humoral immunity.

Practices:

- Characteristics of the cellular elements of the immune system.
- Diagnostic significance of investigation of immune cells.
- Definition of antigen, epitope, hapten.
- Diagnostic and therapeutic benefits of the characteristics of the adaptive immune response.
- Polyclonal vs. monoclonal antibodies: Definition and production (immunization, hybridoma technique).
- Therapeutic value of antibodies: "Naked" antibodies, immunoconjugates.
- Diagnostic value of antibodies – labeling methods.
- Primary and secondary antibodies.
- Diagnostic parameters of antibodies: sensitivity, specificity.
- Antigen-antibody interaction-based tests in daily clinical practice.
- Antibodies as targets and tools in laboratory practice.
- Antigen-antibody interactions and related basic concepts (antibody classes – specificity – cross-reactivity, affinity – avidity).
- Serum electrophoresis and its densitograms.
- Immune complexes, immunoprecipitation, agglutination: Definitions, turbidimetry, and nephelometry.
- Radial immunodiffusion and immunofixation based on immunoprecipitation.
- Hemagglutination, antibody titer, direct, indirect, and passive agglutination.
- The principle of ELISA: Indirect and sandwich types.
- Lateral flow test.
- Detection methods using radioactively labeled antibodies: RIA, IRMA.
- The role of immunoassays in infection diagnostics.

- Flow cytometry and the principle of cytometer operation.
- Identification of cell populations based on size and granularity, scatter plot.
- Immunophenotyping, fluorescence intensity-based measurements, histogram, dot plot, co-expression measurement.
- Clinical applications of flow cytometry (absolute indications): Diagnosis, disease progression monitoring.
- Measurement of total complement activity (CH50). Changes in CH50 values.
- Complement activation ELISA.
- Diseases of the complement system based on molecular defects.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirements can be found in the course information guide for the semester on the department's website and on Moodle.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The written exam score must reach at least the sufficient level (50%) in both Genetics and Immunology to earn the credits.
A grade of five is offered to students who achieve 85% or higher on both the first Genetics and the second Immunology midterms, and a grade of four to those who achieve at least 75%.
If a student achieves 75% in only one of the modules, they will not be asked questions from that module during the exam.

A grade of five is offered to students who achieve 85% or higher on both the first Genetics and the second Immunology midterms, and a grade of four to those who achieve at least 75%.
If a student achieves 75% in only one of the modules, they will not be asked questions from that module during the exam.

A grade of five is offered to students who achieve 85% or higher on both the first Genetics and the second Immunology midterms, and a grade of four to those who achieve at least 75%.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We encourage students to use AI when completing independent assignments, as we also teach them critical thinking and how to effectively use databases. The use of IA is prohibited during exams and midterms.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Immunology seminars
Link	https://gsi.semmelweis.hu/files/ebook/Seminars%20in%20Immunology_2015.pdf

Type	Mandatory
Title	Medical genetics and genomics
Link	https://gsi.semmelweis.hu/files/ebook/Medical_genetics_and_genomics_v2022.pdf

Printed resources:

Type	Mandatory
Author	Abul Abbas, Andrew Lichtman, Shiv Pillai
Title	Basic Immunology 7th Edition
Publisher	Elsevier
Year of publication	2024

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Genetikai, Sejt- és Immunbiológiai Intézet

Name of subject in Hungarian: Orvosi Genetika és Immunológia II.
Name of subject in English: Medical Genetics and Immunology II.
Name of subject in German: Medizinische Genetik und Immunologie II.

Credit value of the course: 4
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	2.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKGEN1102_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Buzás Edit (Intézet igazgató)
Course coordinator location of work, telephone availability: Semmelweis University, Department of Genetics, Cell- and Immunobiology, H-1089 Budapest, Nagyvárad tér 4., +36-1-210-2929 / 56241
Course coordinator position: Professor and Chairman
Course coordinator Date and number of habilitation: 2009/273

Objectives of the course, and its place in the curriculum of the medical training program:

Structure of the human genome, and the most important methods and their application in theoretical and clinical medicine, according to the needs of medical students, and evaluates the results (in practice). It presents the forms of genetic and epigenetic variability, their mechanisms and their consequences for human health. Through selected examples, the pathway from gene to

disease is analyzed using a systems biology approach.

The course introduces students to the processes of immunological regulation in the healthy human body, including the immunology of pregnancy. It also addresses the course and alterations of immunological processes in various pathological conditions, such as infections, tumors, hypersensitivity reactions, autoimmunity, immunodeficiencies, and during transplantation. In the accompanying practical sessions, students are introduced to immunomodulatory techniques used in therapy, the basics of vaccination, and commonly applied immunotherapeutic procedures illustrated through clinical examples. Diagnostic and therapeutic approaches based on immunological principles for hypersensitivity reactions and autoimmune diseases are also demonstrated through case examples. The immunology module provides essential theoretical foundations for immunopathology lectures in the Pathology course, for Rheumatology lectures in Internal Medicine II, and supports the teaching of all subsequent clinical subjects.

Format of the course (lectures, group work, practical lessons, etc.):

lectures and practices

Competencies acquired through completion of course:

Background of monogenic and multifactorial diseases. Basics of prenatal diagnosis, detection of monogenic diseases by molecular genetic methods. Basic knowledge of oncogenetics, epigenetics, population genetics, nutrigenetics, evolutionary genetics, pharmacogenetics with biomedical approach. Role of gene-gene and gene-environment interactions in various diseases. Basic knowledge of bioinformatics and systems biology related to medical genetics and genomics. Basics of gene therapy.

Understanding the interrelations of immunological processes and the role of the immune system in the prevention, development, and progression of diseases. Theoretical knowledge of fundamental immunological therapeutic techniques.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Molecular Cell Biology I. ; Medical Biochemistry II. ; Medical Genetics and Immunology I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

According to the Study and Exam Policy

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Study and Exam Policy

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Medical Genetics Lectures*:

1. Introduction to genomics Dr Hargita Hegyesi

2. Methods in genomics, Genetic screening Dr Hargita Hegyesi

3. Genomic approach of complex inheritance Dr Hargita Hegyesi

4. Genetic therapies Dr Wiener Zoltán

5. Genome and environment, Evolutiongenetics Dr Wiener Zoltán

6. Pharmacogenomics Dr Eszter Lajkó

7. Nutrigenomics Dr Eszter Lajkó

Practices**:

1. Genetic background of monogenic disorders I.

2. Genetic background of monogenic disorders II.

3. Genetic background of monogenic disorders III.

4. Complex disorders I.

5. Complex disorders II.

6. Gametogenesis, prenatal genetic testing

7. From genes to bedside

Immunology Lectures*:

8. Immune response in infections - Dr. Edit Buzás

9. Mucosal immunity - Dr. Edit Buzás

10. Hypersensitivity reactions - Dr. Edit Buzás

11. Immunological tolerance; natural and pathological autoimmunity - Dr. Edit Buzás

12. Immunodeficiencies - Dr. Edit Buzás

13. Antitumor immunity - Dr. Edit Buzás

14. Immunology of transplantation and pregnancy immunity. Summary of immune response - Dr. Edit Buzás

Practices:

8. Immunological therapies I

9. Immunological therapies II

10. Immunization and vaccination I

11. Immunization and vaccination II

12. Hypersensitivity I: Allergy

13. Hypersensitivity reactions II-IV

14. Testing methods for autoantibodies

*The order of the lectures may change. In case the lecturere is unavailable, Dr. András Falus, Dr. Marianna Holub, Dr. Zsolt Komlósi, and Dr. Éva Pállinger, Dr Hargita, Hegyesi, Dr Eszter Lajkó, Dr Barbara Molnár-Érsek, Dr Zoltán Wiener may also be lecturer.

**The order of the topics may change. The teachers of the practical groups will teach all practical topics: Dr. Marianna Holub, Dr. Éva Pállinger, Dr. Zsolt Komlósi, Dr. Eszter Tóth, Dr. Krisztina Vukman Visnovitzné, Panna Királyhidi, Júlia Opra, Bence Nagy, Kelsey Fletcher, Dr Tamás, Orbán, Dr Tamás Visnovitz, Sayam Gosal, Dr Xabier Osteikoetxea, Dr Hargita, Hegyesi, Dr Eszter Lajkó, Dr Barbara Molnár-Érsek, Dr Rita Oláhné Szabó, Dr Eszter Joóné Baricza, András, Försönits, Szabolcs Hajdó, Dorina Lenzinger

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Practices can only be attended to in an appropriate mental and health condition. The presence at the

seminars (practices) are registered weekly, more than three absences from the seminars invalidate the semester as well. The sessions can be attended in an appropriate mental and health condition. In cases of documented absence from a practical session, it is possible to make up the session during the given academic week in a parallel class, following prior consultation with the instructors and the course coordinator.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two mid-term written tests – one on genetics and one on immunology – will be given during thesemester, based on the material covered in the lectures and practical sessions up to that week. A score of 30% on each of the midterms is required to obtain the signature. The midterm cannot be postponed or retaken. Students who are absent with a valid reason or who fail the midterm will be given two additional opportunities. If the results of both midterms reach the 85% level, the student receives one grade better at final exam.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

According to the Study and Exam Policy; Attendance of a minimum of 75% of the practices, and both midterm results must achieve at least a
30%.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Exam topics from the previous semester, supplemented with additional material.

Medical Genetics

Introduction to genomics. Methods in genomics

MGGe: Chapter 9, pages 148-173; Lecture: Introduction to genomics. Methods in genomics; Practices:

Genomics, Human Genome , DNA sequencing, Participants in the Human Genome Project, Some results of the HGP, Variations in the human genome, Some novel data about gene expression and genetic variability, Junk DNA in the human genome, Comparative genomics, ENCODE project, Genetic markers, GWAS, Principle of molecular genetic methods: hybridization, restriction enzymes, DNA isolation, Visualization of genomic DNA, separation of DNA fragments by gel electrophoresis, capillary gelelectrophoresis), non-specific staining of DNA (EtBr), Allele-Specific Oligonucleotide (ASO) test, RFLP, , microarray, PCR, PCR- RFLP, Multiplex PCR, MLPA, Significance of real time-PCR. Significance and detection of VNTR. VNTR and trinucleotide diseases. Significance of polymorphism detection in forensic medicine. DNA fingerprint. Foreign DNA (bacterial, viral) detection. Sequencing in genotyping. NGS, RT (reverse transcriptase)-PCR.

Complex inheritance.

MGGe: Chapters 10, pages 174-177; Lecture: Complex inheritance, Population genetics, Practice: Complex inheritance

Features of complex inheritance. Environmental factors. Heritability of the complex diseases. Disease example Types of sample collection, prospective and retrospective studies. Selection of populations for genetic studies. Hardy Weinberg equilibrium. Linkage, haplotype, linkage disequilibrium. Founder populations. Association studies, population stratification, population admixture. Risk calculation, odds ratio and relative risk, p-value.

Pharmacogenomics

MGGe: Chapter 14, pages 266-286; Lecture: Pharmacogenomics and nutrigenomics

Pharmacogenetics and pharmacogenomics. Pharmacokinetics, -dynamics, Drug development Adverse drug response, Genomic background of adverse effects, CYP (cytochrome P-450) gene family, Warfarin, Mercaptopurine, Genes influencing pharmacodynamics, Examples of pharmacogenetic studies, Pharmacogenetics of statins, Clopidogrel, Pharmacotherapy of asthma, MODY, Succinylcholine sensitivity, Thiopurine methyltransferase variations, Role of membrane receptors in drug effects.

Nutrigenomics

MGGe: Chapter 13, pages 255-263; Lecture: nutrigenomics

Genetic variations and food, food and gene expression.

Gene therapy

Gene therapy types (real, gene expression modification) and forms (in vivo, ex vivo). Nucleic acids applied in gene therapy: DNA, RNA. Forms of introduction of nucleic acids into target cells. Vectors applied in gene therapy: adenovirus, adeno associated virus, retrovirus, lentivirus, nonviral integrating vectors. Comparison of viral vectors. Examples of successful gene therapy trial.

Evolution genetics

MGGe: Chapter 12, pages 225-236; Lecture: Population and evolution genetics

Gene environmental interactions and the human genome. Natural selection. Role of infections in formation of the genome. Genetic drift, bottleneck effect. Why are some lethal mutations frequent? Examples for effects forming the genome.

Genome and environment

MGGe: Chapter 13, pages 238-254; Lecture: Population and evolution genetics

Penetrance of the genetic variants; Interactions between highly and low penetrant variations and the environment; smoking-genome interaction, gene-environmental interactions.

Gametogenesis, prenatal genetic testing

Practice: Gametogenesis, prenatal genetic testing

Comparison of spermatogenesis and oogenesis; Genetic aspects of infertility; Genetic aspects of assisted reproduction techniques; CGH; aCGH prenatal genetic testing; Non-invasive prenatal testing

Autosomal Inheritance and Molecular Diagnostics

Practices: Genetic background of monogenic disorders
Monogenic inheritance, Inheritance patterns, Polycystic kidney disease, Achondroplasia, Marfan syndrome, Osteogenesis imperfecta, Huntington disease, Polydactyly, Familial hypercholesterolemia, Cystic fibrosis, Xeroderma pigmentosum, Albinism, Congenital adrenal hyperplasia (CAH), Thalassemia, Sickle cell anemia, Epistasis, Heterogeneity, Penetrance, Expressivity, Lethality, New mutation, Phenocopy, Anticipation, Complementation, Compound heterozygosity,

Genetics – Practical questions/tasks:

Hybridization techniques: microarray methods (oligonucleotide and expression arrays), CGH (comparative genomic hybridization)

PCR-based methods: PCR, allele-specific PCR, multiplex PCR, RT-PCR, Q-PCR, MLPA

Significance of nucleic acid sequencing: traditional and NGS (biochemical details not required), interpretation of chromatograms

Interpretation of genetic fingerprints

Interpretation of molecular diagnostic diagrams and analysis of case reports (interpretation of diagnostic examples)

Immunology:

Theoretical topics:

Immune response in infections : Antimicrobial immune response. Escape mechanisms of the pathogens.

Mucosal Immunity: Key components of mucosal immunity, induction and effector phases of the mucosal immune response. Composition and role of Peyer's patches in the immune response, intraepithelial lymphocytes, and lamina propria lymphocytes. Production and function of mucosal IgA. Development of mucosal immune tolerance. Connections between mucosal immune responses and various diseases.

Hypersensitivity reactions: The Mechanisms and Cellular/Humoral Participants of Type I–IV Hypersensitivity Reactions. Type I Hypersensitivity: Sensitization, anaphylaxis, early and late effector phases, atopy, and the mechanisms underlying the increased prevalence of allergic conditions. Type II Hypersensitivity: Rh incompatibility; stimulatory and inhibitory effects of antibodies directed against receptors. Type III Hypersensitivity: Consequences of immune complex deposition. Type IV Hypersensitivity: Development of hapten-induced contact dermatitis; immunological background of gluten sensitivity.

Immunology of transplantation: Immunological background of transplantation. Organ transplantation and rejection reactions. Immunological background of graft-versus-host (GVH) disease.

Immunological tolerance and autoimmunity: Central and peripheral immune tolerance. Natural and pathological autoimmunity. The concept of the immunological homunculus and immune ignorance.

Immune deficiencies: Primary and acquired immune deficiencies.

Anti-tumor-immunity: Tumor antigens. Anti-tumor immunity. Escape strategies of tumor cells.

Pregnancy immunity: Neonatal immunity. Immunological crosstalk between mother and fetus. The role of the placenta in establishing immune tolerance during pregnancy. Immunological protection of the fetus and the newborn.

Immunology:

Practical topics:

Biological therapies: Definition of targeted molecular therapy and immune modulation. Monoclonal antibodies in the therapy: Adverse effects and types of the monoclonal antibodies, fusion proteins. Monoclonal antibodies in the tumour therapy, checkpoint blockade, induction of ADCC, bispecific antibodies. Antibody therapy in autoimmune diseases. TNF alpha, T- and B cells as therapeutic targets in RA. IVIG, Adjuvant based immunotherapy, CAR-T-cell therapy, DC-therapy, oncolytic virus therapy.

Immunization, vaccination: The aims and practical implementation of immunization. Immunodominant epitope. Optimal dose, adjuvants, route of administration. Oral tolerance. The aim of immune stimulation, active immunization. Passive vaccination.

Hypersensitivity reactions I., II, III., IV.: Mechanisms and diagnosis of type I hypersensitivity reaction. Penetration of antigens, types of IgE mediated responses. Deliberation of histamine and its effects. Allergy tests. Anaphylaxis vs. anaphylactoid reaction; Urticaria vs. angioedema. Food intolerance vs. food allergy. Basics of pharmacotherapy. Desensitization and prevention. Mechanisms and diagnosis of type II, III and IV hypersensitivity reactions. Clinical examples. Diagnostic tests.

Screening methods of autoantibodies: Natural vs. pathological autoantibodies. Autoantigens. Detection of autoantibodies. Example diseases.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirements can be found in the course information guide for the semester on the institute's website and on Moodle.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Students who obtain the course signature must take a comprehensive final exam (comprehensive examination) at the end of the semester. To pass the exam successfully, students must achieve at least a passing level in both genetics and immunology.

If a student fails to reach the passing level in one of the subjects, they are required to retake the exam only in that specific subject during the retake examination.

Equally weighted

A student who achieves at least 85% based on the two midterm tests receives a one-grade improvement on the final exam grade, provided the exam is passed successfully.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

We encourage students to use AI when completing independent assignments, as we also teach them critical thinking and how to effectively use databases. The use of IA is prohibited during exams and midterms.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Immunology seminars
Link	https://gsi.semmelweis.hu/files/ebook/Seminars%20in%20Immunology_2015.pdf

Type	Recommended
Title	Medical Genetics and Genomics
Link	https://gsi.semmelweis.hu/files/ebook/Medical_genetics_and_genomics_v2022.pdf
Other/Comment	e-book

Printed resources:

Type	Mandatory
Author	Abul Abbas, Andrew Lichtman, Shiv Pillai
Title	Basic Immunology 7th Edition
Publisher	Elsevier
Year of publication	2024

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szaknyelvi Intézet

Name of subject in Hungarian: Magyar orvosi szaknyelv III.
Name of subject in English: Medical Hungarian III.
Name of subject in German: Medizinische Fachsprache Ungarisch III.

Credit value of the course: 2
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	0.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNYE906_3A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fogarasi Katalin (igazgató)
Course coordinator location of work, telephone availability: 06206701330
Course coordinator position: director, habilitated associate professor
Course coordinator Date and number of habilitation: 06.02.2023. 11/2023/habil.

Objectives of the course, and its place in the curriculum of the medical training program:

This is the third semester of a 4-semester medical language course. The aim of the course is to enable students to take anamnesis, to be informed about past illnesses and present complaints, and to have appropriate strategies for understanding the patient in clinical practice.

Students will get familiar with the instructions used in the examination of patients, be able to examine patients independently, and be able to give relevant instructions (examination of the

thoracic organs, circulation, abdomen, musculoskeletal system, nervous system - based on the medical chart)

Students will get familiar with the forms of medical documentation (fever chart, chart, etc...)

Students will be able to understand the symptoms of diseases – according to the list proposed by the clinics – in Hungarian and ask the patients relevant questions about their illness.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson, group work

Competencies acquired through completion of course:

Students will be able to communicate independently with patients, have appropriate strategies to understand patients' responses, and be able to ask relevant questions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Hungarian II. (AOKNYE906_2A)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Students who did not obtain a grade in AOKNYE906_2A in the previous semester but have a signature, may take the exam-only course of AOKNYE906_2A and, in parallel, AOKNYE906_3A. They will be required to give an account of their knowledge and obtain a term grade in AOKNYE906_2A by the end of the academic term, at a date arranged with the instructor.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum number of students: 5

Maximum number of students: 20

Anyone who meets the prerequisites can take the course.

Detailed course syllabus (if the course can be divided into modules, please indicate):

(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

weeks	*Topics:* Hungarian language competencies in taking medical history in the following topics:
1.	Revision: Present complaints
2.	Family history 1: Is there any disease in the family?
3.	Family history 2: Is there any disease in the family?
4.	Pain 1: Questions about pain
5.	Pain 2: Questions about pain
6.	Respiratory complaints 1
7.	Oral test
8.	Respiratory complaints 2
9.	Cardiovascular complaints 1
10.	Cardiovascular complaints 2
11.	Gastrointestinal problems; urine 1
12.	Gastrointestinal problems; urine 1
13.	Revision
14.	Oral test

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another group (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29). For more than the allowed number of absences, a medical certificate of long-term illness or hospitalization is required.

According to the Study and Examination Regulations (§ 28), three tardies count as one absence. Arriving 15 minutes later than the start of the lesson is considered tardiness.

Assessment methods during semester (number, topics, and dates of midterms and reports,

method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two oral tests in weeks 7 and 14

Topic: the material covered

Make-up and upgrade opportunities: to be arranged outside of class with the instructor, at the latest by the end of the first week of the examination period.

The two oral tests will be weighted equally, 50-50% of the term grade.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Attendance at both oral tests and class attendance.

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another class (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29).

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

(There is no exam.)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Minimum requirement: Completing both oral interviews with a passing mark of at least 50%. This includes the ability to ask questions and understand answers related to the topics covered in the syllabus (based on English keywords).

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The average of the oral tests (including the test(s) for an upgrade) is the basis for the final semester grade, which may be modified by the assessment of class work. A minimum of 50% (pass) must be achieved in both oral tests. Tests for an upgrade may be made by the end of the first week of the examination period at a time arranged with the instructor.

Assessment of the two oral tests:

0-49% = fail (1)

50-59% = pass (2)

60-74% = fair (3)

75-89% = good (4)

90-100% = excellent (5)

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of artificial intelligence is neither relevant nor permitted in this course, as we focus on improving communication skills and do not employ AI in class, primarily for patient safety reasons.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szaknyelvi Intézet

Name of subject in Hungarian: Magyar orvosi szaknyelv IV.
Name of subject in English: Medical Hungarian IV.
Name of subject in German: Medizinische Fachsprache Ungarisch IV.

Credit value of the course: 2
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	0.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNYE906_4A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fogarasi Katalin (igazgató)
Course coordinator location of work, telephone availability: 06206701330
Course coordinator position: director, habilitated associate professor
Course coordinator Date and number of habilitation: 06.02.2023. 11/2023/habil.

Objectives of the course, and its place in the curriculum of the medical training program:

This is the fourth semester of a 4-semester medical language course. The aim of the course is to enable students to take anamnesis, to be informed about past illnesses and present complaints, and to have appropriate strategies for understanding the patient in clinical practice.

Students will get familiar with the instructions used in the examination of patients, be able to examine patients independently, and be able to give relevant instructions (examination of the

thoracic organs, circulation, abdomen, musculoskeletal system, nervous system - based on the medical chart)

Students will get familiar with the forms of medical documentation (fever chart, chart, etc...)

Students will be able to understand the symptoms of diseases – according to the list proposed by the clinics – in Hungarian and ask the patients relevant questions about their illness.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson, groupwork

Competencies acquired through completion of course:

Students will be able to communicate independently with patients, have appropriate strategies to understand patients' responses, and be able to ask relevant questions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Hungarian III. (AOKNYE906_3A)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Students who did not obtain a grade in AOKNYE906_3A in the previous semester but have a signature, may take the exam-only course of AOKNYE906_3A and, in parallel, AOKNYE906_4A. They will be required to give an account of their knowledge and obtain a term grade in AOKNYE906_3A by the end of the academic term, at a date arranged with the instructor.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum number of students: 5

Maximum number of students: 20

Anyone who meets the prerequisites can take the course.

Detailed course syllabus (if the course can be divided into modules, please indicate):

(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

weeks	*Topics: Sentences, instructions used during the medical examination* *Preparing for the comprehensive exam*
1.	Revision: Medical history taking
2.	Examination 1: Informing the patient
3.	Examination 2: Instructions
4.	Examination 3: Further instructions
5.	Diseases, anamnesis 1, listening (revision) 1-2, listening practice for the comprehensive exam 1-2, situations 1.
6.	Diseases, anamnesis 2, listening (revision) 3-4, listening practice for the comprehensive exam 3-4, situations 2.
7.	Revision, oral test
8.	Anamnesis 3,4, listening (revision) 5-6, listening practice for the comprehensive exam 5-6, situations 3.
9.	Anamnesis 5, listening (revision) 7-8, listening practice for the comprehensive exam 7-8, situations 4.
10.	Anamnesis 6, listening practice for the comprehensive exam 9-10, situations 5-6.
11.	Anamnesis 7, listening practice for the comprehensive exam 11-13, situations 7-8.
12.	Anamnesis 8, listening practice for the comprehensive exam 14-16, situations 9.
13.	Anamnesis 9, listening practice for the comprehensive exam 17-18, situations 10.
14.	Revision, mock comprehensive exam

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another group (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29). For more than the allowed number of absences, a medical certificate of long-term illness or hospitalization is required.

According to the Study and Examination Regulations (§ 28), three tardies count as one absence. Arriving 15 minutes later than the start of the lesson is considered tardiness.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

One oral test on week 7 and a mock comprehensive examination on week 14

Topic: the material covered

Make-up and upgrade opportunities: to be arranged outside of class with the instructor, at the latest by the end of the first week of the examination period.

Attendance in the oral test and the mock comprehensive examination is a prerequisite for signature.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Participation in the oral test and mock comprehensive examination, and class attendance.

A maximum of 7 absences is allowed (7x90 minutes, i.e., 14x45 minutes); if the number of absences exceeds this, the student may make up missed classes in another class (maximum two times) in agreement with the instructor.

A student who misses more than 25% of the practical classes will not be allowed to get a signature (Study and Examination Regulations §29).

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam consists of a listening comprehension task and an oral test. It is a skills test to determine whether the student is ready to communicate with patients.

A detailed sample exam is provided in the study material, which students can download from the moodle interface.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Minimum requirements (see further details in the coursebook):

- Completing the listening task with a minimum score of 4 out of 10
- Participating in the oral interview and achieving a passing mark of at least 50%. Students should demonstrate the ability to give instructions, ask questions, and understand answers related to the topics covered in the syllabus over the past four semesters.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

comprehensive examination grade

0-49% = fail (1)

50-59% = pass (2)

60-74% = fair (3)

75-89% = good (4)

90-100% = excellent (5)

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of artificial intelligence is neither relevant nor permitted in this course, as we focus on improving communication skills and do not employ AI in class, primarily for patient safety reasons.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Orvosi Mikrobiológiai Intézet

Name of subject in Hungarian: Orvosi Mikrobiológia I.
Name of subject in English: Medical Microbiology I.
Name of subject in German: Medizinische Mikrobiologie I.

Credit value of the course: 5
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	2.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMIK1106_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Dóra (igazgató)
Course coordinator location of work, telephone availability: Institute of medical Microbiology
Course coordinator position: Professor
Course coordinator Date and number of habilitation: 2010.06.07., száma: 311

Objectives of the course, and its place in the curriculum of the medical training program:

The teaching activities of the Institute of Medical Microbiology cover all areas of Medical Microbiology: in the first semester, General and Systemic Bacteriology is covered. The theoretical basis and background is provided in the classroom lectures, with special emphasis on the pathomechanism and pathogenesis of infections/diseases caused by microorganisms. As far as possible, during laboratory practices we teach the students to perform taxonomic identification of bacteria and to be able to interpret the microbiological laboratory evidence. We also provide students with the opportunity to develop their manual skills by practising smear preparation,

staining techniques, biochemical reactions, sterility tests, antibiotic susceptibility tests and basic serological reactions.

Our students will learn safe handling of microbes and infectious agents, aseptic techniques in microbiology practicals, in order to be able to safe handle patients with infectious diseases in the future. They also need to learn the basic steps and methods used in microbiology laboratory diagnostics, which they will use in clinical practice.

Format of the course (lectures, group work, practical lessons, etc.):

The subject is taught by lectures and practices

Competencies acquired through completion of course:

After successful completion of the course, the student should have adequate competence in the background of bacterial infections, pathomechanisms and prevention of bacterial infections and treatment options.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biochemistry II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

not possible

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on the registration in Neptun program

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered

separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:

LECTURES I. SEMESTER

1. Introduction ● General information and requirements ● Morphology and physiology of bacteria ● Host-parasite relationship: Pathogenicity and virulence ● Pathomechanism, molecular pathogenesis, virulence factors ● Infection and disease ● vaccines

2. Antimicrobial drugs I.: Modes of action and interactions of antibiotics and chemotherapeutics

3. Antimicrobial drugs II.: Origin, mechanisms, induction, transfer, spreading, elimination and control of resistance ● Principles and practice of the antibacterial chemotherapy

4. Introduction to the classification of medically important bacteria: principles of taxonomic, epidemiolgical, nosological, as well as pathogenetical classification Gram-positive cocci: The Staphylococcus and Streptococcus genus ● The normal flora of the skin

5. Gram-positive non-spore forming rods: Corynebacterium, Listeria, Erysipelothrix, Lactobacillus ● Normal flora of the vagina ● Probiotics

6. Gram-negative cocci and coccobacilli I.: Neisseriaceae, Pasteurella, Bordetella ● Normal flora of the respiratory tract

7. Gram-negative cocci and coccobacilli II.: Haemophilus, Francisella, Brucella

8. Gram-negative non-fermenting rods: Pseudomonas, Burkholderia, Acinetobacter, Stenotrophomonas and Legionella

9. Gram-negative facultative anaerobic rods I: Escherichia coli, Klebsiella, Salmonella, Shigella, Proteus

10. Gram-negative facultative anaerobic rods II: Yersinia, Vibrio ● Gram-negative microaerophilic curved rods: Campylobacter, Helicobacter ● Normal flora of the gastrointestinal tract

11. Gram positive spore-forming rods: Bacillus and Clostridium genus ● Non-spore-forming obligate anaerobic bacteria and associated infections

12. Unclassifiable bacteria by Gram stain (acid-fast bacteria) ● Aerobic: Mycobacterium, Nocardia ● Anaerobic: Actinomyces

13. Obligate intracellular and epicellular bacteria: Rickettsiales, Chlamydiales, Mycoplasmatales ● Spirochaetales: Treponema, Borrelia. Leptospira

14. Nosocomial and iatrogenic infections. Vaccines

PRACTICES I. SEMESTER

1. Introduction. Rules and tools of infectious disease laboratory work. Microbiological testing methods (MVM) I: Microscopic morphological tests

2. Cultivation of bacteria: culture and teleomorphological studies

3. Sterilization. Testing the susceptibility of bacteria to disinfectants

4. Testing bacterial susceptibility to antibiotics

5. Serological methods

6. Identification of Gram-positive coccus I: Staphylococcus

7. Identification of Gram-positive coccus II : Streptococcus

8. Identification of Gram-positive cocci

9. Identification of Gram-negative coccus and coccobacillus. Identification of Gram-negative aerobic rods

10. Identification of Gram-negative facultative anaerobic rods

11. Identification of aerobic and anaerobic spore-forming bacteria, anaerobic and microaerophilic bacteria

13. Spirochaetes

14. Rickettsiae, Chlamydiae and bacteria without a cell wall

Lecturers: Prof. Szabó Dóra, Dr. Dobay Orsolya, Dr. Kocsis Béla, Dr. Ghidán Ágoston, Dr. Horváth Andrea, Dr. Domokos Judit,

Instructor of practices: Dr. Dobay Orsolya, Dr. Kocsis Béla, Dr. Ghidán Ágoston, Dr. Horváth Andrea, Dr. Domokos Judit, Dr. Kubicskó András, Dr. Kamotsay Katalin, Dr. Szász Máté, Dr. Kádár Béla, Dr. Hofmeister Bálint. Dr. Gugolya Máté, Dr. Bartha Árpád László, Dr. Nagy Orsolya

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Practices replacement during the week.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

1st Midterm on the 6th week. Topic: general microbiology (1-3 Lectures and 1-5 practices)

2nd Midterm on the 12th week. Topic: systemic bacteriology (4-12 Lectures and 6-11 practices)

Both midterm retake on the following week.

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

Active participation at the lab practice, no more than the allowed absences and passing successfully both midterms

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

General bacteriology, pathogenecity

1. Significance, sub-fields and short history of medical microbiology

2. Comparison of pro-and eukaryotic cells

3. System of classification (taxonomy) of bacteria

4. Obligate structures of the bacterial cells

5. Facultative structures of the bacterial cells

6. Structure of the bacterial cell wall and description of the peptidoglycan layer

7. Bacterial metabolism

8. Bacterial genetics: mutation, reversion and modes of gene transfer

9. Sterilisation: theoretical background and practical approaches

10. Disinfection: theoretical background and practical approaches

11. Selective toxicity and the chemotherapeutic index and principles of antibacterial chemotherapy

12. Antimicrobial drugs in combination

13. Chemoprophylaxis: definition, examples

14. Risks and side effects of antimicrobial drugs

15. Antibiotics altering the cell wall synthesis of bacteria: penicillin, cephalosporin

16. Antibiotics altering the cell wall synthesis of bacteria: monobactam, carbapenem, bacitracin

17.Antibiotics altering the protein synthesis of bacteria: aminoglycosides, tetracycline

18. Antibiotics altering the protein synthesis of bacteria: chloramphenicol, macrolide, lincosamides

19. Glycopeptides and antimicrobial drugs altering the membrane functions

20. Antimicrobial drugs altering the DNA and RNA synthesis of bacteria

21. Antituberculotic drugs

22. Possible mechanisms of resistance against antibiotics (examples)

23. The Koch's postulates. Pathogenicity, virulence. Determination of virulence

24. Exotoxins: characterisation, types. Bacterial super-antigens and associated syndromes

25. Endotoxin: characterisation, mode of action

26. Non-toxic virulence factors of bacteria

27. Infection: definition, source, portal of entry, transmission routes, and possible outcome

28. Pathomechanism of infection: adhesion, penetration, invasion, dissemination; bacteraemia and toxaemia

29. Active immunisation. Obligatory vaccines for prevention of bacterial infections

30. Non obligatory vaccines for prevention of bacterial infections

31. Passive immunisation. Preparations for the prevention and treatment of bacterial infections

32. Pathomechanism of infection: molecular mimicry and masking; antigen-shift; immunosuppression. Immunomodulant and immunosuppressive effects of microbes (examples)

33. Normal flora of the human body and its significance

34. Pathomechanism of sepsis and its diagnosis

35. Bacterial growth: Growth curve and description of the phases

36. Nosocomial and iatrogenic infections caused by bacteria

II. Systematic bacteriology

(Taxonomy (classification), morphology, virulence factors, diseases, microbiological diagnosis, treatment and prevention of the associated diseases)

1. Staphylococcus aureus

2. Coagulase negative staphylococci

3. S. pneumoniae, oral streptococci and cariogenesis

4. Streptococcus pyogenes

5. Streptococcus agalactiae, Enterococcus genus

6. Aanaerobic Gram-negative rods (Bacteroides, Fusobacterium, Prevotella, Porphyromonas) and associated infections

7. N. meningitidis, and apathogenic Neisseria species

8. N. gonorrhoeae and Moraxella

9. Bacillus anthracis and other bacilli

10. Escherichia coli and the associated intestinal and extraintestinal infections

11. Klebsiella, Serratia, Enterobacter (KES) group and Proteus genus

12. Salmonella genus and salmonellosis

13. Salmonella typhi, S. paratyphi A, B, C

14. Shigella genus and shigellosis

15. Yersinia genus, Yersinia pestis and yersiniosis

16. Pseudomonas, Burkholderia, Stenotrophomonas and Acinetobacter

17. Legionella pneumophila

18. Haemophilus genus

19. Vibrio cholera

20. Vibrio parahaemolyticus and V. vulnificus. Plesiomonas and Aeromonas

21. Campylobacter genus and Helicobacter pylori

22. Brucella genus and brucellosis.

23. Bordetella genus

24. Pasteurella multocida, Francisella tularensis and Bartonella

25. Clostridium tetani

26. Gas-gangrene clostridia

27. Clostridium botulinum and Clostridium difficile

28. Treponema genus

29. Borrelia and Leptospira genus

30. Corynebacterium diphtheriae. Corynebacterium genus and the diphtheroids

31. Listeria monocytogenes and Erysipelothrix rhusiopathiae, Lactobacillus genus and Bifidobacterium. Pre- and probiotics.

32. Actinomyces and Nocardia genera, atypical and apathogenic Mycobacteria

33. Bacteria causing human tuberculosis. Mycobacterium leprae

34. Rickettsiae, Orientia and Coxiella

35.Chlamydia trachomatis, respiratory tract diseases caused by Chlamydia

36. Mycoplasma and Ureaplasma

III. Bacterial diagnostics

1. Steps of the preparation and fixation of bacterial smears

2. Native preparations and their applications. Vital staining methods and their applications

3. Gram staining (steps and mode of action)

4. Neisser staining

5. Acid-fast staining (steps and mode of action)

6. Detection of bacterial capsule, spore and flagella

7. Significance and information content of microscopic examinations

8. Control of sterilisation and sterility

9. Principles of the preparation of bacterial culture media

10. Transport and nutrient transport media. Enrichment, selective and differential culture media

11. Rules of surface streaking of bacteria, preparation of bacterial lawn. Definition of pure culture, isolate and strain in bacteriology

12. Aerobic and microaerophilic culture of bacteria

13. Anaerobic culture of bacteria

14. Propagation and maintenance of obligate intracellular bacteria

15. Use of laboratory animals in the medical microbiology

16. The minimal inhibitory concentration (MIC), as well as the minimal bactericidal concentration (MBC) and their determination

17. Methods of antibiotic susceptibility testing of bacteria, measuring the efficacy of antibiotics

18. Modes of action of disinfectants and antiseptics

19. Identification of bacteria at species level

20. Serological reactions utilising agglutination and their applications

21. Serological reactions utilising precipitation and their applications

22. Diagnosis of the bacterial meningitis from liquor

23. Theory and application of the immunofluorescent methods (IF)

24. Theory and application of the enzyme linked immunosorbent assays (ELISA)

25. Principles of the evaluation of serological tests. Pair of sera test, meaning of titre

26. Diagnostic (allergic and susceptibility) skin tests and their applications

27. Measurement of toxicity, antitoxins in vitro and in vivo

28. Theory of serotyping and phagetyping methods and their applications

29. Rules and regulation of the collection, storage and transport of infectious material

30. Significance and major rules of blood cultures (haemocultures)

31. Biofilms and its significance

32. Bacterial causative agents of meningitis and diagnosis

33. Bacterial causative agents of atypical pneumonia and diagnosis

34. Bacterial causative agents of diarrhoea and diagnosis

35. Urinary infections caused by bacteria and diagnosis

36. Bacterial STD/STIs and diagnosis

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The list of the minimum questions and the answers together with other useful hand-outs of the course are uploaded to the Moodle surface. Link: https://itc.semmelweis.hu/moodle/course/view.php?id=11921

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The student draws a card at the colloquium, which contains 1 question from each of the three topics in the question set. The student must have at least a satisfactory knowledge of all three topics.

none

none

none

Artificial intelligence systems used in the teaching of the subject and the manner of their application

none

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Élettani Intézet

Name of subject in Hungarian: Orvosi élettan I.
Name of subject in English: Medical Physiology I.
Name of subject in German: Medizinische Physiologie I

Credit value of the course: 11
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
11.0	6.0	5.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKELT1100_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: VÁRNAI, Péter
Course coordinator location of work, telephone availability: Semmelweis University, Department of Physiology; phone: +36-1-459-1500/60439
Course coordinator position: Full Professor
Course coordinator Date and number of habilitation: 2013; reference number: 347

Objectives of the course, and its place in the curriculum of the medical training program:

The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.
In addition, the practical activities contribute to achieving the following expected learning outcomes:

- Understanding and interpreting the problems to be solved
- Demonstrating initiative
- Demonstrating decisiveness
- Gathering professional reasons, evidences, decision criteria, and knowledge and critically evaluating them
- Committing to scientific principles and evidence-based medicine, prioritizing scientific evidences in medical practice

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Format of the course (lectures, group work, practical lessons, etc.):

lecture, small group work (laboratory), Q&A, formative feedback, case studies, CBCL, laboratory and computer simulation studies, human physiological measurements

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Competencies acquired through completion of course:

Understanding of the human physiology which is foundation of medical practice.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Macroscopic Anatomy and Embryology II.

Medical Biophysics II.,

Medical Biochemistry I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Requests for special permission are evaluated by the Academic and Exam Committee.

The number of students required to start the course (minimum, maximum), method of selecting participants:

There is no minimum and maximum number of students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of

CV is required in all cases!)

Lectures:

Week	No.	Topic
	1	Introduction, fluid compartments
1	2	Transport across cell membranes
	3	Transepithelial transports
	4	Plasma membrane receptors and their signal transduction I.
2	5	Plasma membrane receptors and their signal transduction II.
	6	Intracellular receptors. Calcium metabolism of the cells. Vesicular transport.
	7	Physiology of blood I., Blood groups
3	8	Physiology of blood II.
	9	Membrane potentials
	10	Ion channels and action potential
4	11	Physiology of nerve cells, synaptic transmission in the central nervous system
	12	Neuromuscular junction and physiology of skeletal muscle
	13	Autonomic neurotransmitters and physiology of smooth muscle
5	14	Physiology of the heart I.: origin and spread of cardiac excitation
	15	Physiology of the heart II.: cardiac cycle
	16	Physiology of the heart III.: regulation of cardiac output
6	17	Electrocardiography
	18	Echocardiography
	19	Physiology of blood circulation: introduction, hemodynamics
7	20	Arterial circulation
	21	Microcirculation
	22	Venous circulation and lymph flow
8	23	Local control of circulation
	24	Reflex control of circulation I.
	25	Reflex control of circulation II.
9	26	Coronary circulation and circulation of blood in the brain
	27	Skeletal muscle, splanchnic and skin circulation
	28	Respiration I.: pulmonary ventilation
10	29	Respiration II.: gas exchange
	30	Respiration III.: pulmonary circulation, ventilation-perfusion relationship
	31	Respiration IV.: gas transport, hypoxias
11	32	Respiration V.: control of respiration
	33	Adaptation of cardiovascular and respiratory system I.
	34	Adaptation of cardiovascular and respiratory system II.
12	35	General principles and motor functions of the gastrointestinal tract
	36	Secretory functions of the gastrointestinal tract 1
	37	Secretory functions of the gastrointestinal tract 2
13	38	Digestion and absorption of food
	39	Energy balance, quality and quantity requirement of food
	40	Consultation

14	41	Competition Exam
	42	Consultation

Practices:

1. Blood cell counting, determination of hemoglobin concentration and hematocrit
2. Measurement of transport rate on red blood cells. Hemolysis
3. Leukocyte differential count on peripheral blood smear
4. Typing of blood groups
5. Computer simulation: Neuromuscular junction
6. Electromyography (EMG), nerve conduction velocity
7. Recording and analyzing the human ECG
8. Effects of vagal nerve stimulation on cardiac functions
9. Investigation of cardiac functions in situ
10. Blood pressure measurement in humans
11. Echocardiography
12. Examination of cardiac function in humans
13. Respiratory physiology calculations
14. Practice for lab exam

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The attendance in minimum 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The knowledge of the students is tested on a weekly base. The short tests cover the material of lectures of the previous week. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of percentages of the nine best written tests results in a five-point scale:

0-50% = 1, >50-60% = 2, >60-70% = 3, >70-85% = 4, >85% = 5.
This grade (practical grade) is taken into account in the exams.

Number and type of individual assignments to be completed, submission deadlines:

No assignments.

Requirements for the successful completion of the course:

1) The attendance in minimum 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.
2) The average of the taken in account weekly tests must be above 50% to obtain the end-term signature. Students who do not meet this requirement need to take a written test covering the material of the semester in the 14th week of the semester during the “Competition exam”, and achieving a result of 50% or higher is necessary to obtain the end-term signature.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination requirements:
Requirements of the semi-final exam: material of the Medical Physiology I.
The semi-final exam is oral exam. The students need to bring ID card and the laboratory report book to participate in the exam. Lists of the theoretical questions can be found in the webpage of the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and coats should be placed next to the wall of the exam place; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Topics of the semifinal exam:
1.1. Body fluid compartments and their determination. The extracellular and intravascular fluid.
1.2. Structure, permeability and transport functions of the cell membrane.
1.3. Classification, function and main features of ion channels. Voltage-gated Ca2+ channels.
1.4. The development of the resting membrane potential.
1.5. The development of the action potential in excitable cells: similarities and differences between distinct cells. Conduction of the action potential.
1.6. Communication between cells. Secondary signaling mechanisms.
1.7. The mechanism of muscle contraction in striated muscles. The electromechanical coupling.

Mechanical features of the contraction.
1.8. The functions of different types of smooth muscle.
1.9. Synaptic transmission and its regulation. Neurotransmitters.
1.10. The neuromuscular transmission in striated muscle.
1.11. Parasympathetic efferent mechanisms.
1.12. Sympathetic efferent mechanisms, adrenergic receptors.
2.1. Impulse generation in the heart. Mechanism of pacemaker potential. Control of pacemaker activity.
2.2. Impulse conduction in the heart. Nervous control of impulse conduction.
2.3. Normal human electrocardiogram. Methods for ECG recording.
2.4. Pump function of the heart, the heart cycle. Changes in pressure and volume during the cardiac cycle. Heart sounds.
2.5. Cardiac output and its control. Control of stroke volume.
2.6. Organization of the circulatory system. Hemodynamic functions of different vessels. Relationship of pressure and flow. Measurement of arterial blood pressure. Factors influencing arterial blood pressure.
2.7. Functional organization of microcirculation and its control.
2.8. Physiological vasoconstrictors.
2.9. Physiological vasodilators.
2.10. Control of interstitial fluid volume, Starling forces. Lymph flow.
2.11. Venous circulation, factors determining venous pressure and flow. Control of capacity vessels.
2.12. Reflex control of circulation: baroreceptor and chemoreceptor reflexes. Cardiovascular centers.
2.13. Local control of circulation. Characteristics of vascular smooth muscle. Myogenic, humoral, hormonal and neural control mechanisms.
2.14. Coronary circulation and its control.
2.15. Circulation of the skeletal muscle. Circulatory effects of physical exercise.
2.16. Splanchnic circulation and circulation of the skin.
2.17. Circulation of the brain. Cerebrospinal fluid. Blood-brain barrier.
3.1. Hematopoiesis. The composition of the blood.
3.2. Hemostasis and the role of thrombocytes.
3.3. Blood coagulation. Fibrinolysis. Physiological anticoagulant mechanisms.
3.4. The human blood group systems.
4.1. Lung volumes. Mechanical properties of the airways, chest wall and lung. Pressure-volume relationship in the respiratory system, surface tension in the alveolus and compliance of the chest wall.
4.2. Dead space in the breathing apparatus. Alveolar ventilation.
4.3. Gas exchange in the respiratory system.
4.4. The pulmonary circulation.
4.5. Oxygen and carbon dioxide transport. Hemoglobin. Types of hypoxia.
4.6. Cardiopulmonary adaptation during change in the body position and during physical exercise.
4.7. The muscles of respiration and the breathing movements. Neurogenesis of the regular breathing movements. Localization and function of the respiratory control center. Non-chemical control of the respiration.
4.8. Chemical control of the respiration. Pulmonary adaptations to training.
5.1. Regulation in the gastrointestinal tract: enteric nervous system and gastrointestinal hormones.
5.2. Motor functions of the gastrointestinal tract and their control:
5.3. Function of the salivary glands and regulation of salivary secretion. Gastric secretion and its

control.
5.4. Exocrine secretion of pancreas and its regulation. Bile production of the liver. Metabolism and secretion of bile pigments.
5.5. Degradation and absorption of nutrients. Absorption of water, potassium and sodium. Absorption of iron and vitamin B12.
5.6. Energy balance of the body. The quantitative and qualitative requirements of food. The regulation of food intake.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

A complete lack of knowledge of any minimum requirement detailed below and on the Department's website in itself justifies a failing grade, while partial lack of knowledge results in a grade lower than excellent.

The list of fundamental physiological concepts and mechanisms to be covered during the exams is published on the website of the Department of Physiology.

https://semmelweis.hu/elettan/en/teaching/

Lists of mandatory parameters, equations and figures:

Parameters:

Cellular physiology:
Body water content
Blood volume
Plasma volume
Extracellular fluid volume
Intracellular fluid volume
Interstitial fluid volume
Hematocrit
Hemoglobin concentration
Blood plasma Na+ concentration
Blood plasma H+ concentration
Blood plasma K+ concentration
Blood plasma Ca2+ concentration and its fractions
Blood plasma Cl- concentration
Blood plasma HCO3- concentration
Blood plasma protein concentration
Intracellular Na+ concentration

Extracellular Na+ concentration
Intracellular H+ concentration
Intracellular K+ concentration
Cytosolic Ca2+ concentration
Intracellular Cl- concentration
Intracellular HCO3- concentration
Blood plasma osmolarity and oncotic pressure
Resting membrane potential of skeletal muscle cells
Resting membrane potential of neurons
Conduction velocity of different type of nerves
Equilibrium potential of Na+ in neurons
Equilibrium potential of K+ in neurons
Equilibrium potential of Ca2+ in neurons
Equilibrium potential of Cl- in neurons

Cardiovascular system:
Duration of PQ interval of ECG (HR=75/min)
Duration of QRS complex of ECG (HR=75/min)
Duration of P wave of ECG (HR=75/min)
Amplitude of ST-segment of ECG
Amplitude of R and T waves of ECG in II. lead
Duration of cardiac cycle (HR=75/min)
Duration of systole (HR=75/min)
Duration of diastole (HR=75/min)
Duration of ventricular ejection (HR=75/min)
Duration of ventricular filling (HR=75/min)
Stroke volume
Systolic pressure in the aorta
Diastolic pressure in the aorta
Systolic pressure in the right ventricle
Diastolic pressure in the right ventricle
Systolic pressure in the left ventricle
Diastolic pressure in the left ventricle
Systolic pressure in the a. pulmonalis
Diastolic pressure in the a. pulmonalis
Central venous pressure
Blood flow of kidney
Blood flow of splanchic area
Blood flow of brain
Blood flow of heart
Blood flow of skin
Blood flow of skeletal muscles
Cerebrospinal fluid volume
Protein concentration of cerebrospinal fluid
Hydrostatic pressure of capillaries in the arteriolar end and in the venular end
Effective filtration pressure of capillaries in the arteriolar end and in the venular end
Oxygen consumption in 1 minute
AVDO2 in the systemic circulation

AVDO2 in the kidney
AVDO2 in the splanchnic area
AVDO2 in the brain
AVDO2 in the heart in resting condition and during physical exercise
AVDO2 in the skin
AVDO2 in the skeletal muscles in resting condition and during physical exercise

Respiratory system:
Residual volume
Expiratory reserve volume
Inspiratory reserve volume
Tidal volume
Vital capacity
Total lung capacity
Functional residual capacity
Dead space
Alveolar ventilation
Intrapleural pressure and alveolar pressure during inspiration
Intrapleural pressure and alveolar pressure during expiration
Intrapleural pressure and alveolar pressure at the end of inspiration
Intrapleural pressure and alveolar pressure at the end of expiration
PO2 and PCO2 of the alveolar gas
PO2 and PCO2 in the arteries
PO2 and PCO2 in the veins
Concentration of oxygen in the arteries and in the veins
O2 consumption in resting condition
CO2 production in resting condition

Gastrointestinal tract:
Pressure values in the different parts of the esophagus
Basal Metabolic Rate
Respiratory Quotient (carbohydrate, fat, protein)
Energy content of different foods (carbohydrate, fat, protein)

Equations:
Body fluid compartments
Blood volume
Equilibrium potential
Cardiac output
Total peripheral resistance
Alveolar ventilation
Dead space
Functional residual capacity
Respiratory quotient

Figures:
Cell Physiology
1. Action potential of a mammalian motor neuron. Give values of both axes!
2. Action potential and changes in contraction force of a muscle fiber during a single twitch.

3. Action potentials and changes in contraction force during single twitch, incomplete and complete tetanus of a muscle fiber. (Draw the curves in proportion to each other in their amplitudes and duration!)
4. Length-tension relationship of a skeletal muscle fiber. Give values of both axes!
5. End plate potentials before and after the application of curare.

Cardiovascular Physiology
6. Action potential recorded from a cardiac ventricular cell. (Give values of both axes in case of the human resting heart!) Draw also transmembrane currents of Na+, Ca2+ and K+ ions below!
7. Time-dependent changes in membrane potential and contraction force of a ventricular muscle fiber. (Give values of both axes in case of the human resting heart!)
8. Time-dependent changes in membrane potential and transmembrane ionic currents of the sinoatrial nodal cell.
9. Action potentials recorded from the cells in sinoatrial node, atrioventricular node and in Purkinje fibers. (Give values of both axes in case of the human resting heart!)
10. Effects of sympathetic and parasympathetic mediators on the sinoatrial nodal action potential. Draw action potentials in control and in experimental conditions separately! Indicate the potential values!
11. Draw Einthoven's triangle and indicate Einthoven limb leads!
12. Draw circuit diagram of unipolar limb leads!
13. Draw circuit diagram of augmented unipolar limb leads!
14. An example of normal ECG curve represented by lead II. Indicate atrioventricular transit time and QT interval and give their values for a resting human heart!
15. An example of normal ECG curves with a normal electrical main axis represented by the 3 bipolar limb leads. (Give values of time axis in case of the human resting heart!)
16. Draw action potentials recorded from the cells of sinoatrial node and ventricular muscle fiber and also draw the ECG curve (lead II) in the same time scale! Give values for the time axis!
17. Construct main electrical axis of the heart with Einthoven's triangle!
18. Draw left atrial, aortic, left ventricular pressure and ECG curves for a cardiac cycle! Give values of both axes!
19. Draw ECG curves (lead II), the pulmonary arterial pressure and right ventricular pressure curves for a cardiac cycle in the same time scale! Give values of both axes!
20. Draw ECG curves (lead II) and changes in left ventricular volume for a cardiac cycle in the same time scale! Give values of both axes (human values)! Indicate 1st and the 2nd heart sounds!
21. Draw diagram of left ventricular pressure versus left ventricular volume (pressure-volume loop) for a single cardiac cycle during resting condition and also during an increased preload! Give values of both axes (human values)!
22. Draw diagram of left ventricular pressure versus left ventricular volume (pressure-volume loop) for a single cardiac cycle during resting condition and also during an increased afterload! Give values of both axes (human values)!
23. Draw phasic changes of left coronary blood flow and aortic pressure in the same time scale! Give values of pressure and time axes in case of thee resting human heart!
24. Changes in intravascular pressure throughout the systemic circulation. Give pressure values on the Y axis!
25. Changes in cerebral blood flow in relation with arterial blood pressure. Give values of both axes!

Respiratory Physiology
26. Graphic representation of static lung volumes. Give normal values on Y axis!

27. Real-time tracing of tidal volume, alveolar pressure and intrapleural pressure in eupnoe (normal tidal breath). Give phases of respiration on X axis and normal values on Y axis!
28. Time-related spirogram of forced expiration. Mark FEV1 and vital capacity on Y axis and give corresponding time values on X axis!
29. Changes in ventilation during physical exercise. Give duration of the exercise on X axis and normal values on Y axis!
30. Changes in minute ventilation in relation with alveolar pCO2. Give values on both axes!
31. Changes in minute ventilation in relation with alveolar pO2. Give values on both axes!
32. Respiratory flow-volume relationship during normal and forced respiration.

Physiology of blood
33. Oxyhemoglobin dissociation curve in blood. Give normal values related to arterial and venous blood on both axes!
34. Oxyhemoglobin dissociation curve in blood with altered pH (decreased and increased from normal). Give normal values related to arterial and venous blood on both axes!
35. Oxyhemoglobin dissociation curve in blood of a mother and her fetus. Give normal values related to arterial and venous blood of the mother on both axes!
36. Mechanism of CO2 uptake by red blood cells in tissues.
37. Mechanism of CO2 release by red blood cells in lung capillaries.
38. Draw a figure representing the role of Cl--HCO3- exchanger in the mechanism of hemolysis of RBCs in isosmotic NH4Cl solution!

Gastrointestinal Physiology
39. Gastrin release of a G cell and its control.
40. Direct and indirect effects of gastrin on the HCl secretion of parietal cells.
41. Local reflex pathways in enteric nervous system.
42. Mechanism of HCl secretion of parietal cells.
43. Mechanism of bicarbonate secretion of pancreatic ducts.
44. Absorption of glucose and galactose by enterocytes.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The semi-final exam is oral exam. The exam starts at 8:45 by showing up in the selected exam place. The exam place and examiners are announced at 8:40. The students need to bring ID card and the laboratory report book to participate in the exam. The oral exam consists of two theoretical questions (I-II). Grouping of questions, the topics of the semifinal exam can be found in http://semmelweis.hu/elettan/teaching/first-semester.

--> I: 1 and 2 topics of the semifinal exam
--> II: 3, 4 and 5 topics of the semifinal exam

The overall result of the oral exam is based on the practical grade and two theoretical grades but a failed (1) theoretical question results in an overall failed (1) exam. The mathematical average of three partial grades (practical grade and two oral exam grades) gives the grade of the semi-final exam:

Excellent (5): 4.51 - 5.00
Good (4): 3.51 - 4.50
Satisfactory (3): 2.51 - 3.50
Pass (2): 2.00 - 2.50
Fail (1): below 2.00 or in case of failed (1) theoretical question.

The following rules will be enforced during the exam: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls or the practice rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The application of artificial intelligence in teaching of the course:

Students can use artificial intelligence (AI) to find answers to the complex questions that arise during consultations. The Department of Physiology encourages the responsible, transparent and critical use of AI.

Printed resources:

Type	Mandatory
Author	Edited by: Péter Enyedi and Levente Kiss
Title	Practices in Medical Physiology
Publisher	Semmelweis University: ISBN: 9780323393942
Year of publication	2024
Other/Comment	ISBN: 978-963-331-629-0

Type	Recommended
Author	Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy
Title	Physiology
Publisher	ISBN: 9780323393942
Year of publication	2017
Other/Comment	ISBN: 9780323393942

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Élettani Intézet

Name of subject in Hungarian: Orvosi élettan II.
Name of subject in English: Medical Physiology II
Name of subject in German: Medizinische Physiologie II

Credit value of the course: 11
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
11.0	6.0	5.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKELT1100_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: VÁRNAI, Péter
Course coordinator location of work, telephone availability: Semmelweis University, Department of Physiology; phone: +36-1-459-1500/60439
Course coordinator position: Full Professor
Course coordinator Date and number of habilitation: 2013; reference number: 347

Objectives of the course, and its place in the curriculum of the medical training program:

The goal of Medical Physiology course is to give the students the understanding of the concepts and principles of medical physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course.
In addition, the practical activities contribute to achieving the following expected learning outcomes:

- Understanding and interpreting the problems to be solved
- Demonstrating initiative
- Demonstrating decisiveness
- Gathering professional reasons, evidences, decision criteria, and knowledge and critically evaluating them
- Committing to scientific principles and evidence-based medicine, prioritizing scientific evidences in medical practice

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Format of the course (lectures, group work, practical lessons, etc.):

lecture, small group work (laboratory), Q&A, formative feedback, case studies, CBCL, laboratory and computer simulation studies, human physiological measurements

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Competencies acquired through completion of course:

Understanding of the human physiology which is foundation of medical practice.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology I.
Microscopic Anatomy and Embryology II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Requests for special permission are evaluated by the Academic and Exam Committee.

The number of students required to start the course (minimum, maximum), method of selecting participants:

There is no minimum and maximum number of students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures:

Week	No.	Topic
	1	Renal function I.: renal circulation, glomerular filtration
1	2	Renal function II.: tubular functions
	3	Renal function III.: concentration, dilution
	4	Osmo- and volume regulation
2	5	Acid-base balance I.: introduction and the role of kidneys
	6	Acid-base balance II.: the role of lungs and clinical implications
	7	Endocrine regulations
3	8	The hypothalamo-adenohypophyseal system. Growth hormone, somatomedins.
	9	Function of the adrenal cortex 1
	10	Function of the adrenal cortex 2
4	11	Function of the thyroid gland 1
	12	Function of the thyroid gland 2
	13	Physiology of calcium metabolism
5	14	Physiology of bones
	15	Hormonal regulation of intermedier metabolism 1
	16	Hormonal regulation of intermedier metabolism 2
6	17	Hormonal regulation of intermedier metabolism 3
	18	Hormonal regulation of intermedier metabolism 4
	19	Function of the reproductive system 1 Endocrinology of the sexual differentiation and development
7	20	Function of the reproductive system 2 Male sexual function
	21	Function of the reproductive system 3 Female sexual function
	22	Function of the reproductive system 4 Endocrinology of pregnancy, parturition and lactation
8	23	Introduction to neurophysiology, physiology of nerve and glia cells
	24	Sensory functions 1
	25	Sensory functions 2
9	26	Sensory functions 3
	27	Sensory functions 4
	28	Physiology of hearing and equilibrium I.
10	29	Physiology of hearing and equilibrium II.
	30	Physiology of vision I.
	31	Physiology of vision II.
11	32	Electroencephalogram, sleep phenomena
	33	Motor functions I.
	34	Motor functions II.
12	35	Motor functions III.
	36	Thermoregulation
	37	Integration of autonomic responses
13	38	Learning and memory
	39	Regulation of behavioral mechanisms, motivation and emotion
	40	Physiology of aging
14	41	Exercise physiology
	42	Competition

Practices

1. Smooth muscle of rabbit small intestine
2. Human pulmonary function tests - Body plethysmography
3. Circulatory and respiratory reflexes in rabbit
4. Studies on circulatory reactions of a virtual rat
5. Human pulmonary function tests - Spirometry
6. Spiroergometry
7. Pulse wave in human
8. Evaluation of acid-base parameters with the Siggaard-Andersen nomogram
9. Electrooculography (EOG) and investigation of the vestibular system
10. Oral glucose tolerance test (OGTT)
11. Human visual physiology
12. Investigation of reflexes
13. Practice for lab exam
14. Lab exam

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The attendance in minimum 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. There are no extra practices and missed practices cannot be retaken.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The knowledge of the students is tested on a weekly base. The short tests cover the material of lectures of the previous week. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of percentages of the nine best written tests results in a five-point scale:

0-50% = 1, >50-60% = 2, >60-70% = 3, >70-85% = 4, >85% = 5.

This grade (practical grade) is taken into account in the exams.

Number and type of individual assignments to be completed, submission deadlines:

No assignments.

Requirements for the successful completion of the course:

1) The attendance in minimum 75% of practices is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited.
2) The average of the taken in account weekly tests must be above 50% to obtain the end-term signature. Students who do not meet this requirement need to take a written test covering the material of the semester in the 14th week of the semester during the "Competition", and achieving a result of 50% or higher is necessary to obtain the end-term signature.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination requirements:

Requirements of the **final exam**: material of the Medical Physiology I. and Medical Physiology II.

The final exam consists of practical, written and oral parts. The students need to bring student identity card and the laboratory report book to participate in the exam. The practical part (lab exam) takes place in the last week of the second semester. Passing the lab exam is not a prerequisite to participate on the other parts of the final exam. A failed or missed lab exam is taken into account in grading the final exam as fail (1) partial grade (a successful lab exam does not result in any grade). The written and oral part of the final exam is held on the same day. The topics of the final exam can be found in the webpage of the Department of Physiology (http://semmelweis.hu/elettan/teaching/second-semester). The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the exam rooms; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Topics of the final exam:

1.1. Body fluid compartments and their determination. The extracellular and intravascular fluid.

1.2. Structure, permeability and transport functions of the cell membrane. Transepithelial transports

1.3. Signal transduction: receptors, G proteins, second messengers.

1.4. Classification, function and main features of ion channels. Voltage-gated Ca2+ channels. Cellular calcium metabolism.

1.5. The development of the resting membrane potential. The development and properties of the electrotonic potential.

1.6. The development of the action potential in excitable cells: similarities and differences between distinct cells. Conduction of the action potential.

1.7. Physiology of nerve cells. Synaptic transmission and its regulation. Neurotransmitters.

1.8. The physiology of smooth muscle. The functions of different types of smooth muscle.

1.9. Neuromuscular junction and physiology of the skeletal muscle.

1.10. Parasympathetic and sympathetic efferent mechanisms.

2.1. Impulse generation and conduction in the heart. Mechanism of pacemaker potential. Control of pacemaker activity and impulse conduction.

2.2. Electrocardiography, the human electrocardiogram.

2.3. The heart cycle. Changes in pressure and volume during the cardiac cycle. Heart sounds.

2.4. Pump function of the heart. Cardiac output and its control.

2.5. Organization of the circulatory system. Hemodynamic functions of different vessel segments in the systemic circulation. Biophysical basis of blood flow. Relationship of pressure and flow.

2.6. Measurement of arterial blood pressure. Factors influencing arterial blood pressure.

2.7. Functional organization of microcirculation and its control. Control of interstitial fluid volume, Starling forces.

2.8. Venous circulation, factors determining venous pressure and flow. Control of capacity vessels. Lymph flow.

2.9. Local control of circulation. Myogenic, humoral control mechanisms. Functional and reactive hyperemia.

2.10. Neurohormonal and reflex control of circulation: baroreceptor and chemoreceptor reflexes. Cardiovascular centers.

2.11. Circulation of the skeletal muscle. Circulatory effects of physical exercise. Splanchnic circulation.

2.12. Coronary circulation. Circulation of the brain. Cerebrospinal fluid. Blood-brain barrier.

3.1. Lung volumes. Dead space in the breathing apparatus. Alveolar ventilation. Mechanical

properties of the airways, chest wall and lung. Pressure-volume relationship in the respiratory system, surface tension in the alveolus and compliance of the chest wall.

3.2. Gas exchange in the respiratory system. The pulmonary circulation. Ventilation-perfusion relationship.

3.3. Oxygen and carbon dioxide transport. Hemoglobin. Types of hypoxia.

3.4. Localization and function of the respiratory control centers. Neural and chemical control of the respiration.

3.5. Cardiopulmonary adaptation during change in the body position and during physical exercise.

4.1. Circulation of the kidney. Glomerular-filtration.

4.2. Tubular transport processes.

4.3. Concentration and dilution in the kidney. The function of the urinary bladder and the regulation of the urination.

4.4. Control of body fluid volumes and extracellular fluid osmolality.

4.5. The acid-base balance. The role of the lung and kidney in the regulation of the pH and in the compensation of acid-base imbalances.

5.1. Hematopoiesis. The composition of the blood.

5.2. Hemostasis and the role of thrombocytes.

5.3. Blood coagulation. Fibrinolysis. Physiological anticoagulant mechanisms.

5.4. The human blood group systems.

6.1. Regulation in the gastrointestinal tract: enteric nervous system and gastrointestinal hormones.

6.2. Motor functions of the gastrointestinal tract and their control:

6.3. Function of the salivary glands and regulation of salivary secretion. Gastric secretion and its control.

6.4. Exocrine secretion of pancreas and its regulation. Bile production of the liver. Metabolism and secretion of bile pigments.

6.5. Degradation and absorption of nutrients. Absorption of water, potassium and sodium. Absorption of iron and vitamin B12.

6.6. Energy balance of the body. The quantitative and qualitative requirements of food. The regulation of food intake. Control of body weight.

7.1. The hypothalamus-pituitary gland system. Growth hormone and somatomedins.

7.2. The function of the adrenal cortex.

7.3. Production and effects of thyroid hormones (T3/T4). The regulation of their secretion.

7.4. Insulin secretion and the regulation of the secretion. The effects of insulin on the intermediary metabolism. Diabetes mellitus.

7.5. Glucagon secretion and the regulation of the secretion. Endocrine mechanisms protecting from hypoglycemia. Endocrine and metabolic changes related to starving and physical exercise.

7.6. Calcium metabolism. The physiology of bone and growth.

7.7. Endocrine physiology of sexual development. Male reproductive physiology.

7.8. Female sexual endocrinology.

7.9. Endocrinology of pregnancy, delivery, and lactation.

7.10. The function of adrenal medulla. Adaptation to environmental stress.

8.1. Physiology of nerve and glia cells.

8.2. The somatovisceral Sensory System: properties of the receptors, afferent pathways, role of the thalamus and the cerebral cortex. Tactile sensations.

8.3. Physiology of pain sensation.

8.4. Physiology of vision.

8.5. Physiology of hearing.

8.6. Physiology of equilibrium. The senses of taste and smell.

8.7. Motor functions of the spinal cord. Cord reflexes. Spinal cord transection and spinal shock.

8.8. Supraspinal regulation of muscle functions. Postural reflexes.

8.9. The role of the cerebellum and basal ganglia in motor functions.

8.10. Thermoreceptors. Thermoregulation. Regulation of the circulation of the skin.

8.11. Electroencephalogram (EEG); sleep phenomena. Learning and memory.

8.12. Integration of autonomic responses. Regulation of behavioral mechanisms. Motivation. Emotion.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum

requirements of the course.

A complete lack of knowledge of any minimum requirement detailed below and on the Department's website in itself justifies a failing grade, while partial lack of knowledge results in a grade lower than excellent.

The list of fundamental physiological concepts and mechanisms to be covered during the exams is published on the website of the Department of Physiology.

https://semmelweis.hu/elettan/en/teaching/

Lists of mandatory parameters, equations and figures:

Parameters:

Cellular physiology:
Body water content
Blood volume
Plasma volume
Extracellular fluid volume
Intracellular fluid volume
Interstitial fluid volume
Hematocrit
Hemoglobin concentration
Blood plasma Na^+ concentration
Blood plasma H^+ concentration
Blood plasma K^+ concentration
Blood plasma Ca^{2+} concentration and its fractions
Blood plasma Cl^- concentration
Blood plasma HCO_3^- concentration
Blood plasma protein concentration
Intracellular Na^+ concentration
Extracellular Na^+ concentration
Intracellular H^+ concentration
Intracellular K^+ concentration
Cytosolic Ca^{2+} concentration
Intracellular Cl^- concentration
Intracellular HCO_3^- concentration
Blood plasma osmolarity and oncotic pressure
Resting membrane potential of skeletal muscle cells
Resting membrane potential of neurons
Conduction velocity of different type of nerves
Equilibrium potential of Na^+ in neurons
Equilibrium potential of K^+ in neurons
Equilibrium potential of Ca^{2+} in neurons
Equilibrium potential of Cl^- in neurons

Cardiovascular system:
Duration of PQ interval of ECG (HR=75/min)
Duration of QRS complex of ECG (HR=75/min)
Duration of P wave of ECG (HR=75/min)
Amplitude of ST-segment of ECG
Amplitude of R and T waves of ECG in II. lead
Duration of cardiac cycle (HR=75/min)
Duration of systole (HR=75/min)
Duration of diastole (HR=75/min)
Duration of ventricular ejection (HR=75/min)
Duration of ventricular filling (HR=75/min)
Stroke volume
Systolic pressure in the aorta
Diastolic pressure in the aorta
Systolic pressure in the right ventricle
Diastolic pressure in the right ventricle
Systolic pressure in the left ventricle
Diastolic pressure in the left ventricle
Systolic pressure in the a. pulmonalis
Diastolic pressure in the a. pulmonalis
Central venous pressure
Blood flow of kidney
Blood flow of splanchnic area
Blood flow of brain
Blood flow of heart
Blood flow of skin
Blood flow of skeletal muscles
Cerebrospinal fluid volume
Protein concentration of cerebrospinal fluid
Hydrostatic pressure of capillaries in the arteriolar end and in the venular end
Effective filtration pressure of capillaries in the arteriolar end and in the venular end
Oxygen consumption in 1 minute
AVDO2 in the systemic circulation
AVDO2 in the kidney
AVDO2 in the splanchnic area
AVDO2 in the brain
AVDO2 in the heart in resting condition and during physical exercise
AVDO2 in the skin
AVDO2 in the skeletal muscles in resting condition and during physical exercise

Respiratory system:
Residual volume
Expiratory reserve volume
Inspiratory reserve volume
Tidal volume
Vital capacity
Total lung capacity
Functional residual capacity

Dead space
Alveolar ventilation
Intrapleural pressure and alveolar pressure during inspiration
Intrapleural pressure and alveolar pressure during expiration
Intrapleural pressure and alveolar pressure at the end of inspiration
Intrapleural pressure and alveolar pressure at the end of expiration
PO2 and PCO2 of the alveolar gas
PO2 and PCO2 in the arteries
PO2 and PCO2 in the veins
Concentration of oxygen in the arteries and in the veins
O2 consumption in resting condition
CO2 production in resting condition

Urinary system:
Renal blood flow
Renal plasma flow
Glomerular filtration rate
Filtration fraction
Hydrostatic and colloid osmotic pressures in the glomerular capillaries (afferent and efferent sides)
Hydrostatic and colloid osmotic pressures in the Bowman's space
Effective filtration pressure in the glomerular capillaries (afferent and efferent sides)
Osmotic concentration in the proximal tubule
Osmotic concentration of the interstitium in the cortex
Urine volume (maximal concentration)
Urine osmolarity (maximal concentration)
Urine volume (maximal dilution)
Urine osmolarity (maximal dilution)
Osmotic concentration and composition of the interstitium in the inner medulla during maximal concentration
Transport maximum of tubular glucose-reabsorbtion

Acid-Base Balance:
Arterial blood pH and pCO2
Buffer base
Base excess
Standard HCO3-
Actual HCO3-

Gastrointestinal tract:
Pressure values in the different parts of the esophagus

Blood:
Red blood cell count
White blood cell count
Thrombocyte count
Percentage of different white blood cell types

Endocrinology:
Total and ionic Ca2+ concentration in the plasma

Basal glucose level in the plasma
Basal Metabolic Rate
Respiratory Quotient (carbohydrate, fat, protein)
Energy content of different foods (carbohydrate, fat, protein)

Nervous system:
EEG: α-wave frequency; β-wave frequency
Refractive power of cornea and lens

Equations:
Body fluid compartments
Blood volume
Equilibrium potential
Cardiac output
Total peripheral resistance
Alveolar ventilation
Dead space
Functional residual capacity
Henderson-Hasselbalch equation
Clearance
RBF, RPF
Filtration fraction
Energy expenditure
Respiratory quotient

Figures:
Cell Physiology
1. Action potential of a mammalian motor neuron. Give values of both axes!
2. Action potential and changes in contraction force of a muscle fiber during a single twitch.
3. Action potentials and changes in contraction force during single twitch, incomplete and complete tetanus of a muscle fiber. (Draw the curves in proportion to each other in their amplitudes and duration!)
4. Length-tension relationship of a skeletal muscle fiber. Give values of both axes!
5. End plate potentials before and after the application of curare.

Cardiovascular Physiology
6. Action potential recorded from a cardiac ventricular cell. (Give values of both axes in case of the human resting heart!) Draw also transmembrane currents of Na+, Ca2+ and K+ ions below!
7. Time-dependent changes in membrane potential and contraction force of a ventricular muscle fiber. (Give values of both axes in case of the human resting heart!)
8. Time-dependent changes in membrane potential and transmembrane ionic currents of the sinoatrial nodal cell.
9. Action potentials recorded from the cells in sinoatrial node, atrioventricular node and in Purkinje fibers. (Give values of both axes in case of the human resting heart!)
10. Effects of sympathetic and parasympathetic mediators on the sinoatrial nodal action potential. Draw action potentials in control and in experimental conditions separately! Indicate the potential values!
11. Draw Einthoven’s triangle and indicate Einthoven limb leads!
12. Draw circuit diagram of unipolar limb leads!

13. Draw circuit diagram of augmented unipolar limb leads!
14. An example of normal ECG curve represented by lead II. Indicate atrioventricular transit time and QT interval and give their values for a resting human heart!
15. An example of normal ECG curves with a normal electrical main axis represented by the 3 bipolar limb leads. (Give values of time axis in case of the human resting heart!)
16. Draw action potentials recorded from the cells of sinoatrial node and ventricular muscle fiber and also draw the ECG curve (lead II) in the same time scale! Give values for the time axis!
17. Construct main electrical axis of the heart with Einthoven's triangle!
18. Draw left atrial, aortic, left ventricular pressure and ECG curves for a cardiac cycle! Give values of both axes!
19. Draw ECG curves (lead II), the pulmonary arterial pressure and right ventricular pressure curves for a cardiac cycle in the same time scale! Give values of both axes!
20. Draw ECG curves (lead II) and changes in left ventricular volume for a cardiac cycle in the same time scale! Give values of both axes (human values)! Indicate 1st and the 2nd heart sounds!
21. Draw diagram of left ventricular pressure versus left ventricular volume (pressure-volume loop) for a single cardiac cycle during resting condition and also during an increased preload! Give values of both axes (human values)!
22. Draw diagram of left ventricular pressure versus left ventricular volume (pressure-volume loop) for a single cardiac cycle during resting condition and also during an increased afterload! Give values of both axes (human values)!
23. Draw phasic changes of left coronary blood flow and aortic pressure in the same time scale! Give values of pressure and time axes in case of thee resting human heart!
24. Changes in intravascular pressure throughout the systemic circulation. Give pressure values on the Y axis!
25. Changes in cerebral blood flow in relation with arterial blood pressure. Give values of both axes!

Renal Physiology

26. Changes in intravascular pressure throughout the kidney vasculature. Mark the types of vessels on X axis and give pressure values on Y axis!
27. Transepithelial transport of glucose.
28. The rate of filtered, reabsorbed and excreted glucose in relation with the plasma glucose concentration. Give plasma concentration values on X axis! Mark Tm glucose (transport maximum of tubular reabsorption) on Y axis!
29. Transport mechanism for NaCl reabsorption in the thick ascending limb of the loop of Henle.

Respiratory Physiology

30. Graphic representation of static lung volumes. Give normal values on Y axis!
31. Real-time tracing of tidal volume, alveolar pressure and intrapleural pressure in eupnoe (normal tidal breath). Give phases of respiration on X axis and normal values on Y axis!
32. Time-related spirogram of forced expiration. Mark FEV1 and vital capacity on Y axis and give corresponding time values on X axis!
33. Changes in ventilation during physical exercise. Give duration of the exercise on X axis and normal values on Y axis!
34. Changes in minute ventilation in relation with alveolar pCO_2. Give values on both axes!
35. Changes in minute ventilation in relation with alveolar pO_2. Give values on both axes!
36. Respiratory flow-volume relationship during normal and forced respiration.

Physiology of blood

37. Oxyhemoglobin dissociation curve in blood. Give normal values related to arterial and venous blood on both axes!
38. Oxyhemoglobin dissociation curve in blood with altered pH (decreased and increased from normal). Give normal values related to arterial and venous blood on both axes!
39. Oxyhemoglobin dissociation curve in blood of a mother and her fetus. Give normal values related to arterial and venous blood of the mother on both axes!
40. Mechanism of CO_2 uptake by red blood cells in tissues.
41. Mechanism of CO_2 release by red blood cells in lung capillaries.
42. Draw a figure representing the role of Cl--HCO_3^- exchanger in the mechanism of hemolysis of RBCs in isosmotic NH_4Cl solution!

Gastrointestinal Physiology
43. Gastrin release of a G cell and its control.
44. Direct and indirect effects of gastrin on the HCl secretion of parietal cells.
45. Local reflex pathways in enteric nervous system.
46. Mechanism of HCl secretion of parietal cells.
47. Mechanism of bicarbonate secretion of pancreatic ducts.
48. Absorption of glucose and galactose by enterocytes.

Endocrine Physiology
49. Oral glucose tolerance test (OGTT) curve of a healthy and a diabetic patient. Give values on both axes!
50. Mechanism of insulin secretion induced by glucose in pancreatic β cells.
51. Feedback control of the secretion of parathyroid hormone. Indicate the effects of PTH!
52. Draw the relationship between PTH secretion and plasma Ca^{2+} concentration in humans! Give physiological Ca^{2+} concentration values on X axis!
53. Feedback control of the function of thyroid gland.
54. Feedback control of the function of adrenal cortex.
55. Feedback control of the secretion of growth hormone.
56. Hormonal control of testicular function.
57. Changes in testosterone secretion in intrauterine and postnatal life periods. Give age values on X axis!
58. Hormonal control of the ovarian function.
59. Changes in plasma FSH and LH hormone levels throughout the menstrual cycle. Give the days of the cycle and the ovulatory phase on X axis!

Physiology of the Nervous System
60. Receptor potential and changes in frequency of action potentials in phasic and tonic receptors: signal adaptation.
61. Draw the neuronal network of Renshaw-inhibition.
62. Signaling mechanism in the hair cell.
63. Mechanism of referred pain.
64. Neuronal network of endogenous analgesia system in the spinal cord.
65. Sensitivity of cold thermoreceptors in function of temperature in mammals. Give the temperaure values on X axis!
66. Sensitivity of warm thermoreceptors in function of temperature in mammals. Give the temperaure values on X axis!
67. Ionic currents of photoreceptors in darkness and during light.
68. Visual field and main visual pathways of both eyes.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Method and type of grading:

The final exam consists of a practical, a written and an oral part. The practical part (lab exam) takes place in the last week of the second semester. The topics of the lab exam can be found in http://semmelweis.hu/elettan/en/teaching/second-semester/. Passing the lab exam is not a prerequisite to participate on the final exam, but a failed lab exam is taken into account in grading the final exam as a failed (1) partial grade. Outstanding performance in the lab exam can lead to an excellent (5) partial grade, which is taken into account in grading the final exam.

The theoretical exam starts at 8:45 by showing up in the selected exam place. The exam place and examiners are announced at 8:40. The students need to bring ID card and the laboratory report book to participate in the exam.
The written part consists of 30 questions and takes 45 minutes. Grading of the written part:
0-14 correct answers = 1
15-18 correct answers = 2
19-22 correct answers = 3
23-26 correct answers = 4
27-30 correct answers = 5

The oral exam starts at 9:45 and consists of two theoretical questions (I-II). At the beginning of the oral exam, two theoretical questions (I. and II.) will be drawn.
I: 1, 2, 3, 4 and 5 topics of the final exam
II: 6, 7 and 8 topics of the final exam
The topics of the final exam can be found in http://semmelweis.hu/elettan/teaching/second-semester.

The mathematical average of four or five partial grades (practical grade, one written exam grade, two theoretical exam grades and lab exam grade if applicable) gives the grade of the final exam, but a failed (1) theoretical question results in an overall failed (1) exam.

Excellent (5): 4.51 - 5.00
Good (4): 3.51 - 4.50
Satisfactory (3): 2.51 - 3.50
Pass (2): 2.00 - 2.50
Fail (1): below 2.00 or in case of failed (1) theoretical question

Artificial intelligence systems used in the teaching of the subject and the manner of their

application

The application of artificial intelligence in teaching of the course:
Students can use artificial intelligence (AI) to find answers to the complex questions that arise during consultations. The Department of Physiology encourages the responsible, transparent and critical use of AI.

Printed resources:

Type	Mandatory
Author	Péter Enyedi and Levente Kiss
Title	Practices in Medical Physiology
Publisher	Semmelweis Kiadó
Year of publication	2024
Other/Comment	ISBN: 978-963-331-629-0

Type	Mandatory
Author	Koeppen-Bruce M, Stanton- Bruce A
Title	Berne & Levy Physiology
Publisher	Elsevier
Year of publication	2017
Other/Comment	ISBN: 9780323393942

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Magatartástudományi Intézet

Name of subject in Hungarian: Orvosi pszichológia
Name of subject in English: Medical Psychology
Name of subject in German: Medizinische Psychologie

Credit value of the course: 4
Semester: 3rd semester, 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	1.0	0.0	2.5

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMAG1079_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Purebl György (intézet igazgató)
Course coordinator location of work, telephone availability: Institute of Behavioral Sciences, +36 (1) 210-2953
Course coordinator position: director
Course coordinator Date and number of habilitation: 2019.06.06. 5/2019

Objectives of the course, and its place in the curriculum of the medical training program:

The course is designed to give a broad overview of the field of medical psychology, including major theoretical concepts, research and clinical practice. A distinct aim of the course is to introduce those low intensity psychological interventions, which can be efficiently used in everyday medical practice.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and seminars. Seminars include small group works, student presentations and interactive tasks, practical skill development based on role plays and processing clinical case studies.

Competencies acquired through completion of course:

· Developing an understanding of the complex interplay between one's physical well-being and a variety of biological, psychological, and social factors.

· Learning the nature of the stress response and its impact in the etiology and course of many health problems.

· Understanding the approach of bio-psycho-social model and become familiar with some frequent psychosomatic diseases.

· Being able to identify various psychological disorders and key personality traits related to health/disease.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Communication

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Mandatory subject, according to the central group schedule, every registered student is accepted**.** The preferred maximum number of seminar groups is 18.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Thematic of the lectures: Week 1 – week 7:

Week 1. Major Schools of Psychology Dr. János Kollár

Week 2. Introduction to Human Behavior Dr. Péter Ujma

Week 3. People Living with Disabilities Dr. János Kollár

Week 4. Depression and Suicide – The Role of Online Prevention Prof. György Purebl

Week 5. Conscious States, Sleep, Dreaming and General Anesthesia Dr. Róber Bódizs

Week 6. Stress and illness; Behavioral Interventions Dr. Stauder Adrienne

Week 7. Clinical Management of Eating and Body Image Disorders Dr. Tamás Szalai

Thematic of the seminars:

Week 1. Developmental psychology, attachment theories

Week 2. Personality theories

Week 3. Human sexuality and sexual disorders

Week 4. Depression and mood disorders.

Week 5. Anxiety and medical illnesses.

Week 6. Eating and body image disorders.

Week 7. Psychosomatic disorders; somatization and dissociative disorders.

Week 8. Personality disorders.

Week 9. Sleep disorders

Week 10. Addiction, substance use

Week 11. Suicide, cry for help, crisis intervention

Week 12. Psychology of death, grief, and dying

Week 13. Behaviour change and psychotherapy. Stress management in medical practice.

Week 14. Mental health of medical doctors. Prevention and management of burn-out. Bálint-groups.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKMAG1091_1A, AOKPSI762_1A

Requirements for attendance, options for making up missed sessions, and method of

absence justification:

Students are expected to attend regularly the course and participation list will be recorded at the end of every seminar. Participating on at least 75% of the total number of seminars is a prerequisite for getting the signature needed to absolve the course. The maximum number of absences permitted: three absences from the seminars.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

An active participation on at least 75% of the total number of seminars, and keeping a presentation from a specific topic related to the seminars are prerequisites for getting the signature needed to absolve the course.

Number and type of individual assignments to be completed, submission deadlines:

Keeping a presentation from a specific topic related to the seminars is required until the end of the semester.

Requirements for the successful completion of the course:

An active participation on at least 75% of the total number of seminars (maximum of 3 absences), and keeping a presentation from a specific topic related to the seminars are prerequisites for getting the signature needed to absolve the course.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Theoretical exam based on the topics of the lectures and seminars. The exam contains simple choice, multiple choice test questions as well as definitions (e.g. diagnostic criteria of certain mental disorders) and short essay questions.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as

an exam.) A link published on the department's website referring to the minimum requirements of the course.

Both the Moodle surface of the course as well as our website describes all the requirements and contains all necessary study materials in detail, please find them below:

https://itc.semmelweis.hu/moodle/course/view.php?id=9928

https://semmelweis.hu/magtud/en/education/faculty-of-medicine/medical-psychology/

As mentioned above, the theoretical exam, therefore the core requirement of the assessment from Medical Psychology is based on the content of the lecture and seminar slides. A "**Brief study material**" stored on the Moodle surface as well as on the website also helps the preparation of the students.

Basic requirements involve: 1. the definition of human attachment with its childhood adult patterns; 2. the cognitive and the behavioral personality theories; 3. the diagnosis and the basics of the VBT treatment of major depression; 4. the diagnosis of panic disorder; 5. the diagnostic as well as hospital admission criteria of anorexia nervosa and bulimia nervosa; 6. the recognition of illness anxiety and the vicious circle of somatization; 7. the general criteria and 3 clusters of personality disorders; 8. the diagnosis of insomnia and basic sleep hygiene recommendations; 9. the criteria of substance use disorder; 10. recognition of cry for help and the assessment of the risk factors of suicide; 11. the stages of dying and grief; 12. the transtheoretical model of behavior change; 13. knowing the general adaptation syndrome; 14. well as the symptoms and stages of burn-out.

The bare minimum requirement for the exam is the "Question bank", which summarizes the potential questions and correct answers can be asked on the exam. The evaluation of the test result is based on the total score reached, according to the following:

45 – 50 points: 5 (excellent)

39 – 44 points: 4 (good)

32 – 38 points: 3 (satisfactory)

25 – 31 points: 2 (pass)

0 – 24 points: 1 (failed)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of

and conditions for offered grades)

The sole source of grading is the achievement reached on the written exam.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We do not involve artificial intelligence in the teaching of the subject; teachers do not use AI-assisted materials during the lectures or seminars. Students' individual work shall rely on scientifically established materials such as peer-reviewed journals, e.g. when preparing the content of presentations or case studies.

AI tools may assist students in organising information, personalising learning materials, and accessing or processing scientific literature more efficiently. However, the use of AI does not exempt students from their individual responsibilities related to studying, literature review, and preparation of assignments. While AI tools may support the search for relevant scientific sources, the interpretation, critical evaluation, and synthesis of the information remain the responsibility of the student.

The use of AI systems during examinations or formal assessments is strictly prohibited, unless the task explicitly requires the knowledge or application of AI tools.

Printed resources:

Type	Mandatory
Author	Danny Wedding
Title	Behavior & Medicine, 4th Edition
Publisher	Hogrefe & Huber Publishers, Seattle
Year of publication	2006

Type	Recommended
Author	Kopp M. – Skrabski Á.
Title	Behavioural Sciences Applied in a Changing Society
Publisher	Corvina
Year of publication	1996

Type	Recommended
Author	Fadem B.
Title	Behavioural Science, , 5th ed.
Publisher	Lippincott Williams & Wilkins
Year of publication	2008

Type	Recommended

Author	Sarafino E.P.
Title	Health Psychology. Biopsychosocial interactions, 6 th ed.
Publisher	Wiley
Year of publication	2008

Other resources:

Required	pdf.igen
Other/Comment	Lecture and seminar slides are the compulsory material for the exam, and are available both on the Moodle surface of the course and on our website: https://itc.semmelweis.hu/moodle/course/view.php?id=9928 https://semmelweis.hu/magtud/en/education/faculty-of-medicine/medical-psychology/

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Magatartástudományi Intézet

Name of subject in Hungarian: Orvosi szociológia
Name of subject in English: Medical Sociology
Name of subject in German: Medizinische Soziologie

Credit value of the course: 2
Semester: 3rd semester, 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	8.0	20.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMAG1208_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Purebl György (intézet igazgató)
Course coordinator location of work, telephone availability: Institute of Behavioral Sciences, +36 (1) 210-2953
Course coordinator position: Director of the Institute and Professor
Course coordinator Date and number of habilitation: 06.06.2019. 5/2019

Objectives of the course, and its place in the curriculum of the medical training program:

In the second half of the 20th century, the biomedical model in medicine was increasingly replaced by a systems-based bio-psycho-social theory. According to this approach, biological, psychological and social factors, as well as their mutual interactions, play a significant role in the aetiology of diseases. In our teaching, we approach the various topics of the world of health and illness based on this perspective.
Based on the above approach, the aim of medical sociology is to familiarise future doctors

with the social factors whose understanding is essential in the processes of treatment and prevention. Understanding the role of social inequalities, the fundamental principles of how healthcare systems operate, the medical profession and its transformation, and the phenomenon of medicalisation are all part of the curriculum. Our educational programme and project tasks also include an exploration of socially relevant issues in digital health and healthcare. A key objective of the course is to prepare students for the OSCE examination. In the OSCE exam, the assessment of psychosocial and social factors is an integral part of clinical competence, primarily during history-taking, communication and clinical decision-making.

Format of the course (lectures, group work, practical lessons, etc.):

lectures + practical sessions, with small-group work during the practical sessions

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Competencies acquired through completion of course:

Acquisition of the background knowledge of social and ciltural issues that is essential both prior to the first encounter with patients and throughout the entire healing process.
An understanding of healthcare systems is also furthered by the course.
Case studies form a key pillar of the course, enabling students to understand how social issues manifest themselves in everyday medical practice.
Through project-based tasks, students gain experience in practical research work and learn the fundamentals of teamwork.

The main areas of competence development in the teaching of medical sociology within medical training:
1. Developing structural sensitivity – recognising the social patterns of diseases, as well as identifying social factors influencing health and health inequalities.
2. Competence in taking a social history – exploring the patient's living conditions, family and social relationships, and social situation as part of the clinical history.
3. Development of contextual clinical reasoning – the integrated interpretation of biomedical, psychological and social factors when assessing the patient's condition and treatment options.
4. Assessment and adaptive management of health literacy – assessing patients' level of health literacy and tailoring communication and therapeutic explanations accordingly.
5. Patient-centred communication and cultural sensitivity – empathetic, culturally sensitive doctor–patient communication, and taking patients' values and preferences into account during shared decision-making.
6. Recognising social factors influencing treatment adherence – understanding how socio-economic status, family support or living conditions influence the feasibility of treatment and patient cooperation.
7. Developing an intervention-oriented mindset – identifying opportunities for intervention at individual, family, community, institutional and structural levels.
8. Interdisciplinary and systems-level approach – recognising opportunities for collaboration between the health and social care systems and the education system, as well as the ability to involve other professions in complex patient care.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Communication AOKMAG1091_1A

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject, based on group allocation

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures
Week 1: Introduction to medical sociology, basic concepts and principles (Lecture Dr. Bence Döbrössy)
Week 2: Health and illness in society, a historical transformation of mortality and morbidity patterns (Lecture Dr. Bence Döbrössy)
Week 3: Health care systems (Lecture Dr. Bence Döbrössy)
Week 4: Intercultural healthcare (Lecture Dr. Bence Döbrössy)

Practices (Dr. Bence Döbrössy, Dr. Edmond Girasek, Dr. Julia Boros, Dr. Zsuzsa Győrffy, Dr. György Jóna)
Week 5: Introduction to medical sociology and to the tasks in practicals (practical)
Week 6: Methods of medical sociology-the case of measuring patient satisfaction (practical)
Week 7: Help seeking behaviour (practical)
Week 8: Intercultural differences: cultural dimensions in medicine (practical)
Week 9: Social inequalities I (practical)
Week 10: Social inequalities II (practical)
Week 11: Workshop: Scarce resources in healthcare at the macro level (practical)
Week 12: Workshop: Scarce resources in healthcare at the micro level – characteristics of the profession (practical)
Week 13: OSCE practice session (practical)
Week 14: Summary (practical)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOVMAG1168_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students may miss a maximum of two practical sessions; the possibility of making up for absences must be discussed with the practical session leader.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

A multi-part project assignment, which accounts for 50% of the final mark

Number and type of individual assignments to be completed, submission deadlines:

During the practical sessions, students work on individual topics in small teams. The topic and the specific tasks of each team (methodology, subtopics, etc.) are finalised by the students in consultation with the tutor. To ensure the successful completion of the group work, students are provided with methodological support materials, which can be found amongst the teaching resources on the website, in the textbook,
and in the e-learning system (Moodle). The group work takes place during the practical session. Students must upload their completed assignments to the e-learning system by the end of the session.

Requirements for the successful completion of the course:

Participation in 75% of the practical sessions, such as paying attention, contributing to discussions on the topics covered, engaging in small-group tasks, and completing online knowledge assessment tests during the semester on the topics covered to aid exam preparation; as well as achieving at least half of the maximum project marks (50) (min. 25 marks).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

To undertake the written exam successfully, students must know the lecture and practical material made available to them on Moodle as well as in selected chapters of the textbook.

The material covered in the exam:
Basic sociological concepts (Culture, structure, roles, statuses, social stratification, social institutions, social mobility)
Health and Illness through history, basic epidemiological ideas
Health inequalities and social inequalities (Age, gender, ethnicity, material conditions)
Global inequality
Intercultural factors in healthcare
Healthcare systems
Digital health: cultural and social aspects
The doctor-patient relationship
Illness behaviour
Health Behaviour
The medical profession- sociological aspects

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

To achieve a pass mark, students must be familiar with the following key terms and their meanings:
1. Social inequalities
2. Socio-economic status
3. Absolute poverty
4. Relative poverty
5. Social gradient
6. Social stratification
7. Social mobility
8. Regional inequalities
9. Material and cultural differences
10. Childhood living conditions
11. Hazards in the workplace
12. Discrimination
13. Prejudice
14. Stereotypes
15. Minority group
16. Ethnic group
17. Cultural pluralism
18. Health behaviour
19. Health-risk behaviour
20. Protective factors

Overall, the student should be able to:

• recognise social inequalities in health-related examples
• interpret simple case studies
• apply concepts to specific situations
• formulate basic sociological relationships.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The examination is a combined examination in accordance with Section 30 of the TVSz, comprising an assessment of academic performance during the term (project work) and a written assessment. The mark is determined on the basis of the results of the tasks completed during the term. A maximum of 50 marks can be awarded for the project work and a maximum of 50 marks for the written examination. A further requirement is that a minimum of 51% must be achieved in the written exam.

The assessment categories, based on the combined total of the two scores, are as follows:
Excellent (5): 85–100 marks
Good (4): 74–84 marks
Satisfactory (3): 61–73 points
Pass (2): 51–60 marks
Fail (1): 0–50 marks

Artificial intelligence systems used in the teaching of the subject and the manner of their application

In accordance with University regulations.
Artificial intelligence (AI)-based systems may be used in a supplementary capacity to support the teaching process (e.g. explanations of concepts, generation of examples, learning aids).
During assessment (written exam, assignments, project work), only the student’s independent performance may be assessed. AI is not permitted in a way that replaces independent work. Furthermore, the submission of AI-generated texts without citing sources is not permitted. Critical evaluation and transparent use of generated content is expected.

Printed resources:

Type	Recommended
Author	Graham Scrambler (ed)
Title	Sociology as Applied to Health and Medicine
Publisher	Palgrave Macmillan
Year of publication	2018

Other resources:

Required	pdf.igen
Other/Comment	Topics of lectures and practical sessions (electronic learning materials) and the relevant chapters of the textbook are uploaded on Moodle before the classes

Required	pdf.nem
Other/Comment	Individual consultation sessions may be requested from the tutorial leader twice per semester; during the examination period, two group consultation sessions are available by prior arrangement

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Anatómiai, Szövet- és Fejlődéstani Intézet

Name of subject in Hungarian: Mikroszkópos Anatómia és Fejlődéstan II.
Name of subject in English: Microscopic Anatomy and Embryology II.
Name of subject in German: Mikroskopische Anatomie und Embryologie II.

Credit value of the course: 4
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	2.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANT674_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Alpár Alán
Course coordinator location of work, telephone availability: Semmelweis University, Department of Anatomy, Histology and Embryology, +36 1 459 1500 / 53609
Course coordinator position: Professor, Head of Department
Course coordinator Date and number of habilitation: Karolinska Intézet, Svédország, 2012, Honosítva Semmelweis Egyetem, 2014, száma: 13/2014

Objectives of the course, and its place in the curriculum of the medical training program:

Demonstration of the fine structure of cells and tissues composing the organs of the human body specifically to provide the future clinicians/medical doctors with a valid body of information describing the microscopical elements of clinically significant morphological structures (including cell biology, general histology and the histology of organs).

The part covering the microscopy of the CNS provides the students with a basic knowledge concerning the major roles of the brain together with the spinal cord with special reference to function and structure. The development of the nervous systems together with the detailed morphological/histological/developmental description of organs of special senses as well as the endocrine system will also be discussed. Teaching is done in the form of lectures and histology laboratory classes

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Format of the course (lectures, group work, practical lessons, etc.):

Lecture and practical lesson

Competencies acquired through completion of course:

Understanding the microscopical composition of the human body together with the understanding of human development in order to draw parallels with macroscopical anatomy. Clear understanding of histological structure and function. Ability to identify basic structural elements within the tissue specimen. Identification of general directions/landmarks within digitized tissue slides.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Microscopic Anatomy and Embryology I, Macroscopic Anatomy and Embryology II, Cell Science

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Students need to successfully pass the Microscopic Anatomy and Embryology I. semifinal examination with a valid mark (a pass – 2 at least) to be able to register for the course.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Obligatory for all registered students, on the basis of registration via the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lecturers

Dr Alpár Alán, Dr Ádám Ágota, Dr Székely Andrea Dorottya, Dr Barna János, Dr Zsiros Viktória, Dr Katz Sándor, Dr Horváth András, Dr Dóra Dávid, Dr Csáki Ágnes, Szászné Dr Kocsis Katalin, Dr Kozsurek Márk, Dr Hanics János, Dr Rácz Éva, Dr Puskár Zita, Dr Várnainé Dr Tóth Zsuzsanna, Dr Nagy Nándor, Dr Adorján István, Dr Vereczki Viktória

List of lectures

1. week: 1. Nerve tissue

2. Development of the neural tube, craniocaudal and dorsoventral differentiation. Divisions of the central nervous system

2. week: 3. Formation and derivatives of the neural crest and placode ectoderm

4. Fine structure of the spinal cord (spinal reflexes, receptors, effectors)

3. week: 5. Brain tracts, neurotransmitters, neuronal circuits, "*connectomics*"

6. Central autonomic nervous system. Monoaminergic and cholinergic neurones and pathways. *„Ascending Reticular Activating System*" (ARAS)

4. week: 7. Somatosensory system. Spinal and trigeminal sensory pathways. Thalamus, cortical areas.

8. Viscerosensory system. Role of the reticular formation, thalamus, insula and the prefrontal cortices in visceral sensory activities.

5. week: 9. Neuroanatomy of pain. Referred pain. Cerebral inhibition of pain sensation.

10. Neuroanatomy of movements/locomotion I. Motor cortical areas, planning and programming of movements. Motor pathways.

6. week: 11. Neuroanatomy of movements/locomotion II. The role of basal ganglia in eliciting movements.

12. The role of the cerebellum in movement coordination. Gait control mechanism.

7. week: 13. Visceromotor system. Control of micturition. Spinal motor reflexes.

14. External ear. Middle ear.

8. week: 15. Inner ear. Bony and membranous labyrinth. Development of the organ of hearing.

16. Spiral organ of Corti. Auditory pathway. Neuroanatomy of hearing, understanding and control of speech.

9. week: 17. Fine structure of the labyrinth, tracts of the vestibular system. Control of balancing and posture together with the movements ofthe eye and head. Awareness of spatial position.

18. Fibrous and vascular coats of the eyeball. Lens, chambers of the eye, vitreous body, accommodation. Lacrimal gland, lacrimal apparatus.

10. week: 19. Inner coat of the eyeball, retina. Development of the eye.

20. Neuroanatomy of vision. Visual pathway, visual recognition, neuroanatomy of reading and understanding of written/text.

11. week: 21. Endocrine system I. Hypothalamus, the hypothalamo-hypophysial system, epiphysis

22. Endocrine system II. Thyroid, parathyroid, adrenal glands.

12.week: 23. Energy metabolism, neuroanatomy of food intake, taste sensation and olfaction. Structure and functional significance of the reward system

24. Limbic system. Amygdala, hippocampus.

13. week: 25. Circadian rythm, sleep/wake cycle; neuroanatomy of resting state and activation.

26. Behaviour and motivation. Neuroanatomy of emotions, empathy, well-being, agression, fear, anxiety and depression.

14. week: 27. Cognitive functions. Neuroanatomy of determination, planning, alertedness together with learning&memory, personality, consiousness and creativity.

28. Histology revision

Histology laboratories

1. week: Histology of the peripheral nervous system

2. week: Microscopy of the CNS – consultation 1.

3. week: Histology of the central nervous system

4. week: Microscopy of the CNS – consultation 2.

5. week: Microscopy of the CNS – consultation 3.

6. week: Midterm test

7. week: Histology of the organ of hearing

8. week: Histology of the organ of vision I.

9. week: Histology of the organ of vision II.

10. week: Skin.

11. week: Midterm test

12. week: Endocrine system 1.

13. week: Endocrine system 2.

14. week: Histology revision

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation in at least 75% of sessions, including the midterm tests (irrespective of the result) is obligatory for every student. Presence is recorded by the instructor. If a student is not prepared to participate in, or arrives late to, the class, the event will also be recorded. Three such occasions will be taken as an absence (see the Study and Examination Policy 28/12). Students arriving later than 5 minutes counted from the beginning of the class will be registered as absent.)

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The knowledge of students will be checked in written (moodle) tests in the form of midterm tests during weeks 6 and 11. Midterm test are composed of images and theory questions (20 questions, passing rate: 50%). Attendance is obligatory at the two midterm tests. The successful passing of the midterm test is a prerequisite of the acceptance of the semester ('signature'). Students with unsuccessful test result(s) and/or being absent from the tests should reattend at one of the offered retakes (2 occasions) or their semester is not accepted.

Test 1 - (week 6) - Microscopy of the CNS. Development of the nervous system.

Test 2 - (week 11) - Histology of the organs of special senses. Hypothalamo-hypophyseal system.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Active participation in at least 75% of histology laboratory sessions, including the midterm tests, and

the successful passing (with at least a mark 2) of the two midterm tests will be obligatory for every student to gain the signature.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Final examinations are composed of written and oral parts. The written examination is done using an e-learning module (moodle) while the oral/practical examination is conducted with the help of digitized histological tissue slides. Students will have to prove their knowledge in theoretical questions concerning organ and general Histology, as well as the fine structure, functional role and development of the CNS.

The topic list includes questions from both semesters.

Microscopic Anatomy and Embryology I.

Topic list for the semifinal examination: *(see there)*

Microscopic Anatomy and Embryology II.

Development of the nervous system and organs of special senses

Development and primary differentiation of the neural tube

Development of brain vesicles

Development of the peripheral nervous system (neural crest, placodes)

Development of the organ of vision

Development of the organ of hearing&equilibrium

Neurohistology

Histology of neurons developing from the neural tube

Glial cells

Histology of the neurons and supporting cells developing from the neural crest

Fine structure of peripheral nerves

Receptors and effectors

Interneuronal synapses

Microscopy of the central nervous system

Fine structure (microscopy) of the spinal cord

Proprioceptive reflexes

Nociceptive reflexes

Autonomic reflexes

Brain tracts, neurotransmitters, neuronal circuits, "*connectomics*"

Central autonomic nervous system. Monoaminergic and cholinergic neurones and pathways.

„Ascending Reticular Activating System" (ARAS)

Somatosensory system. Spinal and trigeminal sensory pathways. Thalamus, sensory cortical areas.

Viscerosensory system. Role of the reticular formation, thalamus, insula and the prefrontal cortices in visceral sensory activities.

Neuroanatomy of pain. Referred pain. Cerebral inhibition of pain sensation.

Motor cortical areas, planning and programming of movements. Motor pathways.

The role of cerebellum and basal ganglia in eliciting movements. Gait control mechanism.

Visceromotor system. Control of micturition. Spinal motor reflexes.

Energy metabolism, neuroanatomy of food intake, taste sensation and olfaction. Structure and functional significance of the reward system.

Limbic system. Amygdala, hippocampus.

Circadian rythm, sleep/wake cycle; neuroanatomy of resting state and activation.

Behaviour and motivation. Neuroanatomy of emotions, empathy, well-being, agression, fear, anxiety and depression.

Cognitive functions. Neuroanatomy of determination, planning, alertedness together with learning&memory, personality, consiousness and creativity.

Endocrine organs

Microscopical anatomy and development of the pituitary gland. Portal circulation

Microscopical anatomy and development of the pineal gland

Microscopical anatomy and development of the thyroid gland

Microscopical anatomy and development of the parathyroid gland

Microscopical anatomy and development of the suprarenal gland

Histology of the islands of Langerhans

Organs of special senses

Microscopical structure of the skinand skin appendages

Coats of the eyeball

Chambers of the eye, vitreous body

Lens, accomodation

Neuroanatomy of vision. Visual pathway, visual recognition, neuroanatomy of reading and understanding of written/text.

External ear, tympanic membrane. Middle ear, auditory tube, hearing ossicles.

Spiral organ of Corti. Auditory pathway. Neuroanatomy of hearing, understanding and control of speech.

Fine structure of the labyrinth, tracts of the vestibular system. Control of balancing and posture together with the movements of the eye and head. Awareness of spatial position.

Organs of taste and olfaction.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Identification of tissues and cell types appearing on the specimens is mandatory for a passing mark. For the theory consultations (CNS midterm) the identification and understanding of mechanisms appearing on the illustrations/slides of the lectures is mandatory for a passing mark.

Histology of the peripheral nervous system

40. Peripheral nerve (sciatic nerve, HE)

41. Autonomic ganglion (celiac ganglion, Bielschowsky’s impregnation)

6. (Vater-)Pacinian corpuscle (plantar skin, HE)

203. Autonomic ganglion (submandibular gland, HE)

204. Spinal cord + dorsal root ganglion (Luxol Fast blue + cresyl violet*)*

205. Motor end plate (cholinesterase enzyme histochemistry)

206 Meissnerian corpuscle (human fingertip, neurofilament ICC)

Histology of the CNS

209. Muscle spindle (striated muscle, HE

211. Spinal cord (Luxol Fast blue + cresyl violet)

213. Cortex cerebri (pre- and postcentral gyri, Nissl

214. Cortex cerebri (Bodian)

217.a. Cerebellar cortex (HE)

218. Cerebellar cortex (neurofilament ICC)

Microscopy of the CNS (theory topics)

Spinal cord, reflexes

Sensory systems

Motor systems

Cerebellum

Organ of hearing and vestibular system

220. Cochlea / organ of Corti (semithin, toluidine blue)

221. Macula (semithin, toluidine blue)

Organ of vision

233. Eyelid (HE)

234. Lacrimal gland (HE)

Skin
207. Palm skin (HE)
64. Glomus organ, nail (HE)
12. Scalp skin (HE)

Endocrine system

240. Hypothalamus (Chrom haematoxylin floxin/ GÖMÖRI)

241. Pituitary gland (Chrom haematoxylin floxin/GÖMÖRI)

210. Thyroid gland (HE)

245. Parathyroid gland (HE)

246. Suprarenal gland (HE)

142.a. Endocrine pancreas/ islands of Langerhans (HE)

181.ab. Corpus luteum (HE)

247. Pineal body (HE)

Limbic system

250. Hippocampus + choroidal plexus (Nissl)

251. Olfactory bulb (Nissl)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final examinations are composed of written and oral parts. The written theoretical examination is done using an e-learning module (moodle) while the oral/practical examination is conducted with the help of digitized histological tissue slides.

Students will be given separate marks for each part of the examination. Upon the termination of the examination the Head of the Examination Committee composes the final mark from the partial marks earned in the written and practical parts.

Evaluation of the written test: passing rate 60% - pass (2), 70% - accepted (3), 80% - good (4), 90% - excellent (5).

In case the result of the test falls below 60%, the mark is fail (1), but the students may continue with the oral examination .

Students earning a 4 (good) or 5 (excellent) mark from the written part will be exempted from the written test in case they fail the exam in the oral part.

Students, whose average of the two midterm marks is at least 4.00, may participate in the semester-end **exam competition** (written, moodle test). Those whose test result is at least 80%, may earn an exemption from the written part of the final examination with the marks earned from the exam competition (4 – between 80-89,999% and 5 – 90% and above). These students need only to sit for the oral part of the final examination.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Mandatory
Author	MH Ross and W Pawlina
Title	Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition
Publisher	Wolters KluwerISBN 9781451187427
Year of publication	2015

Type	Mandatory
Author	M. Réthelyi and J. Szentágothai
Title	Functional Anatomy, Histology and Embryology for medical and dental students
Publisher	Medicina
Year of publication	2018

Type	Recommended
Author	B Young, G O'Dowd and P Woodford
Title	Wheater's Functional Histology, A Text and Colour Atlas
Publisher	Churchill Livingstone, Edinburgh,ISBN 9780702047473
Year of publication	2013

Type	Mandatory
Author	Á Nemeskéri, V. Zsiros
Title	Histology practical manual I-II.
Publisher	Apáthy István Alapítvány
Year of publication	2023

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Molekuláris Biológiai Tanszék

Name of subject in Hungarian: Molekuláris sejtbiológia I.
Name of subject in English: Molecular Cell Biology I
Name of subject in German: Molekulare Zellbiologie I

Credit value of the course: 4
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.5	2.5	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKMBT1101_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Csala Miklós
Course coordinator location of work, telephone availability: Department of Molecular Biology, +36206660100
Course coordinator position: full professor
Course coordinator Date and number of habilitation: 07/06/2010, 293

Objectives of the course, and its place in the curriculum of the medical training program:

The subject provides the foundations of modern molecular medicine, emphasizing points of interest for diagnostics, intervention and therapeutic applications.

It serves as a base for several fields in medicine, such as molecular pathology, molecular diagnostics, pharmacology, gene therapy and medical biotechnology.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practical courses with small group work in the practical lessons. These practical lessons introduce students to some of the modern molecular biology procedures of clinical relevance and develop their manual skills essential for a medical doctor.

Competencies acquired through completion of course:

Students who complete the course will learn the principles, major pathways and mechanisms of molecular biology and cell biology, which will help them to orient themselves and apply scientific findings in the different fields of molecular medicine, which is essential in the 21st century.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Chemistry, Medical Biochemistry I

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The successful completion of the subject is an essential prerequisite for registering to the subject ”Molecular cell biology II” in the next semester.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject for year 2 medical students. Maximum number of participants: 500, there is no student selection.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures:

1. Introduction to molecular cell biology (Miklós Csala)
2. Structure and function of nucleotides and nucleic acids. Packaging of DNA into chromatin (Miklós Csala)
3. DNA packaging in pro- and eukaryotic cells; the role of topoisomerases (Miklós Csala)

4. Structure of the human genome 1 (Viola Tamási)
5. Structure of the human genome 2 (Viola Tamási)
6. Principles of DNA replication. Replication in prokaryotes (Zsolt Rónai)
7. Replication in eukaryotes (Zsolt Rónai)
8. DNA repair (Zsolt Rónai)
9. Methods in molecular biology 1: genetic polymorphisms (Éva Kereszturi)
10. Methods in molecular biology 2: PCR, investigation of length variations (Éva Kereszturi)
11. Methods in molecular biology 3: Investigation of SNPs (Éva Kereszturi)
12. Transcription in prokaryotes 1 (Miklós Csala)
13. Transcription in prokaryotes 2 (Miklós Csala)
14. Transcription in eukaryotes, mRNA processing (Miklós Csala)
15. Regulation of transcription (Miklós Csala)
16. Alternative ways to regulate eukaryotic gene expression (Miklós Csala)
17. Nuclear receptors. Transcriptional factors, DNA-binding domains (Szabolcs Sipeki)
18. MicroRNAs (Tamás Arányi)
19. Epigenetics (Tamás Arányi)
20. The genetic code, translation 1 (Tamás Mészáros)
21. The genetic code, translation 2 (Tamás Mészáros)
22. The genetic code, translation 3 (Tamás Mészáros)
23. Posttranslational modification of proteins (Tamás Mészáros)
24. Protein folding, Quality control (Tamás Mészáros)
25. Protein targeting into metabolic compartments 1 (Tamás Mészáros)
26. Methods in molecular biology 4: real-time PCR (Éva Kereszturi)
27. Methods in molecular biology 5: gene expression analysis (Éva Kereszturi)
28. Methods in molecular biology 6: DNA-cloning (Éva Kereszturi)

Practicals (4x45 min every other week):

1. Introduction, Column chromatography
2. Biuret test, Ellmann’s reaction
3. Regulation of beta-galactosidase expression
4. Purification of a bacterially expressed protein by affinity chromatography
5. Consultation, midterm exam
6. SDS-PAGE and Western-blot
7. Investigation of cell fractions

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance in at least 75% of the practical lessons is obligatory.

Assessment methods during semester (number, topics, and dates of midterms and reports,

method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

A compulsory midterm theoretical assessment will be organized, details (date, time, topics) will be announced at the beginning of the semester. Students can collect “practical points”, which can be used at the and end of Molecular cell biology II in the following semester to receive a bonus at the final exam.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

To obtain the signature, students must attend at least 75% of the practical classes and pass the compulsory midterm exam. (In exceptional cases, a delay of up to 5 minutes is acceptable at the practical classes.)

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The written and oral exam is based on the topic list announced in the beginning of the semester.

I. DNA
1. Chemical structure of nucleotides; primary and secondary structures of nucleic acids (DNA and various RNAs)
2. Condensation levels of DNA in the eukaryotic cells; the role of topoisomerases and chromatin proteins
3. The structure of the human genome; coding and gene expression regulatory sequences (enhancers, insulators)
4. The non-coding regions of the human genome: structuring and function of pseudogenes, transposons and repetitive sequences
5. Principles of the semiconservative DNA replication; replication fork, leading and lagging strand
6. DNA replication in the pro- and eukaryotic cells; comparison of the enzymes, proteins involved
7. The telomere; function of the telomerase, biological and medical significance of its presence or absence
8. Common types of DNA damage and repair mechanisms; DNA lesions versus mutations
9. Formation and repair of DNA deamination
10. Formation and repair of thymine dimers
11. Formation and repair of DNA mismatch

12. Formation of point mutations spontaneously, i.e., without exposure to chemical or physical mutagenicity
13. Possible effects of point mutations or single nucleotide polymorphisms on the encoded proteins
14. The principles and mechanism of PCR and real-time PCR, their application in research and medicine
15. Concept of genetic mutations and polymorphisms, and methods of their analysis (DNA sequencing and targeted techniques)

II. RNA
16. Structure and function of RNA polymerase of E. coli; initiation of transcription in prokaryotes; the prokaryotic transcription unit
17. Termination of transcription in prokaryotes; post-transcriptional RNA modifications in prokaryotic cells
18. Regulation of transcription in prokaryotes
19. The eukaryotic transcription unit; initiation and termination of transcription in the eukaryotic cells
20. Regulation of transcription in eukaryotes
21. Maturation of mRNA
22. Regulation of the eukaryotic gene expression by proteins binding to UTR segments of mRNA
23. Formation and regulatory functions of microRNAs in eukaryotic cells
24. Significance of DNA methylation and histone modifications
25. Alternative maturation of eukaryotic mRNA, and subsequent modifications in their coding sequence – their roles in the control of gene expression
26. In vitro analysis of gene expression by reverse transcription real-time PCR and DNA microarray

III. Proteins
27. The genetic code; codon-anticodon interaction; function and role of aminoacyl-tRNA synthetases
28. Structure and function of the ribosome; the ribosome cycle; role of tRNA in translation
29. Initiation of translation in pro- and eukaryotic cells
30. Regulation of eukaryotic translation; the role of eIF2α phosphorylation
31. Elongation and termination of translation in pro- and eukaryotic cells; pharmacological inhibitors of translation
32. Protein folding and chaperon proteins
33. Posttranslational modifications of collagen, posttranslational modifications responsible for membrane tethering, protein phosphorylation
34. Posttranslational modifications in the endoplasmic reticulum
35. N-glycosylation of proteins and its role in the quality control; ERAD
36. Formation of the proteome of subcellular organelles; principles and mechanisms of protein sorting
37. Intracellular protein trafficking by gated transport and by transmembrane transport
38. The role of genetic variations in the development of diseases; the importance and possibilities of identifying genetic factors
39. Production of recombinant DNA (cloning), and its main applications (reporter and expression

vectors)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Knowledge of all topics and concepts listed in the topic list — at least at satisfactory level — which are covered in the lectures and practical courses, as well as in the course materials available on the Moodle page (itc.semmelweis.hu), including lecture slides and recordings, textbooks, practical notes, and supplementary materials.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The written and oral exam is based on the topic list announced in the beginning of the semester, and it takes place before a committee of two (examiner and co-examiner). The exam can be passed if all the topics are sufficiently answered after the written part of the exam.

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle

Printed resources:

Type	Mandatory
Author	Miklós Csala, Szabolcs Sipeki
Title	Molecular cell biology
Publisher	Semmelweis Kiadó és Média Kft.

Year of publication	2025

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Molekuláris Biológiai Tanszék

Name of subject in Hungarian: Molekuláris sejtbiológia II.
Name of subject in English: Molecular Cell Biology II
Name of subject in German: Molekulare Zellbiologie II

Credit value of the course: 5
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	3.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKMBT795_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Csala Miklós
Course coordinator location of work, telephone availability: Department of Molecular Biology, 20/666-0100
Course coordinator position: full professor
Course coordinator Date and number of habilitation: 07/06/2010, 293

Objectives of the course, and its place in the curriculum of the medical training program:

The subject provides the foundations of modern molecular medicine, emphasizing points of interest for diagnostics, intervention and therapeutic applications. It serves as a base for several fields in medicine, such as molecular pathology, molecular diagnostics, pharmacology, gene therapy and medical biotechnology.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practical courses with small group work in the practical lessons. These practical lessons introduce students to some of the modern molecular biology procedures of clinical relevance and develop their manual skills essential for a medical doctor.

Competencies acquired through completion of course:

Students who complete the course will learn the principles, major pathways and mechanisms of molecular biology and cell biology, which will help them to orient themselves and apply scientific findings in the different fields of molecular medicine, which is essential in the 21st century.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Molecular Cell Biology I., Medical Biochemistry II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The successful completion of “Molecular cell biology I” is an essential prerequisite for registering to this subject.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject for year 2 medical students. Maximum number of participants: 500, there is no student selection.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures

Control of cell cycle 1 (Csala, Miklós)

Control of cell cycle 2 (Csala, Miklós)

Control of cell cycle 3 (Csala, Miklós)

Control of cell cycle 4 (Csala, Miklós)

Programmed cell death – Apoptosis 1 (Csala, Miklós)

Programmed cell death – Apoptosis 2 (Csala, Miklós)

Molecular basis of tumorigenesis (Csala, Miklós)

Types of non-apoptotic programmed cell death (Varga, Attila)

Proteostasis, the ubiquitin–proteasome system (Sőti, Csaba)

Mechanisms of autophagy (Sőti, Csaba)

Molecular biology of viruses 1 (Csala, Miklós)

Molecular biology of viruses 2 (Csala, Miklós)

Methods in molecular biology: knock-out techniques (Vereczkei, Andrea)

Methods in molecular biology: gene therapy (Vereczkei, Andrea)

Nuclear receptors. Transcriptional factors, DNA-binding domains (Sipeki, Szabolcs)

Transcriptional factors, DNA-binding domains (Sipeki, Szabolcs)

Classification of membrane receptors, GTP-binding proteins (Sipeki, Szabolcs)

Phosphatidylinositol signaling pathways (Sipeki, Szabolcs)

NF-κB and TGFβ signaling (Sipeki, Szabolcs)

Intracellular signals: mTOR, AMP-kinase, hypoxia (Kapuy, Orsolya)

Mechanisms of ageing (Sőti, Csaba)

Components of the cytoskeleton, molecular motor proteins (Lizák, Beáta)

Vesicular transport, mechanisms of exo- and endocytosis (Kereszturi, Éva)

Formation of the metabolome of cellular compartments 1. (Mészáros, Tamás)

Formation of the metabolome of cellular compartments 2. (Mészáros, Tamás)

Endoplasmatic and mitochondrial stress response (Mészáros, Tamás)

Extracellular matrix, tissue architecture, adhesion molecules (Somogyvári, Milán)

Methods in cell biology (cell cultures, cell fractionation, *in vivo* microscopy) (Kapuy, Orsolya)

Practicals (4x45 min every other week):

Genotyping of a taste receptor SNP by PCR-RFLP 1: in silico design

Genotyping of a taste receptor SNP by PCR-RFLP 2: DNA isolation + PCR

Genotyping of a taste receptor SNP by PCR-RFLP 3: digestion + electrophoresis

Consultation, midterm exam

Molecular cloning and *in vitro* protein synthesis 1: recombinant DNA construction, bacterial transformation

Molecular cloning and *in vitro* protein synthesis 2: analysis of the DNA construct, *in vitro* mRNA transcription

Molecular cloning and *in vitro* protein synthesis 3: protein expression by *in vitro* translation

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance in at least 75% of the practical lessons is obligatory.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

A compulsory midterm theoretical assessment will be organized, details (date, time, topics) will be announced at the beginning of the semester.

At the end of the study period, students can take an optional practical exam. The test consists of questions related to experiments carried out in the first and second semester. Students have 30 minutes to answer the questions. There is no retaking of the practical exam.

A total of 12 practical points can be collected in the two semesters. Students who have achieved at least 25 points (out of a maximum of 20 (optional practical test) + 12 (practical points) + 4 (bonus points in case of “good” or “excellent” theoretical midterm) = 36) receive a bonus at the final exam: no practical question has to be answered. This bonus is valid during the whole exam period (in case of a retake exam), as well as in the next semester (in a “CV”-course).

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

To obtain the signature, students must attend at least 75% of the practical classes and pass the compulsory midterm exam. (In exceptional cases, a delay of up to 5 minutes is acceptable at the practical classes.)

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The written and oral exam is based on the **topic list announced** in the beginning of the semester **in Moodle**.

I. DNA and RNA

Chemical structure of nucleotides; primary and secondary structure of nucleic acids (DNA and different types of RNA)

Condensation of the genetic material in pro- and eukaryotic cells; the role of topoisomerases and chromatin proteins

Structure of the human genome: coding and regulatory sequences; noncoding genomic sequences: introns, pseudogenes, repetitive sequences

The role of genetic variations in the pathogenesis of diseases; methods to study genetic factors

Principles of the semiconservative DNA replication; replication fork, leading and lagging strand synthesis

Comparison of DNA-replication in pro- and eukaryotes

Telomeric repeat sequences: replication of the telomeric regions of eukaryotic chromosomes; functions and importance of the telomerase

The most important types of DNA damage; repair of base deamination

Formation and repair of thymine dimers; mismatch repair

Types of point mutations; mechanisms of their development; possible effects of DNA sequence variations on the corresponding protein

Structure and function of the RNA-polymerase of *E. coli*; initiation and termination of transcription in prokaryotes

Characterization, role and synthesis of different types of RNA

Regulation of transcription in prokaryotes, definition of operon; positive and negative regulation

Structure of the eukaryotic genes, initiation and termination of transcription in eukaryotes

Regulation of the transcription in eukaryotes

Processing of the eukaryotic mRNA

Function and application of PCR and real-time PCR

Methods for the investigation of genetic mutations and polymorphisms (RFLP, allele-specific PCR, DNA-sequencing and primer extension)

Generation and application of recombinant DNA, reporter- and expression vectors

II. Post-transcription

Regulation of eukaryotic gene expression at post-transcriptional level (alternative splicing, RNA editing, regulation of RNA stability, RNA quality control)

Regulation of eukaryotic gene expression by RNA interference (miRNA, siRNA)

Epigenetic regulation of eukaryotic transcription: the role of DNA methylation and histone modifications

The genetic code; structure and function of tRNAs; aminoacyl-tRNA synthetases; codon-anticodon connections

The structure of prokaryotic and eukaryotic ribosomes; the ribosome cycle; binding of tRNA to ribosomes

Initiation of the translation in pro- and eukaryotes; regulation of eukaryotic translation; the role of phosphorylation of eIF2α

Elongation and termination of pro- and eukaryotic translation; pharmacological inhibitors of translation

Post-translational modifications of proteins

Types, structure and synthesis of collagen

Investigation of gene expression by real-time PCR and DNA-microarray methodology

Definition of proteostasis; types of intracellular protein degradation

Structure and function of the proteasome; role of immune-proteasome and TAP

Types, mechanism and role of autophagy

Lytic and lysogenic replication cycles of bacteriophages

Classification of animal viruses; structure and replication of retroviruses

Principles of human gene therapy (*in vivo* vs. *ex vivo* methods, gene augmentation, CRISPR/Cas9 system)

Biomedical application of genetic engineering processes (transgenic animals; knock-out, knock-in and knock-down techniques; cloning)

III. Signal transduction and cell cycle

Nuclear receptors: steroid, thyroid, retinoid and Ah receptors

Classification and function of membrane receptors

Types and functions of GTP-binding proteins in signaling

Activation mechanisms of serine / threonine protein-kinases with examples

cAMP signaling pathway; regulation of gene expression by cAMP

Phosphatidylinositol signaling pathways

NFκB and TGFβ signaling

Structure and function of tyrosine kinase receptors, the Erkl / Erk2 MAP kinase cascade

Insulin signaling

Integrating role of mTOR, and its effects on translation

Role of AMPK in the regulation of the metabolism and autophagy

Mechanisms of cellular oxygen sensing; adaption to hypoxia

Regulation of the cell cycle in the G1 phase, transition to S phase

Regulation of the cell cycle in the G2 and M phases

Molecular sensors detecting DNA damage and completion of DNA replication during the cell cycle

Molecular background of tumor generation

Structure and function of the apoptosome, DISC and PIDDosome complexes

Members of the Bcl-2 superfamily and their roles in various apoptotic pathways, the „survival signal”

Function and activation of apoptotic caspases, role of granzyme B

Types of non-apoptotic programmed cell death

Regulation of p53 levels and activity; role of p53 in determining the cell’s fate

Molecular mechanisms involved in aging

IV. Cell Biology

Principles of the organization of the eukaryotic cells; compartmentation; main features of subcellular organelles

Structure of cytoskeleton; structure and function of motor proteins

The protein secretory pathway; role of the rab cycle in the regulation of vesicular transport

Endo- and exocytosis

Formation of the proteome of subcellular organelles; principles and mechanisms of protein sorting

Protein targeting in the secretory pathway

Protein targeting into mitochondria and peroxisomes; uptake of substrates into lysosomes

Nuclear import and export of macromolecules

Endoplasmic reticulum stress, connection between the Unfolded Protein Response (UPR) and apoptosis

Protein quality control in the endoplasmic reticulum; the fate of misfolded proteins; ERAD

Characteristics of the metabolome of subcellular organelles; maintenance of the internal milieu of subcellular organelles

Role of the extracellular matrix in signal transduction (e.g., integrin receptors), role of the extracellular matrix in the formation of metastasis

Methods in cell biology: cell culturing, cell fractionation, *in vivo* microscopy, flow cytometry, FACS

V. Lab

Quantification of proteins by biuret reaction and Ellmann-method

Investigation of subcellular cell fractions

Investigation of the gene expression in prokaryotes: induction of *β*-galactosidase in *E. coli*

Purification of a bacterially expressed protein by affinity chromatography

SDS-polyacrylamide gel electrophoresis and Western blot

In silico tools in molecular biology

Genotyping of the TAS2R38 tasting receptor by PCR-RFLP

Analysis and generation of a recombinant DNA

In vitro transcription and translation

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Knowledge of all topics and concepts listed in the topic list – at least at satisfactory level – which are covered in the lectures and practical courses, as well as in the course materials available on the Moodle page (itc.semmelweis.hu), including lecture slides and recordings, textbooks, practical notes, and supplementary materials.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The written and oral exam is based on the topic list announced in the beginning of the semester, and it takes place at a committee of two (examiner and co-examiner). The exam can be passed if all the topics are sufficiently answered. Students who have achieved at least 25 practical points (out of a maximum of 20 + 12 + 4 = 36) during the two semesters, receive a bonus: no practical question has to be answered. This bonus is valid during the whole exam period (in case of a retake exam), as well as in the next semester (in a "CV"-course).

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:

Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle

Printed resources:

Type	Mandatory
Author	Miklós Csala, Szabolcs Sipeki
Title	Molecular cell biology
Publisher	Semmelweis Kiadó és Média Kft.
Year of publication	2025

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés III.
Name of subject in English: Physical Education (PE) III
Name of subject in German: Körpererziehung (Sport) III

Credit value of the course: 1
Semester: 3rd semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI1093_3A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) I*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 1. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 25 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st Week: Information on the semester acceptance requirements, the structure of the classes, and the university's extracurricular sports opportunities.

2nd Week: Athletic: Differend athletic exercises like throwing, shot put. Preferably outdoors with the aim of learn how to exetute the exercise with a proper form and breathing technique.

3rd Week: Tennis: Introducing and learning advanced technical elements (serve, volley) and game.

4th Week.: Agility ladder: To perform different exercises to improve speed, balance and concentration. Preferably outdoors, on grass ground.

5th Week: Relay race and competitive games: To improve explosiveness, skills and experience good team spirit.

6th Week: Football: Practicing the technical elements of football in pairs and game situation.

7th Week: Circuit training: Functional exercises with bodyweight and exercises with basic equipments to improve general coordination skills.

8th Week: Badminton: Introducing the technical and tactical elements of doubles game. Game applying all the previously known rules.

9th Week: Various sports games

10th Week: Meta: Reminders of the basic need to know about META. Learn tactical elemnts of the game and using them. Aim to improve ball skill development, reaction time, explosiveness and collective gaming experience.

11th Week: Obsticle course: To complete a built up obsticle course using differend creepping- climbing,hovering, pulling,skipping, throwing techniques for general skill developement.

12th Week: Mobilisation: Diamic stretching exercises with and without equipment to prevent the health of the joints by maintaining and developing the mobility of it.

13th Week: Skipping rope: Skill developing exercises with skipping rope individually and in pairs, in place and in motion at different levels.

14th Week: Kettlebell: Different kind of strenghtening exercises with kettlebell.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men's and women football, handball, basketball, volleyball, waterpolo)

Teachers:

Lehel Zsolt
Sótonyiné hrehuss Nóra
Doharné Buczkó Anikó
Kalmus Dániel
Juhász András
Weisz Miklós

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Active participation in practice classes 10 times and completion of a practical exercise

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Rating 5 grades A student can earn an excellent (5) practical grade if they compete in an event at the EUSA or MEFOB competitions, or the Medical Cup.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés IV.
Name of subject in English: Physical Education (PE) IV
Name of subject in German: Körpererziehung (Sport) IV

Credit value of the course: 1
Semester: 4th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI1093_4A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

One aim of the course is to improve the health status of medical students, maintaining and increasing physical performance, creating the conditions for better physical quality of life.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) II*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 2. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 25 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st.week: General information: Accident, fire and environmental knowledge. Requirement foracceptance of the semester system, the structure of the classes and thepresentation of the university recreational sports opportunities for extra-curricular activities.

2nd.week: Basketball: Dribbling and shooting skill improving drills. Games: 1 on 1; 2 on 2; shooting contests, king of the court. Scrimmage**.**

3rd.week: Wall-bar exercises: Enhance strength and balance by climbing ,declining, hanging, skipping, pulling, pushing etc. exercises.

4th.week: Circuit training: A chain of compete drills in a certain time period with and without equipment. The aim is to improve the general level of strength and stamina**.**

5th.week: Floorball: Passing and receiving skill improving drills. Exposing shots on goal (wrist- slap- and snapshots). Scrimmage.

6th.week: Drills in pairs: Strength, agility, coordination and battling skill improving exercises with a partner incorporated.

7th.week: Volleyball: Introducing the defensive elements of the game (receiving serves, blocks). Exposing unknown rules. Games**.**

8th.week: Game-day: Introducing and practicing different kind of cohesion enhancing games (Tick-Tac-Toe, etc.)

9th.week: Various sports games

10th.week: Circuit training: Specialized chain of drills for strengthen the shoulder, back, chest, arm and leg muscles, considering the fitness level of the Students.

11th.week: Tennis: Introducing variations of ground strokes and grip types (slice, topspin, lobs etc.) Exposing the rules of doubles. Games (all around the world, etc.)

12th.week: Badminton: Exposing the rules and the basic tactical elements of the doubles game. Scrimmage.

13th.week: Core exercises: Body-weight exercises targeting to strengthen the muscles of the trunk thus develop a strong fascia to protect it from the harmful effects of overdose sitting (studying)

14th.week: Medicine-ball exercises: Strength and coordination (complex) skill developing exercises by throwing, rolling, passing,lob, shot-put, etc. with a partner incorporated.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes! (2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men's and women football, handball, basketball, volleyball, waterpolo

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Active participation in practice classes 10 times and completion of a practical exercise

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and

conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Rating 5 grades A student can earn an excellent (5) practical grade if they compete in an event at the EUSA or MEFOB competitions, or the Medical Cup.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Kísérletes Kardiológiai és Sebészeti Műtéttani Tanszék

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Name of subject in Hungarian: Kísérletes és sebészeti műtéttan
Name of subject in English: Basic Surgical Techniques
Name of subject in German: Experimentelle und chirurgische Operationslehre

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Credit value of the course: 2
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.1	0.6	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKKMI1210_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Radovits Tamás (klinikai főorvos)
Course coordinator location of work, telephone availability: +36-20-825-88-95 Nagyvárad tér 4
Course coordinator position: professor Head of the Department
Course coordinator Date and number of habilitation: 2020, 07/2020

Objectives of the course, and its place in the curriculum of the medical training program:

The goal of the practical sessions is to teach basic suturing techniques, laparoscopic tasks and microsurgical tasks on skill models and to teach the basics of asepsis, antisepsis, the rules and standards of behaviour in the operating theatre, (scrubbing, dressing, preparation of the operating field etc.), knowledge of basic surgical instruments and equipment, knotting and suturing techniques. In addition to the classical surgical techniques, it is important to develop and enhance

the knowledge and skills of video-endoscopy. Laparoscopic exercises are practiced in pelvitrainer, it develops eye-brain-hand coordination.
The course aims to provide:
(1) Practice-oriented surgical training in small groups.
(2) To enable all graduating physicians to perform basic surgical procedures (e.g. wound treatment, suture removal, etc.)
(3) To provide a stable foundation for understanding and performing the manual skills taught in the clinical module
(4) The main objective of the course is to assess the manual skills of the students and to assist them in further specialization.

Format of the course (lectures, group work, practical lessons, etc.):

lecture+ practical lessons

Competencies acquired through completion of course:

Knowledge of the rules of asepsis (from scrubbing to theatre preparation, basic surgical instruments, knotting techniques by hand and with instruments, suturing and suture removal techniques, FLS (fundamental laparoscopic skills) for training eye-brain-hand coordination.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology II, Macroscopic Anatomy and Embryology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

minimum 15, maximum 400 students, Registration in Neptun

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

There will be 8 lectures (45 minutes each) during the first half of the semester:
1st and 2nd lecture will be held during the 2nd week of the semester,
3rd and 4th lecture during the 3rd week of the semester
5th and 6th lecture 4th week of the semester
7th and 8th lecture 5th week of the semester

Lectures:
1. Prof. Dr. József Sándor: The structure and equipments of the operating room. Asepsis and antisepsis. Sterilisation and disinfetion. Surgical site infection. Nosocomial infections.
2. Dr. Kálmán Benke: The role of the experimental surgery in medicine
3. Dr. Györgyi Szabó: Classification and management of wounds, principle of wound-healing. Haemorrhage and bleeding control.
4. Dr. Eva Toronyi: Process and types of wound healing. Tetanus: signs and symptoms, vaccination. Gas gangrene.
5. Dr. Eva Toronyi: Basic surgical tools and suture materials.
6. Dr. Györgyi Szabó: Basic and special suturing techniques in surgery.
7. Prof. Dr. Masashi Yoshida Surgical procedures: acute, elective. Preoperative patient management. Surgical approaches.
8. Prof. Dr. József Sándor: Basics of laparoscopic surgery

Practicals: 3x45 minutes every second week
1. Basics of surgerical instruments, Basic suturing techniques ex vivo. Tying surgical knots with both hands
2. Varosmajor practice
a. Knowing the rules of operating theatre, behaviour in operating theatre, scrubbing, gowning, gloving. Preparation and disinfection of the operating area
b. Introduction to the hybrid operating theatre, viewing the performed procedures
c. Introduction to Experimental Surgery, description of the experiment, importance of the animal experiments
3. Practice of basic suturing techniques on ex vivo animal tissue (interrupted sutures).
4. Practice basic suturing techniqes ex vivo on animal tissue (running sutures).
5. Laparoscopic tools and instruments. Demonstration of the laparoscopic tower. Practice of laparoscopic movements on pelvitrainer. PEG transfer, special excercises.
6. Practice of microsurgical tasks with the help of a magnifying glass. Consultation
7. Practical exam

Instructors: Dr. Givi Damenija, Dr. Domokos Csukás, Dr. László Mészáros, Dr. Levente Fazekas, Dr. Györgyi Szabó and guest lecturers.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance at practical sessions is compulsory. Students are permitted to miss one practical session during the semester. The number of partially completed or mixed practical sessions must not exceed 25% of the total number of sessions.

One missed practice can be made up in a two-week period by attending the same pratice of another group. Registration on the website xoyondo is required for the replacement practicals.

In case of two missed practices, extra dates will be offered for replacement during the 12th week of the semester. The student has to send this request by e-mail to kksmtnet@semmelweis. hu (stating their group number and the number of missed practices).
More than two missed practicals can be made up only with special authorisation from the head of the department.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

No more than 25% absences of the practices.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam has a practical and a theoretical part.
Practical part:
All students have to take a practical exam during the 7th practice.
Stations:
1. Answering a series of questions containing minimum requirements by the student. We provide the

students with a pre-compiled set of "minimum requirements" that includes the questions, their answers, and explanations. From this set of questions, we will ask three questions, and a 2-3 sentence answer will be expected.
2. Recognising surgical instruments and showing their correct use.
3. Showing surgical knot tying with both hands.
4. Performing basic suturing techniques on ex vivo animal tissue.
5. Recognising laparoscopic instruments and showing their correct use.
6. Performing different tasks on the pelvitrainer with time measurement.

Theoretical part:
The theoretical part of the examination consists of a written test, which must be taken in person at the specified examination times during the examination period. 60 questions in 45 minutes have to be answered. The minimum requirement for the written test are 40 points out of 60.
If the student does not get 40 points, the written test must be repeated. Students who attend the lectures get 3 test questions at the end of each lecture. If a student answers these test questions and collects a minimum of 16 points out of 24 in 8 lectures, they get an additional 10 points, which will be added to the score of the theoretical test. The test includes single choice, multiple choice and true-false question types and pictures,
tables, lists, groupings from the textbook Basic Surgical Techniques. Example questions: “What is in the picture?, Write the name of the device in the picture and its parts marked with letters. Put the procedure in chronological order.” Latin terms and author names that are part of basic medical literacy are regularly asked, and the proper spelling is expected. The practical and theoretical exam results are summarized to determine the grade as written
below.

Topics for the theoretical exam:
1. ASEPSIS, ANTISEPSIS
Historical background of asepsis (Semmelweis)
The definition of asepsis
Asepsis in practice: dressing up, wearing a cap and mask
Preparing the hands and fingers for surgery
Surgical scrubbing
Scrubbing and skin protection
Sterile surgical gown
The rubber gloves
Preparation of the surgical site: cleaning, shaving, scrubbing, isolation
Behaviour in the operating room
Historical background of antisepsis (Lister)
Definition of antisepsis
Antiseptic wound management
Antibiotic administration as an antiseptic procedure
Sterilisation and expectations of sterilisation procedures
General aspects of surgical sterilisation
Sterilisation by heat
Cold sterilisation
Sterilisation by gas
Plasma sterilization

Sterilisation by irradiation
Disinfection
Definition, mechanism and effectiveness of disinfection
Disinfection in surgical practice

2. THE OPERATING ROOM
Historical development of the operating theatre/room
Location of the operating room
The zones and movement in the operating site block
Rooms of the operating site block
Design and equipment of the operating room. The operating table
Forms of patient positioning
Lighting of the operating room
Furniture in the operating room
Technical equipment of the operating room
Textiles and dressings used in the operating room
The operating room staff, their duties and responsibilities: the operating surgeon and assistants, the operating nurse and assistant, the anaesthetist and assistant
Position in the operating room
Rules and work discipline in the operating room
Disinfection and ventilation of the operating room

3. SURGICAL INSTRUMENTS
The history of the surgical instruments
Disposable surgical instruments
Reusable surgical instruments
Groups of surgical instruments
Role and groups of cutting and dissecting instruments
Cutting and dissecting instruments: scalpels, scissors, haemostatic clamps, dissectors, amputation knives, saws, raspatories
Cutting and dissecting instruments: the operation of an electric knife (diathermy)
Biological effects of electric knife (diathermy)
Cutting mode
Coagulation mode
Monopolar diathermy
Dangers of monopolar diathermy
Bipolar diathermy
Functions and groups of grasping instruments
Grasping instruments: forceps, towel clamps, haemostatic clamps, needle holders, organ clamps, dressing forceps
Function and groups of haemostatic instruments
Haemostatic instruments: ultrasonic knife, clips
Function and groups of retracting instruments
Retracting instruments. Hand-held retractors: spatula, hook, hook
Self-retaining retractors
Functions and groups of tissue-unifying tools and materials
Tissue-unifying tools and materials: sewing machines, staples and wound closure strips,

tissue adhesives
Functions and groups of special instruments (bone surgery, thoracic surgery, abdominal surgery, gynaecology, cardiovascular surgery, burns and plastic surgery, microsurgery instruments).
Special instruments used by a wide range of surgical specialities: Volkmann curette, round-ended probe, biopsy forceps, suction equipment, implants, Argon Beam Coagulator, Laser
Packaging of instruments, surgical trays

4. SURGICAL SUTURES, NEEDLES, SUTURE TYPES
History of surgical sutures
General properties of suture materials
Classification of suture materials
Natural suture materials
Synthetic suture materials
Monofilament suture materials
Multifil suture materials
Absorbable suture materials
Non-absorbable suture materials
Suture material size, tensile strength, colour, handling, knotting
General characteristics of surgical needles
Traumatic needles
Atraumatic needles
Needle parts, needle shapes
Types of needles (circular needles, cutting needles)
Use of needles
Connection between atraumatic needle and suture material
Sterilisation and packaging of suture material and needles
Antibacterial threads
Wound closure without knotting
Tissue unifying methods: hand-held needles
Simple interrupted suture
Vertical mattress suture
Horizontal mattress sutures, corner stitch
Simple running suture
Running locked suture
Intracutaneous running stitch
Tobacco bag suture
Suture removal
Ligatures
Bowel anastomoses
Vascular anastomoses
Other tissue unifying methods: use of staplers

5. INJURY, WOUND
Definition of injury
Definition of wound
Definition of simple wound

Definition of compound wound
Description of a wound
Questions to clarify in the case of wounds.
Risk of tetanus infection depending on the characteristics of the injury.
Vaccination order for adults suspected of tetanus infection.
Classification of wounds according to their origin
Characteristics of surgical wounds.
Mechanical wounds (abraded wound, puncture wound, incised wound, cut wound, laceration, torn wound, gunshot wound, bite wound)
Thermal wounds
Chemical wounds
Irradiation wounds
Special wounds
Classification of wounds according to the bacterial contamination
Classification of wounds according to the time
Treatment of acute wounds
Chronic wound care
Use of antibiotics in surgery

6. WOUND HEALING
The process of hemostasis
The inflammatory phase
The granulation and proliferation phase
The process of maturation and remodelling
Scarless wound healing in fetal age
Types of wound healing
Local factors disturbing wound healing
Systemic factors disturbing wound healing
Classification of wound healing disorders according to their time of onset
Haematoma
Seroma
Wound disruption
Wound infections
Athrophic scar
Hypertrophic scar
Keloid
Procedures to facilitate wound healing

7. BLEEDING AND HAEMOSTASIS
Local and general symptoms of haemorrhage
Concept of surgical haemostasis
Mechanical haemostasis in the prehospital phase
Intraoperative mechanical haemostasis
Intraoperative prophylactic surgical haemostasis and postoperative haemostasis
Thermal haemostatic procedures
The use of chemical-biological haemostatic materials

8. THE OPERATION
Operative indication
Operative contraindication
The risk of surgical intervention
Preoperative procedures
The operation
Principles of oncological surgical operations
The surgical team and patient’s assurance
One-day surgical intervention
Complication of operations
The importance of the surgical safety checklist
Principles of surgical incision lines
Incisions on the face and in the cervical region
Surgical incisions on the thoracic wall
Surgical incisions on the abdominal wall, opening of the abdominal cavity
Longitudinal laparotomies
Transverse and oblique laparotomies
Gridiron incisions
Incisions on the hand
Surgical incisions (trocar positions) in laparoscopic operations
Closure of operating wounds
Complications of wound closure

9. THE BASICS OF VIDEO-ENDOSCOPIC TECHNIQUE
Disadvantages of open surgery and advantages of laparoscopic surgery
Difficulties of the laparoscopic technique
Classification of video-endoscopic procedures
Structure and usage of flexible video-endoscopy
Laparoscopic tools of image creation: optics, video system, monitor, light source, light cable
Trocars
Hand-held laparoscopic instruments: graspers and dissectors, scissors, clip appliers, needle-thread complex,
knotting, electrocoagulation, ultrasonic cutting instruments
Personal requirements of laparoscopic operations
Options for creating a surgical space for laparoscopic operations
Pneumoperitoneum
Hand-assisted laparoscopy
Scarless surgery (NOTES)
Single-port laparoscopic surgery
Comparison of open and endoscopic surgery
Advantages of robotic surgery
The first robotic assistant equipments
Robotic surgical systems, robots nowadays
Telesurgery, surgery in space

Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

No more than 25% absences of the practices. The exam is passed if the minimum score (61 points) is achieved by the student.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Determination of the grade:

The results of the practical test (60 points) and the written test (60 points) are added up and the final mark is determined on the basis of a 120-points system. Both parts of the exam (practical and written) are mandatory.
The grade limits are the following:
Unsatisfactory (1) 0 -60,99 points
Pass (2) 61 - 89,99 points
Average (3) 90 - 99,99 points
Good (4) 100 - 109,99 points
Excellent (5) 110 - 120 points

How to register for the exam: via the Neptun system
Options for retaking the exam as per the Study and Examination Regulations

The practical exam (60 points) and the written test result (60 points) are summed up and the final grade is determined on a 120-point scale.

Anyone who attends the lectures and correctly answers the 3 test questions at the end of each lectures, meaning answering 16 out of 24 questions correctly in the case of 8 lectures, will receive an additional 10 points, which will be added to their score on the theoretical test exam.

Students who achieve an outstanding performance in the competitions can be offered a grade 5 (excellent) based on their results.

Sutura competition
One student from each group can participate in the competition based on their performance in the 4th suture technique exercise. All participants of the competition will receive a grade 5 (excellent) in the subject.

Laparoscopy competition
One student from each group can participate in the competition based on their performance in the 5th laparoscopic practice. All participants of the competition will receive a grade 5 (excellent) in the subject.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Ferencz, A. et al. (Ed.) (2021). Basic Surgical Techniques. Semmelweis Publishers
Link	https://www.semmelweiskiado.hu/termek/1732/basic-surgical-techniques

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Kardiológiai Tanszék - Kardiológiai Központ

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Name of subject in Hungarian: EKG a klinikumban
Name of subject in English: Clinical ECG
Name of subject in German: Klinische Elektrokardiographie

Credit value of the course: 3
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	1.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKKAR680_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Becker Dávid
Course coordinator location of work, telephone availability: SE Városmajori Szív-és Érgyógyászati Klinika, +361458 6844
Course coordinator position: Deputy Director, University Professor
Course coordinator Date and number of habilitation: 2020/02

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the subject is to prepare students for the courses in cardiology and internal medicine. The student should be able to recognize the conditions requiring immediate cardiac intervention and the most important arrhythmias.

Format of the course (lectures, group work, practical lessons, etc.):

lecture, practical lesson

Competencies acquired through completion of course:

The student will be able to independently record an ECG and give a professionally correct description
of a 12-lead ECG at rest. He/she will be able to estimate basic parameters, identify abnormalities and
list clinical conditions that may cause the abnormalities described. Of particular importance is the ability to recognize ST-elevation myocardial infarction, atrial fibrillation and arrhythmias requiring acute intervention.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biophysics II , Medical Physiology I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on the registration in the Neptun system.

Through The Neptun system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Weeks 1–7, lectures (2·45 min):
Week Translational Medicine (45 min) Cardiovascular Center (45 min)

1 The concept and classification of
arrhythmias. Mechanisms of origin of
tachyarrhythmias.

Examination of a patient with supraventricular tachycardia. Differential diagnosis of narrow QRS tachycardias.

2 Classification of conduction disorders, mechanisms of bradyarrhythmias

The practical significance of impulse formation and conduction disorders

3 Repolarization disorders. ECG signs of different forms of ischaemic heart disease.

The role of ECG in the investigation of chest pain pathologies and its role in risk stratification.

4 Ventricular arrhythmias Differential diagnosis of wide QRS tachycardias. Detection of ventricular tachycardias, ECG criteria.
5 Basics of pacemaker systems ECG of a patient with pacemaker
6 Cases with multiple abnormalities Description of complex ECGs, ECG

differential diagnostics.

7 Cases to learn from Revision
Weeks 1-7, practicals:
1. ECG lead systems, nomenclature. Analysis of normal ECG tracings. Estimation of frequency and heart axis. The ladder diagram.
2. Recognition of nomotopic and heterotopic pacemaker disturbances, supraventricular and ventricular tachycardias on ECG tracings.
3. Recognition of SA, AV and intraventricular conduction disturbances. Aberrant conduction.
4. Angina and NSTEMI. Localization and staging of ST-elevation infarcts.
5. Recognition of electrolyte abnormalities, atrial and ventricular strain and hypertrophy.
6. Recognition and practice of multiple abnormalities.
7. Mid term exam

Weeks 8-14, practicals:
During the practicals, theoretical knowledge is correlated with clinical practice at the bedside of the wards of the Heart and Vascular Center, and ECG curves of patients are analyzed.
From week 14 – end of the exam period: Examination (written)

Tutors: Dr Tornóci László, Dr. Becker Dávid, Dr. Benyó Zoltán

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN

ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

75 % of the practices are compulsory Students can miss two practices, above that they have to make up. It is not possible to make up
lectures, but you can make up the practicals in another group in the same week.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

An oral mid term of the material from the basic course (first 6 weeks) in week 7 (analysis of ECG tracings. Attendance is compulsory.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Successful (at least satisfactory) oral demonstration (as the subject is taught by two different departments).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Recognition of attendance, signature

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

At least 51% is required on the ECG exam to receive a passing grade. The exam questions are available on the Moodle platform. It is not possible to identify specific ECG waveforms in this type of

assessment.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grading is based on performance in the written test. According to Study and Examination Regulations

only theoretical exam

At least satisfactory demonstration at the end of the 7th week

competition

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory
Author	Malcolm S. Thaler:
Title	The Only EKG Book You'll Ever Need,
Publisher	Wolters Kluver,
Year of publication	2019

Type	Mandatory
Author	Simon András–Tornóci László:
Title	Understanding ECG (workbook),
Publisher	Semmelweis Kiadó,
Year of publication	2016

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Klinikai Kórélettani Intézet

Name of subject in Hungarian: Klinikai kórélettan I.
Name of subject in English: Clinical Pathophysiology I.
Name of subject in German: Klinische Pathophysiologie I.

Credit value of the course: 3
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	2.0	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKTLM1270_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Benyó Zoltán (igazgató)
Course coordinator location of work, telephone availability: Institute of Clinical Pathophysiology, (+36-1) 210-0306; internal extension: 60300
Course coordinator position: Director, University Professor
Course coordinator Date and number of habilitation: 259; 2008.05.26.

Objectives of the course, and its place in the curriculum of the medical training program:

The objective of the course is to have the students understand the complex mechanisms responsible for the development of functional disturbances in common conditions affecting the function of the entire organism through integration of the knowledge imparted by initial courses (most importantly anatomy, biochemistry and physiology), as well as the regulatory processes that are activated in order to fend off these disturbances. Having assimilated the knowledge encompassing organ systems

and disciplines and the integrative approach, the students will be ready to understand, in the course of their clinical education, the mechanisms and symptomatology of various diseases and the respective therapeutic possibilities.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture: weekly 2 hours

Practice: biweekly 3 hours

Location: Center of Theoretical Medicine, 37–47 Tűzoltó street, 1094 Budapest
and/or Theoretical Building, and 4. Nagyvárad square, 1089 Budapest

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Competencies acquired through completion of course:

Based on their basic training in anatomy, biochemistry and physiology, the students will become capable of understanding the manifestation, on the organism level, of the pathological processes underlying the most common diseases, their symptoms, causes and potential therapeutic outcomes. Helped by practice sessions closely linked with the theoretical material, the students will acquire the skills necessary for following causality relationships in the disturbances of physiological processes and for recognizing the effects of these disturbances on the totality of the function of the organism, and will gain experience in test methods utilized in clinical practice, their theoretical bases, margins for interpretation and actual execution.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology II., Macroscopic Anatomy and Embryology II., Medical Biochemistry II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Academic and Examination Committee (AEC) may permit for special permission once per academic period. The student should earning the credits for the prerequisite subjects for the preceding semester.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system; offered in the fall semester for the entire class.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures (weekly 2 hours)

Week 1 Hypertension

Week 2 Congestive heart failure

Week 3 Obesity

Week 4 Diabetes I: Pathogenesis of Type 1 and 2 diabetes

Week 5 Diabetes II: Pathogenesis of diabetic complication

Week 6 Atherosclerosis and disorders of lipid metabolism

Week 7 Disorders of Hemostasis

Week 8 Endocrine diseases I: Pituitary gland and reproductive system

Week 9 Endocrine diseases II: Thyroid gland

Week 10 Endocrine diseases III: Adrenal gland

Week 11 Menopause

Week 12 Osteoporosis. Calcium and phosphate homeostasis

Week 13 Systemic autoimmune diseases and joint disorders

Week 14 Disorders developing in the course of immobilization and their treatment. Cachexia. Rehabilitation.

Practices (biweekly 3 hours)

Teachers: Ágnes Andrásfalvy, Gábor Firneisz, Domokos Gerő, Péter Hamar, Iring András, Gábor Kökény, Zoltán Lohinai, Éva Margittai, Miklós Mózes, Éva Ruisanchez, Csaba Schvarcz, Tímea Tímár, László Tornóci, Sára Zsigrai

Weeks 1-2 Hypertension, ABPM and Clinical case discussion

Weeks 3-4 Blood pressure measurement, arterial pulse wave, ankle-brachial index

Weeks 5-6 Obesity and Diabetes, and Clinical case discussion

Weeks 7-8 Diabetic neuropathy diagnostic procedures

Weeks 9-10 Diabetic vascular function task

Weeks 11-12 Adrenal gland and Thyroid gland, and Clinical case discussion

Weeks 13-14 Menopause and Osteoporosis, and Clinical case discussion

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Participation at practice sessions is compulsory. Maximum of 1 absence from the practice sessions is acceptable. Absence from more than 1 of the practice sessions in a semester means that the student did not fulfil his/her semestrial study obligations. There is no possibility for making up for absence from lectures; absence from practice sessions can be made up for with another group in the same week, if there is room for additional participants. In case of absence students should immediately contact (e-mail) your course tutors who will decide the request.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Students might give account of – which there is no compulsory participation - their theoretical and practical curriculum knowledge of the material so far presented in the lectures and the practical lessons at the end of the semester at predetermined dates/times, in the form of written or online test. Registration takes place on the course page in the MOODLE platform.

Number and type of individual assignments to be completed, submission deadlines:

None

Requirements for the successful completion of the course:

The requirement for the end-of-semester signature: absence from more than 1 practice sessions in a semester also means that the student did not fulfil his/her semestral study obligations, therefore he/she is not permitted to take the exam.

Type of assessment:

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1st Semester, Exam topics - Theory

1/1. Definition of hypertension and its different forms; hypertension of known causes; complications of hypertension

1/2. Essential hypertension; principles of hypertension treatment

1/3. Heart failure, its causes and symptoms

1/4. Secondary effects of heart failure, therapeutic options

1/5. Prevalence, causes and definition of obesity

1/6. Adipose tissue function and dysfunction

1/7. Systemic consequences of obesity

1/8. Pathogenesis of Type 1 diabetes mellitus

1/9. Pathogenesis of Type 2 diabetes mellitus

1/10. Microvascular complications of diabetes mellitus

1/11. Macrovascular complications of diabetes mellitus

1/12. Classification of dyslipidemias; syndromes of primary hyperlipoproteinemia

1/13. Syndromes associated with secondary hyperlipoproteinemia

1/14. Atherosclerosis

1/15. Conditions associated with coagulation system dysfunction

1/16. Conditions associated with excessive activation of the coagulation system

1/17. Simultaneous under- and overacting disorders of the coagulation system

1/18. Pathogenesis of hypothyroidism and the symptoms of hypothyroidism

1/19. Pathogenesis of syndromes with hyperthyroidism and symptoms of thyrotoxicosis

1/20. Pathogenesis of acute and chronic adrenocortical insufficiency, pathomechanism underlying the main symptoms; congenital adrenal hyperplasia

1/21. Pathogenesis of Cushing's syndrome, pathomechanism underlying the symptoms and diagnosis

1/22. Pathogenesis of primary and secondary hyperaldosteronism; the pathomechanism underlying the symptoms

1/23. Possible causes of overproduction of growth hormone and prolactin, the pathomechanism of the consequences

1/24. Male hypogonadism and androgen insensitivity syndrome

1/25. Disorders of the female hormonal regulation

1/26. Menopausal transition and menopause

1/27. Postmenopause

1/28. Hormonal regulation of calcium and phosphate metabolism in physiological and pathological conditions

1/29. Hormonal regulation of calcium and phosphate metabolism in physiological and pathological conditions, its effects on the skeletal system

1/30. Non-osteoporotic bone diseases in adults and extraskeletal effects of vitamin D deficiency

1/31. General mechanisms in the development of systemic autoimmune diseases

1/32. Autoimmune joint diseases; rheumatoid arthritis and ankylosing spondylitis

1/33. Pathomechanism of Systemic lupus erythematosus, systemic sclerosis and Sjögren's syndrome

1/34. The effect of the immobilization syndrome on somatic functions

1/35. The effect of immobilization syndrome on autonomic functions

1st Semester, Exam topics - Practice

Case study presentation of relevant clinical cases to discuss the pathogenesis of typical symptoms, diagnosis and therapeutic approaches in diseases.

Case 1-4. Hypertension

Case 5-8. Obesity – Diabetes

Case 9-12. Endocrine disorder

Case 13-16. Menopause and osteoporosis

Practical tasks, device operation:

17. Methods to measure blood pressure. Practical aspects of correctly performing blood pressure measurement.

18. ABPM and its indications. How is an ABPM test performed? Why is it important to assess diurnal rhythm?

19. Diagnostic criteria of hypertension using different methods of measurement. What are the indications and benefits of home blood pressure monitoring?

20. Investigation methods of vascular aging. The significance of pulse wave velocity and its measurement.

21. Characterization of the physiological arterial pulse wave and its changes with aging.

22. The definition and measurement of the ankle-brachial index. Its significance.

23. Diabetic neuropathy task: the manifestations and symptoms of diabetic neuropathy, their pathomechanism.

24. Examination procedures used for diagnosing neuropathy affecting somatic nerves. Explanation of the physical examination procedures presented in the practical lesson.

25. Diabetic neuropathy Diagnostic procedures used in the investigation of autonomic neuropathic abnormalities. Demonstration of the performance of the Ewing test.

26. Diabetic vascular function task: briefly describe the methods of laser Doppler flow measurement and transcutaneous partial oxygen tension measurement. Describe the blood flow response to heating and its changes in diabetic vascular dysfunction; explain the underlying pathomechanism.

27. Diabetic vascular function task: briefly describe the methods of laser Doppler flow measurement and transcutaneous partial oxygen tension measurement. Explain what post-occlusive reactive hyperaemia is and how it changes with diabetic vascular dysfunction; explain the underlying pathomechanism.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The grade for the colloquium is determined through an oral examination, where the response is based on one theoretical and one practical topic. A minimum satisfactory level of knowledge of both topics is required to pass the exam.

The lecture and practical notes uploaded to the course’s Moodle page, as well as diagram materials, case study image materials, and recorded lecture videos, are available on the course platform.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Semifinal/Colloquium Exam: Exam is oral, which has two parts, including first semester lecture *(exam topics: theory)* and practical lesson *(exam topics: practical).* Students should achieve at least *2(pass)* grades for both parts to complete a successful exam.

Exam exemption may be obtained by achieving exceptional results in the competition, a grade “4” or “5” may be offered as the colloquium/semifinal examination grade.

There is no practical exam

Exam exemption may be obtained by achieving exceptional results in the competition, a grade “4” or “5” may be offered as the colloquium/semifinal examination grade.

Exam exemption may be obtained by achieving exceptional results in the competition, a grade “4” or “5” may be offered as the colloquium/semifinal examination grade.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Institute banned Artificial Intelligence (AI)

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php
Other/Comment	The lecture and practical notes uploaded to the course’s Moodle page, as well as diagram materials, case study image materials, and recorded lecture videos, are available on the course platform.

Printed resources:

Type	Recommended
Author	Gary D. Hammer, Stephen J. McPhee
Title	Pathophysiology of Diseases: An Introduction to Clinical Medicine
Publisher	McGraw-Hill Education
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Klinikai Kórélettani Intézet

Name of subject in Hungarian: Klinikai kórélettan II.
Name of subject in English: Clinical Pathophysiology II.
Name of subject in German: Klinische Pathophysiologie II.

Credit value of the course: 3
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	2.0	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKTLM1270_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Benyó Zoltán (igazgató)
Course coordinator location of work, telephone availability: Institute of Clinical Pathophysiology, (+36-1) 210-0306; internal extension: 60300
Course coordinator position: Director, University Professor
Course coordinator Date and number of habilitation: 259; 2008.05.26.

Objectives of the course, and its place in the curriculum of the medical training program:

The objective of the course is to have the students understand the complex mechanisms responsible for the development of functional disturbances in common conditions affecting the function of the entire organism through integration of the knowledge imparted by initial courses (most importantly anatomy, biochemistry and physiology), as well as the regulatory processes that are activated in order to fend off these disturbances. Having assimilated the knowledge encompassing organ systems

and disciplines and the integrative approach, the students will be ready to understand, in the course of their clinical education, the mechanisms and symptomatology of various diseases and the respective therapeutic possibilities.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture: weekly 2 hours

Practice: biweekly 3 hours

Location: Centre of Theoretical Medicine, 37–47 Tűzoltó street, 1094 Budapest and/or Theoretical Building, and 4. Nagyvárad square, 1089 Budapest

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Competencies acquired through completion of course:

Based on their basic training in anatomy, biochemistry and physiology, the students will become capable of understanding the manifestation, on the organism level, of the pathological processes underlying the most common diseases, their symptoms, causes and potential therapeutic outcomes. Helped by practice sessions closely linked with the theoretical material, the students will acquire the skills necessary for following causality relationships in the disturbances of physiological processes and for recognizing the effects of these disturbances on the totality of the function of the organism, and will gain experience in test methods utilized in clinical practice, their theoretical bases, margins for interpretation and actual execution.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pathology I, Clinical Pathophysiology I

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Academic and Examination Committee (AEC) may permit for special permission once per academic period. The student should earning the credits for the prerequisite subjects for the preceding semester.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system; offered in the spring semester for the entire class.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures (weekly 2 hours)

Week 1 Pathophysiology of gastrointestinal diseases

Week 2 Liver tract disorders

Week 3 Acute alcohol and biliary poisoning. Acute and chronic pancreatitis

Week 4 Acute kidney injury

Week 5 Chronic kidney disease

Week 6 Acute respiratory failure

Week 7 Chronic respiratory disorders

Week 8 Acid-base disorders

Week 9 Na+-, K+- and water balance:, pathophysiology of fluid and electrolyte disorders

Week 10 Circulatory shock

Week 11 Septic and anaphylactic shock

Week 12 Pathophysiology of ageing

Week 13 Secondary disorders developing in malignant diseases

Week 14 Consultation lecture

Practices (biweekly 3 hours)

Teachers: Ágnes Andrásfalvy, Gábor Firneisz, Domokos Gerő, Péter Hamar, Iring András, Gábor Kökény, Zoltán Lohinai, Éva Margittai, Miklós Mózes, Éva Ruisanchez, Csaba Schvarcz, Tímea Tímár, László Tornóci, Sára Zsigrai

Weeks 1-2 GI diseases and Nutritional status analysis, Clinical case discussion

Weeks 3-4 Liver diseases and Clinical case discussion

Weeks 5-6 Kidney diseases and Clinical case discussion

Weeks 7-8 Respiratory diseases and Clinical case discussion

Weeks 9-10 Acid-base disorders and Clinical case discussion

Weeks 11-12 Circulatory shock and Clinical case discussion

Weeks 13-14 Vascular cognitive disorders: fNIRS and cognitive tests

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Participation at practice sessions is compulsory. Maximum of 1 absence from the practice sessions is acceptable. Absence from more than 1 of the practice sessions in a semester means that the student did not fulfil his/her semestrial study obligations. There is no possibility for making up for absence from lectures; absence from practice sessions can be made up for with another group in the same week, if there is room for additional participants. In case of absence students should immediately contact (e-mail) your course tutors who will decide the request.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Students might give account of – which there is no compulsory participation - their theoretical and practical curriculum knowledge of the material so far presented in the lectures and the practical lessons at the end of the semester at predetermined dates/times, in the form of written or online test. Registration takes place on the course page in the MOODLE platform.

Number and type of individual assignments to be completed, submission deadlines:

None

Requirements for the successful completion of the course:

The requirement for the end-of-semester signature: absence from more than 1 practice sessions in a semester also means that the student did not fulfil his/her semestral study obligations, therefore he/she is not permitted to take the exam.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1st Semester, Exam topics - Theory

1/1. Definition of hypertension and its different forms; hypertension of known causes; complications of hypertension

1/2. Essential hypertension; principles of hypertension treatment

1/3. Heart failure, its causes and symptoms

1/4. Secondary effects of heart failure, therapeutic options

1/5. Prevalence, causes and definition of obesity

1/6. Adipose tissue function and dysfunction

1/7. Systemic consequences of obesity

1/8. Pathogenesis of Type 1 diabetes mellitus

1/9. Pathogenesis of Type 2 diabetes mellitus

1/10. Microvascular complications of diabetes mellitus

1/11. Macrovascular complications of diabetes mellitus

1/12. Classification of dyslipidemias; syndromes of primary hyperlipoproteinemia

1/13. Syndromes associated with secondary hyperlipoproteinemia

1/14. Atherosclerosis

1/15. Conditions associated with coagulation system dysfunction

1/16. Conditions associated with excessive activation of the coagulation system

1/17. Simultaneous under- and overacting disorders of the coagulation system

1/18. Pathogenesis of hypothyroidism and the symptoms of hypothyroidism

1/19. Pathogenesis of syndromes with hyperthyroidism and symptoms of thyrotoxicosis

1/20. Pathogenesis of acute and chronic adrenocortical insufficiency, pathomechanism

underlying the main symptoms; congenital adrenal hyperplasia

1/21. Pathogenesis of Cushing's syndrome, pathomechanism underlying the symptoms and diagnosis

1/22. Pathogenesis of primary and secondary hyperaldosteronism; the pathomechanism underlying the symptoms

1/23. Possible causes of overproduction of growth hormone and prolactin, the pathomechanism of the consequences

1/24. Male hypogonadism and androgen insensitivity syndrome

1/25. Disorders of the female hormonal regulation

1/26. Menopausal transition and menopause

1/27. Postmenopause

1/28. Hormonal regulation of calcium and phosphate metabolism in physiological and pathological conditions

1/29. Hormonal regulation of calcium and phosphate metabolism in physiological and pathological conditions, its effects on the skeletal system

1/30. Non-osteoporotic bone diseases in adults and extraskeletal effects of vitamin D deficiency

1/31. General mechanisms in the development of systemic autoimmune diseases

1/32. Autoimmune joint diseases; rheumatoid arthritis and ankylosing spondylitis

1/33. Pathomechanism of Systemic lupus erythematosus, systemic sclerosis and Sjögren's syndrome

1/34. The effect of the immobilization syndrome on somatic functions

1/35. The effect of immobilization syndrome on autonomic functions

2nd Semester, Exam topics -Theory

2/1. The pathophysiology of the gastrointestinal system - the diseases of the stomach and the small intestine

2/2. The pathophysiology of the gastrointestinal system - inflammatory bowel diseases

2/3. Liver dysfunction I.

2/4. Liver dysfunction II.

2/5. The metabolism of alcohol

2/6. Acute alcohol intoxication

2/7. Chronic alcoholism

2/8. The causes and systemic consequences of acute renal failure

2/9. The causes and definition of chronic renal failure

2/10. Pathological changes in organs affected by chronic renal failure

2/11. Pulmonary ventilation disorders and respiratory function tests to detect them; the definition and forms of respiratory failure

2/12. The symptoms of acute respiratory failure; the effect of consequent hyperventilation on blood gas and acid-base values

2/13. The effects of prolonged smoking on the large and small airways and on the elastic fibers of the lungs

2/14. Chronic Obstructive Pulmonary Disease (COPD) and Pulmonary Fibrosis (PF) impacts on respiratory mechanism and blood gas levels

2/15. Various types of organ damage caused by chronic global respiratory failure (mainly COPD)

2/16. Acid-base disorders of metabolic origin: metabolic acidosis and metabolic alkalosis

2/17. Acid-base disorders of respiratory origin: respiratory acidosis and respiratory alkalosis

2/18. Sodium (Na+) balance disorders

2/19. Potassium (K+) balance disorders

2/20. The definition and classification of circulatory shock

2/21. Forms of hypovolemic shock

2/22. The different phases of hypovolemic shock

2/23. The progression of circulatory shock

2/24. Organ manifestations of circulatory shock

2/25. Possible causes of cardiogenic shock

2/26. The definition and mechanism of septic shock and the principles of its treatment

2/27. The development and consequences of pro- and anti-inflammatory processes, coagulation disorders and endothelial dysfunction in septic shock

2/28. Molecular and cellular aging

2/29. Organ-level manifestations of the aging syndrome

2/30. Secondary disorders caused by tumors I: Disorders of other organs in cancer patients

2/31. Secondary disorders caused by tumors II: Systemic consequences of cancer

1st Semester, Exam topics - Practice

Case study presentation of relevant clinical cases to discuss the pathogenesis of typical symptoms, diagnosis and therapeutic approaches in diseases.

Case 1-4. Hypertension

Case 5-8. Obesity – Diabetes

Case 9-12. Endocrine disorder

Case 13-16. Menopause and osteoporosis

Practical tasks, device operation:

17. Methods to measure blood pressure. Practical aspects of correctly performing blood pressure measurement.

18. ABPM and its indications. How is an ABPM test performed? Why is it important to assess diurnal rhythm?

19. Diagnostic criteria of hypertension using different methods of measurement. What are the indications and benefits of home blood pressure monitoring?

20. Investigation methods of vascular aging. The significance of pulse wave velocity and its measurement.

21. Characterization of the physiological arterial pulse wave and its changes with aging.

22. The definition and measurement of the ankle-brachial index. Its significance.

23. Diabetic neuropathy task: the manifestations and symptoms of diabetic neuropathy, their pathomechanism.

24. Examination procedures used for diagnosing neuropathy affecting somatic nerves. Explanation of the physical examination procedures presented in the practical lesson.

25. Diabetic neuropathy Diagnostic procedures used in the investigation of autonomic

neuropathic abnormalities. Demonstration of the performance of the Ewing test.

26. Diabetic vascular function task: briefly describe the methods of laser Doppler flow measurement and transcutaneous partial oxygen tension measurement. Describe the blood flow response to heating and its changes in diabetic vascular dysfunction; explain the underlying pathomechanism.

27. Diabetic vascular function task: briefly describe the methods of laser Doppler flow measurement and transcutaneous partial oxygen tension measurement. Explain what post-occlusive reactive hyperaemia is and how it changes with diabetic vascular dysfunction; explain the underlying pathomechanism.

2nd Semester, Exam topics – Practice

Case study presentation of relevant clinical cases to discuss the pathogenesis of typical symptoms, diagnosis and therapeutic approaches in diseases.

Case 1-3. Gastrointestinal disease

Case 4-8. Liver disease

Case 9-13. Kidney disease

Case 14-17. Respiratory disease

Case 18-21. Acid-base disorder

Case 22-25. Circulatory shock

Practical tasks, device operation:

26. What options can you name to define nutritional status? What are the advantages and disadvantages of the different methods?

27. How does the body composition monitor based on bioimpedance spectroscopy work? What are the most important parameters that are determined?

28. What are the clinical uses of bioelectrical impedance analyzers? What are the main parameters used in different areas?

29. Describe the abnormal findings in urine tests; describe the most common symptoms and their causes. Reference values.

30. Possible causes of abnormal urine color.

31. The mechanism and clinical significance of neurovascular coupling in functional brain imaging. The theoretical background and practical application of the fNIRS method and its significance in the study of frontal cortical function.

32. Types of cognitive tests and their significance in the diagnosis of neurodegenerative disorders. The significance of the recognition of mild cognitive impairment and the theoretical basis of its differential diagnosis.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The final examination grade is determined in an oral exam, where the answer is based on two theoretical topics and one practical topic. A minimum pass-level knowledge of all three topics is required to successfully complete the exam.

The lecture and practical notes, diagram materials, case study image materials, and recorded lecture videos are available on the course's Moodle platform.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final Exam: Exam is oral, which has three parts, including both first and second semester lecture *(exam topics: theory)* and one practical lesson *(exam topics: practical).* Students should achieve at least *2(pass)* grades for each three parts to complete a successful exam.

Exam exemption may be obtained by achieving exceptional results in the competition, a grade "4" or "5" may be offered as the Final examination grade.

no practical exam

Exam exemption may be obtained by achieving exceptional results in the competition, a grade "4" or "5" may be offered as the Final examination grade.

Exam exemption may be obtained by achieving exceptional results in the competition, a grade "4" or "5" may be offered as the Final examination grade.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Institute banned Artificial Intelligence (AI)

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of

knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php
Other/Comment	The lecture and practical notes, diagram materials, case study image materials, and recorded lecture videos are available on the course's Moodle platform.

Printed resources:

Type	Recommended
Author	Hammer, Stephen J. McPhee
Title	Pathophysiology of Diseases: An Introduction to Clinical Medicine
Publisher	McGraw-Hill Education
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika

Name of subject in Hungarian: Belgyógyászati propedeutika
Name of subject in English: Internal Medicine – Propedeutics
Name of subject in German: Innere Medizin - Propädeutik

Credit value of the course: 3
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	0.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBHK1111_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Masszi Tamás Pál (Klinika igazgató)
Course coordinator location of work, telephone availability: Belgyógyászati és Hematológiai Klinika +3613754364
Course coordinator position: egyetemi tanár, klinikaigazgató
Course coordinator Date and number of habilitation: 2010.06.07., száma: 305

Objectives of the course, and its place in the curriculum of the medical training program:

The most important objective of the 5th and 6th semester course in Internal Medicine is to teach the student the basic methods of medical examination. During the practicals the most important rules of history taking and the basics of physical examination will be introduced. During bedside exercises, we help students learn these examination methods, and our other main goal is to teach the rules of medical behavior at the patient's bedside.

Format of the course (lectures, group work, practical lessons, etc.):

online lecture + practice, individual tasks and small group work during the practices

Competencies acquired through completion of course:

Completion of the course will enable the student to develop a professional physician-patient relationship, learn the elements of medical interview and types of medical documentation. Students will also obtain knowledge and practice in basic physical examination. After completion of the course, students will have the opportunity to further their knowledge during the obligatory summer practice.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology II OR Medical Genetics and Immunology II; Macroscopic Anatomy and Embryology II, Introduction to Patient Care

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

One sixth of the students registered at the Neptun system for the third year.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Duration: 3 contact hours = 3x45 minutes

Week 1 Introduction to medicine, history of the Korányi Clinic. Patient interview and health history

Week 2 Approach to symptoms, patient documentation (patient chart, flowsheet, follow up)

Week 3 Methods of physical examination: inspection, palpation

Week 4 Methods of physical examination: percussion, auscultation

Week 5 Practicing physical examination of the thorax and lung I

Week 6 Practicing physical examination of the thorax and lung II

Week 7 Practicing physical examination of the heart I

Week 8 Practicing physical examination of the heart, ECG evaluation

Week 9 Practicing blood pressure and pulse measurement, evaluation of the vascular system

Week 10 Practicing physical examination of the abdomen I

Week 11 Practicing physical examination of the abdomen II

Week 12 Practicing evaluation of changes in body temperature and examination of the urogenital system. Bedside blood glucose measurement

Week 13 Practicing physical examination of the musculoskeletal system, breasts and lymph nodes

Week 14 Summary and review

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 75% of all sessions. This is evaluated through attendance sheets signed by the tutor

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no formal midterm evaluation. Students are individually followed for their progress by the tutor of the group during the patient oriented practices. The objective is to allow the teacher and students develop a personal relationship with regular feed backs on their advances and areas that need further improvement.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Participate on at least 75% of all sessions. At the end of the semester, once the tutor certified that the student met this requirement be evaluating the attendance sheets, the course director grants credits to students in the Neptun system.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam is organized in accordance with the principles of the OSCE ("Objective Structured Clinical
Examination"):
1. patient examination and referral of the findings under standardized conditions with the participation of a simulated/standard patient, evaluation using a checklist
2. taking medical history with the participation of a simulated/standard patient, evaluation using a checklist
3. referring the information obtained during the interview to a colleague, evaluation using a checklist
4. Verification of theoretical knowledge related to propedeutics in the form of a written test exam

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Complex patient examination (lungs, heart, abdomen, lymph nodes, vascular system, body temperature, and body weight; measurement of blood pressure and pulse; various types of urinalysis; blood glucose testing; taking medical history; reporting findings; and documenting examination results).

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Patient examination and referral, history taking and referral, and scores on the theory test are weighted. The assessment criteria will be communicated to students at the beginning of the semester and will be available on the course Moodle. A total of 100 points are available. The grade for the colloquium will be based on the scores obtained:
86-100 points 5 (excellent)
75-85 points 4 (good)
60-74 points 3 (medium)
50-59 points 2 (fair)
0-49 points 1 (unsatisfactory)
In the case of an unsatisfactory result or a need for improvement, a re-examination/revision may be made in accordance with the provisions of the Study and Examination Regulations.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Mandatory
Author	Kasper, Fauci, Hauser, Longo, Jameson, Loscalzo
Title	Harrison’s Principles of Internal Medicine. 20th Ed.,
Publisher	
Year of publication	2018

Type	Mandatory
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking. 12th Ed.
Publisher	
Year of publication	2017

Type	Mandatory
Author	Papadakis, McPhee, Rabow
Title	CURRENT Medical Diagnosis and Treatment
Publisher	
Year of publication	2018

Type	Mandatory
Author	Porter
Title	The Merck Manual of Diagnosis and Therapy. 20th Ed.
Publisher	
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Onkológiai Klinika

Name of subject in Hungarian: Belgyógyászati propedeutika
Name of subject in English: Internal Medicine – Propedeutics
Name of subject in German: Innere Medizin - Propädeutik

Credit value of the course: 3
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	0.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBOK1112_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Takács István (igazgató)
Course coordinator location of work, telephone availability: Department of Internal Medicine and Oncology, Semmelweis University, Tel: 06-1-459-1500/51520
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2011, 328 (Semmelweis University)

Objectives of the course, and its place in the curriculum of the medical training program:

The primary objective of Internal Medicine Propedeutics is to acquire clinical proficiency in two relevant areas: health history and physical examination. During bedside practices students learn how to interview a patient and take the health history. They are introduced to and practice the techniques of physical examination, and they experience and interpret the common and typical findings in health and in diseases. By learning the essential elements of the diagnostic process, Internal Medicine Propedeutics is a fundamental discipline not only for Internal Medicine but all

clinical fields of medicine.

Format of the course (lectures, group work, practical lessons, etc.):

bedside practices

Competencies acquired through completion of course:

Completion of the course enables medical students to take medical history from an adult patient, to conduct a comprehensive physical examination and to interpret and summarize the findings in a medical document. Students also learn how to develop a professional physician-patient relationship. After completion of the course, students have the opportunity to improve their knowledge during the obligatory Summer Practice.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Macroscopic Anatomy and Embryology II, Introduction to Patient Care, Medical Genetics and Immunology II OR Medical Physiology II, Macroscopic Anatomy and Embryology II, Introduction to Patient Care

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1. Introduction to medicine. Patient interview and health history

2. Approach to symptoms, patient documentation (patient chart, flowsheet, follow up)

3. Methods of physical examination: inspection, palpation

4. Methods of physical examination: percussion, auscultation

5. Physical examination of the thorax and lung I.

6. Physical examination of the thorax and lung II.

7. Physical examination of the heart I.

8. Physical examination of the heart, ECG evaluation.

9. Blood pressure and pulse measurement, evaluation of the vascular system

10. Physical examination of the abdomen I.

11. Physical examination of the abdomen II.

12. Evaluation of changes in body temperature and examination of the urogenital system. Bedside blood glucose measurement.

13. Physical examination of the musculoskeletal system, breasts and lymph nodes.

14. Summary and review.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 75% of all sessions. This is evaluated through attendance sheets signed by the tutor.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the course coordinator (studinger.peter@semmelweis.hu), with the permission of the course director.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no formal midterm evaluation. Students are individually followed for their progress by the tutor of the group during the patient oriented practices. The objective is to allow the teacher and students develop a personal relationship with regular feedbacks on their advances and areas that

need further improvement.

Number and type of individual assignments to be completed, submission deadlines:

Not applicable

Requirements for the successful completion of the course:

Participation on at least 75% of all sessions. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam has two parts: bedside patient examination followed by answering two questions from the topic list.

During bedside patient examination the student is required to demonstrate the acquired skills in taking medical history and physical examination as well as interpret the findings.

The oral question part allows the student to demonstrate lexical knowledge.

Topic list for the oral questions

1. Components of a comprehensive patient interview, medical history.
2. Significance of inspection in the physical examination.
3. Pulmonary findings during auscultation.
4. How to differentiate pneumonia, pleural effusion, bronchitis, asthma pneumothorax with physical examination.
5. Physical signs of dispone, their causes and differentiation.
6. Rules of auscultating the heart, heart sounds and murmurs.
7. Systolic murmurs.
8. Diastolic murmurs.

9. Diagnosing mitral stenosis with physical examination.
10. Diagnosing mitral insufficiency with physical examination.
11. Diagnosing aortic stenosis with physical examination.
12. Diagnosing aortic insufficiency with physical examination.
13. Physical signs and symptoms a circulatory failure.
14. Physical examination of the large vessels, arteries and veins.
15. Measuring body temperature, types of fever.
16. Significance of changes in complete blood count and differential count.
17. Signs of iron deficiency.
18. Palpation of the spleen, causes of splenomegaly.
19. Examination of the lymph nodes. Causes of lymphadenomegaly.
20. The significance of scoring performance status in oncological diseases.
21. Methods and significance of assessing bone mineral density.
22. Methods of examining the urogenital system. Signs of urinary tract infection.
23. Palpation and auscultation of the abdomen. Abnormal findings.
24. Diagnosis of acute abdomen, list possible causes.
25. Physical findings in patient with ascites.
26. Physical examination of the liver.
27. Signs and symptoms of gall bladder stones, examination methods.
28. Signs and symptoms of acute and chronic cholecystitis, examination methods.
29. Signs and symptoms of acute and chronic pancreatitis, examination methods.
30. Signs and symptoms of diseases of the small and large intestine, examination methods.
31. Diagnosis of acute appendicitis.
32. Signs and types of ileus.
33. Physical signs and symptoms of endocrine diseases.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Complete physical examination of a patient (general assessment + respiratory / cardiovascular / gastrointestinal system): presentation of techniques, description and interpretation of findings. Ability to instruct patients in Hungarian during physical examination.

https://semmelweis.hu/belonko/en/education/internal-medicine-propedeutics/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

A grade from 1 (fail) to 5 (excellent) is given, that is the mean of the three scores obtained for the oral and bedside patient examination.

There is not any possibility of an offered grade.

Retake of a failed exam is feasible in the exam period or on the extracurricular exam week, according to the rules of the University.

Exam grading and retake rules are concordant with the Study and Examination Regulations of Semmelweis University.

(https://semmelweis.hu/jogigfoig/dokumentumtar/szabalyzattar/szervezeti-es-mukodesi-szabalyzat/iii-konyv-hkr/iii-konyv-hallgatoi-kovetelmenyrendszer-iii-2-resz-tanulmanyi-es-vizsgaszabalyzat-es-mellekletei/)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Printed resources:

Type	Mandatory
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking.
Publisher	Wolters Kluwer, 12th Ed.
Year of publication	2016

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Magatartástudományi Intézet

Name of subject in Hungarian: Orvosi etika, bioetika és jog
Name of subject in English: Medical Ethics, Bioethics and Medical Law
Name of subject in German: Ethik der Medizin, Bioethik und Medizinrecht

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Credit value of the course: 2
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	2.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMAG1195_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Purebl György (intézet igazgató)
Course coordinator location of work, telephone availability: Institute of Behavioral Sciences, +36 (1) 210-2953
Course coordinator position: Professor, Director
Course coordinator Date and number of habilitation: 2019.06.06. 5/2019

Objectives of the course, and its place in the curriculum of the medical training program:

The course is designed to give a broad overview of the field of bioethics, including concepts, theory, and research.

Format of the course (lectures, group work, practical lessons, etc.):

Interactive lectures in the Lecture Hall. Interactivity is ensured by the Moodle system of the university and by the professional version of the Slido software.

Competencies acquired through completion of course:

a.) To enable students to recognize ethical issues when encountered in everyday clinical practice and research

b.) To provide students with a conceptual-logical system, which helps them to address ethical questions and toresolve ethical dilemmas in an efficent way

c.) To introduce students to a body of knowledge, which helps them to understand, respect and protect the rights of patienst research subjects and fellow health care professionals

d.) To help the would be health care professional to undertand the responsibility of the individual, of the health care system and of the society as a whole in maintaining health

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Psychology, Medical Sociology

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

This is a mandatory course

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures:
1. week. (Lecture) Principles of Medical Ethics (László Nemes)
2. week. (Lecture) Competence and Capacity to Make Health Care Decisions (Ágnes Dósa)
3. week. (Lecture) Informed Consent. (László Nemes)

4. week. (Lecture) Ethical questions of human reserarch (Ágnes Dósa)
5. week. (Lecture) Organ and Tissue Transplantation (Ágnes Dósa)
6. week. (Lecture) Doctor-Patient relationship. (László Nemes)
7. week. (Lecture) Doctor-Doctor Relationship. (László Nemes)
8. week. (Lecture) Doctor and Society (László Nemes)
9. week. (Lecture) End of Life Issues. (László Nemes)
10. week. (Lecture) Reproductive Issues (László Nemes)
11. week (Lecture).Information Disclosure to Terminally Ill Patients. Telling the Truth to Patients (Ágnes Dósa)
12. week (Lecture). Malpractice (Ágnes Dósa)
13. week (Lecture). Confidentiality and Medical Records. Reportable Illnesses, HIV-Related Issues, Sexually Transmitted Diseases (STDs) (Ágnes Dósa)
14. week (Lecture) The Rights of Patients (Ágnes Dósa)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKMAG1091_1A, AOKMAG1079_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students are expected to attend the lectures regularly.

There will be tasks on the lectures and students' achievement will be assessed by the lecturers. The signature will be based on carrying out the tasks on the lectures. A student can be offered plus points based on her/his good achievement, which can make the final exam easier for her/him.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There will be questions or minor tasks on some of the lectures. The signature will be based upon successfully carrying out most of the tasks.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Students are expected to attend the lectures regularly.

There will be tasks on the lectures and students' achievement will be assessed by the lecturers. The signature will be based on carrying out the tasks on the lectures. A student can be offered plus points based on her/his good achievement, which can make the final exam easier for her/him.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1. The principles of medical ethics

2. Competence and the capacity to make decisions

3. Paternalism in medical practice

4. Informed consent

5. Information disclosure for terminally ill patients

6. Withholding and withdrawal of medical treatment

7. Advance Directives

8. Do not resuscitate (DNR) orders

9. Withholding Fluids and Nutrition in terminally ill patients

10. Physician assisted suicide

11. Active and Passive Euthanasia

12. Terminal sedation and the law of double effect

13. Futile medical care

14. Determination of death and brain death

15. Ethical probems of live organ donation

16. Organ donation from brain-dead donors: the system of donor cards.

17. Organ donation form brain-dead donors: presumed consent

18. Reproductive issues (abortion, contraception, sterilization, donation of sperm and eggs)

19. HIV related issues (confidentiality, partner notification, HIV-positive health-care workers, refusal to treat HIV-positive patients) and sexually transmitted diseases (STDs)

20. Malpractice

21. Doctor-patient relationship (beginning and ending the relationship, gifts from patients, doctor/patient sexual contact)

22. Doctor and society (child abuse, elder abuse, impaired drivers, physician participation in executions, torture, spousal abuse, gunshot wounds, gifts and industry funding)

23. Doctor-doctor relationship (reporting impaired phyisicians, physician disagreements)

24. Confidentiality and medical records

25. Ethical Questions of Human Research

26. The Rights of Patients

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The knowledge of the following concepts are the minimum requirements to pass the exam:
· The principles of medical ethics
· Competence and the capacity to make decisions
· Paternalism in medical practice
· Informed consent
· Information disclosure for terminally ill patients
· Withholding and withdrawal of medical treatment
· Advance Directives
· Do not resuscitate (DNR) orders
· Withholding Fluids and Nutrition in terminally ill patients
· Physician assisted suicide
· Active and Passive Euthanasia
· Terminal sedation and the law of double effect
· Futile medical care
· Determination of death and brain death
· Ethical probems of live organ donation
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· Organd donation form brain-dead donors: presumed consent
· Reproductive issues (abortion, contraception, sterilization, donation of sperm and eggs)
· HIV related issues (confidentiality, partner notification, HIV-positive health-care workers, refusal to treat HIV-positive patients) and sexually transmitted diseases (STDs)

· Malpractice
· Doctor-patient relationship (beginning and ending the relationship, gifts from patients, doctor/patient sexual contact)
· Doctor and society (child abuse, elder abuse, impaired drivers, physician participation in executions, torture, spousal abuse, gunshot wounds, gifts and industry funding)
· Doctor-doctor relationship (reporting impaired phyisicians, physician disagreements)
· Confidentiality and medical records
· Ethical Questions of Human Research
· The Rights of Patients

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The source of grading is the achievement reached on the written or oral exam. If the student has got plus points during the lectures, this will be added to the points of the test, which can result in a better grade for the student.

Collecting extra scores during the semester:
With the exception of the first and last lecture, you will be given the opportunity to collect extra scores during lectures in order to significantly improve your end-of-semester examination results. As it is outlined hereunder, the maximum number of scores at the written examination is 40 (forty) and you will need at least 21 (twenty-one) scores to successfully pass. During the semester you may earn a total of 3 (three) extra scores, provided you correctly answer a quiz question at the end of each lecture. The quiz questions will be simple choice ones, i.e. you must select the correct answer from among 4 or more possible options. The question will refer to the subject matter of the respective lecture, and each correct answer will be worth 0.3 extra scores.
At the end of each lecture the respective question will be presented to you in the “Moodle” system. You will need a smartphone or a computer in order to log in.
The quiz will open at 11:15 hours and will remain available for 15 minutes, until 11:30 hours. Within this time frame you will have two (2) minutes to answer the question after you have started the quiz. Your extra scores will be automatically recorded in the “Moodle” system and later will be added to the scores achieved during the examination – provided you reach the “Sufficient/Pass” (2) level, i.e. a minimum of 21 (twenty-one) scores, on the written test. You therefore cannot use your extra scores if you fail to achieve at least 21 (twenty-one) scores during the written end-of-semester examination. Your extra scores, however, will not be lost, i.e. they will be taken into account during your repeated examination.

„Aláírás” (the „signature” indicating the fulfilment of the semester requirements) will be granted if you log into the “Moodle” system and answer the respective weekly quiz 6 (six) times during the semester. Your answer need not be correct, as it is the attempt itself that will be taken into account.
The examinations will take place during the examination period.
There is a written examination at the end of the semester.
The written examinations will be in the form of a test consisting of 40 “true-or-false” questions, i.e. the candidate must decide whether the statements, as they appear in the test without any conjectures and/or additional information, are indeed true or false. Scores for Grades: Excellent (5):

36-40; Good (4): 31-35; Mediocre/Fair (3): 26-30; Sufficient/Pass (2): 21-25; Insufficient/Fail (1): 0-20.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Artificial intelligence (AI) systems may be used solely to support learning and the acquisition of knowledge. Their use should complement, but not replace, students' independent work and critical thinking.

AI tools may assist students in organising information, personalising learning materials, and accessing or processing scientific literature more efficiently. However, the use of AI does not exempt students from their individual responsibilities related to studying, literature review, and preparation of assignments.

While AI tools may support the search for relevant scientific sources, the interpretation, critical evaluation, and synthesis of the information remain the responsibility of the student.

The use of AI systems during examinations or formal assessments is strictly prohibited, unless the task explicitly requires the knowledge or application of AI tools.

Printed resources:

Type	Mandatory
Author	Conrad Fischer—Caterina Oneto
Title	Medical Ethics fot the Boards. (Third edition)
Publisher	New York: McGraw-Hill Education.
Year of publication	2016

Other resources:

Required	pdf.nem
Other/Comment	Powerpoint slides used for the lectures. The power point slides of the lectures can be found at: http://semmelweis.hu/magtud/en/education/faculty-of-medicine and on the Moodle site of the course

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Orvosi Mikrobiológiai Intézet

Name of subject in Hungarian: Orvosi Mikrobiológia II.
Name of subject in English: Medical Microbiology II.
Name of subject in German: Medizinische Mikrobiologie II.

Credit value of the course: 3
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.5	1.5	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKMIK022_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Dóra (igazgató)
Course coordinator location of work, telephone availability: Institute of Medical Microbiology
Course coordinator position: professor
Course coordinator Date and number of habilitation: 2010.06.07., száma: 311

Objectives of the course, and its place in the curriculum of the medical training program:

The teaching activities of the Institute of Medical Microbiology in the second semester cover the fields of Mycology, Parasitology (Protozoa and Worms) and Virology. The theoretical basis and background will be provided through classroom lectures, with special emphasis on pathomechanism and pathogenesis of infections/diseases caused by microorganisms. As far as possible, laboratory practicals will include technical instruction in the methods of taxonomic identification of microbes and clinical microbiological diagnostics. We also provide students with the opportunity to develop their manual skills by practising smear preparation, staining techniques, biochemical reactions,

sterility tests, antibiotic susceptibility tests and basic serological reactions. Our students will learn safe handling of microbes and infectious agents, aseptic techniques in microbiology practicals, in order to be able to safely handle patients with infectious diseases in the future.

Format of the course (lectures, group work, practical lessons, etc.):

The subject is taught by lectures and practices

Competencies acquired through completion of course:

After successful completion of the course, the student should be able to think in terms of pathogens for different infections, to use the appropriate sampling device, to take microbiologically appropriate samples and to conduct professional consultations with the diagnostic laboratory.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Microbiology I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not possible

The number of students required to start the course (minimum, maximum), method of selecting participants:

By Neptun program

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:

LECTURES:

1. Medical Mycology: general and detailed mycology, pathogens and pathomechanisms of local, systemic and subcutaneous mycoses, antimycotics and treatment

2. Intestinal and body cavity protozoan infections: Entamoeba histolytica, Giardia lamblia, Balantidium coli, Cryptosporidia Body cavity protozoan: Trichomonas vaginalis

3. Blood and tissue protozoan infections: Plasmodium, Leishmania, Trypanosoma Acanthamoeba, Naegleria, Toxoplasma gondii

4. Infections caused by flatworms: Cestoda (Echinococcosis, Taeniasis, Hymenolepis and Diphyllobotrium, Fasciola hepatica, Paragonimus westermani

5. Infections caused by roundworms: Enterobius, Trichuris, Ascaris and Necator, Strongyloides, Trichinella; filariasis

6. General virology: introduction, morphology, pathomechanism and course of viral infections

7. DNA viruses I: Herpes viruses (HHV-1-8, B virus), DNA viruses II: Poxvirus, Adenovirus, Parvovirus, Papilloma and Polioviruses

8. Hepatitis viruses (A-E and G)

9. Respiratory viruses: RNA viruses I: orthomyxovirus, avian influenza, coronavirus

10. Respiratory viruses: RNA viruses II: Paramyxovirus, Rubivirus

11. Enterally transmitted viruses: Picornavirus, Calicivirus, Rotavirus

12. Viruses causing neurological infections and haemorrhagic fever: Arena, Filo, Flavi, Toga, Reo, Orbi, Bunyavirus, Rhabdovirus

13. Retroviruses. HIV and AIDS, AIDS-related opportunistic infections Tumour viruses, viral oncogenesis; Slow viral infections

14. Nosocomial (iatrogenic) infections. “Emerging” or “re-emerging” pathogens and

the associated diseases. “Old” infective agents in new roles.

PRACTICES

1. Medical Mycology
2. Protozoology I.
3. Protozoology II. and Helminthology I.
4. Helmintology II.
5. General virology: virus morphology, culture, serological reactions
6. Microbiological sampling devices; transport and processing of samples, evaluation of microbiological findings
7. Clinical microbiological diagnostics I: skin and eye infections, soft tissue infections
8. Clinical microbiology II: respiratory tract infections
9. Clinical microbiology III: urinary tract infections
10. Clinical microbiology IV: infections of the digestive tract
11. Clinical microbiology V: infections of the nervous system
12. Clinical microbiology diagnostics VI Microbiology of endocarditis, bacteremia, sepsis
13. Repetition of material from microbiology practical exam - media, cultures
14. Practical exam: smears, sampling devices, serological reactions

Lecturers: Prof. Szabó Dóra, Dr. Dobay Orsolya, Dr. Kocsis Béla, Dr. Ghidán Ágoston, Dr. Horváth Andrea, Dr. Domokos Judit, Dr. Kis Zoltán

Instructor of practices: Dr. Dobay Orsolya, Dr. Kocsis Béla, Dr. Ghidán Ágoston, Dr. Horváth Andrea, Dr. Domokos Judit, Dr. Kamotsay Katalin, Dr. Szász Máté, Dr. Kádár Béla, Dr. Hofmeister Bálint. Dr.

Gugolya Máté, Dr. Bartha Árpád László, Dr. Nagy Orsolya, Dr. Kubicskó András

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Laboratory practice: maximum 3 absences acceptable practice in microbiological laboratory methods. Retaking practice on the same week in another group

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Two midterms during the semester: 1st on 5th week (topic: mycology and parasitology), 2nd midterm on 10th week (topic: general virology and DNA viruses)

Number and type of individual assignments to be completed, submission deadlines:

There is none

Requirements for the successful completion of the course:

Active participation at the lab practice, no more than 3 absences. Passing both midterms and the practical exam.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination requirements:

(*list of examination topics, subject areas of tests / examinations, lists of mandatory parameters,*

figures, concepts and calculations, practical skills)

Final exam questions

I. General microbiology and general bacteriology

1. Medical microbiology: significance, sub-fields and brief history
2. Comparison of pro- and eukaryotic cells
3. Essential structures of the bacterial cells
4. Structure of the bacterial cell wall
5. Accessory/non-essential cell components of bacterial cells
6. Classification (taxonomy) of bacteria
7. Principles of bacterial metabolism
8. Bacterial genetics: modification, mutation, reversion
9. Bacterial genetics: mechanisms of the transfer of genetic material
10. Principles and practice of sterilization, LAL test
11. Principles and practice of disinfection
12. Selective toxicity, chemotherapeutic index, principles of antibacterial chemotherapy
13. Chemoprophylaxis: its importance and examples
14. Antibiotics in combinations
15. Risks and side effects of antibacterial chemotherapy
16. Antibiotics altering the peptidoglycan synthesis: Penicillin, Cephalosporin
17. Antibiotics altering the peptidoglycan synthesis: monobactam, carbapenem, bacitracin
18. Antibiotics altering the protein synthesis: aminoglycosides, tetracycline
19. Antibiotics altering the protein synthesis: chloramphenicol, macrolides, lincosamides
20. Antibacterial drugs acting at the level of nucleic acid synthesis
21. Glycopeptides and antimicrobial drugs altering the membrane functions. Antibiotics altering the membrane functions
22. Antituberculotic drugs

23. Resistance mechanism against antibiotics (examples)

24. Pathogenicity, virulence. Obligate, facultative, and opportunistic pathogens

25. Infection: definition, source, portal of entry, transmission routes, and possible outcome

26. Pathomechanism of infection: adhesion, penetration, invasion, dissemination; bacteriaemia and toxaemia

27. Endotoxin: characterisation, mode of action

28. Exotoxins: characterisation, types. Bacterial super-antigens and associated syndromes

29. Non-toxic virulence factors of bacteria

30. Role of the host organism in the pathogenesis

31. Active immunization. Obligatory vaccines

32. Active immunization: non obligatory vaccines

33. Passive immunization, and its risks and side-effects. Chemoprophylaxis

34. Pathomechanism of infection: molecular mimicry and masking; antigen-shift; immunosuppression. Immunomodulant and immunosuppressive effects of microbes (examples)

35. Nosocomial (iatrogenic) infections and their most important causative agents

36. Sepsis (definition, pathomechanism, microbiological diagnosis)

37. Normal microbial flora of human and its significance

II. Systematic bacteriology

(Note: morphology, culture, antigen structures, virulence factors, pathogenesis of caused disease(s), diagnosis, therapy, prevention.)

1. Staphylococcus aureus

2. Coagulase negative staphylococci

3. Streptococcus pneumoniae, oral streptococci and cariogenezis. Anaerobic cocci

4. Streptococcus pyogenes

5. Streptococcus agalactiae, Enterococcus genus

6. Anaerobic Gram-negative rods (Bacteroides, Fusobacterium, Prevotella, Porphyromonas streptococci)

7. Neisseria meningitidis. Apathogenic Neisseria species

8. Neisseria gonorrhoeae. Moraxella genus.

9. Salmonella genus. Salmonellae causing gastroenteritis

10. Salmonella typhi and Salmonlla paratyphi A, B, C

11. Escherichia coli

12. Shigella genus

13. Klebsiella, Enterobacter, Proteus, and Serratia genus

14. Yersinia genus (Y. pestis and yersiniosis)

15. Vibrio cholera

16. Vibrio parahaemolyticus, V. vulnificus. Aeromonas and Plesiomonas genus

17. Campylobacter genus and Helicobacter pylori

18. Haemophilus genus

19. Pseudomonas group and Acinetobacter, Burkholderia, Stenotrophomonas genus

20. Bordetella genus

21. Legionella pneumophila

22. Brucella genus

23. Pasteurella multocida, Francisella tularensis, Bartonella species

24. Bacillus anthracis and other species of the Bacillus genus

25. Gas-gangrene clostridia

26. Clostridium tetani

27. Clostridium botulinum and C. difficile

28. Listeria monocytogenes. Erysipelothrix rhusiopathiae, Lactobacillus and Bifidobacterium genus. Pre- and probiotics

29. Treponema genus

30. Borrelia genus

31. Leptospira genus

32. Corynebacterium diphtheriae, diphtheroids and the Propionibacterium genus

33. Actinomyces and Nocardia genus, atypical and apathogenic mycobacteria

34. Causative agents of human tuberculosis, Mycobacterium leprae.

35. Rickettsia, Orientia, Coxiella,

36. Chlamydia trachomatis and respiratory tract infections caused by Chlamydia

37. Mycoplasma and Ureaplasma genus

III. General and systematic virology

1) Principles of virus structures. Sub-viral agents: viroid, prion

2) Propagation of viruses. Molecular bases of the biosynthesis of viruses: productive infection

3) Latent and persistent viral infections (examples)

4) Congenital viral infections (examples)

5) Malignant transformation. Viral oncogenesis, oncogenic viruses (examples)

6) Host defence mechanism against viruses

7) Pathogenicity of viruses, pathogenesis of viral diseases

8) Chemoprophylaxis and treatment of viral diseases

9) Obligatory vaccines against viruses

10) Non-obligatory vaccines against viruses

11) Adenoviruses

12) Herpesviruses: HSV-1 and -2

13) Herpesviruses: VZV

14) Herpesviruses: EBV

15) Herpesviruses: CMV

16) Herpesviruses: HHV6, 7, 8

17) Parvoviruses

18) Papilloma and Polyomaviruses (BK, JC)

19) Poxviruses

20) Arena- (LCM-, Lassa-, Machupovirus)

21) Bunyaviruses (Hanta-, Crimean-Congo haemorrhagic fever virus)

22) Corona- and Filoviruses

23) Flavivirus (yellow fever, Dengue)

24) Flavivirus: Tick-born ecephalitis-, West Nile- and Zikavirus

25) Rota-, Calici- and Astroviruses

26) Orthomyxoviruses

27) Paramyxoviruses: Mumps-, Morbillivirus

28) Paramyxoviruses: RSV, Parainfluenzavirus

29) Picornaviruses: Poliovirus)

30) Picornaviruses: Rhino-, Coxsackie-, echo- and enteroviruses

31) Rhabdoviruses

32) Retroviruses and AIDS

33) Togaviruses (Alpha- and Rubi virus)

34) Hepatitis viruses: A, E

35) Hepatitis viruses: B, C, D, G

36) Conventional and non-conventional slow virus infections

37) Serological reactions in the diagnosis of viral diseases

IV. General and systematic mycology and parasitology

1. Structure, metabolism, life cycle and classification of medically important fungi

2. Classification, pathomechanism and risk factors of mycoses

3. Cultivation of fungi. Microbiological diagnosis of fungal infections

4. Treatment of fungal infections

5. Mycoses of the skin and its adnexes: dermatophytoses
6. Superficial and sub-cutaneous mycoses
7. Coccidioides immitis. Histoplasma capsulatum
8. Blastomyces dermatitidis, Paracoccidiodes brasiliensis
9. Cryptococcus neoformans, Pneumocystis jirovecii (carinii)
10. Zygo- (phyco-) mycoses. Aspergillus species and Penicillum genus
11. Candida genus
12. General characterisation and taxonomy of protozoa
13. Entamoeba histolytica and Entamoeba coli
14. Acanthamoeba and Naegleria genus
15. Giardia lamblia, Balantidium coli
16. Cryptosporodium spp. and Blastocystis hominis
17. Trichomonas vaginalis
18. Plasmodia
19. Trypanosoma brucei
20. Trypanosoma cruzi
21. Leishmaniae
22. Toxoplasma gondii
23. General characterisation and taxonomy of helminths
24. Taenia saginata
25. Taenia solium
26. Diphyllobothrium latum and Hymenolepis nana
27. Echinococcus species
28. Fasciola hepatica
29. Paragonimus westermani
30. Schistosomes

31. Ancylostoma duodenale and Necator americanus

32. Toxocara canis, T. cati

33. Trichinella spiralis

34. Enterobius vermicularis

35. Ascaris lumbricoides. Trichuris trichuria

36. Strongyloides stercoralis, Dirofilaria repens

37. Worms causing filariasis

V. Summary: Clinical microbiology and microbiological diagnostics

1. Bacteria causing skin and wound infections (list) and their diagnosis

2. Bacteria causing abdominal infections (peritonitis, cholecystitis, cholangitis - (list) and their diagnosis

3. Bacteria and viruses causing ophthalmic (eye) infections (list) and their diagnosis

4. Bacteria causing air-borne upper respiratory tract infections (list) and their diagnostics

5. Normal flora of the oral cavity. Microbes causing infections of the oral cavity (list)

6. Normal flora of the gastrointestinal tract and its significance

7. Pathogens of the enterally (faecal-oral route) spreading bacterial infections (list) and their diagnosis

8. The most important microbial pathogens of the urinary tract (list)

9. Causative agents of arthropode borne bacterial infections (list)

10. Bacterial pathogens of food-poisoning and toxico-infections (list)

11. Zoonotic infections (list) and their prevention

12. The most important bacteria causing meningitis, and encephalitis (list) their diagnosis, and principles of treatment

13. Bacteria causing lower respiratory tract infections (list) and their diagnosis

14. Bacterial exotoxins and the related diseases. Prevention and therapy

15. Microbiological diagnosis of bacteriaemia, endocarditis, and sepsis

16. Description and diagnosis of infections caused by anaerobic bacteria

17. Enterally acquired parasitic infections (list) and their diagnosis

18. Causative agents of arthropode borne parasitic infections (list) and their diagnosis

19. Pathogens of the air-borne viral infections (list)

20. Pathogens of the enterally acquired viral infections (list)

21. Causative agents of arthropode borne viral infections (list)

22. Pathogens of viral and fungal meningitis and encephalitis (list)

23. Pathogens of fungal and parasitic lung infections (list)

24. Microbes causing pre- and perinatal infections (list) in the fetus/new-born baby

25. Child-hood infections characterized by exanthemas (rashes)

26. Normal flora of the genital tract. Pathogens of sexually transmitted diseases (list)

27. Screening and verification of HIV-infections. Microbes causing opportunistic infections related to AIDS (list)

28. Pathogens of hepatitis and their transmission, as well as microbiological diagnosis

29. Infectious specimens: basic rules of sample collection, transport, and laboratory procedures

30. Measurement and alteration of virulence. Significance of attenuation. Bioterrorism and biological weapons

31. The use of laboratory animals in the medical microbiology.

32. Sero-typing and phage-typing

33. Molecular examination methods used in microbiology

34. Causative agents causing atypical pneumonia and their diagnosis

35. Causative agents of diarrhoea and diagnosis

36. Principles of the evaluation of serological tests. Pair of sera test, meaning of titre

37. Protozoa and helminths causing ophthalmic (eye) infections (list) and their diagnosis

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The list of the Minimum questions and answers together with other useful hand-outs of the course are uploaded to the Moodle surface. Link:
https://itc.semmelweis.hu/moodle/course/view.php?id=10003

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

After passing the minimum questions, the student draws a card at the final exam, which contains 1 question from each of the five topics in the question set. The student must have at least a satisfactory knowledge of all five topics.

There is none

There is none

There is none

Artificial intelligence systems used in the teaching of the subject and the manner of their application

none

Printed resources:

Type	Recommended
Author	Dr. Szabó Dóra
Title	Basics of Medical Microbiology
Publisher	Semmelweis Editor
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Biofizikai és Sugárbiológiai Intézet

Name of subject in Hungarian: Orvosi statisztika, informatika és telemedicina
Name of subject in English: Medical Statistics, Informatics and Telemedicine
Name of subject in German: Medizinische Statistik, Informatik und Telemedizin

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Credit value of the course: 2
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.5	1.0	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKFIZ974_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kellermayer Miklós (Intézet igazgató)
Course coordinator location of work, telephone availability: SE Biofizikai és Sugárbiológiai Intézet, 06-1-4591500/60200
Course coordinator position: egyetemi tanár, igazgató
Course coordinator Date and number of habilitation: 2004 PTE ÁOK 7/2004/habil

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Objectives of the course, and its place in the curriculum of the medical training program:

In recent years, medicine relies more intensively on statistics, as well as on the use and interactive management of databases. Our aim is to introduce students to the fundamentals of data analysis and decision support methods that are most common in medical practice.

The subject focuses on the presentation of basic principles and concepts. We focus on logical

thinking rather than computational techniques. The aim of the exercises is to deepen the knowledge conveyed in the lectures in a problem-oriented way and to apply it realistically. The calculation tasks that occasionally occur in the exercises are performed using simple, easy-to-use software on specified databases. During the internships, students have to acquire knowledge on making basic descriptive figures and tables, basic inferential statistics and regression models, as well as interpret scientific publications results.

Format of the course (lectures, group work, practical lessons, etc.):

The lecture materials are available in detailed summary and video form on the university's common educational platform ("Moodle"). Students are required to process this part of the curriculum based on these materials; however, there is, of course, an opportunity to deepen this knowledge during the exercises. During the exercises, students individually work on the theoretical and practical curriculum using a computer program. The solutions to the tasks must be uploaded to the educational platform by completing a "questionnaire" structured similarly to the exam.

Competencies acquired through completion of course:

The aim of the student is to acquire the following “theoretical” competencies (listed according to the planned lectures):

- biostatistics in science: understand what statistics do and do not answer - be familiar with the basic statistics behaviour of clinical studies: 1. its steps (planning, data collection, data description, data analysis, interpretation of ressults) 2. its type (observational and experimental studies) - know the different data type - know the simple concept of a variable and its outcome
- know and be able to interpret the basics of the following concepts: descriptive statistics, frequency, relative frequency, cumulative frequency, mean, median, standard deviation, quantiles, data range, interquartile range; frequency (empirical) distribution, normal distribution - know and able to interpret the following graph types: histogram, bar plot, box plot, scatter plot, mosaic plot, percentile curves
- know and be able to interpret the basics of the following concepts: event, frequency and probability of an event; elementary event, independent events, mutually exclusive events - know the concept of conditional probability, recognize in text what the condition is - know the basic properties of normal and binomial distribution, its occurrence in the clinical practice - know and can simply tell the theorem of the central limit theorem, be aware of its relevance

- know the concept of: sampling error; estimation, estimand, estimate; point and interval estimations; estimation intervals and reference interval - know and be able to interpret the concept of estimation error (as standard error), - know the concept of confidence interval - know the concept of effect size
- know the basic thread of thought of the hypothesis tests, the underlying philosophy (falsification) and logic (existing knowledge, new hypothesis) - know the concept of: effect size, relevant difference, null hypothesis, null distribution, test statistics, first and second type error, significance level, significant difference, statistical power - know what is true and not true about Pearson p-value
- know the basic concept of t-tests and chi-square tests - know and be able to interpret the assumptions related to the t-test: 1. independence 2. homogeneity 3. normality - identify if the conditions for the t-test are met - be aware of the problem caused by multiple comparisons
- know the concept of correlation, regression, cause and effect, differences - know the concept of the outcome variable, explanatory variable - be aware of the meaning and scope of OLS - know the concept of residuals in the case of OLS - be familiar with the concept of slope and intercept of a fitted line - know the meaning of Pearson's correlation coefficient in a simple case
- know the basic of argumentation technics and phallacies
- be familiar with the concept and "role" of biases and confounding in clinical research - know the weaknesses and strengths of the types of clinical studies (based on bias, confounding) - know the possibility of “treating” confounding through regression - be familiar with the concept of control variables - know about generalizability of regression models: categorical explanatory variable, categorical target variables, correlated outcomes - know the concepts of odds, risks, odds ratio and logit
- know the basic concepts of epidemiology related to diagnostic tests (sensitivity, specificity…) - know importance (situations) of the test parameters
- be familiar with the comparability of diagnostic tests in certain respects - know the concept of incidence, prevalence, limitations of their use, "correctness" - know the concepts of likelihood ratios
- know when and how to consult a statistician (know what information you should provide for) - know the most important pitfalls of the questionnaires, how to avoid them
- know the basic concepts of decision theory - know a priori and a posteriori distributions, probabilities concepts - know the basis of Bayesian thinking
- get to know some of the possibilities and limitations of AI - be familiar with some data sets that are important in clinical practice

The aim of the student is to acquire the following “practical” competencies (listed according to the planned practices):

- be able to classify variables (based on measurement results, outputs) into different data types
- be able to create and interpret histograms, bar charts
- be able to select the type of plot corresponding to the type of variables - be able to create a box plot, scatter plot, mosaic plot (using a given computer program) and interpret it - be able to calculate and interpret the mean, median, quantiles, IQR - be able to read and interpret perecentile curves
- be able to answer simple clinical questions based on a binomial distribution
- be able to interpret the normal range, in the case of a normally distributed variable, calculate from a large number of samples - be able to interpret the confidence interval of the mean
- be able to formulate a question suitable for hypothesis testing and a null hypothesis - be able to interpret the result of a simple hypothesis test - be able to distinguish between relevant and significant result
- be able to perform a t-test in a simple situation, - be able to interpret the results of a simple hypothesis test - be able to recognize multiple comparisons
- be able to calculate the correlation of two variables (if applicable), to interpret the correlation coefficient - be able to make a simple linear regression: to estimate a slope - be able to evaluate the result of a hypothesis test related to a simple linear regression - be able to estimate based on the fitted slope and intercept
- be able to distinguish between "right and wrong" arguments
- be able to give examples of basic bias (selection and information bias), confounding, recognize them - be able to give examples of basic clinical study types and recognize them - be able to basically interpret the outcome of multiple linear regression and logistic regression (estimate, confidence interval, p-value) - be able to interpret the odds ratio
- be able to calculate basic diagnostic test parameters on the basis of a confusion matrix - be able to interpret each test parameter; recognize their significance, advantages and disadvantages
- be able to compare ROC curves - be able to correctly recognize the use of incidence and prevalence - be able to estimate the likelihood ratios
- be able to organize his data into an appropriate structure which can be processed by statistical programs
- be able to prepare a not terribly bad questionnaire - be able to recognize what data and information to share with a statistician

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biophysics II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

There is no maximum or minimum number of students, we select them based on their application

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Planned schedule of lectures:

Week	Title
1	Principles of quantitative medicine.
2	Summary of data: descriptive statistics.
3	Event, probability, distribution.
4	Estimations.
5	Principles of hypothesis testing in medical practice.
6	T-tests; chi-square tests. Multiplicity.
7	Correlation. Simple linear regression.
8	Arguing.
9	Confounding, biases. Linear regression as a tool against confounding,
10	Evaluation of diagnostic tests.
11	Statistical concepts in epidemiology. Prevalence, incidence, risk, odds. ROC curves. Likelihood ratios.
12	Communication with a statistician. Sample size. Data tables. Survey tips.
13	Introduction to medical decision theory, Bayesian theory: a priori and a posteriori distributions, learning model.
14	Databases, expert systems, AI supported diagnostics, BigData.

Lecturers: Dr. KELLERMAYER Miklós Sándor Zoltán, Dr. AGÓCS Gergely, Dr. KISS Balázs, Dr. MÁRTONFALVI Zsolt, Dr. SCHAY Gusztáv, Dr. VERES Dániel Sándor.

Planned schedule of practices:

Week	Title
1	Introduction. *Data types.* Introduction to data types.
2	*Graphical representation of data and interpretation of plots I.* Ploting frequencies: visualization of samples with a large number of elements on a histogram, bar plot.
3	*Graphical representation of data and interpretation of plots II*. Box plots, scatter plot, mosaic plot. Outliers. Interpretatation of percentile curves. *Descriptive values.* Determination of descriptive values from a large sample size.
4	*Distributions*. Using binomial distributions. Using normal distributions.
5	*Reference interval.* Approximate calculation for normal distribution. Interpretation. *Confidence intervals.* Simple calculation of the confidence interval of mean. Interpratation.
6	*Hypothesis tests*. Logic of hypothesis tests.
7	*Hypothesis test and confidence interval calculation on difference between two ratios.* Chi-square tests, Fisher exact test. Confidence interval of difference between two ratios.
8	*Hypothesis test and confidence interval on difference of means. Student t-tests*. Making t-tests. Interpretation of effect size, confidence interval and p-value. *Multiplicity*. Examples for multiple testing.
9	*Correlation, regression*. Interpretation of correlation coefficient. Making simple linear regression, interpretation of the slope.
10	*Regression models*. Interpreting the results of multiple regression models.
11	*Diagnostic tests I.* Diagnostic tests.
12	*Diagnostic tests II.* Odds, OR, RR. Likelihood ratios.
13	*Preparing data*. Organizing data tables.
14	Possibility to write an exam test.

Tutors: Dr. AGÓCS Gergely, Dr. GALÁNTAI Rita, Dr. GÁL-SOMKUTI Judit, HALMÓCZKI Sarolta, Dr. KELLERMAYER Miklós Sándor Zoltán, Dr. KISS Balázs, Dr. KISS Bálint, Dr. HEGEDŰS Nikolett, Dr. MÁRTONFALVI Zsolt, Dr. PADÁNYI Rita, Dr. SCHAY Gusztáv, Dr. S. NAGY Krisztina, Dr. SZIKLAI Dominik, Dr. VERES Dániel Sándor, Dr. ZOLCSÁK Ádám.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students may be absent a maximum of 3 practice in their own group (as registered in Neptun) during the semester. A report must be prepared on the content of each practical session, and uploading it to the designated platform is a condition for confirming attendance. Missed practicals can be made up during the same week (even in advance) in another group after prior consultation with the instructors. Completing a practical in another group does not count as attendance and therefore does not reduce the number of absences. Absences do not need to be justified. Any deviation from these rules is only possible with the permission of the head of the institute or by higher university instruction.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Continuous partial assessments (learning-supporting assignments)

After completing major topics, a short test is administered the following week in each student's own group, during the first ~15 minutes of class. Planned weeks: week 5 (basic concepts, descriptive statistics, distributions), week 9 (estimation and simple hypothesis testing), week 11 (regression and confounding). In week 13, one make-up opportunity is provided for one topic, at a pre-scheduled time with prior registration.

Tests cover both theoretical and practical material in Moodle format (single choice, multiple choice, fill-in, diagrams, calculations). Incorrect answers in multiple-choice questions result in point deductions; calculation tasks do not penalize incorrect answers. Questions are available on Moodle for practice. Numerical values in calculation tasks are randomly generated, so results may vary, but correct solution methods remain consistent.

Bonus points: average >80% → +12 percentage points; >70% → +8; >50% → +4.

Summary assessment

In the final week, a comprehensive test is available (weeks 1–12). Bonus points may be included. Grading:
<50% (bonus points should not be used): fail (1)
50–62%: 2
62–72% (bonus points could be used): 3
72–80% (bonus points could be used): 4
80% (bonus points could be used): 5

Number and type of individual assignments to be completed, submission deadlines:

A report must be prepared on the material covered in practical sessions, and uploading it is a condition for confirming attendance. There are no other individual assignments.

Requirements for the successful completion of the course:

Maximum of 3 absences (see point 24).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Written exam corresponds to the final summary test but covers the full semester. Same grading scale, without bonus points.
Oral exam topics correspond to lecture titles.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Minimum requirement: the weighted average of the test exam (see point 29) must reach 50%. *If below 50%, there is an opportunity for oral clarification and assisted answering of exam questions, which may modify the original result based on the examiner's judgment.* The minimum requirement for the oral part is a grade of 2 (pass). Standardized examination is supported by the institute's "Teaching the Teachers" project. Students may consult examiners during both the study and exam periods regarding the expected theoretical weight of concepts and calculations through concrete examples.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Students may request that their written exam or final test result counts as 100% of the final grade. Otherwise, the final grade is the weighted average of written and oral exam (2:3).

Same rule: either 100% written/test, or weighted average (2:3).

Students may request the final test to count as 100%.

None.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

AI systems may be used cautiously by both instructors and students. During exams, only pre-approved AI systems may be used; others are not allowed.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai, Igazságügyi és Biztosítási Orvostani Intézet

Name of subject in Hungarian: Patológia I.
Name of subject in English: Pathology I
Name of subject in German: Allgemeine und spezielle Pathologie I

Credit value of the course: 8
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
8.0	4.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKPIB1110_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kiss András (igazgató)
Course coordinator location of work, telephone availability: Department of Pathology, Forensic and Insurance Medicine, +36208259664
Course coordinator position: director
Course coordinator Date and number of habilitation: Dr. Kiss András 2007. május 30. Anyakönyvi szám: 248

Objectives of the course, and its place in the curriculum of the medical training program:

Lectures:

Lectures form the foundation for mastering the subject of pathology. In addition to providing a general overview of the course material, greater emphasis is placed on chapters that are more difficult to understand and cannot be adequately covered within the framework of practical sessions.

Following general pathology, the organ systems are discussed in sequence, and the lectures are synchronized with the topics of the histology practicals. Certain topics are also addressed in the lectures (e.g., perinatal pathology) that are not directly associated with a slide seminar.

The lectures are richly illustrated with both macroscopic and microscopic images, and considerable emphasis is also placed on clinicopathological correlation. In the clinicopathology lectures, pathology as a medical specialty is brought closer to students through case presentations.

The chronological order of the lectures and the information regarding the designated lecturers are provided for informational purposes only and may change during the academic year. The updated version is continuously available to our students online on the course's Moodle platform.

Autopsy Room Practices

During the first practical sessions of the first semester, students become familiar with the health and safety regulations to be followed in the autopsy room and the basic standard organ dissection techniques as well. Through discussion and review of the medical documentation related to autopsies, clinicopathological knowledge can gradually be integrated into the students' understanding. During the subsequent practical sessions of the semester, students learn the structured description of normal morphology as well as pathological alterations.

Together with the lectures on systemic pathology, the emphasis is placed on teaching autopsy diagnostics, recognizing the connections within the patient's medical history, and developing a clinicopathological approach.

If a body is not available for the autopsy practice, visits to the institute's laboratories or case presentations will take place. Preparation for the exam and the synthesis of acquired knowledge are supported by supplementary seminars, which are held at the same time as the autopsy practicals, with the group divided.

Information obtained during autopsies, lectures, and demonstrations forms part of medical confidentiality and is therefore also binding for students.

Any form of recording (audio, photographs, video, etc.) of the Institute's teaching and demonstration materials, projected presentations, built environment, equipment, or other facilities is strictly prohibited, with particular regard to autopsy and histopathology practicals and lectures. The demonstration materials presented during teaching are the property of the Institute, or their presentation falls under the direct supervision of the Institute; therefore, they are not public in any respect and may not be disclosed, recorded, or removed without the knowledge and permission of the Institute. Violation of the above regulations will result in disciplinary proceedings. Exceptions to this prohibition may only be granted with prior written permission from the leadership of the Institute. By this, the Institute reserves the full right to control all outward communication concerning the Institute.

Histopathology Practices

These practical sessions are intended to help students acquire fundamental histopathological knowledge and develop certain (minimal) diagnostic and documentation skills. The presented slides are studied by students in digital form using an online teleconsultation program, partly together with the instructor and partly independently. The material of the histopathology practicals is also available in the Moodle system in video format. The theoretical content of the histopathology practicals is aligned with the lectures.

The Institute reserves the right to change the order of the listed practical topics (for example, due to public holidays). The updated version is continuously available to our students online on the course's Moodle platform.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practices

Competencies acquired through completion of course:

Basic knowledge about development and process of the diseases, application of medical terminology, recognition of basic microscopic, macroscopic alterations and clinico-pathology associations.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology II., Macroscopic Anatomy and Embryology II. , Microscopic Anatomy and Embryology II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

In accordance with the provisions of the Study and Examination Regulations , with the individual consent of the head of the educational-research unit that has announced the subject parallel enrolment is possible.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum of 160 students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest

lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Week 1

I/1. Introduction / Dr. András Kiss

- Intracellular storage

I/2. Clinicopathology: Clinical and forensic aspects of natural - unnatural death

I/3. Cell injury / Dr. András Kiss

- Reversible cell injury (hydropic swelling, atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia).
- Irreversible cell injury (necrosis, apoptosis, ischemic cell injury, external damaging agents, calcification, hyalinization, aging).

Week 2

I/4. Hemodynamic disorders I. / Dr. Lilla Madaras

- Basics of hemodynamics.
- Hemorrhage, active and passive hyperemia.
- Disorders of fluid homeostasis and electrolytes.
- Edema.
-

I/5. Clinicopathology of the organ specific complications of haemodynamic disorders (brain edema, lung edema, congestion of internal organs)

I/6. Hemodynamic disorders II. / Dr. Lilla Madaras

- Thrombosis, embolism. Infarction. Shock.

Week 3

I/7. Inflammation I. / Dr. István Kenessey

- Definition.
- Symptoms.

- Vascular permeability.
- Inflammatory mediators and their origin.
- Cellular recruitment.
- Acute inflammation.
- Systemic manifestations of inflammation.
- Inflammation of avascular tissues.
- Wound healing, regeneration and repair.
- Classification of cells and tissues according to their regenerative capability.
- Extracellular matrix.
-

I/8. Clinicopathology of sepsis, abscess, purulent bronchopneumonia, lobar pneumonia

I/9. Inflammation II. / Dr. Gábor Lotz

- Chronic inflammation.
- Fibrosis, scar formation.
- Granulomatous inflammation: (tuberculosis, syphilis. etc.)

Week 4

I/10. Cardiovascular pathology I. / Dr. Tibor Glasz

- Structure of vessels.
- Atherosclerosis.
- Aneurysms.
- Hypertensive vascular disease.
- Inflammatory disorders of blood vessels.
- Microvascular disease.
- Diseases of the veins and lymphatic vessels.
- Vascular tumors.
-

I/11. Clinicopathology of heart infarction (acute, chronic, complications)

I/12. Cardiovascular pathology II. / Dr. Tibor Glasz

- Endocarditis, myocarditis, pericarditis.
- Rheumatic heart disease.
- Ischemic heart disease

Week 5

I/13. Cardiovascular pathology III. / Dr. Tibor Glasz

- Congenital heart diseases.
- Cardiomyopathies.
- Heart failure.
- Systemic diseases involving the heart.
- Cardiac tumors.

I/14. Clinicopathology of pericarditis and endocarditis

I/15. Neoplasia I. / Dr. András Kiss

- Neoplasia - definition.
- Characteristics of benign and malignant tumors.
- Histological classification of tumors.
- Grading.

Week 6

I/16. Neoplasia II. / Dr. István Kenessey

- Causes of neoplasia.
- Epidemiology.
- Chemical, physical and biological carcinogenesis.
- Prevention.
- Screening.
-

I/17. Clinicopathology of tumor progression and metastasis

I/18. Neoplasia III. / Dr. József Tímár

- Molecular mechanisms of tumor development: protooncogenes, oncogenes, tumor suppressor genes, growth factors.

Week 7

I/19. Neoplasia IV. / Dr. József Tímár

- Tumor growth, tumor progression, metastasis.
- Familiar cancer

I/20 Clinicopathology of synchronous and metachronous tumours, Cancer of Unknown Primary (CUP)

I/21. Neoplasia V. / Dr. Janina Kulka

- Prognostic factors in tumor pathology.
- Staging and grading of tumors.
- TNM. Handling of surgical biopsy material

Week 8

I/22. Childhood tumors / Dr. Judit Halász

- Hematologic and solid childhood tumors
-

I/23. Clinicopathology of childhood tumors

I/24. Methods of pathology I. / Dr. Tibor Várkonyi

- Grossing, HE and special staining techniques, immunohistochemistry. FNAB, core biopsy

Week 9

I/25. Methods of pathology II. / Dr. András Kiss

- Diagnostic parameters, requirements, which guide the clinical protocols.
- Molecular diagnostics of tumors.
- Targeted therapy

I/26. Clinicopathology: Molecular pathology diagnostics - Comprehensive Cancer Panel, BRCA, POLE, NTRK

I/27. Genetic and developmental disorders. Gene pathology I. / Dr. András Kiss

- Single-gene abnormalities.
- Autosomal dominant and recessive inheritance, sex-linked disorders.

- Lysosomal storage disease.

Week 10

I/28. Genetic and developmental disorders. Gene pathology II. / Dr. András Kiss

- Chromosomal abnormalities.
- Morphogenic disorders, malformations, multifactorial inheritance.
- Prenatal diagnosis. Familiar diseases and symptoms.
-

I/29. Clinicopathology of autoimmune liver diseases

II/30. Immunopathology / Dr. András Kiss

- Constituents of the immune system.
- Hypersensitive reactions.
- Allergy.
- Transplantation.
- Immunodeficiency.
- AIDS.

Week 11

I/31. Autoimmune diseases / Dr. Tibor Glasz

- Etiology.
- Monosystemic diseases (e.g. chr. athrophic gastritis, myasthenia gravis, Graves disease, Hashimoto thyroiditis, Addison disease., Insulin-dependent diabetes mellitus, multiple sclerosis) and Oligo- polysystemic diseases (e.g. SLE, Sjögren sy, RA, scleroderma, dermatomyositis)
-

I/32. Clinicopathology of rejection after kidney and liver transplantation

I/33. Hematopathology I. / Dr. Ildikó Illyés

- Hemopoetic system.
- Normal function (bone marrow, lymph nodes, spleen).
- Morphology and immunologic evaluation.
- Disorders of platelets and coagulation.
- Anemias, polycytemia.
- Neutrophilia.

- Proliferative disorders of mast cells.
- Monocytosis.
- Sinus histiocytosis.
- Benign disorders of lymphoid cells.

Week 12

I/34. Hematopathology II. / Dr. Zsófia Kramer

- Acute myeloproliferative syndromes (acute leukaemias).
- Chronic myeloproliferative syndromes (CML, myelofibrosis, thrombocytemia).
- Acute and chronic lymphocytic leukemias.
- Disorders of the spleen.

I/35. Clinicopathology: Manifestation of haematological diseases in biopsy specimens

I/36. Hematopathology III. / Dr. Benedek Gyöngyösi

- Lymphomas (Hodgkin, non-Hodgkin).
- Metastatic tumors in bone marrow and lymph nodes.

Week 13

I/37. Infectious diseases / Dr. Gábor Lotz

- Viral diseases (tick-borne viruses, polio, smallpox, herpes, CMV, EBV, rubella, varicella, mumps, influenza), Rickettsiae, Spirochetes.
- Bacteria (tularaemia, pertussis, legionella, brucellosis, listeriosis, clostridial infections (tetanus, botulism), Streptococci) Actinomycosis. Mycobacteria (tbc, leprosy).
- Protozoa (malaria, toxoplasmosis, amebiasis)

I/38. Clinicopathology of infectious diseases

I/39. Environmental and nutritional pathology / Dr. Roland Istók

- Smoking, alcoholism, drugs.
- Iatrogenic injuries.
- Environmental chemical and physical factors.
- Obesity, protein malnutrition, vitamins

Week 14

I/40. Bones and joints / Dr. Gabriella Arató (Department of Pathology and Experimental Cancer Research)

- Structure of the bone and cartilage.
- Osteogenesis.
- Growth and maturation disorders of the skeleton.
- Aseptic bone necrosis.
- Reactive osteogenesis.
- Osteomyelitis and specific inflammatory diseases.
- Metabolic disorders.
- Tumors and tumor-like lesions of the bones and joints

I/41. Clinicopathology of soft tissue tumors

I/42. Clinicopathology

Practices

Practice 1- Introduction

- Safety rules
- Digital teaching system
- Teleconsultation
- E-school

Practice 2- Cell injury, adaptation, storage disorders

- Coagulative necrosis,
- Liquefactive necrosis
- Apoptosis
- Hypertrophy
- Hyperplasia
- Fatty degeneration
- Amyloidosis
- Infiltratio adiposa myocardii
- Bronchus - squamous metaplasia

Practice 3- Hemodynamic disorders I.

- Acute congestion - pulmonary edema
- Chronic pulmonary congestion

- Hemosiderin in alveolar macrophages (“heart failure cells”)
- Chronic congestion in the liver (“nutmeg liver”)
- Shock, DIC

Practice 4 – Hemodynamic disorders II.

- Thrombus
- Fat embolism
- Anemic infarction – kidney
- Hemorrhagic infarction - lung

Practice 5- Inflammation, cell repair

- Acute appendicitis
- Fibrinous pericarditis
- Granulation tissue
- Foreign body granuloma
- Rheumatic myocarditis

Practice 6- Cardiovascular diseases

- Arteriosclerosis
- Atherosclerosis
- Acute myocardial infarction
- Myocardial infarction - healing
- Endocarditis
- Viral myocarditis
- Temporal arteritis
- Kaposi-sarcoma

Practice 7- Neoplasia I

- Squamous metaplasia
- Condyloma (LSIL)
- CIN 3 (HSIL)
- Invasive carcinoma

Practice 8- Neoplasia II. (Benign and malignant tumors)

- Squamous papilloma
- Squamous cell carcinoma
- Adenoma
- Adenocarcinoma
- Lymph node metastasis
- Liver metastasis

Practice 9- Neoplasia III. (Soft tissue and childhood tumors)

- Leiomyoma
- Leiomyosarcoma

- Osteosarcoma
- Wilms tumor
- Neuroblastoma
- Mature teratoma
- Fascitis nodularis
- Desmoid fibromatosis
- Rhabdomyosarcoma
- Liposarcoma

Practice 10- Biopsy techniques, protein- and DNA-based diagnostics

- Cytology smear
- Core needle biopsy
- Biopsy by endoscopy
- Frozen section
- Special stains
- Immunohistochemistry
- FISH
- Polypus nasi
- Asthma bronchiale
- Acut rejectio
- Lupus nephritis
- Scleroderma

Practice 11- Hematopathology I.

- Reactive lymphadenopathy
- Hodgkin’s lymphoma
- Nodal non-Hodgkin’s lymphoma
- Extranodal non-Hodgkin’s lymphoma
- Multiple myeloma

Practice 12- Practical exam

Practice 13- Hematopathology II.

- Megaloblastos vérképzés
- AML
- CML
- Myelofibrosis
- CLL

Practice 14- The pathology report, Interesting autopsy case presentation, Consultation

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

As a general rule, attendance at practical sessions is mandatory. Instructors record attendance at the beginning of each practical session (attendance may be recorded both on paper and online). During one semester, students may miss up to **three (3) histopathology practicals** and **three (3) autopsy room practicals**. Any absences exceeding this limit must be made up during the same semester.

Autopsy room practicals may be made up with another group from the same program, regardless of the topic, during their scheduled practical time.

Histopathology practicals may be made up with any group, but only within the **same week**.

This is due tot he strict order of topics.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

No written midterm test will be held during the semester.

In **week 12**, during the scheduled practical sessions, students will take a **practical exam**, in which they demonstrate the knowledge acquired during the autopsy room and histopathology classes. The tasks include:

- **Organ demonstration**,
- **Recognition and description of one (1) histological slide**,
- **Correct definition of three (3) terms** selected from the definition list available on the website.

Based on the results of the practical examination, the following **percentage bonus points** will be added to the score of the **semifinal written test**:

Organ demonstration

- Excellent: **3 percentage points**
- Good: **2 percentage points**
- Satisfactory: **1 percentage point**
- Fail: **0 percentage points** (repeat required)

Histology

- Excellent: **3 percentage points**
- Good: **2 percentage points**

- Satisfactory: **1 percentage point**
- Fail: **0 percentage points** (repeat required)

Definitions

- Excellent: **3 percentage points**
- Good: **2 percentage points**
- Satisfactory: **1 percentage point**
- Fail: **0 percentage points** (repeat required)

A **retake opportunity** will be provided at a time determined by the academic coordinator (depending on the number of students), and **only one retake is allowed for those, who failed at one or multiple parts of the first exam**. During the retake, students must repeat **only those parts of the practical examination in which they received a failing grade**. In the case of a retake examination, **no additional bonus points will be added to the semifinal score**.

Number and type of individual assignments to be completed, submission deadlines:

Not relevant.

Requirements for the successful completion of the course:

Requirements for Obtaining the Semester Signature

1. During one semester, students may be absent **without justification from 3 (three) histopathology practicals AND 3 autopsy room practicals**. All other missed practicals must be made up.
   Autopsy room practicals may be made up with another group from the same program during their scheduled practical time, regardless of the topic.
   Histopathology practicals may be made up with any group, but **only within the same week**.
2. Achieving **at least a passing grade** in each component of the practical examination (**organ demonstration, histology, definitions**) is a prerequisite for being admitted to the exam, i.e., for obtaining the semester signature.

In the histology assessment that forms part of the practical examination, a **passing grade** means that, based on the examination of **one histological slide**, the student:

- correctly **identifies the organ**,
- establishes the **correct diagnosis**, and
- is able to present **at least three basic histological features** related to the diagnosis.

The results of the demonstration and the practical examination (as well as the results of the written semifinal exam and the final semifinal grade) are recorded on an **individual examination record sheet**.

Type of assessment:

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The semifinal consists of a **written examination**. A maximum of **60 points** can be obtained on the written exam. The time available for completing the exam is **60 minutes**.

The maximum **60 points** obtainable in the written exam are composed of the following parts:

- **36 points (60% of the exam)** can be obtained by correctly answering **test questions**. The test consists of **single-choice and multiple-choice questions** covering topics taught during the first semester. Both the questions and the answer options are randomized, but organized by topic, from our question database.
- **18 points (6 questions × 3 points, representing 30% of the exam)** can be obtained by correctly answering **short-answer questions**, mostly requiring brief explanations or listings. The maximum score for one question is **3 points**. The questions are randomly selected from our database.
- An additional **6 points (3 questions × 2 points, representing 10% of the exam)** can be obtained through **image recognition and answering questions related to the images**. The images are randomly selected from our database.

The written examination is compiled from the **lectures and practical sessions of the first semester as well as the relevant chapters of the textbook**. The **semifinal test question database and the correct answers** will be made available on the **course Moodle platform** in accordance with the Study and Examination Regulations.

The **minimum score obtainable for a question is 0 points**, meaning **negative scores are not possible**. In the case of multiple-choice questions, **incorrect answers within the same question result in proportional point deductions**.

If a student **does not reach 60%** on the written exam, the examination is graded **fail**, and any **additional percentage points earned during the semester cannot be added** to the final semifinal grade.

If the **written exam result reaches at least 60%**, the **final grade** is determined by adding the **additional percentage points earned during the semester** (during the practical examination and demonstrations) to the percentage score of the written exam.

Example:
Written exam result: **41 points = 68%**

- **2% + 2% + 1%** bonus points from the practical examination
  Final combined result: **73%**

The written exam result is considered **in percentage form**, rounded to whole numbers according to standard rounding rules (e.g., **68.333% = 68%**).

The **final grade** (based on the written exam percentage plus bonus percentage points earned during

the semester) is determined as follows:

- **0–59.99%:** 1 (fail)
- **60–69.99%:** 2
- **70–79.99%:** 3
- **80–89.99%:** 4
- **90–100%:** 5

Students who achieve at least a passing grade but are not satisfied with their written exam result may take a written improvement exam.

In the case of a failed written exam, the student may repeat the written exam in the format described above. In such cases, the student may also request an oral examination, which must be submitted in writing to the department using one of the contact options listed on the course Moodle page.

Requested oral examinations are organized separately at pre-announced dates determined by the department, generally during the last two weeks of the exam period.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

In the histology assessment that forms part of the practical examination, a **passing grade** means that, based on the examination of **one histological slide**, the student:

- correctly **identifies the organ**,
- establishes the **correct diagnosis**, and
- is able to present **at least three basic histological features** related to the diagnosis.

In the autopsy part of the practical exam, the minimum requirements are:

- recognizing the organ or organ complex, correctly orienting it
- knowing the negative status provided by the institute as organ description file
- recognizing major, outstanding pathological alterations and describing them in a logical way

The list of definitions is given, shared on Moodle and on the institute's website.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

If a student **does not achieve 60%** on the written examination, the exam is graded **fail**, and the

additional percentage points earned during the semester cannot be added to the semifinal grade in the case of a failing result.

If the **written examination result reaches at least 60%**, the **final grade** is determined by adding the **additional percentage points earned during the semester** during the practical examination and demonstration to the percentage result of the written semifinal exam.

The written examination result is considered **in percentage form**, rounded to whole numbers according to standard rounding rules (e.g., **68.333% = 68%**).

The **final grade** (based on the written exam percentage plus the additional percentage points earned during the semester) is determined as follows:

- **0–59.99%:** 1 (fail)
- **60–69.99%:** 2
- **70–79.99%:** 3
- **80–89.99%:** 4
- **90–100%:** 5

Rules for retakes: see the previous section.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

During the teaching of the course, informational presentation of artificial intelligence systems may be included among the future possibilities of diagnostic procedures; however, it does not form part of the examinable material.

Printed resources:

Type	Mandatory
Author	Kumar, Abbas, Aster
Title	Robbins Basic Pathology
Publisher	Elsevier,
Year of publication	2017

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai és Kísérleti Rákkutató Intézet

Name of subject in Hungarian: Patológia I.
Name of subject in English: Pathology I
Name of subject in German: Allgemeine und spezielle Pathologie I

Credit value of the course: 8
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
8.0	4.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKPTK1109_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bödör, Csaba
Course coordinator location of work, telephone availability: Department of Pathology and Experimental Cancer Research, 06-1-317-1074
Course coordinator position: Full Professor, Deputy head of department
Course coordinator Date and number of habilitation: 01/2021

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of teaching the pathology subject is to familiarize the students with pathological changes and the pathomechanism of diseases. In the course of the training, students get to know the examination methods and diagnostic procedures of pathology and gain insight into clinicopathological thinking. The training takes place in the form of classroom lectures, clinicopathological practices, histology, autopsy and organ demonstration practices.

Format of the course (lectures, group work, practical lessons, etc.):

3 hours lecture/week

5 hours practical lessons/week

Competencies acquired through completion of course:

Knowledge of the development and course of diseases, knowledge of the nomenclature of diseases, recognition and knowledge of basic histopathological and macroscopic changes, knowledge of clinicopathological correlations.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Physiology II, Macroscopic Anatomy and Embryology II, Microscopic Anatomy and Embryology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

According to the recent Semmelweis University Study and Examination regulations.

The number of students required to start the course (minimum, maximum), method of selecting participants:

maximum 180 students, groups 10,11,12,13,14,15,16,17,18

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures and Clinicopathology Practices:

1. week	Bödör	Introduction, Signs of Death, Morphology of Cell and Tissue Injury, Degenerations The place and role of Pathology in the Medicine. Structure of pathology and methods
	Kiss	Definition of Death, Signs of Death, Necrosis and Apoptosis.
	Rácz/Danics	Clinical and forensic pathological aspects of the natural and non-natural

death
2. week Kiss Examples of Necrosis. Myocardial Infarction.
Kiss Reversible Cell Injury

Pálos Sampling and diagnostic pitfalls of in the pathological workup

Growth disturbances, Abnormal Accumulation, Pigments, Pathologic Calcification.
3. week Csernus Lipid accumulation, Atherosclerosis, Protein accumulation, Amyloidosis.
Csernus Endogeneous and Exogeneous Pigments, Calcification, Lithiasis
Matolcsy/Pápay Hemochromatosis and amyloidosis
4. week Csernus Cellular adaptations: Hypertrophy, Hyperplasia, Atrophy, Metaplasia

Hemodynamic Disorders, Thrombosis, and Shock
Csernus Stagnation, oedema, shock
Zalatnai Lymphedema and elephantiasis
5. week Mózes Thrombosis, Embolism
Mózes DIC, Hemorrhage
Matolcsy Differential diagnostics of disseminated cutaneus hemorrhages

Inflammation
6. week Scheich Acute inflammation and sepsis
Scheich Chronic Inflammation
Csomor/Sinkó Clinicopathology of sepsis

Diseases of the Immune System
7. week Fintha/Sághi Mechanisms of Immune-Mediated Injury
Fintha/Sághi Immune deficency Diseases I. Rejection of Transplants
Fintha/Sághi Autoimmun diseases II.

Neoplasia
8. week Bödör Carcinogenesis, Etiology of Neoplasia
Fintha/Sághi Rejection following heart transplantation
9. week Bödör Chemical, microbal and radiation carcinogenesis. Preneoplastic conditions.
Bödör Characteristics of Benign and Malignant Neoplasms
Regős Clinicopathology of the pulmonary space-occupying lesions
10. week Bödör Targeted diagnosis and treatment of cancer

Pediatric
Kiss Pediatric diseases (congenital and prenatal diseases, childhood tumors)
Kuroli/Bödör Oncoteam 1: late metastatising mechanisms/Oncoteam 2: Childhood leukemias

Diseases of the heart and the cardiovascular system
11. week Sághi Vascular pathology
Sághi Anomalies of cardiac development
Kiss Comprehensive Genomic Profiling (CGP) in childhood tumors
12. week Sághi Diseases of endocardium, myocardium, pericardium

Pathology of the respiratory tract

Pápay Lesions of the upper respiratory tract. Pulmonary infections
Sághi/Matolcsy Case demonstrations: Young adult, athlete sudden cardial death. Infective endocarditis.

13. week Regős Obstructive and Restrictive pulmonary diseases.
Krencz Lung tumors. Pleural lesions.
Krencz COVID pneumonia (clinicalpathological case)

Environmental and Nutritional Diseases

14. week Rácz Effects of tobacco. Effect of alcohol.
Rácz Injury by Drugs and Drugs of Abuse. Obesity
Rácz Clinicopathology of the extreme obesity

Histopathology and Specimen pratice thematics:

1. week Introduction

2. week Necrosis I.

3. week Necrosis II.

4. week Adaptation, degeneration

5. week Adaptation, calcification, stone formation

6. week Circulation I.

7. week Circulation II.

8. week Acute inflammation

9.week Chronic inflammation

10. week Immunology

11. week Oncology I.

12. week Oncology II.

13. week Cardiology

14. week Pulmonology

Practical tutors:

1.Dr. Judit Pápay

2. Dr. Ildikó Krencz

3. Dr. Attila Fintha

4. Dr. Réka Mózes

5. Dr. Bödör Csaba

6. Dr. Márton Szentkereszty

7. Dr. Péter Nagy

8. Dr. Márton Sághi

9. Dr. Judit Csomor

10. Dr. Noémi Jákob

11. Dr. Balázs Csernus

12. Dr. Katalin Pálos

13. Dr. Alex Jenei

14. Dr. Árpád Szállási

15. Dr. Attila Zalatnai

16. Dr. Tamás Székely

17. Dr. Richárd Kiss

18. Dr. László Fónyad

19. Dr. Gergely Rácz -registrar

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance of the lectures is not mandatory, but the lectures are part of the material that can be counted in the exams. At least 75% attendance and participation in practical sessions is mandatory. The practice leaders (tutors) fill out an attendance form at the beginning of each practice. Over the course of the semester, absences that exceed three practical sessions in the autopsy room, three absences in histology/organ demonstration practical sessions, three absences in clinicopathology practice, one absence in more than one consultation practical session must be made up in the semester. A histology-organ demonstration exercise can only be replaced with an exercise on the same topic, in Hungarian or English. Autopsy and consultation practice can be replaced at any time,

with any group, in both Hungarian and English. Absences from more than three dissection and histology-organ demonstration sessions, as well as one consultation practice session, must be confirmed in writing by the practice supervisors or the person in charge of studies. The clinicopathology lectures in Fridays are practices and they are not able to replaced.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There are no midterm exams nor in the first and not in the second semester. During the semesters, the tutors are constantly informed about the students' preparation. In consultation with the students of the group and the demonstrator, the tutor can carry out a mid-year competence and subject knowledge level assessment of various forms (oral report, presentation, test, essay, demonstration, homework, project task), however, the result of this is not followed by a practical mark, and the semester is not a condition signature and cannot be taken into account in the results of the semifinal exam.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Attendance of the lectures is not mandatory, but the lectures are part of the material that can be counted in the exams. At least 75% attendance and participation in practical sessions is mandatory. The practice leaders (tutors) fill out an attendance form at the beginning of each practice. Over the course of the semester, absences that exceed three practical sessions in the autopsy room, three absences in histology/organ demonstration practical sessions, three absences in clinicopathology practice, one absence in more than one consultation practical session must be made up in the semester. A histology-organ demonstration exercise can only be replaced with an exercise on the same topic, in Hungarian or English. Autopsy and consultation practice can be replaced at any time, with any group, in both Hungarian and English. Absences from more than three dissection and histology-organ demonstration sessions, as well as one consultation practice session, must be confirmed in writing by the practice supervisors or the person in charge of studies. The clinicopathology lectures in Fridays are practices and they are not able to replaced. Department of Pathology and Experimental Cancer Research has the right for not acknowledging the semester.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

GENERAL PATHOLOGY TOPICS „A”
NECROSIS, APOPTOSIS
A/01. Causes, morphology and mechanism of cell necrosis
A/02. Reperfusion injury
A/03. Mechanisms of apoptosis and its pathological characteristics
A/04. Coagulative necrosis and its organ manifestation
A/05. Colliquative necrosis and its organ manifestation
A/06. Hemorrhagic infarction and its organ manifestation
A/07. Fat, caseous and fibrinoid necrosis and its organ manifestation
A/08. Acute myocardial infarction
A/09. Cerebral infarction
REVERSIBILE CELL INJURY, PATHOLOGIC ACCUMLATION, PIGMENTS, CALCIFICATION
A/10. Reversible cell injury, types of degeneration and its organ manifestation
A/11. Types of fatty degeneration and its organ manifestation
A/12. Atherosclerosis
A/13. Amyloidosis
A/14. Cystic fibrosis
A/15. Hyaline accumulation and its organ manifestation
A/16. Anthracosis, lipofuscin, hemosiderin and melanin accumulation
A/17. Dystrophic calcification and its organ manifestation
A/18. Metastatic calcification and its organ manifestation
A/19. Stone formation; kidney and gallbladder stones
CELLULAR ADAPTATION TO STRESS
A/20. Pathomechanism of atrophy and hypertrophy, examples
A/21. Myocardial hypertrophy and its clinical forms
A/22. Pathomechanism of hyperplasia, examples
A/23. Pathomechanism of metaplasia and dysplasia, examples
HEMODYNAMIC DISORDERS, THROMBOSIS, HEMORRHAGE
A/24. Pathomechanism of cardiac insufficiency
A/25. Congestion and its organ manifestation
A/26. Causes and types of shock
A/27. Causes and types of edema
A/28. Causes and types of thrombosis
A/29. DIC
A/30. Types of emboli
A/31. Types of hemorrhages and their clinical presentation
A/32. Intracranial hemorrhages
INFLAMMATION
A/33. Caracteristics of acute inflammation (cellular events, chemical mediators, systemic effects according to the exudate, organic example)
A/34. Pathomechanism and types of chronic inflammation, organic example
DISEASES OF THE IMMUNE SYSTEM
A/35. Type I. and Type II. Hypersensitivity reactions and their pathological presentations
A/36. Type III. and Type IV. Hypersensitivity reactions and their pathological presentations
A/37. Rejection of transplants
A/38. Pathomechanism of autoimmume diseases
A/39. Systemic Lupus Erythematodes, Rheumatoid Arthritis
A/40. Sjögren Syndrome, Scleroderma, Polyarteritis Nodosa
A/41. Inherited and Acquired immunodeficiencies
A/42. AIDS
PEDIATRIC DISEASES
A/43. Pathogeneis of congenital anomalies
A/44. Disorders associated with prematurity (IRDS, NEC, Sudden Infant Death)
A/45. Fetal Hydrops
ENVIRONMENTAL DISEASES
A/46. Pathology of smoking-related disorders
A/47. Pathology of alcohol-related disorders
A/48. Pathomechanism of obesity and its consequences; examples

ONCOLOGY AND CARDIOLOGY TOPICS „B”
NEOPLASIA
B/01. General caracteristics of neoplasms (benign, malignant tumors)
B/02. Classification of neoplasms on histiolgy basis
B/03. Caracteristics of neoplasms rate growth
B/04. Invasion and metastasis of neoplasms
B/05. Promotion mechanisms of oncogenes and role in carcinogenesis
B/06. Inhibitory mechanisms of tumor suppressor genes and role in carcinogenesis
B/07. EGFR, ABL and BCL2 genes and their roles in tumor development
B/08. RB, p53 and APC genes and their roles in tumor development
B/09. BRCA1, BRCA2 and ATM genes and their roles in tumor development
B/10. DNA repair genes and role in carcinogenesis
B/11. Cytogenetic aberrations and the role of telomer in carcinogenesis
B/12. Epigenectic changes (DNA methylaton, MicroRNAs) and role in carcinogenesis
B/13. Inherited cancer syndromes (autosomal dominant, recessive and familiar)
B/14. Viral and microbal oncogenesis
B/15. Chemical and radiation carcinogenesis
B/16. Tumor antigenes
B/17. Tumor immunity and immune surveillance
B/18. Epidemiology of neoplasms
B/19. Caracteristics and morphology of preneoplastic disorders
B/20. Grading and staging of cancer
B/21. Effects of tumor on host (cancer cachexia, paraneoplastic syndromes)
B/22. Tumors of childhood and their characteristics (neuroblastoma, retinoblastoma, Wilms tumor)
B/23. Pathological, genetic, immunological and molecular diagnostics of tumors
B/24. Tumor therapy (surgical, radiation, chemo, target molecular and immunotherapy)
PATHOLOGY OF CARDIOVASCULAR SYSTEM
B/25. Left-sided heart failure
B/26. Right-sided heart failure
B/27. Congenital heart diseases
B/28. Myocardial infarction, sudden cardiac death
B/29. Angina pectoris, chronic ischemic heart disease
B/30. Hypertensive heart disease
B/31. Rheumatic fever and rheumatic myocarditis
B/32. Degenerative valvular heart disease (calcific aorta stenosis, mitral prolapse)
B/33. Infective endocarditis (acute and subacute)
B/34. Noninfective endocarditis (thrombotic endocarditis, Libman-Sacks endocarditis)
B/35. Valvular vitiums and their consequences
B/36. Myocarditis and Cardiomyopathies
B/37. Cor pulmonale
B/38. Arteriolosclerosis
B/39. Aneurysms and Aortic Dissection
B/40. Arteritis and Phlebitis
B/41. Varices, varicosities and disorders of the lymphatic vessles
B/42. Cardiac and vascular tumors
PATHOLOGY OF THE RESPIRATORY TRACT TOPICS „C”
C/18. Atelectasis and acute respiratory distress syndrome
C/19. Obstructive lung diseases- COPD
C/20. Obstructive lung diseases- bronchial asthma and bronchiectasis
C/21. Chronic interstitial (restrictive) lung diseases
C/22. Pulmonary diseases of vascular origin - pulmonary embolism, hemorrhage, and infarction
C/23. Pulmonary hypertension
C/24. Pulmonary infections (except tuberculosis)
C/25. Granulomatous diseases of the lung
C/26. Primer and metastatic tumors of the lung
C/27. Pathology of the pleura and pericardium
C/28. Lesions of the upper respiratory tract
C/29. Tumors of nasal passages, nasopharynx and larynx

Practical exam: Recognition and demonstration of the slides and macropreparations presented in the histological practice.
Autopsy exam: There is no autopsy demonstration at the semifinal exam.
Theoretical exam questions: 2 topics (A and B-C mixed)
1 topic: (general pathology) Sign with the letter “A”
1 topic of the mixture: (oncology, cardiology and respiratory system). Sign with the letter “B”-“C18-29”

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Compliance with the content requirements of the colloquium topic list. There is no continuous assessment during the semester (demonstration), and it is not a prerequisite for obtaining a signature. During the colloquium, the practical exam is not eliminatory in nature; to achieve a passing grade, it is necessary to identify the annotations indicated on the histological slides. With regard to the specimens, identification of the basic lesion is required.

In the oral examination, for both Topic A and Topic B, knowledge of the fundamental concepts and relationships related to the topic is required.

The awarding of a passing grade requires the joint decision of the chair of the examination committee and a committee member, taking into account the results of both the practical and oral parts, though not as a simple mathematical average.

https://semmelweis.hu/patologia1/en/pathology-for-english-medicine/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The semifinal exam is a combined exam consisting of a combination of practical (performance of practical tasks) and theoretical (oral performance evaluation) exam tasks, both are oral exams. The practical exam consists of a demonstration of a digital histological section and a preserved preparation (specimen). The student receives a separate mark for each practical exam section. Failure of the practice exam is *not obligatory failure* of the *semifinal* exam. The practical exam is followed by the theoretical part of the exam. It takes place at the theoretical examination boards, the chairpersons of which are appointed by the Program Director. Another member of the committee, usually a resident physician, is appointed by the Registrar Tutor. The semifinal oral exam takes place based on the exam topics announced at the beginning of the academic year. The student draws 1 topic: (General Pathology) sign with the letter "A" and 1 topic of the following mixture: (oncology, cardiology and respiratory system) sign with the letter "B"-"C18-29". The student receives a separate mark for each theoretical exam topics. An insufficient theoretical exam transcript is in itself a failure. At the end of the theoretical part, the chairman of the examination board determines the final exam grade based on the practical and oral exam partial marks, which is usually - but not necessarily - the weighted average of the practical and theoretical exam partial marks.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory
Author	Robbins&Kumar
Title	Basic Pathology
Publisher	Medicina
Year of publication	2022
Other/Comment	11th edition

Type	Recommended
Author	Dr. András Matolcsy
Title	Basic Pathology - A Socratic Approach
Publisher	Medicina
Year of publication	2016
Other/Comment	2nd edition

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai, Igazságügyi és Biztosítási Orvostani Intézet

Name of subject in Hungarian: Patológia II.
Name of subject in English: Pathology II.
Name of subject in German: Pathologie II.

Credit value of the course: 8
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
8.0	4.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKPIB1110_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kiss András (igazgató)
Course coordinator location of work, telephone availability: Department of Pathology, Forensic and Insurance Medicine, +36208259664
Course coordinator position: Director
Course coordinator Date and number of habilitation: Dr. András Kiss 2007. május 30. Anyakönyvi szám: 248

Objectives of the course, and its place in the curriculum of the medical training program:

Lectures

The lectures in the **second semester** cover the pathology of the different organ systems. Similar to the first semester, in addition to providing a general overview, the lectures discuss in detail certain subtopics that fit less well within the framework of the practical sessions. The lectures are

conducted in parallel with the histopathology practices. The lecture slides are richly illustrated with both macroscopic and microscopic images.

The chronological order of the lectures and the information regarding the designated lecturers are provided for informational purposes only and may change during the academic year. The updated version is continuously available to our students online on the course's Moodle platform.

Autopsy Room Practices

During the **second-semester autopsy room practices**, the emphasis is on expanding clinicopathological knowledge. In addition, the objectives include summarizing the abnormalities found during autopsies, recognizing their relationship with the patient's medical history, and providing a structured description of the observed pathological findings. Another important goal is the development of a **differential diagnostic approach** and the recognition of theoretical correlations. In addition, seminar-type sessions provide an opportunity to synthesize the knowledge acquired in the autopsy room and to prepare for the examination.

If no body is available for the autopsy practice, visits to the institute's laboratories or case presentations may also take place.

Information obtained during autopsies, lectures, and demonstrations forms part of **medical confidentiality** and therefore also applies to the students.

Any form of recording (audio, photographs, video, etc.) of the Institute's teaching and demonstration materials, projected presentations, built environment, equipment, or other parts of the Institute is **strictly prohibited**, with particular regard to autopsy and histopathology practicals and lectures. The demonstration materials presented during teaching are the property of the Institute, or their presentation falls under the direct supervision of the Institute; therefore, they are not public in any respect and may not be disclosed, recorded, or removed without the knowledge and permission of the Institute. Violation of the above regulations will result in **disciplinary proceedings**. Exceptions to this prohibition may only be granted with prior written permission from the leadership of the Institute. By this, the Institute reserves the full right to control all outward communication concerning the Institute.

Histopathology Practices

These practical sessions are intended to help students acquire **basic histopathological knowledge** and develop certain **diagnostic and documentation skills**. The presented slides are studied by students in digital form using an **online teleconsultation system**, partly together with the instructor and partly independently. The material of the histopathology practices is also available in the **Moodle system in the form of online videos**. The theoretical content of the histopathology practices is aligned with the lectures.

The Institute reserves the right to change the order of the listed practical topics (for example, in consideration of public holidays). The updated version is continuously available to our students online on the course's Moodle platform.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practices.

Competencies acquired through completion of course:

Basic knowledge about development and process of the diseases, application of medical terminology, recognition of basic microscopic, macroscopic alterations and clinico-pathology associations.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pathology I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

In accordance with the provisions of the Study and Examination Regulations , with the individual consent of the head of the educational-research unit that has announced the subject parallel enrolment is possible.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum of 160 students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Week 1

II/1.Head and neck / Dr. Judit Halász

- Neoplastic and non-neoplastic lesions of the lips, oral cavity, tongue, teeth, salivary glands, sinuses, pharynx, larynx, ear.

II/2. Clinicopathology of salivary gland tumors, oral cavity and pharyngeal tumors

II/3. Respiratory system I. / Dr. Eszter Székely

- Diseases of conducting airways and lung parenchyma.
- Diffuse alveolar damage.
- Chronic obstructive pulmonary disease (COPD).
- Restrictive lung diseases.

Week 2

II/4. Respiratory system II. / Dr. József Tímár

- Development of lung cancer.
- Neoplasia (primary cancer of the lung, metastasis, benign tumors).
- Etiology, genetic abnormalities.
- Diseases of the pleura.

II/5. Clinicopathology of COVID-19 pneumonia

II/6. Gastrointestinal tract I. / Dr. András Kiss

- Esophagus (anatomy and developmental disorders, inflammation, trauma, tumors. Pathology of the stomach (part 1).

Week 3

II/7. Gastrointestinal tract II. / Dr. Lilla Madaras

- Pathology of the stomach (part 2) and small bowel.
- Appendix.

II/8. Clinicopathology of diseases of the upper gastrointestinal tract

II/9. Gastrointestinal tract III. / Dr. Lilla Madaras

- Pathology of the Colon (congenital disorders, infections, diverticular disease, inflammation,

Crohn’s disease, ulcerative colitis, vascular diseases, neoplasms, other disorders).
- Peritoneum.

Week 4

II/10. Pathology of the liver I. / Dr. Zsuzsa Schaff / Dr. András Kiss

- Anatomy and function of the liver.
- Bilirubinmetabolism and jaundice.
- Hepatic failure.
- Hepatorenal syndrome.
- Viral hepatitis.
- Chronic hepatitis.
- Cirrhosis.
- Portal hypertension.
- Nonviral hepatitis.

II/11. Clinicopathology of colorectal tumors and inflammatory bowel diseases

II/12. Pathology of the liver II. / Dr. Judit Halász

- Alcoholic liver disease, toxic liver injury.
- Hemochromatosis.
- Vascular disorders.

Week 5

II/13. Pathology of the liver III. / Dr. András Kiss

- Neoplasms.
- Gallbladder and bile ducts (congenital anomalies, cholecystitis, cholelithiasis, cholangitis, neoplasms)
- Liver transplantation.

II/14. Clinicopathology of liver and pancreas tumors

II/15. Pathology of the exocrine pancreas / Dr. Ildikó Illyés

- Developmental abnormalities, inflammation, tumors of the exocrine pancreas.

Week 6

II/16. Endocrinology I. / Dr. Attila Kovács

- Pathology of the endocrine pancreas: Diabetes mellitus.
- The hypothalamus-hypophysis system.
- Pathology of the pituitary gland.

II/17. Clinicopathology of differential diagnosis of endocrine tumors

II/18. Endocrinology II. / Dr. Eszter Székely

- The thyroid gland: hypo- and hyperfunction, inflammations, tumors.
- Pathology of the parathyroid gland.
- Hypo- and hyperfunction and other diseases of the adrenal cortex.
- Tumors of the adrenal gland. Pineal gland. Ectopic hormone production.

Week 7

II/19. Renal pathology I. / Dr. Magdolna Kardos / Dr. Deján Dobi

- Anatomy. Definitions.
- Clinical syndromes.
- Cystic renal diseases.
- Destructive and non-destructive tubulointerstitial diseases.
- Kidney biopsy.
- End stage kidney

II/20. Clinicopathology of glomerular diseases

II/21. Renal pathology II. / Dr. Magdolna Kardos

- Glomerulonephritis.

Week 8

II/22. Renal pathology III. / Dr. Deján Dobi

- Tumors of the kidney.
- Kidney transplantation.

II/23. Clinicopathology of uropathological diseases

II/24. Uropathology / Dr. Eszter Székely

- Congenital abnormalities of the urinary tract.
- Urinary bladder (malformations, inflammation, tumors). Urethra.
- Diseases of the penis and scrotum.

Week 9

II/25. Male genital tract / Dr. Eszter Székely

- Diseases of the epididymis, testes and prostate.

II/26. Clinicopathology of prostatic diseases

II/27. Gynecologic pathology I. / Dr. Lilla Madaras

- Pathology of the vulva and vagina.
- Nonneoplastic diseases of the cervix.
- Precancerous lesions of the cervix.
- HPV. Screening. Conisation. Cervic carcinoma. Bethesda system.

Week 10

II/28. Gynecologic pathology II. / Dr. Madaras Lilla

- Pathology of the uterus.
- Uterine bleeding disorders.
- Endometrial hyperplasia, endometriosis.
- Tumors of the endometrium, myometrium and serosa.

II/29. Clinicopathology of ovarian and uterine tumors

II/30. Gynecologic pathology III. /Dr. Janina Kulka

- Pathology of the fallopian tube and the ovaries.
- Pregnancy-related pathology of the uterus.

Week 11

II/31. Neonatology / Dr. Dóra Hargitai

- Pregnancy-related pathology.
- Premature birth and its complications.
- Intrauterine infections and their sequelae.
- Twin pregnancy.
- Diseases of the perinatal period.
- Sudden infant death.

II/32. Clinicopathology of perinatal diseases

II/33. Breast pathology I. / Dr. Janina Kulka

- Symptoms and diagnosis of breast diseases.
- Malformations.
- Benign symptomatic lesions (inflammations, fibrocystic disease, epithelial dysplasia and its significance, benign tumors).

Week 12

II/34. Breast pathology II. / Dr. Janina Kulka

- Malignant tumors - epidemiology, risk factors.
- Histologic classification of breast cancer.
- Prognostic factors in breast cancer.
- Nonepithelial malignancies of the breast.
- Screening: non-palpable breast lesions. The male breast.

II/35. Clinicopathology of complex diagnosis of breast tumors

II/36. Central nervous system I. / Dr. Benedek Gyöngyösi

- Trauma, vascular and circulatory disorders.
- CSF dynamics.
- Encephalomyelitis, meningitis.
- Congenital malformations.
- Demyelinating diseases.
- Neurodegenerative diseases. Pathology of the eye and ear. Metabolic diseases.

Week 13

II/37. Central nervous system II. / Dr. Benedek Gyöngyösi

- Neoplasms (neuroectodermal, embryonic, ectopic tissue, metastasis).
- Peripheral nervous system (neuropathies, inflammations, trauma, tumors).

II/38. Clinicopathology of eye diseases

II/39. Skin pathology / Dr. Enikő Kuroli (Department of Pathology and Experimental Cancer Research)

- Basics of skin pathology.
- Primary lesions.
- Dermatitides.
- Infectious conditions of the skin.
- Skin manifestations of systemic diseases.
- Tumors of the surface epithelium and skin appendages.
- Pigmented nevi and malignant melanoma

Week 14

II/40. Clinicopathology

II/41. Clinicopathology of skin diseases

II/42. Clinicopathology

Practices

Practice 1- Pulmonary pathology I. - nonneoplastic diseases

• IRDS

• Bronchopneumonia

• Lobar pneumonia

• Tuberculosis

• Boeck sarcoidosis

• Cystic fibrosis

• Pneumocystis pneumonia

Practice 2- Pulmonary pathology II- neoplastic diseases

• Small cell carcinoma

• Squamous cell carcinoma

• Adenocarcinoma

• Mesothelioma

Practice 3- Gastrointestinal pathology I.

• Peptic ulcer - stomach

• Gastritis chronica (H. pylori)

• Carcinoma sigillocellulare

• GIST

• Pleomorphic adenoma – parotid gland

Practice 4- Gastrointestinal pathology II.

• Celiac disease

• Ulcerative colitis

• Crohn’s disease

Practice 5- Liver pathology

• Alcoholic hepatitis

• Viral hepatitis

• Cirrhosis

• Hepatocellular carcinoma

• Chronic cholecystitis

Practice 6- Pathology of the pancreas

• Acute pancreatitis

• Chronic pancreatitis

• Adenocarcinoma of the pancreas

• Neuroendocrine tumor

Practice 7- Endocrine pathology

• Goiter

• Autoimmune thyroiditis (Hashimoto)

• Thyroid gland-follicular adenoma

• Thyroid gland-papillary carcinoma

• Phaeochromocytoma

Practice 8- Renal- and uropathology

• Kidney biopsy – diabetic nephropathy

• End-stage kidney disease

• Renal cell carcinoma

• Transitional cell carcinoma

Practice 9- Uropathology- prostate, testis

• Prostatic hyperplasia

• Prostatic adenocarcinoma

• Testis- seminoma

• Testis -embryonal carcinoma

Practice 10- Gynecologic pathology I.

• Ectopic pregnancy

• Endometriosis

• Endometrial hyperplasia (simple)

• Endometrial carcinoma

• Follicular cyst- ovary

• Mucinous cystadenoma-ovary

• Serous cystadenoma-ovary

• High grade serous carcinoma-ovary

• Choriocarcinoma

Practice 11- Breast pathology

• Fibrocystic disease

• Fibroepithelial tumors

• Ductal carcinoma in situ (DCIS) Invasive carcinoma (NST, lobular)

Practice 12- CNS histopathology

• Purulent meningitis

• Meningeoma

• Glioma

• Brain metastasis

• Parkinson disease

Practice 13 - Skin pathology

· Seborrheic keratosis

· Basal cell carcinoma

· Melanocytic naevus

• Malignant melanoma

Practice 14- Interesting autopsy case presentation Consultation

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Other courses with overlapping topics (obligatory, optional, or elective courses) in

interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

As a general rule, attendance at practical sessions is mandatory. Instructors record attendance at the beginning of each practical session (attendance may be recorded both on paper and online). During one semester, students may miss **3 (three) histopathology practices AND 3 (three) autopsy room practices**. Any absences exceeding this limit must be made up during the same semester.

Autopsy room practices may be made up with another group from the same program during their scheduled practical time, regardless of the topic.

Histopathology practices may be made up with any group, but **only within the same week**

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, **one midterm demonstration test** is held in **week 6** in the form of a test. The demonstration covers the topics taught up to that point in the semester. The test consists of **20 questions** (16 single-choice and 4 multiple-choice questions). Successful completion of the written demonstration is **one of the requirements for obtaining the semester signature** (see below). Students complete the test during the **first 20 minutes of the histopathology practical** in the week designated in the course schedule.

Based on the result achieved in the demonstration, the following **percentage bonus points** are added to the percentage score of the **final comprehensive test examination**:

- **<60%:** 0 percentage points
- **61–74%:** 1 percentage point
- **75–89%:** 2 percentage points
- **90–100%:** 3 percentage points

Practical Exam

A requirement for obtaining the **semester signature** is the successful completion of the **practical examination held in week 11**, in which the achieved grade is converted into **percentage points and added to the result of the final comprehensive test (entry test)**.

During the practical exam, students demonstrate their acquired knowledge **in the autopsy room**. A **retake of the practical examination** is possible at a designated time.

The minimum requirement of the practical examination is the correct orientation of the pre-

dissected organ or organ complex, knowledge of the negative status described in the organ description shared by the institute, recognition of common and prominent pathological alterations on the organ or organ complex, their logical description, and the formulation of a diagnosis consistent with the description.

The frequently occurring abnormalities that must be recognized are listed in the organ description document.

Prominent alterations include mass-forming lesions, larger, well-circumscribed inflammatory or reactive changes, as well as diffuse alterations affecting tissues that result in significant morphological differences compared to normal structure.

Number and type of individual assignments to be completed, submission deadlines:

Not relevant.

Requirements for the successful completion of the course:

1. During one semester, students may be absent **without justification from 3 (three) histopathology practicals AND 3 autopsy room practicals**. All other missed practicals must be made up. The make-up sessions are recorded on the practical attendance sheet by the instructor responsible for keeping the attendance record.
2. **Participation in the written midterm demonstration test (in test format) held during the semester and the successful completion of the practical exam** are prerequisites for obtaining the semester signature.

Autopsy room practices may be made up with another group from the same program during their scheduled practical time, regardless of the topic.

Histopathology practices may be made up with any group, but **only within the same week**.

The results of the **demonstration (and the comprehensive examination)** are recorded on an **individual examination record sheet**.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The aim of the **comprehensive exam** is for the student to demonstrate, in an integrated manner, their theoretical and practical knowledge acquired in pathology. Students are expected to know the **definitions, causes, and pathogenesis of diseases**, as well as the **macroscopic, microscopic, and submicroscopic processes** involved in disease development, which enable the **morphology-based recognition and classification of diseases**.

The comprehensive examination consists of **four parts**, each evaluated with a separate partial grade. The examination may cover the **entire yearly material of the textbook, lectures, and practical sessions**.

Procedure and order of the examination:

1. **Test exam:**
   Consists of **60 test questions** (60 minutes; single-choice and multiple-choice questions distributed proportionally across different topics).
2. **Histology exam:**
   The student must **recognize and describe two histological slides**.
3. **Macroscopic exam:**
   The student receives questions from the examiner based on **a macroscopic image, a group of images or a short video.**
4. **Theoretical exam:**
   Three questions (1–1–1) selected from the question sets of
   - **General Pathology (Set A)**
   - **Cardiovascular and Tumor Pathology (Set B)**
   - **Systemic Pathology (Set C)**.

A failing result in the test examination (Part 1) does not automatically result in failure of the comprehensive exam, meaning the second part of the exam may still be started.

In the histology examination (Part 2), the student must correctly recognize at least one of the two slides in order to proceed to Part 3 and to obtain a passing grade in this part of the exam.

To achieve a passing result in the histology section, for at least one slide the student must:

- correctly **identify the organ**,
- establish the **correct diagnosis** based on the observed lesion, and
- provide **at least three fundamental histological features** related to the diagnosis.

If the test examination is passed but the student cannot successfully demonstrate either of the histological slides (see minimum requirements), the final exam is graded fail. The questions of the comprehensive test examination are not published, as the test is necessarily followed by an oral examination, namely the histological slide recognition (Part 2).

If the test examination is failed but the histology examination is passed, the examination may proceed to Part 3. However, if the student receives a failing grade in the macroscopic examination (Part 3) or the theoretical examination (Part 4), the entire exam is graded fail.

During the macroscopy exam, the student is required to demonstrate the knowledge acquired during the academic year based on high-quality images, image sets, short videos, or 3D models.

The minimum requirement is the recognition of the organ or organ complex, the establishment of the correct diagnosis based on a prominent (clearly visible) abnormality, the provision of a general macroscopic description, and a brief discussion of the clinicopathological relevance of the given lesion.

Summary of the weighting of the comprehensive examination:

- **Test:** 10%
- **Histology:** 30% (2 × 15%)
- **Macroscopy:** 15%
- **Theoretical examination:** 45% (3 × 15%)

If **Parts 2, 3, or 4** of the examination are graded **fail**, the examiner must record the **reason for the failing result** on the exam record sheet.

The comprehensive topic list for the theoretical oral exam are available on our website: https://semmelweis.hu/patologia2/en/education-exam

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

In histology (microscopic) exam slides:

1. Recognition of basic tissue types
2. Establishment of the correct diagnosis
3. Listing three fundamental histological features of the given lesion

In the autopsy practical exam:

1. Correct orientation of an organ or organ complex
2. Knowledge of normal (negative) findings
3. Recognition and logical description of common and characteristic (i.e., conspicuous) abnormalities

In the macroscopic pathology exam:
Recognition of the organ or organ complex, establishment of the correct diagnosis based on a marked (i.e., conspicuous) abnormality, provision of a general macroscopic description, and brief discussion of the clinicopathological relevance of the given lesion.

In the oral (comprehensive) exam sections starting with drawing a topic:
A minimum requirement is that the student is able to speak coherently and independently about the given topic, explaining aspects that fall within general medical competence without fundamental conceptual errors, with particular emphasis on the basic concepts of general pathology (as listed in the definitions list).

Furthermore, knowledge of common diseases presented in lectures is expected, organized by organs and organ systems, with logical classification (e.g., inflammatory vs neoplastic conditions, benign vs malignant, acute vs chronic, autoimmune vs infectious).

Regarding diseases, students are expected to know:

- etiological factors
- basic pathomechanisms

- fundamental macroscopic and microscopic features
- key clinical symptoms
- possible complications
- potential course of the disease

For tumors, special emphasis is placed on:

- understanding of biological behavior (dignity)
- precise naming of the most common tumors in each organ
- knowledge of key molecular alterations highlighted in lectures

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The percentage result of the **written midterm demonstration held during the semester** contributes additional percentage points to the **percentage score of the comprehensive exam test**, as follows:

- **<60%:** 0 percentage points
- **61–74%:** 1 percentage point
- **75–89%:** 2 percentage points
- **90–100%:** 3 percentage points

The **grade obtained in the practical exam** is also added to the result as **percentage points**.

Example:
Demonstration result: **75% = 2 percentage points**
Practical examination result: **4 (good) = 4 percentage points**
Comprehensive test examination result: **79%**

Final comprehensive test result: **79 + 2 + 4 = 85% = good**

The **evaluation of the comprehensive test examination** is as follows:

- **0–59.99%:** 1 (fail)
- **60–69.99%:** 2
- **70–79.99%:** 3
- **80–89.99%:** 4
- **90–100%:** 5

The **weighting of the final exam results** is as follows (see above):

- **Test:** 10%
- **Histology:** 30% (2 × 15%)
- **Macroscopy:** 15%
- **Theoretical exam:** 45% (3 × 15%)

In the case of a repeat exam, if the student previously achieved a passing grade (2) or better, the grades obtained in the test, histology exam, and macroscopy exam components may be retained and do not need to be repeated.

An opportunity for examination benefits is provided through participation in the “Ödön Krompecher Pathology Competition,” which takes place in two rounds at designated times during the semester. The winners receive the following exam advantages:

- Students who reach the second round receive exemption from the written test exam.
- Students who successfully recognize the histological slides receive exemption from the histology exam.
- The top three winners receive partial exemption from the oral examination and are given priority consideration for admission to the TDK (Student Scientific Research Program).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory
Author	Vinay Kumar, Abul K. Abbas, Jon C. Aster, Andrea T Deyrup
Title	Robbins & Kumar Basic Pathology.
Publisher	Elsevier
Year of publication	2023

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai és Kísérleti Rákkutató Intézet

Name of subject in Hungarian: Patológia II.
Name of subject in English: Pathology II
Name of subject in German: Allgemeine und spezielle Pathologie II

Credit value of the course: 8
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
8.0	4.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKPTK1109_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bödör, Csaba
Course coordinator location of work, telephone availability: Department of Pathology and Experimental Cancer Research, +36-1-317-1074
Course coordinator position: deputy head of department
Course coordinator Date and number of habilitation: 01/2021

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of teaching the pathology subject is to familiarize the students with pathological changes and the pathomechanism of diseases. In the course of the training, students get to know the examination methods and diagnostic procedures of pathology and gain insight into clinicopathological thinking. The training takes place in the form of classroom lectures, clinicopathological practices, histology, autopsy and organ demonstration practices.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures + practices

Competencies acquired through completion of course:

Knowledge of the development and course of diseases, knowledge of the nomenclature of diseases, recognition and knowledge of basic histopathological and macroscopic changes, knowledge of clinicopathological correlations.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pathology I.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

According to the recent Semmelweis University Study and examination regulations

The number of students required to start the course (minimum, maximum), method of selecting participants:

maximum 180 students, groups 10, 11, 12, 13, 14, 15, 16, 17, 18

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

	Hematopathology	
1. week	Timár	Methods of hematology diagnostics. Classification of Anemia
	Bödör	Diseases of the Myeloid system
	Bödör	Clinicopathological discussion of CML
2. week	Bödör	Diseases of the Lymphoid system I.
	Bödör	Diseases of the Lymphoid system II.
	Mózes	Clinicopathological discussion of Multiple Myeloma
	Pathology of the liver and biliary tract	
3. week	Nagy	Infectious and inflammatory disorders. Hepatic failure. Liver cirrhosis.

Nagy Toxic injuries of the liver. Liver tumors. Disorders of the gallbladder.
Dezső Clinicopathological discussion of Hemangioendothelioma

Gastrointestinal pathology
4. week Fintha Pathology of the oral cavity, salivary gland, oesophagus
Fintha Pathology of stomach and small intestine
Jákob Clinicopathological discussion of Head-Neck tumor
5. week Fintha Pathology of the large intestine and the peritoneum
Zalatnai Pathology of the pancreas. Diabetes mellitus
Fintha/Zalatnai Clinicopathological discussion of Pancreatitis

Pathology of the Endocrine System
6. week Zalatnai Hypophysis, thyroid gland
Zalatnai Parathyroid gland, adrenals, MEN
Zalatnai Clinicopathological discussion of GH-secreting pituitary adenoma

Pathology of the kidney and the urinary tract
7. week Fintha Malformations. Clinical manifestations of renal disease. Glomerular diseases
Fintha Diseases affecting tubules and interstitium. Diseases involving blood vessels
8. week Kuthi Urinary outflow obstruction. Renal tumors.
Kuthi Clinicopathological discussion of Glomerular diseases
9. week Kuthi Pathology of the urinary bladder

Pathology of the female genital tract
Rókusz Pathology of the female genital tract
Zalatnai Clinicopathological discussion of Renal tumor
10. week Rókusz Pathology of the uterus and pregnancy
Fónyad Pathology of the breast
Marton Pathology of pregnancy. Clinicopathological discussion of endometriosis

Pathology of the male genital tract
11. week Rácz Pathology of the penis, scrotum and funiculus
Rácz Pathology of the testis, epididymis and prostate
Pathology of the nervous system
12. week Scheich Malformations, cerebrovascular diseases, edema, herniation, and hydrocephalus. CNS tumors
Scheich Diseases of myelin, neurodegenerative disorders. Infections
Scheich Clinical and pathological differential diagnostics of CNS diseases

Pathology of the skin
13. week Fónyad Non-neoplastic diseases of the skin
Fónyad Neoplastic skin diseases
Fónyad Clinicopathological discussion of skin

14. week Szentkereszty Pathology of musculoskeletal system I.
Szentkereszty Pathology of musculoskeletal system II.
Matolcsy Pathology competition discussion, consultation

Practical topics:

1. week Hematology I.

2. week Hematology II.

3. week Hepatology

4. week Gastroenterology I.

5. week Gastroenterology II.

6. week Nephrology

7. week Female genital organs, breast

8. week Male genital organs, pregnancy

9.week Endocrinology

10. week Dermatology

11. week Soft tissue

12. week CNS

13. week Consultation

14. week Consultation

Practical instructors:

1.Dr. Judit Pápay

2. Dr. Ildikó Krencz

3. Dr. Attila Fintha

4. Dr. Gergely Racz

5. Dr. Réka Mózes

6. Dr. Eszter Regős

8. Dr. Péter Nagy

9. Dr. Márton Sághi

11. Dr. Noémi Jákob

12. Dr. Balázs Csernus

13. Dr. Katalin Pálos

14. Dr. Alex Jenei

15. Dr. Attila Zalatnai

16. Dr. Tamás Székely

17. Dr. Richárd Kiss

18. Dr. László Fónyad

19. Dr. Tamás Micsik

20. Dr. Vanda Téglási

21. Dr. Gergely Rácz

22. Dr. Borbála Péterffy

23. Dr. Eszter Szatmári

24. Dr. Tamás László

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance of the lectures is not mandatory, but the lectures are part of the material that can be counted in the exams. At least 75% attendance and participation in practical sessions is mandatory. The practice leaders (tutors) fill out an attendance form at the beginning of each practice. Over the course of the semester, absences that exceed three practical sessions in the autopsy room, three absences in histology/organ demonstration practical sessions, three absences in clinicopathology practice, one absence in more than one consultation practical session must be made up in the semester. A histology-organ demonstration exercise can only be replaced with an exercise on the same topic, in Hungarian or English. Autopsy and consultation practice can be replaced at any time, with any group, in both Hungarian and English. Absences from more than three dissection and histology-organ demonstration sessions, as well as one consultation practice session, must be confirmed in writing by the practice supervisors or the person in charge of studies. The clinicopathology lectures in Fridays are practices and they are not able to replaced.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of

marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, we do not hold mandatory subject partial performance evaluations, there are no practical marks. During the semesters, the practical tutor are constantly informed about the students' preparation. In consultation with the students of the group and the demonstrator, the practical tutor can carry out a mid-year competence and subject knowledge level assessment of various forms (oral report, presentation, test, essay, demonstration, homework, project task), however, the result of this is not followed by a practical mark, and the semester is not a condition signature and cannot be taken into account in the results of the semifinal exam.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

At least 75% attendance and participation in practical sessions. In the course of a semester, you can miss the three autopsy room, three histology-organ demonstration exercises, three clinicopathology practice and one consultation exercise without a certificate. The other missed practices must be replaced, the practical tutor of the replaced practice will provide a certificate. Histology and organ demonstration practice can only be replaced with the same practice. Autopsy room and consultation practice can be replaced at any time, with any group. Clinicopathology practices are not able to replaced.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

GENERAL PATHOLOGY TOPICS „A”

NECROSIS, APOPTOSIS

A/01. Causes, morphology and mechanism of cell necrosis

A/02. Reperfusion injury

A/03. Mechanisms of apoptosis and its pathological characteristics

A/04. Coagulative necrosis and its organ manifestation

A/05. Colliquative necrosis and its organ manifestation

A/06. Hemorrhagic infarction and its organ manifestation

A/07. Fat, caseous and fibrinoid necrosis and its organ manifestation

A/08. Acute myocardial infarction

A/09. Cerebral infarction

REVERSIBILE CELL INJURY, PATHOLOGIC ACCUMLATION, PIGMENTS, CALCIFICATION

A/10. Reversible cell injury, types of degeneration and its organ manifestation

A/11. Types of fatty degeneration and its organ manifestation

A/12. Atherosclerosis

A/13. Amyloidosis

A/14. Cystic fibrosis

A/15. Hyaline accumulation and its organ manifestation

A/16. Anthracosis, lipofuscin, hemosiderin and melanin accumulation

A/17. Dystrophic calcification and its organ manifestation

A/18. Metastatic calcification and its organ manifestation

A/19. Stone formation; kidney and gallbladder stones

CELLULAR ADAPTATION TO STRESS

A/20. Pathomechanism of atrophy and hypertrophy, examples

A/21. Myocardial hypertrophy and its clinical forms

A/22. Pathomechanism of hyperplasia, examples

A/23. Pathomechanism of metaplasia and dysplasia, examples

HEMODYNAMIC DISORDERS, THROMBOSIS, HEMORRHAGE

A/24. Pathomechanism of cardiac insufficiency

A/25. Congestion and its organ manifestation

A/26. Causes and types of shock

A/27. Causes and types of edema

A/28. Causes and types of thrombosis

A/29. DIC

A/30. Types of emboli

A/31. Types of hemorrhages and their clinical presentation

A/32. Intracranial hemorrhages

INFLAMMATION

A/33. Caracteristics of acute inflammation (cellular events, chemical mediators, systemic effects according to the exudate, organic example)

A/34. Pathomechanism and types of chronic inflammation, organic example

DISEASES OF THE IMMUNE SYSTEM

A/35. Type I. and Type II. Hypersensitivity reactions and their pathological presentations

A/36. Type III. and Type IV. Hypersensitivity reactions and their pathological presentations

A/37. Rejection of transplants

A/38. Pathomechanism of autoimmume diseases

A/39. Systemic Lupus Erythematodes, Rheumatoid Arthritis

A/40. Sjögren Syndrome, Scleroderma, Polyarteritis Nodosa

A/41. Inherited and Acquired immunodeficiencies

A/42. AIDS

PEDIATRIC DISEASES

A/43 Pathogeneis of congenital anomalies

A/44. Disorders associated with prematurity (IRDS, NEC, Sudden Infant Death)

A/45. Fetal Hydrops

ENVIRONMENTAL DISEASES

A/46. Pathology of smoking-related disorders

A/47. Pathology of alcohol-related disorders

A/48. Pathomechanism of obesity and its consequences; examples

ONCOLOGY AND CARDIOLOGY TOPICS „B”

NEOPLASIA

B/01. General caracteristics of neoplasms (benign, malignant tumors)

B/02. Classification of neoplasms on histiolgy basis

B/03. Caracteristics of neoplasms rate growth

B/04. Invasion and metastasis of neoplasms

B/05. Promotion mechanisms of oncogenes and role in carcinogenesis

B/06. Inhibitory mechanisms of tumor suppressor genes and role in carcinogenesis

B/07. EGFR, ABL and BCL2 genes and their roles in tumor development

B/08. RB, p53 and APC genes and their roles in tumor development

B/09. BRCA1, BRCA2 and ATM genes and their roles in tumor development

B/10. DNA repair genes and role in carcinogenesis

B/11. Cytogenetic aberrations and the role of telomer in carcinogenesis

B/12. Epigenectic changes (DNA methylaton, MicroRNAs) and role in carcinogenesis

B/13. Inherited cancer syndromes (autosomal dominant, recessive and familiar)

B/14. Viral and microbal oncogenesis

B/15. Chemical and radiation carcinogenesis

B/16. Tumor antigenes

B/17. Tumor immunity and immune surveillance

B/18. Epidemiology of neoplasms

B/19. Caracteristics and morphology of preneoplastic disorders

B/20. Grading and staging of cancer

B/21. Effects of tumor on host (cancer cachexia, paraneoplastic syndromes)

B/22. Tumors of childhood and their characteristics (neuroblastoma, retinoblastoma, Wilms tumor)

B/23. Pathological, genetic, immunological and molecular diagnostics of tumors

B/24. Tumor therapy (surgical, radiation, chemo, target molecular and immunotherapy)

PATHOLOGY OF CARDIOVASCULAR SYSTEM

B/25. Left-sided heart failure

B/26. Right-sided heart failure

B/27. Congenital heart diseases

B/28. Myocardial infarction, sudden cardiac death

B/29. Angina pectoris, chronic ischemic heart disease

B/30. Hypertensive heart disease

B/31. Rheumatic fever and rheumatic myocarditis

B/32. Degenerative valvular heart disease (calcific aorta stenosis, mitral prolapse)

B/33. Infective endocarditis (acute and subacute)

B/34. Noninfective endocarditis (thrombotic endocarditis, Libman-Sacks endocarditis)

B/35. Valvular vitiums and their consequences

B/36. Myocarditis and Cardiomyopathies

B/37. Cor pulmonale

B/38. Arteriolosclerosis

B/39. Aneurysms and Aortic Dissection

B/40. Arteritis and Phlebitis

B/41. Varices, varicosities and disorders of the lymphatic vessles

B/42. Cardiac and vascular tumors

SYSTEMIC PATHOLOGY TOPICS„C”

PATHOLOGY OF HEMATOPOETIC AND LYMPHOID SYSTEM

C/1. Diagnostic methods of hematology (biopsy, flow cytometry, histochemical, cytogenetic, molecular diagnosis)

C/2. Anemias of dimished erythropoesis

C/3. Anemia of blood loss

C/4. Non-neoplastic disorders of myeloid and lymphoid system

C/5. CML and chronic myelofibrosis

C/6. Polycythemia vera, essential thrombocythemia

C/7. Disorders of the spleen and thymus

C/8. Myelodysplastic syndromes

C/9. Acute myeloid leukemia, lymphoplasmocytic lymphoma

C/10. Precurzor T- and B-cell lymphoblastic leukemia/lymphoma

C/11. CLL hairy cell leukemia

C/12. Multiple myeloma and related plasma cell disorders

C/13. Follicular lymphoma, mantle cell lymphoma, extranodal marginal zone lymphoma

C/14. Diffuse large B cell lymphoma, Burkitt lymphoma

C/15. Mycosis fungoides, Sezary syndrome, Peripherial T-cell lymphoma

C/16. Hodgkin lymphoma

PATHOLOGY OF THE RESPIRATORY TRACT

C/18. Atelectasis and acute respiratory distress syndrome

C/19. Obstructive lung diseases- COPD

C/20. Obstructive lung diseases- bronchial asthma and bronchiectasis

C/21. Chronic interstitial (restrictive) lung diseases

C/22. Pulmonary diseases of vascular origin - pulmonary embolism, hemorrhage, and infarction

C/23. Pulmonary hypertension

C/24. Pulmonary infections (except tuberculosis)

C/25. Granulomatous diseases of the lung

C/26. Primer and metastatic tumors of the lung

C/27. Pathology of the pleura and pericardium

C/28. Lesions of the upper respiratory tract

C/29. Tumors of nasal passages, nasopharynx and larynx

PATHOLOGY OF THE ORAL CAVITY AND THE GASTROINTESTINAL TRACT

C/30. Pathology of lips, oral cavity and pharynx

C/31. Salivary gland diseases

C/32. Pathology of esophagus

C/33. Gastritis

C/34. Peptic ulcers

C/35. Gastric tumors

C/36. Developmental anomalies and vascular disorders of the GI tract

C/37. Malabsorbtion

C/38. Enterocolitis

C/39. Colonic diverticulosis and bowel obstruction

C/40. Inflammatory bowel diseases (ulcerative colitis, Crohn disease)

C/41. Pathology of the appendix and peritoneum

C/42. Tumors of the small and large intestines

PATHOLOGY OF THE LIVER, BILIARY TRACT, AND PANCREAS

C/43. Liver failure

C/44. Cholestatic liver syndromes (PBC, PSC)

C/45. Pathophysiology of jaundice, defects of bilirubin and bile formation. Cholelithiasis

C/46. Circulatory disorders of liver

C/47. Acute and chronic hepatitis

C/48. Alcohol- and drug-induced liver diseases

C/49. Metabolic and inherited liver diseases

C/50. Liver cirrhosis

C/51. Tumors and tumor-like lesions of the liver

C/52. Inflammations and tumors of the biliary system and gallbladder

C/53. Pancreatitis

C/54. Diabetes mellitus

C/55. Tumors of the exocrine and endocrine pancreas

PATHOLOGY OF THE KIDNEY AND ITS COLLECTING SYSTEMS

C/56. End-stage kidney and renal failure

C/57. Developmental abnormalities and cystic diseases of the kidney

C/58. Pathogenesis of glomerular diseases

C/59. The nephritic syndrome

C/60. The nephrotic syndrome

C/61. Rapidly progressive glomerulonephritis

C/62. Systemic diseases associated glomerular damage

C/63. Vascular diseases of the kidney

C/64. Diabetic nephropathy

C/65. Acute tubular necrosis (ATN)

C/66. Acute and chronic pyelonephritis

C/67. Urolithiasis and urinary outflow obstructions

C/68. Tumors of kidney

C/69. Tumors of the urinary bladder and collecting system

PATHOLOGY OF THE FEMALE GENITAL SYSTEM AND BREAST

C/70. Diseases of the vulva and vagina

C/71. Pathology of the uterine cervix

C/72. Endometritis, endometrial hyperplasia, endometriosis

C/73. Tumors of the endometrium and myometrium

C/74. Non-neoplastic diseases of the ovary and fallopian tube

C/75. Ovarian tumors

C/76. Pathology of pregnancy

C/77. Benign epithelial lesions and benign tumors of the breast

C/78. Malignant tumors of the breast

PATHOLOGY OF THE MALE GENITAL SYSTEM

C/79. Diseaeses of the penis, scrotum and epididymis

C/80. Inflammatory lesions of the testis and epididimys. Cryptorchidism and testicular atrophy.

C/81. Tumors of the testis

C/82. Prostatitis, benign prostatic hyperplasia

C/83. Carcinoma of the prostate

PATHOLOGY OF THE ENDOCRINE SYSTEM

C/84. Hypo- and hyperfunctions of the hypothalamic-hypophysial system

C/85. Thyreoiditis, hypo- and hyperfunctions of the thyreoid gland

C/86. Tumors of thyreoid gland

C/87. Pathology of the parathyroid glands

C/88. Hypo- and hyperfunctions and tumors of the adrenal gland

C/89. Multiple endokrine neoplasia (MEN) and carcinoid syndrome

PATHOLOGY OF THE MUSCULOSCELETAL SYSTEM

C/90. Congenital diseases of bone

C/91. Acquired diseases of bone development (osteoporosis, rickets, osteomalacia)

C/92. Osteomyelitis. Paget’s disease

C/93. Tumors and tumor-like lesions of the bone

C/94. Degenerative and inflammatory joint diseases

C/95. Muscular atrophy, dystrophies and myositis

C/96. Tumors of skeletal and smooth muscles

C/97. Fibroblast-myofibroblast differentiated soft tissue tumors

C/98. Tumors of adipose tissue

C/99. Soft tissue tumors of uncertain origin

PATHOLOGY OF THE SKIN

C/100. Blistering skin disorders (pemphigus, bullous pemphigoid, dermatitis herpetiformis)

C/101. Inflammatory skin diseases

C/102. Melanocytic tumors

C/103. Non-melanocytic skin tumors

PATHOLOGY OF THE NERVOUS SYSTEM

C/104. Pathology of increased intracranial pressure (edema, herniation and hydrocephalus)

C/105. Congenital malformations of the central nervous system

C/106. Cerebrovascular diseases (hypoxia, ischemia, infarction)

C/107. Neurodegenerative and prion diseases

C/108. Intracranial haemorrhages

C/109. Infections of the central nervous system (meningitis, encephalitis)

C/110. Diseases of myelin

C/111. Tumors of central and peripheral nervous system

Practical exam: Recognition and demonstration of the sections and macropreparations presented in the histological practice.

Autopsy exam: demonstrating the organ complexes presented in the autopsy room exercises and answering questions related to the changes seen.

Theory exam: Description of a general pathology (A), an oncology and cardiology (B), and a detailed pathology (C) topics.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Compliance with the content requirements of the comprehensive (final) examination topic list. There is no continuous assessment during the semester (demonstration), and it is not a prerequisite for obtaining a signature. During the comprehensive exam, the practical exam is eliminatory in nature; to achieve a passing grade, it is necessary to identify and recognize the annotations indicated on the histological slides. With regard to the specimens, identification of the basic lesion is required.

In the oral examination, for Topics A, B, and C, knowledge of the fundamental concepts and relationships related to each topic is required.

The awarding of a passing grade requires the joint decision of the chair of the examination committee and a committee member, taking into account the results of both the practical and oral parts, though not as a simple mathematical average.

https://semmelweis.hu/patologia1/en/pathology-for-english-medicine/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The test consists of a practical and a theoretical part, both of which are oral exams. The practical exam consists of an autopsy exam, two digital histological sections and a demonstration of a preserved preparation. The student receives a separate mark for each practical exam section. An insufficient practical exam partial mark is deterrent, i.e. in this case the student can't attempt the theoretical exam part. The successful practical exam is followed by the theoretical part of the exam. It takes place at the theoretical examination boards, the chairpersons of which are appointed by the head of the department. Another member of the committee, usually a resident physician, is appointed by the study supervisor. The final theoretical exam takes place based on the exam topics announced at the beginning of the academic year. The student draws a general pathology topic (A), an oncology and cardiology topic (B), and a systemic pathology topic (C). The student receives a separate mark for each theoretical exam section. An insufficient (1) theoretical exam part is in itself fail. At the end of the theoretical part, the chairman of the examination board determines the final grade based on the practical and oral exam partial marks, which is usually - but not necessarily - the weighted average of the practical and theoretical exam partial marks.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Dr. András Matolcsy
Title	The basics of pathology - in a Socratic manner
Publisher	Medicina
Year of publication	2015
Other/Comment	2nd edition

Type	Mandatory
Author	Robbins-Kumar
Title	Fundamentals of Pathology
Publisher	Medicina

Year of publication	2025
Other/Comment	11th edition

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Farmakológiai és Farmakoterápiás Intézet

Name of subject in Hungarian: Farmakológia I.
Name of subject in English: Pharmacology I.
Name of subject in German: Pharmakologie I.

Credit value of the course: 5
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	2.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKFRM1108_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ferdinandy Péter Elemér
Course coordinator location of work, telephone availability: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: ferdinandy.peter@semmelweis.hu
Course coordinator position: full professor, Head of Department
Course coordinator Date and number of habilitation: June 2 2001., 26/2001 Hab.

Objectives of the course, and its place in the curriculum of the medical training program:

Pharmacology is a synthesizing subject, building on what has been learned in the past, especially physiology, biochemistry, pathology, and translational medicine, and is essential for the later acquisition of clinical knowledge. The subject includes general pharmacology, detailed pharmacology, toxicology and basics of prescription writing. General pharmacology (pharmacodynamics, pharmacokinetics) aims to acquire the basic concepts and knowledge needed

for pharmacological thinking, while in detailed pharmacology the student learns the main principles of the mechanism of action, therapeutic effects, adverse effects, major interactions, and partly dosing of medicines. The basics of toxicology describe the mechanisms and targets of major intoxications and thus provide a theoretical background for oxyology education. All these competencies form the grounds to study clinical pharmacology and prepare students for the skill-level application of pharmacotherapeutic knowledge essential to clinical subjects.

Format of the course (lectures, group work, practical lessons, etc.):

The topics are divided into lectures and practical/seminar sessions. In the practical sessions, the topics of the previous lectures are revisited in an interactive way, sometimes using gamification or group work.

Competencies acquired through completion of course:

Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. They understand the mechanisms and targets of the most important poisonings, as well as the knowledge of the basic rules of prescription writing.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Microbiology I, Molecular Cell Biology II, Medical Physiology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The Department of Pharmacology and Pharmacotherapy does not support parallel registrations with prerequisite courses or Pharmacology II.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Since it is a mandatory subject all the students in the third year of medical education must register.

Detailed course syllabus (if the course can be divided into modules, please indicate):

(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st week

- Lecture: Introduction to Pharmacology. (development, pharmacogenomics, basics of toxicology – Péter Ferdinandy, MD, DSc, MBA
- Practice: Basics of Pharmacodynamics (quantal dose-response curves, therapeutic indices, tolerance, drug interactions).

2nd week

- Lecture: Pharmacodynamics (receptor theories, drug-receptor interactions) – Pál Riba, MD, PhD
- Practice: Basic principles of drug prescribing. Summary of Product Characteristics.

3rd week

- Lecture: Pharmacokinetics I – Klára Gyires, MD, DSc
- Practice: Parasympathomimetics and parasympatholytics, centrally acting anticholinergic drugs

4th week

- Lecture: Pharmacokinetics II – Kornél Király, MD, PhD
- Practice: Sympathomimetics and sympatholytics

5th week

- Lecture: Presynaptic stimulation and inhibition of cholinergic and adrenergic transmission. – Pál Riba, MD, PhD
- Practice: Pharmacology of the skeletal muscles (centrally and peripherally acting).

6th week

- Lecture: Non-steroidal anti-inflammatory drugs (NSAIDs). Minor analgesics. – Klára Gyires, MD, DSc
- Practice: 1st midterm. Drugs acting on opioid receptors.

7th week

- Lecture: Local anesthetics – Mahmoud Al-Khrasani, PharmD, PhD
- Practice: Drugs affecting uric acid metabolism. Drugs for headache syndromes.

8th week

- Lecture: Antipsychotics – Anikó Görbe, MD, PhD
- Practice: Sedative-hypnotics, anxiolytics

9th week

- Lecture: Drugs acting on the extrapyramidal motoric system. Nootropic agents – Pál Riba, MD, PhD
- Practice: Antidepressants, drugs against mania, mood stabilizers

10th week

- Lecture: General anesthetics – Anikó Görbe, MD, PhD
- Practice: Anticonvulsants (antiepileptics). Adjuvant analgesics.

11th week

- Lecture: Antiviral drugs – Zoltán Giricz, PharmD, PhD
- Practice: 2nd midterm Cell wall synthesis inhibitor antibiotics.

12th week

- Lecture: Antifungal drugs. Antimycobacterial drugs. – Zoltán Varga, MD, PhD
- Practice: Protein synthesis inhibitor antibiotics

13th week

- Lecture: Drugs of Abuse - Pál Riba, MD, PhD
- Practice: Inhibitors of nucleic acid synthesis and antibiotics with other mechanisms of action. Disinfectants, antiseptics. Antihelmintic and antiprotozoal agents. Antiparasitic drugs.

14th week

- Lecture: Biological Drugs. Orphan Drugs. Advanced Therapy Medicines. Vaccines - – Anikó Görbe, MD, PhD
- Practice: Nutrients, traditional plant medicines, vitamins, anorectic drugs.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence, the student can attend another class the same week.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):

(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, we organise two compulsory midterm tests in weeks 6 and 11. Making up or improving the midterm (or both midterms) will be possible in week 13. The improvement midterm may only be an oral exam.

The course material for the first midterm test (study material from week 1 to 5): General Pharmacology (Pharmacodynamics, Pharmacokinetics). Pharmacology of cholinergic and adrenergic transmission. Skeletal muscle relaxants. (Prescribing and the Summary of Product Characteristics are not included in the midterm test.)

Second midterm test (study material from week 6 to 10): NSAIDs, Drugs affecting uric acid metabolism, Drugs for headaches, Local anaesthetics, Opioids, Neuropsychopharmacology (Prescribing and the Summary of Product Characteristics are not included in the midterm test.)

The midterm tests will count towards the semester semifinal exam results:

1. Students who achieve a score of at least 80% on both of their midterms (2×24 points) are exempt from the mandatory list of drugs and Topic list A on the semifinal exam; therefore, they must prepare for the Core Concepts and Topic list C. This exemption applies only to the first exam; in the event of a retake, students must be tested on Core Concepts, both sets of questions and the list of drugs. Only the results of the written midterms are counted toward the question exemption; oral corrections are not. Oral corrections allow students to avoid penalties or to qualify for the drug list exemption.
2. If the student scores better than 60% (minimum 19 points) in both midterm tests, the drug recognition question will be waived and in case of a doubtful grade, the better one will be awarded. There is no exemption from the Core Concept topics.
3. If the student fails both midterm tests (even at the time of a retake) or fails to achieve 33% (10 points) in either midterm test or the improvement exam, the student will receive a grade penalty on the semifinal exam.
4. In the case of a repeated semifinal exam after a failure, both positive and negative modifications are cancelled.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

The number of absences must not be more than 25 percent of the number of practices in the semester.

Type of assessment:

terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

In the oral semifinal exam, at first 5 active substances selected from the compulsory list of active substances must be identified the and their mechanism of action explained. If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of of the recognition of active substances, an acceptable level of knowledge of pharmacology must be demonstrated of one core-concept question and two topics of two lists of topics (one from each).

Core concept topic list

1. Stages of drug development in brief.
2. Types of clinical trials.
3. History of the Hungarian pharmaceutical industry.
4. Molecular targets of drugs
5. Receptor theory - agonist, partial agonist, antagonist, inverse agonist
6. Efficacy, potency
7. Dose-effect relationships at population level
8. Adverse drug reactions
9. Therapeutic index
10. Tolerance, tachyphylaxis, dependence
11. Absorption of drugs
12. Membrane transport mechanisms.
13. Distribution of drugs
14. Bioavailability
15. Volume of distribution
16. Phases of drug biotransformation
17. Excretion of drugs
18. Linear and non-linear pharmacokinetics
19. Clearance
20. Half-life
21. Saturating and maintenance dose
22. Drug accumulation and cumulation
23. Enzyme inducers
24. Enzyme inhibitors
25. Pharmacodynamic interactions - synergism
26. Pharmacodynamic interactions - antagonism
27. Pharmacokinetic drug interactions - at the level of absorption
28. Pharmacokinetic drug interactions - at the level of distribution
29. Pharmacokinetic drug interactions - at the level of metabolism
30. Pharmacokinetic drug interactions - at the level of elimination
31. Characterisation of biological medicinal products
32. Orphan drugs
33. Advanced therapy medicinal products. Vaccines

34. Nutritional supplements
35. Traditional herbal active substances
36. Medical device
37. Principles of antimicrobial treatment - selective toxicity
38. Principles of antimicrobial treatment - empirical, targeted and prophylactic therapy
39. Principles of antimicrobial treatment - principles of bactericidal, bacteriostatic antibiotic and antibiotic combinations
40. Principles of antimicrobial treatment - time-, concentration- and exposure-dependent antibiotics
41. Narrow and broad spectrum antibiotics
42. Antibiotic selection considerations - pregnancy, childhood
43. Antibiotic selection considerations - infections affecting specific compartments
44. Considerations for antibiotic choice - comorbidities
45. Classification of drugs according to chemical structure and complexity
46. The Summary of Product Characteristics

Topic list ”A”

1. Cholinergic and adrenergic transmission and its presynaptic modification.
2. Cholinomimetics
3. Muscarinic receptor blocking drugs
4. Catecholamines
5. Indirect sympathomimetics. Selective a1 agonists
6. alpha2-agonists and drugs acting on the imidazoline receptors
7. alpha-receptor antagonists
8. beta-receptor antagonists
9. Centrally and peripherally acting skeletal muscle relaxants
10. Local anesthetics
11. Opioids
12. NSAIDs.
13. Drugs used for treatment of gout. Drugs for headache syndromes
14. Inhalational anesthetics
15. Intravenous anesthetics. Perioperative medication
16. Benzodiazepines
17. Non benzodiazepine anxiolytics and non-benzodiazepine hypnotics.
18. Antipsychotics
19. Monoamine reuptake inhibitors.
20. Non-reuptake-inhibitor antidepressants. Agents used for treatment of manic phase of bipolar disorders.
21. Antiepileptics. Adjuvant analgesics.
22. Drugs of neurodegenerative diseases. (Drugs acting in the extrapyramidal motoric system. Nootropic drugs)

Topic list ”C”

1. Disinfectants and antiseptics
2. Antimycobacterial drugs
3. Antiprotozoal and antihelminthic drugs.
4. Antifungal agents
5. Agents to treat Herpes simplex (HSV), varicella-zoster (VZV) virus, cytomegalovirus (CMV). Anti-influenza agents Drugs against Corona- and other viruses
6. Antiretroviral agents.
7. Agents against hepatitis viruses
8. Penicillins
9. Cephalosporins
10. Carbapenems. Monobactams. Beta-lactamase inhibitors.
11. Chloramphenicol. Polymyxins. Antifolate drugs
12. Tetracyclines and glycylcyclines
13. Aminoglycosides
14. Quinolones and fluoroquinolones
15. Macrolides. Pleuromutilins
16. Clindamycin. Streptogramins. Oxazolidinones. Fusidans.
17. Glycopeptides. Lipopeptides. Bacitracin. Mupirocin.
18. Metronidazole. Fidaxomycine. Rifaximin. Nitrofurantoin. Phosphomycine.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

A complete lack of knowledge regarding any single topic on the exam will result in failure, regardless of the level of knowledge demonstrated in other topics.

1. Required knowledge of basic concepts

· Pharmacokinetics (ADME: absorption, distribution, metabolism, elimination)

· Pharmacodynamics (mechanism of action, receptors, dose-response curve)

· Bioavailability, half-life, steady state

· Therapeutic index, therapeutic range

· First-pass metabolism

· Receptor types (ion channel, GPCR, enzyme-linked, etc.)

2. Recognition and basic knowledge of major drug classes

Minimum:

· Mechanism of action (at least in broad terms)

· 1–2 typical active ingredients per group (from the mandatory list of active ingredients)

· Main indication(s)

· Most important side effect(s)

3. Mechanism of action – "must be understood, not just known"

Minimum:

· Understands the mechanism at least at a basic logical level

· What is the target of the drug

· What effect does this have on the body

4. Side Effects and Safety

Minimum:

· Knowing the most important (most typical or most dangerous) side effects

5. Basics of Clinical Application

· Knowing the basic indications

· Knows the most important contraindications

· Knows the method of administration, key pharmacokinetic properties, and interactions (for commonly used drug classes—not required for specialized drugs, e.g., oncology drugs)

6. What is NOT required at the minimum level

Not required:

· Detailed knowledge of every active ingredient

· Complex molecular mechanisms

· Detailed dosages (except in specific cases)

· Rare side effects

Summary:

The student meets the minimum requirements if:

· Understands the basic concepts

· Recognizes the main drug classes (does not confuse them)

· Can explain a simple mechanism of action

· Knowing the most important side effects

· Knows when and for what drug class is used.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

In the oral semifinal exam, at first 5 active substances selected from the compulsory list of active substances must be identified the and their mechanism of action explained. If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of of the recognition of active substances, an acceptable level of knowledge of pharmacology must be demonstrated of one core-concept question and two topics of two lists of topics (one from each).

Detailed information on the compulsory and the full lists of active substances. If the candidate:

1. knows all the active substances to be studied in full detail, or knows all the active substances with some minor lacks and can mention names of active substances from the full drug list,– mark 5
2. knows all the active substances to be studied and the information to a varying degree and can mention the names of active substances from the full drug list to a varying degree - 2,3,4
3. knows all the active substances to be learned, but only the name and nothing else – unsatisfactory (failure)
4. does not know any active substance names – unsatisfactory (failure)
5. does not know all the active substances from the mandatory list, but knows the active substances from the full list of active substances in the given topic, then points 1,2 or 3 above are taken into consideration, the mark is awarded according to these points

Type of grade: five-mark scale (1=unsatisfactory, 2=satisfactory, 3=average, 4=good, 5=excellent)

-

The midterm tests will count towards the semester semifinal exam results:

1. Students who achieve a score of at least 80% on both of their midterms (2×24 points) are exempt from the mandatory list of drugs and Topic list A on the semifinal exam; therefore, they must prepare for the Core Concepts and Topic list C. This exemption applies only to the first exam; in the event of a retake, students must be tested on Core Concepts, both sets of questions and the list of drugs. Only the results of the written midterms are counted toward the question exemption; oral corrections are not. Oral corrections allow students to avoid penalties or to qualify for the drug list exemption.
2. If the student scores better than 60% (minimum 19 points) in both midterm tests, the drug recognition question will be waived and in case of a doubtful grade, the better one will be awarded. There is no exemption from the Core Concept topics.
3. If the student fails both midterm tests (even at the time of a retake) or fails to achieve 33% (10 points) in either midterm test or the improvement exam, the student will receive a grade penalty on the semifinal exam.
4. In the case of a repeated semifinal exam after a failure, both positive and negative modifications are cancelled.

The Department of Pharmacology and Pharmacotherapy does not offer a semifinal grade.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

No specific artificial intelligence platform is specified for this course. Artificial intelligence platforms may not be used during midterm assessments or the oral exam.

Printed resources:

Type	Mandatory
Author	Editor: B. G. Katzung
Title	Basic and Clinical Pharmacology
Publisher	McGraw-Hill Education
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Farmakológiai és Farmakoterápiás Intézet

Name of subject in Hungarian: Farmakológia II
Name of subject in English: Pharmacology II
Name of subject in German: Pharmakologie II

Credit value of the course: 5
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	2.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKFRM1108_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ferdinandy Péter Elemér
Course coordinator location of work, telephone availability: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: ferdinandy.peter@semmelweis.hu
Course coordinator position: full professor, Head of Department
Course coordinator Date and number of habilitation: June 2 2001., 26/2001 Hab.

Objectives of the course, and its place in the curriculum of the medical training program:

Pharmacology is a synthesizing subject, building on what has been learned in the past, especially physiology, biochemistry, pathology, and translational medicine, and is essential for the later acquisition of clinical knowledge. The subject includes: general pharmacology, detailed pharmacology, toxicology and basics of prescription writing. General pharmacology (pharmacodynamics, pharmacokinetics) aims to acquire the basic concepts and knowledge needed

for pharmacological thinking, while in detailed pharmacology the student learns the main principles of the mechanism of action, therapeutic effects, adverse effects, major interactions, and partly dosing of medicines. The basics of toxicology describe the mechanisms and targets of major intoxications and thus provide a theoretical background for oxyology education. All of these competencies form the grounds to study clinical pharmacology and prepare students for the skill-level application of pharmacotherapeutic knowledge essential to clinical subjects.

Format of the course (lectures, group work, practical lessons, etc.):

The topics are divided into classroom lectures and practical/seminar sessions. In the practical sessions, the topics of the previous lectures are revisited by the students in an interactive way, sometimes using gamification or group work.

Competencies acquired through completion of course:

Students understand the pharmacological terminology, learn the mechanism of action, therapeutic effects, adverse effects, important interactions of drugs and the basics of dosing. They understand the mechanisms and targets of the most important poisonings, as well as the knowledge of the basic rules of prescription writing.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology I , Medical Microbiology II., Pathology I

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The Department of Pharmacology and Pharmacotherapy does not support concurrent enrolment with prerequisite courses and Clinical Pharmacology.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Pharmacology II is a mandatory subject. Registration through the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest

lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st week

- Lecture: Anticoagulants, inhibitors of platelet aggregation – Anikó Görbe, MD, PhD
- Practice: Fibrinolytics, drugs against bleeding, drugs acting on blood cell production.

2nd week

- Lecture: Drugs influencing cardiac electrophysiology – Anikó Görbe, MD, PhD
- Practice: Positive inotropic agents.

3rd week

- Lecture: Diuretics, antidiuretics. – Pál Riba, MD, PhD
- Practice: Drugs influencing blood pressure (sympatholytics, nitrates, Ca-channel blockers and other vasodilators. Pharmacology of RAAS.)

4th week

- Lecture: Toxicology I – Gábor Mórotz, PhD
- Practice: Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation. Drugs affecting lipid metabolism

5th week

- Lecture: Toxicology II – Gábor Mórotz, PhD
- Practice: Drugs acting on blood glucose control. Drugs controlling body weight.

6th week

- Lecture: Pharmacology of the respiratory system (Bronchodilators and drugs inhibiting the bronchial inflammatory processes, expectorants (secretomotorics, secretolytics, mucolytics), antitussive drugs) – Zoltán Varga, MD, PhD
- Practice: Histamine, antihistamines. Drugs acting on smooth muscles 3rd midterm

7th week

- Lecture: Corticosteroids and their antagonists. Drugs inhibiting steroid hormone synthesis – Bence Ágg, MD, PhD
- Practice: Pharmacology of pituitary hormones. Hypothalamic hormones, hormonanalogs and antagonists. Pharmacology of thyroid gland (thyroid hormones and antithyroid drugs).

8th week

- Lecture: Pharmacology of female sexual hormones. Contraceptive medications. – Pál Riba, MD, PhD
- Practice: Androgens, antiandrogens, anabolic steroids, drugs influencing sexual activity. Drugs affecting bone mineral homeostasis.

9th week

- Lecture: Drugs influencing gastric acid secretion, drugs protecting gastric mucosa – Klára Gyires, MD, DSc
- Practice: Core concepts of adverse effects. Toxicology exam

10th week

- Lecture: Immunopharmacology (cytotoxic agents, inhibitors of intracellular signaling, cytokine and cytokine receptor inhibitors) – Zoltán Varga, MD, PhD
- Practice: Appetizers, drugs promoting digestion, antiemetics, prokinetic agents. Laxatives, drugs against diarrhea. Pharmacology of liver and bile.

11th week

- Lecture: Small molecule signal transmission inhibitor anticancer drugs. – Zoltán Varga, MD, PhD
- Practice: Cytotoxic anticancer drugs I. 4th midterm

12th week

- Lecture: Anticancer antibodies. Immunostimulant anticancer agents. – Zoltán Varga, MD, PhD
- Practice: Cytotoxic anticancer drugs II. Anticancer drugs with hormonal mechanisms

13th week

- Lecture: Pharmacodynamic and pharmacokinetic basics of drug interactions – Anikó Görbe, MD, PhD
- Practice: Drugs and pregnancy. Dermatological and ophtalmological drugs - summary

14th week

- Lecture: Pharmacogenomics, personalized medicine, drugs for orphan disease. Special aspects of pharmacology in children and elderly – Zsófia Gulyás-Onódi, MD, PhD
- Practice: Contrast agents. Consultation

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Maximum number of absences is 25 percent of the number of practices in the semester. In the case of absence, the student can attend another class the same week.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the semester, we organize two compulsory midterm tests in weeks 6 and 11. Making up or improving the midterm (or both midterms) will be possible in week 13. The improvement may only be an oral exam. The first semester midterms cannot be improved in the second semester.

The course material for the third midterm test (study material from week 1 to 5, except Toxicology.): Pharmacology of the cardiovascular system. Drugs acting on lipid metabolism. Drug acting on blood glucose level.

Fourth midterm test (study material: from week 6 to 10): Endocrine pharmacology. Pharmacology of the respiratory system. Pharmacology of the gastrointestinal system. Histamine and antihistamines. Drugs acting on smooth muscles. Immunopharmacology.

The midterm tests will count towards the final exam results:

1. If the student scores better than 60% (minimum 19 points) in all four midterm tests during the whole year, the drug recognition question will be waived and in case of a doubtful grade, the better one will be awarded. There is no exemption from the Core Concept topics.
2. If the student achieves at least 80% score of all four midterm tests one final exam topic will be waived as well as the drug recognition question. The waived topic will be chosen by the examiner.
3. At the competition at the end of the year, the student who has at least one midterm of 80% and none of his/her midterm tests is worse than 33%, depending on the result of the competition, will be rewarded: between scores 84-100% (42-50 points) the students will choose one of the three topics, between 74-83% (37-41 points) the students will choose which one he/she will drop, between 64-73% (32-36 points) the examiner will choose one topic to be dropped. The drug recognition question will be waived.
4. If the student fails both midterm tests of the second semester (even at the time of a retake), or fails to achieve 33% (minimum 10 points) in either midterm test with a correction, the student will receive a grade penalty on the first attempt of the final exam. Failure to complete the first-semester midterms will not be counted toward the final exam.
5. In the case of a repeated exam after a failure, both the positive and the negative modifications are cancelled.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

The number of absences must not be more than 25 percent of the number of practices in the semester.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

To register for the oral examination, the student must pass the toxicology exam during the study period (9th week). The result of the toxicology exam can be a pass or an excellent pass. If the toxicology exam is failed, the retake must be completed orally with the teacher of the group. At the oral final exam, at first 5 active substances selected from the compulsory list of active substances must be identified and their mechanism of action explained (except if the student's four midterm exams reach minimum of 60% - 19 points -each). If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of the recognition of active substances, an acceptable level of knowledge must be demonstrated of one core-concept question and three topics of three lists of topics (one from each).

Toxicology topics

1. Management of the poisoned patient I. antidotes
2. Management of the poisoned patient II. Emergency care. Decontamination. Enhancing of elimination of toxins. supportive treatment.
3. Pharmacology of chelators
4. Acid and base poisonings
5. Mercury poisoning
6. Lead poisoning
7. Arsenic poisoning
8. Cadmium poisoning
9. Poisons inducing methemoglobinemia
10. Aliphatic hydrocarbons and aliphatic halogenated hydrocarbons
11. Aromatic hydrocarbons,
12. Nitrobenzene and aniline poisonings
13. DNP, DNOC poisonongs
14. Methanol and glycol poisonings
15. Poisonings caused by aliphatic aldehydes.
16. Carbon monoxide poisoning

17. Poisonings caused by insecticides and herbicides
18. Mushroom poisoning
19. Cyanide poisoning
20. Snake and bee bites
21. Poisonous plants

Core concept topic list

1. Stages of drug development in brief.
2. Types of clinical trials.
3. History of the Hungarian pharmaceutical industry.
4. Molecular targets of drugs
5. Receptor theory - agonist, partial agonist, antagonist, inverse agonist
6. Efficacy, potency
7. Dose-effect relationships at population level
8. Adverse drug reactions
9. Therapeutic index
10. Tolerance, tachyphylaxis, dependence
11. Absorption of drugs
12. Membrane transport mechanisms.
13. Distribution of drugs
14. Bioavailability
15. Volume of distribution
16. Phases of drug biotransformation
17. Excretion of drugs
18. Linear and non-linear pharmacokinetics
19. Clearance
20. Half-life
21. Saturating and maintenance dose
22. Drug accumulation and cumulation
23. Enzyme inducers
24. Enzyme inhibitors
25. Pharmacodynamic interactions - synergism
26. Pharmacodynamic interactions - antagonism
27. Pharmacokinetic drug interactions - at the level of absorption
28. Pharmacokinetic drug interactions - at the level of distribution
29. Pharmacokinetic drug interactions - at the level of metabolism
30. Pharmacokinetic drug interactions - at the level of elimination
31. Special groups - drug interactions: pregnancy
32. Special groups - drug interactions: childhood
33. Special groups - drug interactions: ageing
34. Characterisation of biological medicinal products
35. Orphan drugs
36. Advanced therapy medicinal products. Vaccines
37. Nutritional supplements
38. Traditional herbal active substances
39. Medical device

40. Principles of antimicrobial treatment - selective toxicity
41. Principles of antimicrobial treatment - empirical, targeted and prophylactic therapy
42. Principles of antimicrobial treatment - principles of bactericidal, bacteriostatic antibiotic and antibiotic combinations
43. Principles of antimicrobial treatment - time-, concentration- and exposure-dependent antibiotics
44. Narrow and broad spectrum antibiotics
45. Antibiotic selection considerations - pregnancy, childhood
46. Antibiotic selection considerations - infections affecting specific compartments
47. Considerations for antibiotic choice - comorbidities
48. Antidote - definition and examples
49. Pharmacogenetics, pharmacogenomics - definition, examples
50. Classification of drugs according to chemical structure and complexity
51. Drug-induced adverse reaction: sulfonamide allergy and its characterization
52. Drug-induced adverse reaction: serotonin syndrome
53. Drug-induced adverse reaction: neuroleptic malignant syndrome
54. Drug-induced adverse reaction: Stevens-Johnson sy.
55. Drug-induced adverse reaction: pseudomembranous colitis
56. Drug-induced adverse reaction: cheese reaction
57. Drug-induced adverse reaction: orthostatic hypotension
58. Drug-induced adverse reaction: hemorrhage
59. Drug-induced adverse reaction: thrombosis
60. Drug-induced adverse reaction: bone marrow damage
61. Drug-induced adverse reaction: nephrotoxicity
62. Drug-induced adverse reaction: ototoxicity
63. Drug-induced adverse reaction: hepatotoxicity
64. Drug-induced adverse reaction: QT prolongation
65. Drug-induced adverse reaction: bradycardia / AV block
66. Drug-induced adverse reaction: constipation, diarrhea, vomiting
67. Drug-induced adverse reaction: mucosal damage
68. Drug-induced adverse reaction: weight gain/loss
69. Drug-induced adverse reaction: sedation
70. Drug-induced adverse reaction: epileptiform seizures MI
71. Drug-induced adverse reaction: sexual dysfunction
72. Drug-induced adverse reaction: dental and oral cavity adverse reactions
73. The Summary of Product Characteristics

Topic list ”A”

1. Cholinergic and adrenergic transmission and its presynaptic modification.
2. Cholinomimetics
3. Muscarinic receptor blocking drugs
4. Catecholamines
5. Indirect sympathomimetics. Selective alpha1 agonists
6. alpha2-agonists and drugs acting on the imidazoline receptors
7. alpha-receptor antagonists
8. beta-receptor antagonists

9. Centrally and peripherally acting skeletal muscle relaxants
10. Local anesthetics
11. Opioids
12. NSAIDs.
13. Drugs used for treatment of gout. Drugs for headache syndromes
14. Inhalational anesthetics
15. Intravenous anesthetics. Perioperative medication
16. Benzodiazepines
17. Non benzodiazepine anxiolytics and non-benzodiazepine hypnotics.
18. Antipsychotics
19. Monoamine reuptake inhibitors.
20. Non-reuptake-inhibitor antidepressants. Agents used for treatment of manic phase of bipolar disorders.
21. Antiepileptics. Adjuvant analgesics.
22. Drugs of neurodegenerative diseases. (Drugs acting in the extrapyramidal motoric system. Nootropic drugs)

Topic list ”B”

1. Drugs influencing blood coagulation I: Antiplatelet agents. Fibrinolytic drugs. Drugs inhibiting bleeding
2. Drugs influencing blood coagulation II: Anticoagulant drugs
3. Agents used in anemias
4. Positiv inotropic drugs
5. Drugs influencing cardiac electrophysiology.
6. Drugs acting on the renin-angiotensin-aldosterone-system (RAAS)
7. Ca++-channel blockers and other vasodilators
8. Drugs influencing the oxygen demand and oxygen supply of the heart. Drugs improving microcirculation.
9. Drugs affecting lipid metabolism. Drugs controlling body weight
10. Potassium excreting (wasting) diuretics
11. Potassium sparing diuretics, ADH antagonists, osmotic diuretics
12. Glucocorticoids for oral and parenteral use
13. Mineralocorticoids. Topically applied glucocorticoids. Adrenocortical antagonists, inhibitors of corticosteroid synthesis.
14. Androgens, anabolic steroids, antiandrogens. Agents affecting the sexual activity
15. Estrogens and antiestrogens
16. Progestins and antiprogestins. Contraceptives
17. Thyroid and antithyroid drugs. Pituitary hormones. Hypothalamic hormones, hormonanalogs and antagonists.
18. Pancreatic hormones and parenterally applied antidiabetic drugs.
19. Oral antidiabetics.
20. Agents affecting bone mineral homeostasis (calcium, vitamin D, parathyroid hormone, calcitonin, etc.).
21. Selective b2-stimulants and other bronchodilators.
22. Antiinflammatory agents inhibiting bronchial inflammatory processes. Antitussive agents and expectorants

23. Drugs influencing gastric acid secretion, protective drugs of gastric mucosa
24. Antiemetic drugs. Prokinetic agents.
25. Drugs used in constipation (laxatives) and diarrhea. Drugs promoting digestion. Pharmacology of liver and biliary tract
26. Histamine and antihistamines
27. Drugs acting on smooth muscles. Drugs influencing uterus contractions.
28. Immunopharmacology I. (cytotoxic agents).
29. Immunopharmacology II. (Inhibitors of cytokine gene expression, 5-ASA derivatives)
30. Immunopharmacology III. (Antibodies and fusion proteins)
31. Drugs used in cancer treatment I (antimetabolites)
32. Drugs used in cancer treatment II (cytotoxic agents targeting DNA)
33. Drugs used in cancer treatment III (Topisomerase inhibitors. Inhibitors of mitotic spindle)
34. Drugs used in cancer treatment IV. (Hormonal agents)
35. Drugs used in cancer treatment V. (Small molecule signal transduction inhibitors. Retinoids)
36. Drugs used in cancer treatment VI. (Large molecule signal transduction inhibitors. Immunostimulant anticancer drugs.)

Topic list ”C”

1. Disinfectants and antiseptics
2. Antimycobacterial drugs
3. Antiprotozoal and antihelminthic drugs.
4. Antifungal agents
5. Agents to treat Herpes simplex (HSV), varicella-zoster (VZV) virus, cytomegalovirus (CMV). Anti-influenza agents Drugs against Corona- and other viruses
6. Antiretroviral agents.
7. Agents against hepatitis viruses
8. Penicillins
9. Cephalosporins
10. Carbapenems. Monobactams. Beta-lactamase inhibitors.
11. Chloramphenicol. Polymyxins. Antifolate drugs
12. Tetracyclines and glycylcyclines
13. Aminoglycosides
14. Quinolones and fluoroquinolones
15. Macrolides. Pleuromutilins
16. Clindamycin. Streptogramins. Oxazolidinones. Fusidans.
17. Glycopeptides. Lipopeptides. Bacitracin. Mupirocin.
18. Metronidazole. Fidaxomycine. Rifaximin. Nitrofurantoin. Phosphomycine.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as

an exam.) A link published on the department's website referring to the minimum requirements of the course.

A complete lack of knowledge regarding any single topic on the exam will result in failure, regardless of the level of knowledge demonstrated in other topics.

1. Required knowledge of basic concepts

· Pharmacokinetics (ADME: absorption, distribution, metabolism, elimination)

· Pharmacodynamics (mechanism of action, receptors, dose-response curve)

· Bioavailability, half-life, steady state

· Therapeutic index, therapeutic range

· First-pass metabolism

· Receptor types (ion channel, GPCR, enzyme-linked, etc.)

2. Recognition and basic knowledge of major drug classes

Minimum:

· Mechanism of action (at least in broad terms)

· 1–2 typical active ingredients per group (from the mandatory list of active ingredients)

· Main indication(s)

· Most important side effect(s)

3. Mechanism of action – "must be understood, not just known"

Minimum:

· Understands the mechanism at least at a basic logical level

· What is the target of the drug

· What effect does this have on the body

4. Side Effects and Safety

Minimum:

· Knowing the most important (most typical or most dangerous) side effects

5. Basics of Clinical Application

· Knowing the basic indications

· Knows the most important contraindications

· Knows the method of administration, key pharmacokinetic properties, and interactions (for commonly used drug classes—not required for specialized drugs, e.g., oncology drugs)

6. What is NOT required at the minimum level

Not required:

· Detailed knowledge of every active ingredient

· Complex molecular mechanisms

· Detailed dosages (except in specific cases)

· Rare side effects

Summary:

The student meets the minimum requirements if:

· Understands the basic concepts

· Recognizes the main drug classes (does not confuse them)

· Can explain a simple mechanism of action

· Knowing the most important side effects

· Knows when and for what drug class is used.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

To apply for the final examination, the student must have passed the toxicology exam (on week 9). The student may improve the result of the toxicology exam orally with his/her teacher. The grade of the toxicology exam will be counted towards the result of the final exam.

In the oral final exam, at first 5 active substances selected from the compulsory list of active substances must be identified the and their mechanism of action explained (unless the student achieves better than 60% in each of the four midterms of the academic year). If the student does not recognize at least 3 of the active substances, he/she will not be allowed to continue and will receive a fail mark. After successful completion of the recognition of active substances, an acceptable level of knowledge must be demonstrated of one core-concept question and three topics of three lists of topics (one from each).

Detailed information on the compulsory and the full lists of active substances. If the candidate:

1. knows all the active substances to be studied in full detail, or knows all the active substances with some minor lacks and can mention names of active substances from the full drug list,– mark 5
2. knows all the active substances to be studied and the information to a varying degree and can mention the names of active substances from the full drug list to a varying degree - 2,3,4
3. knows all the active substances to be learned, but only the name and nothing else – unsatisfactory (failure)
4. does not know any active substance names – unsatisfactory (failure)
5. does not know all the active substances from the mandatory list, but knows the active substances from the full list of active substances in the given topic, then points 1,2 or 3 above are taken into consideration, the mark is awarded according to these points

Type of grade: five-mark scale (1=unsatisfactory, 2=satisfactory, 3=average, 4=good, 5=excellent)

The midterm tests will count towards the semester final exam results:

1. If the student scores better than 60% (minimum 19 points) in all four midterm tests during the whole year, the drug recognition question will be waived and in case of a doubtful grade, the better one will be awarded. There is no exemption from the Core Concept topics.
2. If the student achieves at least 80% score of all four midterm tests one final exam topic will be waived as well as the drug recognition question. The waived topic will be chosen by the examiner.
3. At the competition at the end of the year, the student who has at least one midterm of 80% and none of his/her midterm tests is worse than 33%, depending on the result of the competition, will be rewarded: between scores 84-100% (42-50 points) the students will choose one of the three topics, between 74-83% (37-41 points) the students will choose which one he/she will drop, between 64-73% (32-36 points) the examiner will choose one topic to be dropped. The drug recognition question will be waived.
4. If the student fails both midterm tests of the second semester (even at the time of a retake), or fails to achieve 33% (minimum 10 points) in either midterm test with a correction, the student will receive a grade penalty on the first attempt of the final exam. Failure to complete the first-semester midterms will not be counted toward the final exam.
5. In the case of a repeated exam after a failure, both the positive and the negative modifications are cancelled.

Final exam grades cannot be offered.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

No specific artificial intelligence platform is specified for this course. Artificial intelligence platforms may not be used during midterm assessments or the oral exam.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	itc.semmelweis.hu

Printed resources:

Type	Mandatory
Author	B.G. Katzung (editor)
Title	Basic and Clinical Pharamcology (15th edition)
Publisher	McGraw-Hill Education, 2021. ISBN 978-1 260 45231 0
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés V.
Name of subject in English: Physical Education V
Name of subject in German: Körpererziehung V

Credit value of the course: 0
Semester: 5th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI009_5A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Upon completion of the course the student will be able to carry out regular physical activity.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) III*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 1. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 60 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1 x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,

4 x 3 hrs. and 1x 2 hrs. session packages: Golf, Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men'sand and women football, handball, basketball, volleyball, waterpolo

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Except for the Sport Hiking courses, where you have to attend 4 times due to blocking. 3 of these are on your own course and 1 can be made up by arrangement with the instructor!

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times (trainings 15 times) under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Active participation in practice classes 10 times (trainings 15 times)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

signature

Artificial intelligence systems used in the teaching of the subject and the manner of their

application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés VI.
Name of subject in English: Physical Education VI
Name of subject in German: Körpererziehung VI

Credit value of the course: 0
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI009_6A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Upon completion of the course the student will be able to carry out regular physical activity.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) IV*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 1. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 60 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1 x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,

4 x 3 hrs. and 1x 2 hrs. session packages: Golf, Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men'sand and women football, handball, basketball, volleyball, waterpolo

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Except for the Sport Hiking courses, where you have to attend 4 times due to blocking. 3 of these are on your own course and 1 can be made up by arrangement with the instructor!

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course

grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times (trainings 15 times) under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

1. a sports exemption.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Active participation in practice classes

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

signature

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai és Kísérleti Rákkutató Intézet

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
40.0	1.0	30.0	9.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Matolcsy András (Intézet igazgató)
Course coordinator location of work, telephone availability: Department of Pathology and Experimental Cancer Research, 06-1-317-1074
Course coordinator position: director
Course coordinator Date and number of habilitation: 118-6/1997

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the elective subject of pathology is to strengthen the students' understanding of basic pathological changes and the pathomechanism of diseases, as well as their clinicopathological approach.

Format of the course (lectures, group work, practical lessons, etc.):

During the training, students participate in and use the examination methods and diagnostic procedures of pathology, and gain a deeper insight into clinicopathological thinking. The training takes place in the form of classroom lectures, histology seminars, autopsy room and special laboratory exercises.

Competencies acquired through completion of course:

Pathology II. final exam

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Knowledge of the development and course of diseases, knowledge of disease nomenclature, recognition and knowledge of basic histological and macroscopic changes, knowledge of pathological diagnostic examination methods, knowledge of clinicopathological relationships.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

minimum 1 student, maximum 3-5 students depending on interest

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Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed subject matter:

Requirements
1. Participation in autopsy
a) location: the institute's autopsy room
b) time: during the educational period according to the medical student's practical schedule, outside the educational period by joining the daily resident autopsy sessions.
c) requirement: 20 sessions
d) responsible: autopsy department head (dr. Gergely Rácz)
2. Participation in histology initiation

a) location: the institute's histology lab
b) time: joining the daily routine initiation.
c) requirement: 20 sessions
d) responsible: head of the histology department (dr. Péter Nagy)
3. Participation in the diagnostic laboratory work of the institute
a) location: the institute's special diagnostic laboratory
b) time: joining the daily routine diagnostic work
c) requirement: participation in the work of 3 optional laboratories, a total of 20 hours/laboratory
d) responsible: the head of the selected laboratories
4. Participation in histology consultation
a) location: the institute's consultation room
b) time: joining the daily residency training
c) requirement: 20 sessions
d) responsible: (dr. Márton Szentkereszty)
5. Participation in aspiration cytology specialist practice
a) location: the institute's aspiration cytology clinic
b) time: joining the weekly practice
c) requirement: 5 sessions
d) responsible: head of aspiration cytology (dr. Pápay Judit)
6. Participation in the scientific presentations of the Institute
a) place: the institute's classroom/library
b) time: joining the weekly scientific program
c) requirement: 5 times
d) responsible: the head of the presentation sessions (Dr. Anna Sebestyén)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Fulfillment of the requirements, confirmation and signature of those responsible for the modules

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Based on the current Study and Examination Regulations.

Number and type of individual assignments to be completed, submission deadlines:

Based on the current Study and Examination Regulations.

Requirements for the successful completion of the course:

Clinicopathological presentation of an autopsy case

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Presentation in PPT format of a selected pathological case. At least one representative macro- and histopathology photo should be included in the presented presentation.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Active participation in the 6-week practical training in accordance with the syllabus. The applied and productive use of the knowledge presented during the course in the course of assessment. To achieve a passing grade, the candidate is required to provide a medical interpretation, analysis, and demonstrate differential diagnostic reasoning skills regarding the clinicopathological case project they present. The evaluation criteria include identifying and presenting the underlying disease, its complications, and the immediate cause of death, as well as the ability to respond to further clinicopathological questions related to these.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Graded from 1 to 5 marks based on the content and logical structure of the presented clinocopathology case, as well as the answers to the questions.

no

no

no

Artificial intelligence systems used in the teaching of the subject and the manner of their

application

no

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika

Name of subject in Hungarian: Belgyógyászat nyári gyakorlat
Name of subject in English: Summer Practice - Internal Medicine
Name of subject in German: Innere Medizin (Famulatur im Sommer)

Credit value of the course: 3
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
168.0	0.0	168.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKNSG1131_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Masszi Tamás Pál (Klinika igazgató)
Course coordinator location of work, telephone availability: Belgyógyászati és Hematológiai Klinika +3613754364
Course coordinator position: klinikaigazgató
Course coordinator Date and number of habilitation: 2010.06.07., száma: 305

Objectives of the course, and its place in the curriculum of the medical training program:

During Internal Medicine Summer Practice students are involved into daily clinical work at a medical ward. They practice taking health history as well as physical examination and they participate in patient care using their pre-clinical knowledge. They become familiar with differential diagnostics and the integrative perspective of internal medicine.

Format of the course (lectures, group work, practical lessons, etc.):

bedside work on a medical ward, consultations

Competencies acquired through completion of course:

Completion of the course enables medical students to strengthen the knowledge of medical history taking from an adult patient, to conduct a comprehensive physical examination and to create a diagnostic and basic therapeutic plan based on these findings. Throughout the course students become familiar with standard therapies. They also improve their communication skills with colleagues, patients and relatives

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine – Propedeutics*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun, maximum 20 students / month.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students spend 1 month (daily 8 hours , between 8:00 AM - 4:00 PM) at a medical ward. Participation in afternoon /evening shifts for students is optional, and such participation does not substitute attendance in regular hours.

They become familiar with the Department / Clinic and its wards.

They attend consultations with tutors during which they revise the most relevant physical examination techniques (examination of the respiratory system, the cardiovascular system and the

abdomen).

Under supervision of a tutor (Internal Medicine specialist) they participate in daily clinical work. Students' tasks include

- uptake of comprehensive patient history (identifying data, chief complaints, present illness, past history, family, personal and social history, review of systems) using proper medical terms, interpretation of past events and understanding their relationship

- comprehensive physical examination, description and interpretation of findings

- evaluation and interpretation of laboratory findings based on their preclinical knowledge

- evaluation of medical therapy (connecting generic and brand names of medications used by patients, identifying indications of medications, planning a potential drug treatment of the present illness)

- observation of common interventions (arterial blood draw, insertion of central lines / feeding tubes / catheters, removal of pleural / ascitic fluid)

- performing basic medical interventions

  evaluation of blood pressure and pulse, body temperature measurement, ECG

  blood glucose measurement and administration of insulin to patients

  applying basic drug administration techniques (iv., im., sc.),

  venous blood draw

  application of infusions (under supervision)

- becoming familiar with patient charts, documents and medical reports

- becoming familiar with patient consent forms, participation during asking for consent

- participation during consultation with patients' family members

Students summarize their activities in a logbook on a daily basis. They refer a patient on a weekly basis to the head of the Department, and they write a case report from a patient on a weekly basis (4 case reports during 4 weeks altogether)

Students visit special units of the Department (cardiology, plasmapheresis, gastroenterology, osteodensitometry).

Daily program:

08:00-08:30 morning round, meeting patients

08:30-09:00 morning referral (via Zoom)

09:00-10:00 morning round with the junior and senior doctor

10:00-10:20 coffee break

10:20-12:00 admission of new patients, participation on diagnostic examinations, participation on compulsory consultations

12:00-12:30 midday referral of patients (to junior doctors)

12:30-13:00 lunch break

13:00-13:30 evaluation and discussion of new diagnostic findings (laboratory results, imaging)

13:30-16:00 discussion of the daily activities, revision of patient documentation, writing case report / logbook

Dr. Ambrus Viktória, Dr. Barsi Ádám, Dr. Bodó Imre, Dr. Farkas Péter, Dr. Fehér Ágnes, Dr. Franka János, Dr. Gráf László, Dr. Hankó László, Dr. Horváth Anna, Dr. Horváth Eszter, Dr. Horváth Laura, Dr. Hosszúfalusi Nóra, Dr. Jakab László, Dr. Jenei Zsigmond, Dr. Kalabay László, Dr. Karádi István, Dr. Kárpáti Ágnes, Dr. Katona Gábor, Dr. Keltai Katalin, Dr. Kempler Miklós, Dr. Lohinszky Júlia, Dr. Mihály Emese, Dr. Müller Gábor, Dr. Műzes Györgyi, Dr. Nagy Géza, Dr. Nagy Viktor, Dr. Nagy Zsolt, Dr. Nebenführer Zsuzsanna, Dr. Peskó Gergely, Dr. Pozsonyi Zoltán, Dr. Pusztai Péter, Dr. Sármán Beatrix, Dr. Sipos Ferenc, Dr. Sipter Emese, Dr. Szombath Gergely, Dr. Tárkányi Ilona, Dr. Tegze Bálint, Dr. Tóth Éva Katalin, Dr. Varga Éva, Dr. Varga Gergely, Dr. Várkonyi Judit, Dr. Vereckei András, Dr. Vida Ádám, Dr. Wiedemann Ádám, Dr. Zsáry András

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 18 / 20 days (90%). This is evaluated through attendance sheets signed by the tutor.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the course coordinator, with the permission of the course director.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of

marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

Students summarize their activities in a logbook on a daily basis. They write a case report from a patient on a weekly basis (4 case reports during 4 weeks altogether). They visit special units of the Department (cardiology, endocrinology, hematology).

These tasks must be completed by the exam day of the summer practice.

Requirements for the successful completion of the course:

Participation on at least 90% of the summer practice and completion of coursework (logbook and case reports) by the end of the practice. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam is based on the student’s knowledge related to Internal Medicine Propedeutics and the Summer Practice.

The examiner revises the student’s logbook and the student’s case reports.

During bedside patient examination the student is required to demonstrate the acquired skills in taking medical history, physical examination and patient referral.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Complex patient examination (lungs, heart, abdomen, lymph nodes, vascular system, body temperature, and body weight; measurement of blood pressure and pulse; various types of urinalysis; blood glucose testing; taking medical history; reporting findings; and documenting examination results). Practical application and utilization of previously acquired preclinical

knowledge.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

A grade from 1 (fail) to 5 (excellent) is given, that is calculated from the three scores obtained for the logbook (25%), the case report (25%) and the patient examination (50%).

There is not any possibility of an offered grade.

Retake of a failed exam is feasible on the week after the Summer Practice in August.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Recommended
Author	Kasper, Fauci, Hauser, Longo, Jameson, Loscalzo
Title	Harrison’s Principles of Internal Medicine. 20th Ed.,
Publisher	
Year of publication	2018

Type	Recommended
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking. 12th
Publisher	
Year of publication	2017

Type	Recommended

Author	Papadakis, McPhee, Rabow
Title	CURRENT Medical Diagnosis and Treatment
Publisher	
Year of publication	2018

Type	Recommended
Author	Porter
Title	The Merck Manual of Diagnosis and Therapy. 20th Ed.
Publisher	
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Onkológiai Klinika

Name of subject in Hungarian: Belgyógyászat nyári gyakorlat
Name of subject in English: Summer Practice - Internal Medicine
Name of subject in German: Innere Medizin (Famulatur im Sommer)

Credit value of the course: 3
Semester: 6th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
168.0	0.0	168.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKNSG1131_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Takács István (igazgató)
Course coordinator location of work, telephone availability: Department of Internal Medicine and Oncology, Semmelweis University, Tel: 06-1-459-1500/51520
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2011, 328 (Semmelweis University)

Objectives of the course, and its place in the curriculum of the medical training program:

During Internal Medicine Summer Practice students are involved into daily clinical work at a medical ward. They practice taking health history as well as physical examination and they participate in patient care using their pre-clinical knowledge. They become familiar with differential diagnostics and the integrative perspective of internal medicine.

Format of the course (lectures, group work, practical lessons, etc.):

bedside work on a medical ward, consultations

Competencies acquired through completion of course:

Completion of the course enables medical students to strengthen the knowledge of medical history taking from an adult patient, to conduct a comprehensive physical examination and to create a diagnostic and basic therapeutic plan based on these findings. Throughout the course students become familiar with standard therapies. They also improve their communication skills with colleagues, patients and relatives

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine – Propedeutics*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun, maximum 25 students / month.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students spend 1 month (daily 8 hours , between 8:00 AM - 4:00 PM) at a medical ward. Participation in afternoon /evening shifts for students is optional, and such participation does not substitute attendance in regular hours.

They become familiar with the Department / Clinic and its wards.

They attend consultations with tutors during which they revise the most relevant physical examination techniques (examination of the respiratory system, the cardiovascular system and the

abdomen).

Under supervision of a tutor (Internal Medicine specialist) they participate in daily clinical work. Students' tasks include

- uptake of comprehensive patient history (identifying data, chief complaints, present illness, past history, family, personal and social history, review of systems) using proper medical terms, interpretation of past events and understanding their relationship

- comprehensive physical examination, description and interpretation of findings

- evaluation and interpretation of laboratory findings based on their preclinical knowledge

- evaluation of medical therapy (connecting generic and brand names of medications used by patients, identifying indications of medications, planning a potential drug treatment of the present illness)

- observation of common interventions (arterial blood draw, insertion of central lines / feeding tubes / catheters, removal of pleural / ascitic fluid)

- performing basic medical interventions

  evaluation of blood pressure and pulse, body temperature measurement, ECG

  blood glucose measurement and administration of insulin to patients

  applying basic drug administration techniques (iv., im., sc.),

  venous blood draw

  application of infusions (under supervision)

- becoming familiar with patient charts, documents and medical reports

- becoming familiar with patient consent forms, participation during asking for consent

- participation during consultation with patients' family members

Students summarize their activities in a logbook on a daily basis. They refer a patient on a weekly basis to the head of the Department, and they write a case report from a patient on a weekly basis (4 case reports during 4 weeks altogether)

Students visit special units of the Department (cardiology, plasmapheresis, gastroenterology, osteodensitometry).

Daily program:

08:00-08:30 morning round, meeting patients

08:30-09:00 morning referral (via Zoom)

09:00-10:00 morning round with the junior and senior doctor

10:00-10:20 coffee break

10:20-12:00 admission of new patients, participation on diagnostic examinations, participation on compulsory consultations

12:00-12:30 midday referral of patients (to junior doctors)

12:30-13:00 lunch break

13:00-13:30 evaluation and discussion of new diagnostic findings (laboratory results, imaging)

13:30-16:00 discussion of the daily activities, revision of patient documentation, writing case report / logbook

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 18 / 20 days (90%). This is evaluated through attendance sheets signed by the tutor.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the course coordinator (Studinger.peter@semmelweis.hu), with the permission of the course director.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Students discuss their case reports and logbooks with their tutors on a weekly basis.

Number and type of individual assignments to be completed, submission deadlines:

Students summarize their activities in a logbook on a daily basis. They write a case report from a patient on a weekly basis (4 case reports during 4 weeks altogether). They visit special units of the Department (cardiology, plasmapheresis, gastroenterology, osteodensitometry).

These tasks must be completed by the last day of the summer practice.

Requirements for the successful completion of the course:

Participation on at least 90% of the summer practice and completion of coursework (logbook and case reports) by the end of the practice. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam is based on the student’s knowledge related to Internal Medicine Propedeutics and the Summer Practice.

The examiner revises the student’s logbook and the student’s case reports.

During bedside patient examination the student is required to demonstrate the acquired skills in taking medical history, physical examination and patient referral.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Student's logbook of activity.

Four case descriptions.

Complete physical examination of a patient with description and interpretation of physical findings. Ability to instruct the patient during physical examination in Hungarian.

https://semmelweis.hu/belonko/en/education/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

A grade from 1 (fail) to 5 (excellent) is given, that is the weighed mean of the three scores obtained

for the written reports (25-25%) and the bedside patient examination (50%).

There is not any possibility of an offered grade.

Retake of a failed exam is feasible on the week after the Summer Practice in September.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Not applicable.

Printed resources:

Type	Mandatory
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking. 12th Ed., ISBN: 9781469893419
Publisher	Wolters Kluwer
Year of publication	2016

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine

Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Kardiológiai Tanszék - Kardiológiai Központ, Gottsegen György Országos Kardiovaszkuláris Intézet, Észak-Pesti Centrumkórház - Honvédkórház, Szent Imre Egyetemi Oktatókórház, Kistarcsai Flór Ferenc Kórház

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Name of subject in Hungarian: Kardiológia, szívsebészet, angiológia és érsebészet
Name of subject in English: Cardiology, Heart Surgery, Angiology, Vascular Surgery
Name of subject in German: Kardiologie, Herzchirurgie, Angiologie, Gefäßchirurgie

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Credit value of the course: 7
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
7.0	2.0	5.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
Hungarian, English, German

Course code:
AOKKAR1114_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Merkely Béla Péter (Klinika igazgató)
Course coordinator location of work, telephone availability: Heart and Vascular Centre of Semmelweis University +361458 6844
Course coordinator position: Director, Head of Department, University Professor
Course coordinator Date and number of habilitation: 26 May 2006; registration number: 234

Objectives of the course, and its place in the curriculum of the medical training program:

Within the framework of medical training, this cardiology, angiology, vascular surgery, cardiac surgery and vascular intervention radiology training is designed to provide a wide range of up-to-date and useful practical knowledge, and the testing of this knowledge, to the future generation of

doctors. For interested students, we also provide an opportunity for advanced cardiovascular training.

Format of the course (lectures, group work, practical lessons, etc.):

lecture, group work, practical lessons

Competencies acquired through completion of course:

Insight into the development and course of cardiovascular diseases, knowledge of the most common lesions and therapeutic interventions. Recognition of the symptoms of acute life-threatening conditions and their diagnostic and therapeutic possibilities.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Clinical ECG, Internal Medicine – Propedeutics

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on Neptun registration

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures 1. Anatomy and physiology of the heart (Prof Radovits Tamás) 2. Cardiomyopathies (Prof Vágó Hajnalka) 3. Acute coronary syndrome (Dr. Hizoh István) 4. Treatment of Chronic Heart Failure (Dr. Tarjányi Zoltán) 5. Symptoms, diagnosis and conservative treatment of vascular diseases (Dr. Járai Zoltán) 6. The diagnosis and treatment of Stable Coronary Artery Disease (Dr. Bárczi György) 7. Chest pain differential diagnosis. Life threatening diseases (Prof Zima Endre)8. Ventricular arrhythmias. Sudden cardiac death (Prof Gellér László) 9. Resyncronisation therapy, mechanical circulatory support (Dr. Sax Balázs) 10. Heart transplantation (Prof Szabolcs Zoltán) 11-12. Surgical treatment of arterial diseases I-II (Prof Szeberin Zoltán, Dr. Banga Péter) 13.Heart surgery in XXI. Century. Revascularization, valve surgery, circulatory support (Dr. Hartyánszky István) 14. Valvular heart diseases. (Dr. Nagy Andrea) 15. Pacemaker, ICD indications (Dr. Papp

Roland) 16. Primer and secunder prevention (Prof Kiss Róbert Gábor) 17. Paediatric cardiology (Dr. Ablopnczy László) 18. Hypertension (Dr. Hirschberg Kristóf) 19. Supraventricular arrhythmias, atrial fibrillation (Dr. Szegedi Nándor) 20.Antithrombotic, anticoagulant treatment (Dr. Ábrahám Pál) 21-22. Interventional radiology in the treatment of cardiovascular patients. I-II (Dr. Nemes Balázs, Dr. Dósa Edit) 23. Infective Endocarditis (Dr. Prinz Gyula) 24. Immunity and inflammation in cardiovascular disorders (Dr. Szappanos Ágnes) 25. Cardiogenetics (Dr. Fekete Bálint)

Practical lessons

Bedside practice: 1. Patient examination 2. ECG; ECG signs of life-threatening cardiac diseases. 3. Basics of echocardiography; Examination of the heart cavities, heart valves, heart muscle, systolic and diastolic function. 4. Heart failure; Symptoms of left- and right-sided heart failure; Differentiation between systolic and diastolic heart failure; Diagnosis of heart failure; Conservative and interventional treatment of heart failure 5. Cardiac valve dysfunction; Clinical signs of valvular heart disease; Auscultation; Systolic and diastolic murmurs; Valvular heart disease diagnosis and treatment; Transcatheter aortic valve implantation; Heart valve repair and replacement surgery; Anticoagulant therapy. 6. Coronary care unit: intra-aortic balloon pump and cardiogenic shock; Symptoms of acute heart failure and cardiogenic shock, Conservative and interventional treatment; Killip classification. 7. Management of ischemic heart disease in outpatient care; Symptoms and diagnosis of acute coronary syndrome; Signs of STEMI and NSTEMI ECG; Differential diagnosis of major chest disorders with chest pain; GRACE score; Clinical forms of ischemic heart disease; Medication of acute myocardial infarction. 8. Management of arrhythmias in outpatient care; Atrial fibrillation; CHA2DS2–VASc score; Supraventricular arrhythmias and malignant ventricular arrhythmias; Bradyarrhythmias. Practical lessons: 9. Invasive cardiology; Indications and implementation of percutaneous coronary intervention; Types of stents; Transcatheter aortic valve implantation. 10. Non-invasive cardiac imaging: cardiac echo, MRI and CT scans; Indications and procedure of these tests; Vulnerable plaque. 11. Electrophysiology; Indications for pacemaker implantation; Types of pacemakers; Indications for electrophysiological examination; Arrhythmia ablation procedures. 12. Vascular surgery in the operating room 13. Cardiac Surgery in the operating room 14. Intervention laboratory practice 15. Practical examination

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Participation in theoretical and practical courses is conditional on the student's application submitted and accepted by the end of the examination period preceding the subject semester. Absence from one practical sessions is possible, but it is obligatory to supplement the missed practical sessions at a time agreed in advance with the instructor

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):

(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the cardiology and angiology practical training, the lessons are interactive. At the end of the first week, there will be a MIDTERM TEST assessment on THE BASIS OF the presentations given up to that point. An unsuccessful test can be repeated once. The EVALUATION at the end of the semester results from the combined assessment of student activity in the practical lessons, the case presentation at the end of the course and the practical exam taken in the last lesson.

Number and type of individual assignments to be completed, submission deadlines:

Interactive case presentation, presented on the last day

Requirements for the successful completion of the course:

The condition for course validation (obtaining the signature) at the end of the semester and the condition for registration for the theoretical exam are to participate in the practical lessons and SEMINARS as described in the requirements and to pass the MIDTERM test and the practical

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1. Diastolic heart murmurs. Heart sounds.

2. Systolic heart murmurs. Heart sounds.

3. Risk factors, primary and secondary prevention.

4. Dilated cardiomyopathy.

5. Hypertrophic cardiomyopathy.

6. Acute heart failure, cardiogenic shock - etiology, symptoms, diagnostics.

7. Treatment of acute heart failure.

8. Chronic heart failure - etiology, symptoms, diagnostics.

9. Treatment of chronic heart failure.

10. Infective Endocarditis.

11 Pericarditis, pericardial effusion.

12. Aortic valve stenosis. Diagnosis of aortic valve insufficiency.

13. Mitral valve stenosis. Diagnosis of mitral valve insufficiency.

14. Atrial and ventricular septal defects, congenital heart disease.

15. Hypertension I. Etiology, diagnosis.

16. Hypertension II. Treatment. Hypertensive Heart Disease.

17. Anticoagulant treatment and indications.

18. Anti-platelet treatment and indications.

19. Manifestations and evaluation of Ischemic Heart Disease.

20. Chronic coronary syndrome diagnosis and treatment

21. Non ST segment elevation Acute Coronary Syndrome I. Etiology, manifestations, diagnosis.

22. Non ST segment elevation Acute Coronary Syndrome II. Treatment.

23. ST segment elevation Acute Coronary Syndrome I. Etiology, pathomechanism, diagnosis.

24. ST segment elevation Acute Coronary Syndrome II. Treatment.

25. Heart catheterization. Hemodynamic evaluation. The heart cycle.

26. Percutaneous coronary revascularization. (PCI)

27. Differential diagnosis of chest pain syndromes.

28. Pulmonary embolism.

29. Bradyarrhythmias.

30. Supraventricular arrhythmias.

31. Atrial Fibrillation.

32. Electrical and pharmacological cardioversion.

33. Ventricular arrhythmias.

34. Ablation treatment of arrhythmias.

35. Pacemaker indications and pacemaker types.

36. ICD and CRT indications, types.

37. Non-coronary structural interventions in cardiology (TAVI, Mitraclip, Left atrial appendage closure, etc.)

2.

1. Treatment of aortic valve stenosis, aortic valve insufficiency.

2. Treatment of mitral valve stenosis, mitral valve insufficiency.

3. Diagnosis and treatment of aortic dissection

4. Coronary revascularization: CABG

5. Treatment of end-stage heart failure with mechanical circulatory support.

6. Complications of myocardial infarction and their treatment

7. Epidemiology, risk factors, screening, prevention, and conservative treatment of arterial diseases. Vasculitis.

8. Clinical presentation and physical and imaging examination of arterial diseases. Diabetic foot.

9. Chronic venous insufficiency. Clinical presentation, physical and imaging examination, treatment.

10. Deep vein thrombosis. Clinical presentation, investigation, treatment options, early and late complications.

11. Angiography and intervention – basic endovascular techniques. Basic vascular surgery techniques. Vascular grafts.

12. Clinical presentation, investigation, management of diseases of the supra-aortic branches and upper extremity arteries.

13. Aortic and peripheral aneurysms

14. Acute aortic syndromes.

15. Vascular CT, MRI and ultrasound diagnostic methods. Vascular malformations.

16. Renal and visceral occlusive diseases and artery aneurysms. Haemodialysis access.

17. Theory and practical implementation of extracorporeal circulation. Theory and practical implementation of the application of the heart-lung motor.

18. Acute cardiac surgery. 19. Surgical aspects of infectious endocarditis.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Correct execution of a bedside physical examination, preparation and evaluation of an ECG. Possession of cardiological, angiological, and cardiovascular surgery knowledge related to the subject line:

https://itc.semmelweis.hu/moodle/course/view.php?id=10432

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Student performance is evaluated in five grades: excellent (5), good (4), satisfactory (3), pass (2), fail (1). Performance assessment: a pass at the practical exam is a basic requirement. The final grade is predominantly defined by the AVERAGE OF THE WRITTEN test result and the two THEORETICAL QUESTIONS

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	• https://www.semmelweiskiado.hu/termek/1551/vascular-medicine

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Other resources:

Required	pdf.nem
Other/Comment	Oxford Handbook of Cardiology

Required	pdf.nem
Other/Comment	The ESC Textbook of Cardiovascular Medicine (2 ed.)

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Farmakológiai és Farmakoterápiás Intézet

Name of subject in Hungarian: Klinikai farmakológia
Name of subject in English: Clinical Pharmacology
Name of subject in German: Klinische Pharmakologie

Credit value of the course: 3
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	0.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKFRM1117_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ferdinandy Péter Elemér
Course coordinator location of work, telephone availability: Department of Pharmacology and Pharmacotherapy, 1089 Budapest, Nagyvárad tér 4. Tel: +36-1-2104416, e-mail: ferdinandy.peter@med.semmelweis-univ.hu
Course coordinator position: full professor, Head of Department
Course coordinator Date and number of habilitation: June 2 2001., 26/2001 Hab.

Objectives of the course, and its place in the curriculum of the medical training program:

Clinical Pharmacology is based on the knowledge of the subject Pharmacology taught in the 3rd year. In the teaching of clinical pharmacology, we assign drugs to the given disorders and present clinical cases. Based on students' active teamwork and problem-oriented thinking, we teach therapeutic strategies for priority diseases of public health importance according to current guidelines, as well as practical skills in clinical trials and pharmacovigilance. We cover the

development of drugs and medical devices used in clinical practice, including clinical trials, and the continuous evaluation of their efficacy and safety during their use (pharmacovigilance - reporting of side effects). Furthermore, during the practical teaching of the prescription writing, students will master the practical application and legal background of prescribing medicines. Part of the subject is clinical toxicology, which describes the symptomatology and therapy of major drug toxicities and drug overdoses.

Format of the course (lectures, group work, practical lessons, etc.):

Students will learn about the basic drug therapy of the most important diseases, as well as the basic rules of drug development, registration and adverse reaction reporting, partly in interactive collaborative work and partly in individual small group case studies. In addition to the classroom teaching, 7 hours of homework will be devoted to the topics of drug development, drug registration, pharmacovigilance and personalised medicine.

Competencies acquired through completion of course:

Students will learn:

· a pharmacotherapeutic strategy for diseases of public health importance according to current guidelines

· the practical application and legal background of prescription writing in connection with disorders

· therapy for major drug toxicities and drug overdoses

· the most common drug interactions

· the process of drug development, especially in clinical trials

· and be able to use the side effect reporting method

· the basics of personalized pharmacotherapy and the digital therapy systems that support it.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Mandatory subject, registration according to NEPTUN system

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

In a block system of 5 days, divided into two weeks, 7 contact hours of practice per day and altogether 7 hours of individual student's work:

All relevant topics are developed with the involvement of clinical experts. The clinical cases prepared in this way (3-5 cases per topic) are presented and processed in an interactive way on a problem-oriented basis. Current therapeutic recommendations are applied.

Day 1:

Infectious Diseases Treatment Strategy - Dr. Kornél Király, Ph.D., associate professor; Dr. Zsófia Gulyás-Onódi PhD., assistant professor;

Treatment strategy for respiratory and gastrointestinal diseases - Dr. Klára Gyires, Ph.D., D.Sc., Professor Emerita, clinical pharmacologist, Dr. Zoltán Zádori, Ph.D., associate professor

Day 2:

Endocrine Disease Treatment Strategy - Dr. Bence Ágg, Ph.D., associate professor, Dr. Júlia Timár, Ph.D., retired associate professor

Treatment strategy for cardiovascular diseases and metabolic syndrome - Dr. Péter Ferdinandy, Ph.D., D.Sc., MBA, professor, clinical pharmacologist, Dr. Anikó Görbe, Ph.D., professor, specialist in clinical laboratory tests, specialist in psychotherapy, Dr. Zoltán Varga, Ph.D., associate Professor

Day 3:

Strategy for the treatment of psychiatric and neurological diseases - Dr. István Gyertyán, Ph.D., retired research associate, Dr. László Hársing, Ph.D., D.Sc., retired professor, Dr. Ildikó Miklya, Ph.D., retired associate professor,

Clinical Toxicology, Emergency Medicine - Dr. Levente Prácser, anesthesiology resident, university

teaching assistant, Dr. Júlia Timár, Ph.D., retired associate professor, Dr. Gábor Mórotz, Ph.D., research associate

Clinical Addictology- Dr. Levente Prácser, anesthesiology resident, university teaching assistant, Dr. Júlia Timár, Ph.D., retired associate professor, Dr. Gábor Mórotz, Ph.D., research associate

Day 4:

Clinical trials and drug registration - Dr. Zoltán Giricz, Ph.D., research professor, pharmacist, Dr. Pál Riba, Ph.D., associate professor

Basics of Drug Development - Dr. Péter Ferdinandy, Ph.D., D.Sc., MBA, clinical pharmacologist, Dr. Zoltán Giricz, Ph.D., research professor, pharmacist

Pharmacovigilance, recognition of adverse drug reactions in clinical practice. - Dr. Péter Ferdinandy, Ph.D., D.Sc., MBA, professor, specialist in clinical pharmacology, Dr. Anikó Görbe, Ph.D., professor, specialist in clinical laboratory tests, specialist in psychotherapy

Pain Relief - Dr. Al-Khrasani Mahmoud, Ph.D., associate professor, pharmacist in drug supply and organization, Dr. Kornél Király, Ph.D., associate professor

Day 5:

Treatment strategy of autoimmune diseases - Dr. Klára Gyires, Ph.D., D.Sc., professor emeritus, specialist in clinical pharmacology, Dr. Zoltán Zádori, Ph.D., associate professor

Pharmaceutical Formulations and Prescriptions - Dr. Al-Khrasani Mahmoud, Ph.D., associate professor, specialist pharmacist in drug supply and pharmaceutical organization, Dr. Viktória Tóth, Ph.D., research associate

Individualized pharmacotherapy, special patient populations - Dr. Zsófia Gulyás-Onódi PhD., assistant professor

Independent student work (7 hours):

1. Drug development and regulation: independent processing of video material, completion of a control test
2. Pharmacovigilance: independent study of video material, completion of a control test, online exercises related to the topic
3. Personalised pharmacotherapy: independent processing of video material, completion of a control test, online exercises related to the topic

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Maximum number of absences is 10 percent of the number of practices in the semester. In the case of absence the student can attend another block class later during the semester.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

Watch instructional videos on drug development, pharmacovigilance, personalised pharmacotherapy, solve exercises, complete tests at home by the morning of the day of the given topic.

Requirements for the successful completion of the course:

The number of absences must not be more than 10 percent of the number of practices in the semester.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Home-solved tests of drug development, pharmacovigilance and personalized medicine prior to the exam. Assessment of problem-oriented competency tasks with test questions and OSCE type practical exercises from the topics given above.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

1. Clinical reasoning – the essential minimum
The student is able to match a disease to a drug class
In simple clinical cases: Identify a therapeutic strategy
Understand the logic behind basic guidelines (not rote knowledge!)
Minimum:
- No need to know the entire guideline → but must know "what to prescribe and why"

2. Therapeutic foundations of major diseases
Mandatory minimum level:
The student recognizes and manages at a basic level:
- Infectious diseases (logic of antibiotic use)
- Cardiovascular diseases
- Endocrine diseases
- Respiratory and gastroenterological conditions
- Neurological and psychiatric diseases
- Autoimmune diseases
- Principles of pain management

Minimum:
- Not every medication is necessary
- But the following are required:
  - 1–2 first-line treatment options
  - basic logical reasoning

3. Fundamentals of Clinical Toxicology
The student is able to:
- Recognize:
  - symptoms of common drug poisonings
- Knows:
  - basic principles of care (not a detailed protocol!)

Minimum:
- "What makes it dangerous + what to do in broad terms"

4. Prescription Writing – Mandatory Practical Skill
This is an explicit requirement for the course
The student:
- Can select an appropriate medication in a simple situation
- Is able to interpret the medication's prescribing information
- Can write a correct prescription using the prescribing information
- Knows the basic legal regulations

o Does not make serious formal errors

5. Fundamentals of Clinical Trials
The student:
o Understands the purpose and steps of clinical trials
o Has a basic understanding of the drug registration process

6. Pharmacovigilance (minimum practical requirements!)
The student:
• Understands the concept of pharmacovigilance
• recognizes adverse effects
• knows the steps for reporting adverse effects and the data that must be reported

7. Fundamentals of personalized therapy
The student:
• Understands:
o "not all patients are the same"
- age
- comorbidities
- genetic differences

8. Minimum Exam Requirements (Actual Performance Threshold)
• Test + practical + OSCE-style tasks
• Basic knowledge of therapeutic strategies for the test
• Basic case resolution using guidelines
• Prescribing medication (writing prescriptions) using the prescribing guidelines (the country specific prescribing formulations are not required, but applying the Summary of Product Characteristics is a must)

Common mistakes
• Unable to solve a case
• Lack of knowledge of the main therapeutic strategies
• Lack of understanding of the logic behind side effects/risks
• Failure to complete independent tasks (the exam can still be taken, but the candidate starts at a significant disadvantage)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is calculated as follows: 30% for the independent student assignment completed at home, 15% each for the OSCE-style case study and the practical prescription-writing assignment, and 40% for the written exam.

Formation of the final grade:

89-100% excellent (5)

78-88% good (4)

65-77% average (3)

50-64% satisfactory (2)

Less than 50% unsatisfactory (1)

If the written test result is less than 15 points, the grade cannot be better than satisfactory (2). The minimum passing reequirement is at least 10 points of 30 of the two OSCE tasks.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

No artificial intelligence platform is specified during the course. During the exam using artificial intelligence is forbidden.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Printed resources:

Type	Mandatory
Author	Ed. by B. G. Katzung
Title	Basic and Clinical Pharmacology, 15th edition
Publisher	McGraw-Hill Education, 2021. ISBN 978-1 260 45231 0
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Bőr-, Nemikórtani és Bőronkológiai Klinika

Name of subject in Hungarian: Bőrgyógyászat
Name of subject in English: Dermatology
Name of subject in German: Dermatologie

Credit value of the course: 4
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	1.5	2.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
Englisch

Course code:
AOKBOR043_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Holló Péter (igazgató)
Course coordinator location of work, telephone availability: Department of Dermatology-Venerology and Dermatooncology 1085 Budapest, Mária street 41. +36 1 266 0471/55727
Course coordinator position: Head of the Department
Course coordinator Date and number of habilitation: 02/2015

Objectives of the course, and its place in the curriculum of the medical training program:

Understanding the morphology, structure, physiology and general pathology of the skin. Basics of the skin immune system, dermato-allergology, immunology, venereology and dermato-oncology. The main objective is to provide knowledge on the aetiopathogenesis, diagnosis and treatment of skin diseases that can be used in general medical practice. Problem-oriented evaluation and placement of skin disorders in the context of general medicine.

Format of the course (lectures, group work, practical lessons, etc.):

Following an introductory lecture in the classroom, group-based exercises in dermatology inpatient wards and special outpatient clinics, as well as interactive diagnosis-oriented exercises without group-based exercises according to the timetable.

Competencies acquired through completion of course:

General competences: taking anamnesis, effective patient communication, performing physical examination, summarising the data obtained during the examination, preparing a diagnostic and therapeutic plan.

Subject-specific competences: description of the dermatological status with primary and secondary efflorescences, application of basic topical agents, treatment of pyoderma and ulcers, treatment of erysipelas, preparation of a dressing, recognition of chronic venous insufficiency, suspected arterial obliterative disease, treatment of herpes; HPV recognition and treatment; recognition and treatment of onychomycosis and intertigo; recognition and treatment of scabies and pediculosis; identification of clinical signs of gonorrhea, HIV diagnosis; syphilis diagnosis; recognition of the clinical signs of bacterial vaginosis, vulvovaginitis candidiosa, non-gonorrheal urethritis, recognition of suspected skin tumours, suspicion of psoriasis and psoriatic arthritis; recognition of the clinical picture of lichen ruber planus, rosacea, acne vulgaris; clinical differentiation of blistering skin diseases; suspect autoimmune blistering skin disease, recognise basic drug-related adverse reactions; suspect TEN by clinical examination; recognise and treat acute urticaria and Quincke's oedema; recognise burns and frostbite; orient HE stained skin histological sections.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Medical Microbiology II., Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject, based on group assignment. For optional subjects, the method of application, minimum and maximum number of students should be defined - it is not recommended to start a course with less than 10 students.

Minimum: 10 students; maximum: 25 students - according to rotation.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest lecturers, however, must be attached.)

1. Week

Monday	Tuesday	Wednesday	Thursday	Friday
Introduction to general dermatologic pathology and diagnostics **Prof. Holló Péter /** **Dr. Kende Lőrincz**	**Psoriasis** **Dr. Kende Lőrincz** **Dr. András Bánvölgyi**	**Urticaria and Eczema** **Dr. Andrea Lukács** **Dr. Anikó Kovács**		**Dermatopathology** **Dr. Enikő Kuroli** **Dr. Anita Mohos**
Break	**Break**	**Break**		**Break**
OUTPATIENT practical	**OUTPATIENT practical**	**OUTPATIENT practical**		**STI's** **Dr. Eszter Mercédesz Müller** **Dr. Kende Lőrincz**
Break	**Break**	**Break**		**Break**
Leg Ulcers **Dr. András Bánvölgyi** **Dr. Kende Lőrincz**	**INPATIENT practical**	**INPATIENT practical**		Quiz
Break	**Break**	**Break**		
Quiz	**Theoretical questioning**	**Theoretical questioning**		

2. Week

Monday	Tuesday	Wednesday	Thursday	Friday
OUTPATIENT practical	**OUTPATIENT practical**	**OUTPATIENT practical**		**OUTPATIENT practical**
Break	**Break**	**Break**		**Break**
Autoimmune diseases **Dr. Róbert Lili** **Dr. Bernadett Hidvégi**	**Dermatosurgery** **Dr. Kende Lőrincz** **Dr. András Bánvölgyi**	**Dermatooncology** **Dr. Kende Lőrincz** **Dr. Lajos Vince Kemény**		**Autoimmune Bullous Diseases** **Dr. Anikó Kovács** **Dr. Lili Róbert**
Break	**Break**	**Break**		**Break**
Internal diseases and the skin. **Dr. Andrea Lukács** **Dr. Lili Róbert**	**INPATIENT practical** –	**INPATIENT practical** –		**Bacterial and viral skin infections** ***Dr.* Kiss Norbert** **Dr. Noémi Mihalik**
Break	**Break**	**Break**		
Some inflammatory diseases **Prof. Miklós Sárdy** **Dr. Lajos Vince Kemény**	**Theoretical questioning**	**Theoretical questioning**		

3. Week

Monday	Tuesday	Wednesday	Thursday	Friday
Consultation		**Exam**	**Exam**	**Exam**
Written test				

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation in interactive classroom, classroom and outpatient exercises.

Attendance at inpatient classroom exercises and additional outpatient exercises is mandatory, 10% absence is allowed. Absences above the permitted number must be made up. The Clinic will make up the practicals within a given rotation or in subsequent rotations.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Written test in the 2nd week of each rotation.

Number and type of individual assignments to be completed, submission deadlines:

E-learning (online interactive exercise) in Moodl according to the timetable

Requirements for the successful completion of the course:

Active participation in the training. Certified completion of 90% of the exercises.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The exam consists of practical (patient examination) and theoretical parts.

The theoretical examination may be taken after a successful practical examination. The practical examination may be replaced by a written test.

In the theoretical exam, the student has to answer 2 randomly selected questions from the published

items:

I.

1. Elementary phenomena on the skin

2. Structure of the epidermis and dermis. Barrier and adaptive functions of the skin.

3. Principles of dermatological topical treatment. Indications and side effects of cortocisteroid treatment

4. Urticaria, Quincke's oedema

5. atopic dermatitis

Definition and classification of eczema, principles of its treatment. Dyshidrosis.

7. Clinical manifestations of drug-induced eczema. Stevens-Johnson syndrome. TEN (Lyell syndrome).

8. Clinical forms of basalioma

9. Clinical forms of spinalioma

10. Stained moles, melanoma malignum

11. Praecanceroses. In situ carcinomas. Paraneoplasias.

12. Cutaneous T-cell lymphomas. M. Kaposi

13. Clinical forms and treatment of psoriasis

14. Lichen ruber planus. Pityriasis rosea

15. Sebum production disorders, acne disease, rosacea

16. Cutaneous manifestations of lupus erythematosus (DLE, SLE), investigation plan

17. scleroderma (Morphea, PSS)

18. dermatomyositis

19. Skin manifestations of diabetes. Skin manifestations of liver disease. Causes and treatment of pruritus

20. dermatitis herpetiformis Duhring, pemphigoid, pemphigus clinic and their treatment

21. Clinical features, differential diagnosis and treatment of venous leg ulcers

22. Alopecia

23.Erythema exsudativum multiforme. Erythema nodosum.

24.Vasculitis allergica (cutan leukocytoclasticus angiitis), clinical forms, therapy and differential diagnostics.

Examination requirements:
The exam consists of practical (patient examination) and theoretical parts.
The theoretical examination may be taken after a successful practical examination. The practical examination may be replaced by a written test.
In the theoretical exam, the student has to answer 2 randomly selected questions from the published items:
I.

1. Elementary phenomena on the skin
2. Structure of the epidermis and dermis. Barrier and adaptive functions of the skin.
3. Principles of dermatological topical treatment. Indications and side effects of cortocisteroid treatment
4. Urticaria, Quincke's oedema
5. atopic dermatitis
Definition and classification of eczema, principles of its treatment. Dyshidrosis.
7. Clinical manifestations of drug-induced exanthema. Stevens-Johnson syndrome. TEN (Lyell syndrome).
8. Clinical forms of basalioma
9. Clinical forms of spinalioma
10. Stained moles, melanoma malignum
11. Praecanceroses. In situ carcinomas. Paraneoplasias.
12. Cutaneous T-cell lymphomas. M. Kaposi
13. Clinical forms and treatment of psoriasis
14. Lichen ruber planus. Pityriasis rosea
15. Sebum production disorders, acne disease, rosacea
16. Cutaneous manifestations of lupus erythematosus (DLE, SLE), investigation plan
17. scleroderma (Morphea, PSS)
18. dermatomyositis
19. Skin manifestations of diabetes. Skin manifestations of liver disease. Causes and treatment of pruritus
20. dermatitis herpetiformis Duhring, pemphigoid, pemphigus clinic and their treatment
21. Clinical features, differential diagnosis and treatment of venous leg ulcers
22. Alopecia
23.Erythema exsudativum multiforme. Erythema nodosum.
24.Vasculitis allergica (cutan leukocytoclasticus angiitis), clinical forms, therapy and differential diagnostics.

II.
1. Definition of STDs/STIs, causative agents of sexually transmitted infections
2. Sexually transmitted infections causing infertility, perinatal complications
3. Symptoms of syphilis stage I, development of infection
4. Symptoms of syphilis stage II
5. Skin symptoms and visceral lesions of late syphilis
6. Laboratory diagnosis of syphilis
7. Treatment of syphilis (in different stages, in pregnant women and in case of penicillin allergy)
8. Gonorrhoeal infection in men, complications of infection
9. Gonorrhoeal infection in women, complicated forms of infection
10. Laboratory diagnosis and treatment of gonorrhoea
11. Clinical manifestations and treatment of Chlamydia trachomatis infections
12. Diseases caused by herpes virus. Clinical presentation and treatment of progenital herpes.
13. Clinical presentation and treatment of human papilloma virus infections
14. Clinic and clinical presentation of Trichomonas vaginalis. Bacterial vaginosis.
15. Vulvovaginitis candidomycetica, balanitis candidosa. Angulus infectiosus oris, candidosis oris
16. HIV infection, AIDS
17. Clinical picture and treatment of impetigo contagiosa, folliculitis, furunculus, carbunculus
18. Clinical picture, differential diagnosis and treatment of erysipelas
19. Lyme disease
20. Pityriasis versicolor. Microsporia.
21. Mycosis superficialis capitis, corporis. Mycosis pedis.
22. Intertrigo mycotica. Erythrasma. Hydradenitis suppurativa.
23. onychomycosis. Paronychia chronica.
24. Recognition and treatment of scabies. Pediculoses

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

A minimum of 90% attendance is required for the practical sessions. Assessment is based on the theoretical and practical performance demonstrated throughout the semester. The minimum requirements include a confident knowledge of the core concepts defined in the course syllabus and the proficient execution of skills during clinical practices. The detailed, current semester requirements and the list of exam topics are available on the Department's/Clinic's website under the " menu.

https://semmelweis.hu/borklinika/en/for-students/faculty-of-medicine/requirements-aok/

https://semmelweis.hu/borklinika/en/for-students/faculty-of-medicine/theses/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

(Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results of the end-of-term assessment. Possibilities of and conditions for offered grades.)

The practical exam is oral and bedside - assessed with a mark out of 5.

The theoretical items I and II will be presented orally and will be assessed with two marks out of 5.

The arithmetical average of the marks for the practical and theoretical examinations gives the final mark of 5. In the case of an average of 0.5, the final mark is determined by a detailed explanation of an item not previously drawn by the student and freely chosen by the examiner.

The practical exam is oral and bedside - assessed with a mark out of 5.

The theoretical items I and II will be presented orally and will be assessed with two marks out of 5.

The arithmetical average of the marks for the practical and theoretical examinations gives the final mark of 5. In the case of an average of 0.5, the final mark is determined by a detailed explanation of an item not previously drawn by the student and freely chosen by the examiner.

The practical exam can be replaced by passing the written test.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Not relevant.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	cyberderm.com

Type	Recommended
Title	
Link	DermNetz.nz

Type	Recommended
Title	
Link	UpToDate.com/Dermatology

Printed resources:

Type	Recommended
Author	Amanda Oakley
Title	Dermatology Made Easy 1st Edition
Publisher	
Year of publication	

Type	Recommended
Author	Jean L.
Title	Dermatology Essentials 2nd Edition
Publisher	Bolognia MD
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sürgősségi Orvostani Klinika

Name of subject in Hungarian: Sürgősségi orvostan és Oxyológia
Name of subject in English: Emergency Medicine and Oxyology
Name of subject in German: Notfallmedizin und Oxyologie

Credit value of the course: 2
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.5	1.0	1.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSGO891_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fenyves Bánk Gábor (igazgató)
Course coordinator location of work, telephone availability: Department of Emergency Medicine, 06 20 666 2060
Course coordinator position: head of department, associate professor
Course coordinator Date and number of habilitation: none

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of this course is to enable students to:

- recognize critically ill patients, assess them, and initiate management until advanced medical assistance arrives;
- perform basic life support in a hospital setting;
- carry out delegated tasks during advanced life support;

- apply structured communication methods among healthcare professionals;
- perform an eFAST ultrasound examination and interpret the findings;
- understand the basic principles of prehospital and in-hospital organization of care for critically ill patients;
- recognize potentially critically ill patients based on red flag symptoms.

Format of the course (lectures, group work, practical lessons, etc.):

The course is delivered in a block teaching format through the following components:

- lectures;
- workshops;
- classroom-based skills training;
- simulation exercises;
- bedside clinical practice.

Competencies acquired through completion of course:

- recognition of the critically ill patient using the “quick look” approach;
- patient assessment and initiation of management according to the ABCDE approach:
  A: assessment of airway patency and airway opening using simple manual manoeuvres (head tilt–chin lift and jaw thrust), as well as basic adjuncts (nasopharyngeal and oropharyngeal airways);
  B: assessment and evaluation of breathing based on multiple parameters; administration of oxygen therapy; provision of ventilation using bag-valve-mask ventilation;
  C: assessment and evaluation of circulation based on multiple parameters; identification of monitoring modalities; ECG interpretation using the 6+2 step method; establishing indications for intravenous fluid therapy;
  D: basic neurological assessment for suspected stroke (BeFAST); interpretation of blood glucose results; assessment of consciousness using the AVPU scale and the Glasgow Coma Scale;
  E: emergency-focused full body examination (with particular attention to the skin, abdomen, and injuries); assessment of body temperature; five-step interpretation of arterial blood gas analysis;
- application of the SBAR structured communication tool;
- emergency ultrasound skills: performing and interpreting the eFAST examination;
- performance of basic life support in a hospital setting;
- safe use of an automated external defibrillator (AED).

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology I., Translational Medicine and Pathophysiology II., Internal Medicine – Propedeutics

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

The minimum number of students required for a block is 6, and the maximum number is 24.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

- Introduction to emergency medicine (course briefing; unique features of emergency care; the emergency care system; the "quick look" approach; fundamentals of the ABCDE assessment and management framework);
- Assessment and initiation of management of the critically ill patient (theory and skills training):
  A: airway assessment; manual and adjunct-based airway management;
  B: respiratory assessment; oxygen therapy; provision of ventilation;
  C: circulatory assessment; monitoring methods; ECG interpretation; therapeutic intervention options;
  D: emergency neurological assessment;
  E: assessment of body temperature and other abnormalities; blood gas analysis;
- ABCDE assessment in simulation settings followed by bedside clinical practice;
- in-hospital BLS training and AED use (classroom-based);
- management of the critically ill patient in simulation settings (application of acquired skills and problem-oriented clinical thinking);
- emergency ultrasound: eFAST examination (classroom-based and bedside practical training);
- bedside clinical practice;
- recognition of symptoms potentially indicating critical illness (so-called "red flag" symptoms);
- ambulance service training placement (prehospital units and emergency medical equipment).

Instructors: Dr. Péter Vass, Dr. Barbara Bukor, Dr. László Békefi, Dr. Eszter Békefi Erős, Dr. Vivien Enyedi, Dr. Dávid Szabó, Dr. Rita Szentgróti, Dr. Tamara Szulimán

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the Study and Examination Regulations, students must attend at least 90% of the

scheduled practical sessions and lectures in block teaching in order to obtain course completion certification.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

-

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

In accordance with the Study and Examination Regulations, students must attend at least 90% of the scheduled practical sessions and lectures in block teaching in order to obtain course completion certification.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical skills are assessed using the OSCE (Objective Structured Clinical Examination) method, covering the following competencies:

- application of manual airway opening techniques;
- correct use of basic airway adjuncts;
- bag-valve-mask ventilation with four-hand technique;
- assessment of oxygenation (pulse oximetry and arterial blood gas interpretation);
- administration of oxygen therapy;
- assessment, monitoring, and interpretation of circulation (ECG rhythm analysis, non-invasive blood pressure measurement);
- performance of in-hospital basic life support;
- safe use of an automated external defibrillator (AED);
- handover of patient-related information using the SBAR structure;
- performance and interpretation of the FAST examination.

Theoretical knowledge is assessed through an online written test covering the following topics:

- assessment and initiation of management of the critically ill patient until advanced medical assistance arrives;
- problem-oriented clinical thinking (relationships among red flag symptoms, clinical findings, and therapeutic interventions).

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The above-listed practical skills must each be performed with at least 50% proficiency.

The theoretical online examination must be passed with a minimum score of 51%.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is composed of three components:

- OSCE examination I: Basic Life Support (BLS), contributing 25% to the final grade;
- OSCE examination II: assessment of two skills selected from the above-listed competencies, contributing 25% to the final grade;
- online written test, contributing 50% to the final grade.

The final grade is determined based on overall performance as follows:

- 80% and above: grade 5 (excellent);
- 70%–79%: grade 4 (good);
- 60%–69%: grade 3 (satisfactory);
- 50%–59%: grade 2 (pass);
- below 50%: grade 1 (fail).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

-

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Családorvosi Tanszék

Name of subject in Hungarian: Családorvostan
Name of subject in English: Family Medicine
Name of subject in German: Familienmedizin

Credit value of the course: 2
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
20.0	0.0	12.0	8.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKCSA1133_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Torzsa Péter (tanszékvezető)
Course coordinator location of work, telephone availability: 1095 Bp. Üllői út 25. City Corner, 1st floor, TEL.: +3620-9125885
Course coordinator position: professor, Head of Department
Course coordinator Date and number of habilitation: 2020.07.21, 11/2020

Objectives of the course, and its place in the curriculum of the medical training program:

Healthcare is based on the family physicians - primary care in many countries worldwide. General Practitioners are the gatekeepers as practicing a patient-centered, integrating, holistic specialty. Medical students will be given an insight into the ways of approaching complex bio-psycho-social and somatic medical problems, acts of prevention and the differential diagnostics of the most frequent diseases. The aim is to show them through patient cases how and when to apply the basic diagnostic and therapeutic procedures and tools, how to develop and maintain a long-term patient-

doctor relationship, improve communication and motivation skills using minimal interventions.

Format of the course (lectures, group work, practical lessons, etc.):

Family medicine will be introduced on a one-to-one tutoring basis in accredited tutorial practices (with contracted GP tutors in Budapest and its agglomeration). Seminars will take place at lecture halls of our Department or other University facilities.

Competencies acquired through completion of course:

Basics of applying preventive activities and screening methods.

Approach for holistic patient care, managing complex bio-psycho-social-health problems.

Frequent acute and chronic illnesses in primary care.

Introduction to differential diagnostic thinking. Using basic diagnostic tools, assessing and interpreting test results.

Improved skills in communication and working with patients with different personalities, priorities.

Improved skills in physical examination, injections etc.

Patient referral: history taking, medical notes and reports.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine – Propedeutics, Pharmacology II, Laboratory Medicine*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Min. 10 student, maximum is 45 students for one block. Students can participate as of their own block schedule.

Detailed course syllabus (if the course can be divided into modules, please indicate):

(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Seminars - they take place on one day (4x 2 lessons).

Main topics included:

Screening procedures in oncology, levels of prevention.
Cardiovascular prevention, hypertension management.
Diabetes screening and care, Obesity and its management.
Mood- and sleep disorders.
Emergency in the primary care.
Epidemiology and vaccination programs.
Supplementary – integrative medicine.

Leading tutors of the seminars: prof. Torzsa Péter, prof. Kalabay László, prof. Rurik Imre, Becze Ádám, Nemcsik János, Makkos András, Lakó-Futó Zoltán, Perjés Ábel, Vajer Péter, Vörös Krisztián, Xantus Gábor, Zsuffa János of our Department.

Practices - The block consists 2x 6 lessons in the family practice on a one-to-one tutoring basis on two different days of the week, usually 1 morning and 1 afternoon session and consultations with the assigned tutor (case discussion).

The course requirements are:
- participating in the daily healthcare beside the GP tutor
- a detailed case study that introduces a frequent task in primary care and provides an opportunity to discuss the diagnostic and therapeutic ways and possibilities of the following topics for example:

Patient got ‘caught’ in screening activities:
OR
Patient with
– a complex cardiovascular and/or metabolic disease
– a frequent serious communicable disease
– musculoskeletal disease that have a strong impact on her/his life
– (complex) psycho-social problems

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

It’s compulsory for the student to attend 90 percent of the training sessions. It means both 2 days of the practice and all of the seminars, since at least one whole day is free of the block week. Makeup hours must be re-scheduled by the assigned GP tutor, please contact them if needed. Seminars could

be taken with another block if necessary.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During training the tutor evaluates the skills of the student, provide a feedback on attitude and professional knowledge on a 5-scale system in each field: Medical knowledge, Practical abilities, Physical examination, Communication, Motivation.

Number and type of individual assignments to be completed, submission deadlines:

One detailed case report upload on MOODLE site until the next Sunday midnight after the block end.

Requirements for the successful completion of the course:

Tutor’s certificate of taking the required practicals and the upload of the case report that meets the requirements.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Tutor’s assessment of how actively the student has participated in the training (40% of the grade)

Essay in a form of a case study as the practical exam: compiling a 3,000-6,000 character long case study
based on one of the topics given in advance. (60% of the grade):

A relevant study, article from professional literature, or a guideline, a recommendation should be included (e.g. concerning a certain diagnostic problem, a therapy decision, a screening recommendation, a guideline/protocol applied for the specific case).
Composing a case study at least 3000 and maximum 6000 characters **(without spaces)** about an examined patient based on the following topics:
Patient picked through screening, followup plan
Complex cardiovascular/metabolic disease, chronic care
Frequent severe communicable disease
Patient with a musculoskeletal disease that affects the everyday life
A case study displaying a patient with psychosocial problems

Required parts of the case presentation:
1. Anamnesis
2. Current complaints
3. An examination plan
4. Examinations
5. Diagnosis
6. Therapy
7. Further patient care (plan)
8. Processing and assessing the case based on professional literature
9. Bibliography

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Participating the 12 hours in the GP practice certified by the tutor, tutor assessment reaches at least a Grade 2 and the case report essay upload on Moodle before the deadline.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Assessment and grading of the course: essay as a practical exam, grading on a scale 1 to 5.

It's based on the student's activity, participation through the training assessed by the tutor (40 percent) and the grade of the required case study (60 percent).

Grade 1: failing to hand in the essay by deadline, the case study is not an original, but plagiarism

Grade 2: the characters are under 3,000; absence of a required part of the case study, serious but not unacceptable professional mistake

Grade 3: few (2-3) professional or formal mistakes, unsophisticated wording

Grade 4: characters more than 6,000; one not too significant professional mistake

Grade 5: requirements fulfilled, precise and accurate wording in the medical jargon, logical conclusions

Tutor's assessment of how actively the student has participated in the training (40% of the grade)

Essay in a form of a case study -> practical exam: compiling a 3,000-6,000 character long case study based on one of the topics given in advance. (60% of the grade)

None.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

None.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://semmelweis.hu/csot/en/english-program/e-book-download/

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Onkológiai Klinika

Name of subject in Hungarian: Belgyógyászat I. (anyagcsere, endokrinológia, gasztroenterológia, nefrológia)
Name of subject in English: Internal Medicine I (Metabolism, Endocrinology, Gastroenterology, Nephrology)
Name of subject in German: Innere Medizin I (Stoffwechsel, Endokrinologie, Gastroenterologie, Nephrologie)

Credit value of the course: 7
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
7.0	2.0	5.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKBOK784_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Takács István (igazgató)
Course coordinator location of work, telephone availability: Department of Internal Medicine and Oncology, Semmelweis University, Tel: 06-1-459-1500/51520
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2011, 328 (Semmelweis University)

Objectives of the course, and its place in the curriculum of the medical training program:

The primary objective of the course in internal medicine for fourth-year students, who have been acquired the basic skills of physical examination, is the symptom-based and patient-oriented

education of various segments of internal medicine. Internal medicine I comprises endocrinology, metabolic disorders, nephrology and gastroenterology. Students become familiar with the diagnostics and the treatment of the most common disorders of these disciplines.

Format of the course (lectures, group work, practical lessons, etc.):

lectures, case discussions, bedside practices and consultations

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Competencies acquired through completion of course:

Education of internal medicine commences in third year by teaching propedeutics, and finishes in the final year - providing a backbone for medical education. Our major objective throughout this period is the integration of the knowledge provided by preclinical and clinical subjects into our curriculum. By the time of graduation, our students – the future doctors – should have up-to-date theoretical and practical knowledge, as well as an ability to make appropriate interpersonal relationship with patients, relatives and medical personnel that together, provides the basis of independent medical decisions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine – Propedeutics, Pharmacology II, Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun, in six blocks throughout the year.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

During a 5-week block practice, students spend 14 days in the department, through 4 weeks.

Students are assigned into groups (14-15 students / group) for the case discussions that are held in rotation, resulting in fewer students learning about a given topic at a time. Bedside practices are also held in small groups (7-8 students/group). Within the daily schedule, there are lectures for the entire block of students (35-40 students), and case discussion practices in rotation and bedside practices for small groups of students. Every day ends with a consultation.

Exams are held on the fifth, final week.

Schedule:

Schedule:

	Monday	**Tuesday**	**Wednesday**	**Friday**
8:15-9:45	Case discussion	Case discussion	Case discussion	Case discussion
10:00-12:15	Bedside practice	Bedside practice	Bedside practice	Bedside practice
13:15-14:00	Lecture	Lecture	Lecture	Lecture
14:15-15:00	Lecture	Lecture	Lecture	Lecture
15:15-15:45	Consultation	Consultation	Consultation	Consultation

Week #1

	MONDAY	**TUESDAY**	**WEDNESDAY**	**FRIDAY**
8:15-9:45	**8:00-8:20** Introduction **8:30-10:00** S27 Tislér A S210 Folhoffer A S21 Szücs N /Tőke J	S26 Reismann P S211 Hagymási K S23 Tóth M / Tőke J	S29 Pethő Á S110 Hegyi P S24 Horváth Cs	S28 Schnabel K S25 Horváth V S22 Kövesdi A
10:00-12:15	**10:30-12:15** bedside practice	bedside practice	bedside practice	bedside practice
13:15-14:00	D9 Kempler P	N17 Tislér A	G20 Miheller P	E2 Takács I
14:15-15:00	E1 Igaz P	G18 Barkai L	G22 Hritz I	E8 Horváth Cs
15:15-16:00	Consultation	Consultation	Consultation	Consultation

Week #2

	MONDAY	TUESDAY	WEDNESDAY	FRIDAY
8:15-9:45	S21 Szücs N /Tőke S27 Tislér A S210 Folhoffer A	S23 Tóth M / Tőke J S26 Reismann P S211 Hagymási K	S24 Horváth Cs S29 Pethő Á S110 Hegyi P	S22 Kövesdi A S28 Schnabel K S25 Horváth V
10:00-12:15	bedside practice	bedside practice	bedside practice	bedside practice
13:15-14:00	N13 Pethő Á	E3 Lakatos PA	N15 Ledó N	D10 Horváth V
14:15-15:00	D11 Tabák Á	E4 Reismann P	E5 Tóth M	G21 Mihály E
15:15-16:00	Consultation	Consultation	Consultation	Consultation

Week #3

	MONDAY	TUESDAY	WEDNESDAY	FRIDAY
8:15-9:45	S210 Folhoffer A S21 Szücs N /Tőke J S27 Tislér A	S211 Hagymási K S23 Tóth M / Tőke J S26 Reismann P	S110 Hegyi P S24 Horváth Cs S29 Pethő Á	S25 Horváth V S22 Kövesdi A S28 Schnabel K
10:00-12:15	bedside practice	bedside practice	bedside practice	bedside practice
13:15-14:00	E6 Igaz P	G23 Hagymási K	G19 Székely H	N14 Studinger P
14:15-15:00	G24 Hegyi P	E7 Tőke J	N16 Cseprekál O / Wagner L	D12 Barna I
15:15-16:00	Consultation	Consultation	Consultation	Consultation

Week #4

	MONDAY	TUESDAY	WEDNESDAY	FRIDAY
8:15-9:00	S17 Pethő Á S15 Studinger P S11 Bakos B /Szili B	S19 Ledó N S212 Gellért B S12 Tóth M	RETAKE (optional)	RETAKE (optional)
9:15-10:00	S11 Bakos B /Szili B S17 Pethő Á S15 Studinger P	S12 Tóth M S19 Ledó N S212 Gellért B		
10:15-11:00	S15 Studinger P S11 Bakos B /Szili B S17 Pethő Á	S212 Gellért B S12 Tóth M S19 Ledó N	RETAKE (optional)	RETAKE (optional)

12:15-13:00	S16 Kollár R S111 Horváth M / Barkai L S13 Mészáros Sz	S18 Studinger P S112 Mihály E S14 Reismann P / Sumánszki Cs	RETAKE (optional)	RETAKE (optional)
13:15-14:00	S13 Mészáros Sz S16 Kollár R S111 Horváth M / Barkai L	S14 Reismann P / Sumánszki Cs S18 Studinger P S112 Mihály E	RETAKE (optional)	RETAKE (optional)
14:15-15:00	S111 Horváth M / Barkai L S13 Mészáros Sz S16 Kollár R	S112 Mihály E S14 Reismann P / Sumánszki Cs S18 Studinger P	RETAKE (optional)	RETAKE (optional)
15:15-16:00	Consultation	Consultation		

Week #5

	MONDAY	**TUESDAY- FRIDAY**
		oral exam (9:00-13:30)
08:00-09:00	written exam	

Endocrinology and metabolic diseases

Lectures:

1. E1 Introduction to endocrinology. Diseases of the hypothalamus. (Igaz P)

2. E2 Thyroid disorders – symptoms, diagnosis and treatment. (Takács I)

3. E3 Thyroid nodules and cancer. (Lakatos PA)

4. E4 Secondary endocrine hypertension (primary aldosteronism, pheochromocytoma). (Reismann P)

5. E5 Glucocorticoid deficiency and overproduction: Addison’s disease and Cushing’s syndrome, iatrogenic Cushing’s syndrome. (Tóth M)

6. E6 Diseases of the pituitary. (Igaz P)

7. E7 Disorders of the gonads. (Tőke J)

8. E8 Disorders of calcium metabolism. (Horváth Cs)

9. D9 Introduction to diabetology. Causes and diagnosis of blood glucose disorders. (Kempler P)

10. D10 Glucose control in diseases of carbohydrate metabolism. (Tabák Á)

11. D11 Managing diabetic patients and their complications. (Horváth V)

12. D12 Obesity, management and treatment of patients with lipid metabolism disorders. (Barna I)

Case discussions:

1. S21 Diagnosis, treatment and follow-up of patients with pituitary adenoma and hypopituitarism. (90’ Szücs N / Tőke J)

2. S22 What to do in case of altered TSH, examination of thyroid disorders. (90’ Kövesdi A)

3. S23 Examination of cortisol overproduction and deficiency, follow-up and management of patients with Cushing’s syndrome and adrenocortical insufficiency (90’ Tóth M / Tőke J)

4. S24 Diagnosis and treatment of osteoporosis. (90’ Horváth Cs)

5. S25 Managing diabetes mellitus – diet and treatment. (90’ Horváth V)

6. S26 Purine, iron, copper and other rare metabolism disturbances. (90’ Reismann P)

7. S11 Thyroid nodules, examination of thyroid cancer, radioiodine treatment. (45’ Szili B / Bakos B)

8. S12 Options of neuroendocrine tumour treatment, endocrine paraneoplastic syndromes. (45’ Lakatos P.)

9. S13 Examination and treatment of hyper- and hypocalcaemia (45’ Mészáros Sz)

10. S14 Thyroid ultrasound (45’ Sumánszki Cs / Reismann P / Bakos B)

11. S15 Differential diagnosis of polyuria and polydpsia (45’ Studinger P)

12. S16 Obese patient, metabolic syndrome, when to treat elevated cholesterol. (45’ Kollár R)

Nephrology

Lectures:

1. N13 Glomerular diseases. (Pethő Á)

2. N14 Tubulointerstitial and cystic kidney diseases. (Studinger P)

3. N15 Electrolyte disorders. (Ledó N)

4. N16 Renal transplantation. (Wagner L)

5. N17 Introduction to nephrology. Differential diagnostics of renal diseases. (Tislér A)

Case discussions:

1. S27 A young female patient with acute kidney injury and liver dysfunction. (90’ Tislér A)

2. S28 Approach to a patient with glomerulonephritis. (90’ Schnabel K)

3. S29 Dialysis treatment. (90’ Pethő Á)

4. S17 Management of a patient with chronic kidney disease. (45’ Pethő Á)

5. S18 Vascular disorders of the kidneys, kidney stones and urinary tract infection. (45’ Studinger P)

6. S19 Hematuria and proteinuria during pregnancy. (45’ Ledó N)

Gastroenterology

Lectures:

1. G18 Introduction to gastroenterology (Barkai L)

2. G19 Disorders of the esophagus and the stomach. Disorders of the small bowel, malabsorption and maldigestion. (Horváth M / Barkai L)

3. G20 Inflammatory bowel diseases. (Miheller P)

4. G21 Diseases of the large bowel. Functional GI disorders. (Mihály E)

5. G22 Gastrointestinal bleeding. (Hritz I)

6. G23 Management of a patient with acute liver failure. (Hagymási K)

7. G24 Disorders of the pancreas. (Hegyi P)

Case discussions:

1. S110 Management of a patient with a pancreatic disease. (90’ Erőss B)

2. S211 Approach to a patient with acute abdominal pain. (90’ Hagymási K)

3. S210 Approach to a patient with an abnormal liver function test. (90’ Folhoffer A)

4. S212 Differential diagnosis and management of obstructive jaundice. (45’ Patai Á)

5. S111 Approach to a patient with swallowing difficulty. (45’ Gellért B)

6. S112 Celiac disease. Differential diagnosis of diarrhea (45’ Mihály E)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 90% of all sessions. This is evaluated through QR codes on lectures and attendance sheets signed by tutors on case discussions and bedside practices.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the course coordinator (Studinger.peter@semmelweis.hu), with the permission of the course director. Retake is also feasible for 2 weeks in July, after exam week of the last block.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Personal discussion of topics covered throughout the day during afternoon consultations

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Number and type of individual assignments to be completed, submission deadlines:

Not applicable

Requirements for the successful completion of the course:

Participation on at least 90% of all sessions. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

On the first day of the exam week, students take a 60-min written exam which is comprised of 12-15

open-ended questions. The written exam provides 50 points: 20 points from endocrinology and metabolic disorders, 15 points from nephrology and 15 points from gastroenterology.

After the written exam, during the following days, a bedside, patient-oriented oral exam is taken. Oral exam is comprised of physical examination of a patient, interpretation of physical findings and discussion of diagnostic and therapeutic approach to the patient's endocrine / metabolic / renal / gastroenterological medical condition.

There is not any topic list for the written or the oral part of the exam. A sample written exam is provided to students on Moodle to help preparation.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Complete physical examination of a patient (general assessment + respiratory / cardiovascular / gastrointestinal system): presentation of techniques, description and interpretation of findings. Ability to instruct patients in Hungarian during physical examination.

Recognition, differential diagnosis and management of acute, life-threatening conditions in the fields of endocrinology, metabolic disorders, nephrology and gastroenterology.

Diagnosis, differential diagnosis and management of common chronic disorders in the fields of endocrinology, metabolic disorders, nephrology and gastroenterology. (Diseases covered by lectures and case discussions).

https://semmelweis.hu/belonko/en/education/internal-medicine-i-endocrinology-nephrology-and-gastroenterology/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Written and oral exams provide 50-50 points, respectively. Score-to grade conversion is as follows:

90-100: excellent (5), 80-89: good (4), 70-79: average (3), 60-69 pass (2), <60 fail (1).

In case a student's written score is < 10 points, the oral exam can provide maximum 60 points.

There is not any possibility of an offered grade. Retake of any (written or oral) part of the exam is feasible on the exam week of any subsequent block or on the extracurricular exam week (late August).
In case of a failed exam, the student can decide whether to retake the written part, the oral part or both parts of the complex exam.
Rules of exam grading and exam retake are concordant with the current version Study and Examination Regulations of Semmelweis University.
(https://semmelweis.hu/jogigfoig/dokumentumtar/szabalyzattar/szervezeti-es-mukodesi-szabalyzat/iii-konyv-hkr/iii-konyv-hallgatoi-kovetelmenyrendszer-iii-2-resz-tanulmanyi-es-vizsgaszabalyzat-es-mellekletei/).

Written and oral exams provide 50-50 points, respectively. Score-to grade conversion is as follows:

90-100: excellent (5), 80-89: good (4), 70-79: average (3), 60-69 pass (2), <60 fail (1).

In case a student's written score is < 10 points, the oral exam can provide maximum 60 points.

There is not any possibility of an offered grade. Retake of any (written or oral) part of the exam is feasible on the exam week of any subsequent block or on the extracurricular exam week (late August).

In case of a failed exam, the student can decide whether to retake the written part, the oral part or both parts of the complex exam.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Not applicable

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Internal Medicine I.
Link	Moodle
Other/Comment	ed. István Takács

Printed resources:

Type	Recommended
Author	Lynn S. Bickley
Title	Bates' Guide to Physical Examination and History Taking. 12th Ed
Publisher	Wolters Kluwer
Year of publication	2016

Type	Recommended
Author	Feather – Randall – Waterhouse
Title	Kumar and Clark's Clinical Medicine
Publisher	Elsevier
Year of publication	2020

Type	Recommended
Author	Jameson – Fauci – Kasper – Hauser – Longo – Loscalzo

Title	Harrison’s Principles of Internal Medicine
Publisher	McGraw-Hill Education
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Laboratóriumi Medicina Intézet

Name of subject in Hungarian: Laboratóriumi medicina
Name of subject in English: Laboratory Medicine
Name of subject in German: Labormedizin

Credit value of the course: 3
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.5	1.5	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKLMI709_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Vásárhelyi Barna
Course coordinator location of work, telephone availability: Laboratóriumi Medicina Intézet, 06-1-361-459/62098
Course coordinator position: professor
Course coordinator Date and number of habilitation: 010. március 22. száma: 29/2010

Objectives of the course, and its place in the curriculum of the medical training program:

The Laboratory Medicine curriculum is based on knowledge acquired during studies of Pathophysiology obtained during the third year. The major goal is to present some approach and diagnostic algorithms that are required for efficient test ordering and evaluation of lab test results. As part of education the students obtain information regarding:

· the procedure that generates laboratory test results (from test ordering to laboratory reports)

· laboratory tests needed to establish a diagnosis

· the major aspects that the medical doctors should take into account when they evaluate a laboratory report

· novel techniques used in general laboratory (with their drawbacks and benefits).

Beyond the basic knowledge integrated into the internal medicine training, real diagnostic problems through life examples are discussed during the practices.

Format of the course (lectures, group work, practical lessons, etc.):

Lectuer, group work and seminars

Competencies acquired through completion of course:

Our goal is to provide students with the ability to set up cost-effective diagnostic algorithms and evaluate their results with the theoretical and practical knowledge of advanced diagnostic tools.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Pathology II, Translational Medicine and Pathophysiology II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

It is possible by prior arrangement if the students meet the admission criterias

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The number of students required to start the course (minimum, maximum), method of selecting participants:

1/5 – 1/4 of the Neptun registered students

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of

CV is required in all cases!)

Monday

8.00-10.30 Exercise*:* Multiplex diagnosis of a patient with metabolic disease.

11.00-12.30 Exercise: Laboratory diagnostics of patients with endocrine disorders.

12.30-13.30 Lunch break

13.30-15.00 Exercise: Patient, not patient - screening tests., Hypertensive patient., Obez patient.

15.30-16.30 Exercise: Diagnostic possibilities of an autoimmune patient.

Instructors: (Dr. Tünde Kriston, Dr. Miklós Molnár)

Tuesday:

08.00-10.30 Exercise: Diagnosis of a patient with fever. Diagnostic algorithm of a patient with joint complaints

11.00-12.30 Exercise: Fluid, ionic balance disorders. Acid-base imbalance.

12.30-13.30 Lunch break

13.30-15.00 Exercise: Diagnostic algorithm of an alcoholic patient. Kidney disorders.

12.30-14.00 Exercise: Anemic patient. Hemophilic patient.

(Dr. Tünde Kriston, Dr. Miklós Molnár)

Wednesday:

10.00-13.30 Exercise: „How the clinical laboratory works" - Central Laboratory (Korányi Building)

Lectures in "blended learning" system via online (https://itc.semmelweis.hu/moodle) with personal consultation possibilities.

Lecture topics:

1. Introduction, preanalytics (Dr. Barna Vásárhelyi)

2. Postanalytics (Dr. Barna Vásárhelyi)

3. Pre-analytics (Dr. Barna Vásárhelyi)

4. Bedside testing (POCT) and urinalysis (Dr. Barna Vásárhelyi)

5. Laboratory examination of inflammation (Dr. Barna Vásárhelyi)

6. Laboratory examination of the central nervous system (CSF) (Dr. Barna Vásárhelyi)

7. Metabolic diseases 1: Laboratory aspects of diabetes (Dr. Barna Vásárhelyi)

8 Metabolic diseases 2: Laboratory investigation of lipid and purine metabolism (Dr. Barna Vásárhelyi)

9. Blood count elements - blood grouping (Dr. Adrienne Fehér)

10. Haemostasis testing - Anticoagulant monitoring (Dr. Adrienne Fehér)

11. Drug level monitoring in clinical laboratory practice (Dr. Karvaly Gellért Balázs)

12. Immunological tests I. Hypersensitivity reactions, allergy tests (Dr. Zsófia Szabó)

13. Immunological tests II. autoimmune diseases and immunodeficiency tests (Dr. Zsófia Szabó)

14. Diagnostics of SARS-COV-2 at Semmelweis University (Dr. Barna Vásárhelyi)

Thursday: Break

Friday

10.00-13.30 Exercise: „How the clinical laboratory works" - Central Laboratory (Korányi Building)

11.30-12.30 Lunch break

12.30-14.00 Exercise: Practical exam

14.30-16.00 Exercise: Practical exam

Examiners: (Dr. Tünde Kriston, Dr. Miklós Molnár)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with study and examination rules, participation is compulsory in 90% of the classes. There will be make-up classes twice during the block week via the University Zoom.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

We compile blended-learning materials for all theoretical and practical topics, which students can

study in their spare time and answer the related test questions within the Moodle system. The system keeps track of their results and if they perform above 82%, we offer them the exam mark [82-89.9% - 4 (good), 92-100% - 5 (excellent)]. Students participating in the course must complete online theoretical preparation using the aforementioned e-learning materials, the completion of which is confirmed by the successful completion of the tests in the curriculum.

Number and type of individual assignments to be completed, submission deadlines:

3 case studies per student for the first session of the block.

Requirements for the successful completion of the course:

Completing online tests and attendance at practices.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

There will be a test exam, online MCQ test, and oral exam from the practical subjects.

Theoretical part: (MCQ test)

Theoretical topic list:

1. Significance of laboratory tests. Importance of the preanalytical preparation. Analytical phase in the laboratory, major measurement techniques, their advantages and limitations. Post-analytical phase: criteria for validating results.
2. Quick testing options; POCT in General Practice.
3. Metabolic disorders and their diagnosis
4. Laboratory examination of gastrointestinal and liver disorders
5. Investigation of the abnormal functioning of the endocrine system
6. Possibilities of testing for autoimmune diseases
7. Therapeutic drug monitoring, tumor markers
8. Possibilities of testing kidney function.
9. Laboratory characterization of electrolyte balance and hydration status
10. Significance of blood gas analysis
11. Hematological testing options (flow cytometry)
12. Evaluation of hemostasis
13. Examination of normal and abnormal laboratory parameters and infections of special patient groups
14. The role of clinical microbiology in infection control, antimicrobial stewardship.

Practical exam: (oral, discussion of selected case studies, discussed during the practices)

Topics for the practices:

1. Hypertensive patient: Laboratory examination of cardiovascular risk factors. Laboratory evaluation of cardiac markers and circulatory insufficiency / myocardial infarction, endocarditis

2. Obese patient: Laboratory tests of lipid metabolism and carbohydrate metabolism.

3. Diarrhea patient: Diagnosis of gastrointestinal disorders

4. Alcoholic patient: Laboratory examination of liver dysfunction and infections

5. Diabetic patient: Possibilities of studying carbohydrate metabolism. Possibilities of diagnosis and follow-up of therapy.

6. Endocrine patient: Examination of the abnormal functioning of the endocrine system: hypothalamus, pituitary, gonads, thyroid, adrenal gland and cortex. Investigation of calcium phosphate metabolism disorders and diseases of the skeletal system; Connective tissue diseases and their diagnosis

7. Patient with joints complaint: Laboratory examination of the immune system (tumor markers, autoimmune diseases, infectious serological tests)

8. Kidney disease: Diagnosis of acute and chronic kidney diseases, urogenital infections

9. Critically sick patient 1.: Fluid, ion homeostasis disorders, shock

10. Critically sick patient 2.: Disorders of acid-base balance, respiratory failure

11. “Sick or not?” screening tests

12. Patient with anemia: Diseases affecting red blood cell, white blood cell and platelet formation

13. Patients with hemostatic abnormality: Tests of hemostasis.

14. Febrile patient: Laboratory diagnosis of sepsis and diseases affecting the central nervous system.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The learning outcomes can be categorized into three main competency groups: (1) knowledge – understanding the biochemical and pathophysiological background of the most important laboratory parameters and tests; (2) skills – the ability to develop independent diagnostic algorithms and interpret test results; (3) attitude – ordering “necessary but sufficient” laboratory tests and applying

the principles of evidence-based medicine

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Laboratory Medicine mark consists of two parts: 1. the theoretical MCQ test and 2. the practical mark. The average of these is what determines the grade for the colloquium. In doubtful cases, the tutor determines the final grade based on your knowledge.

The practical mark offered will be the average of the marks obtained for the presentations, the answers to the questions and tests for the cases, and the MCQ test written from the material for the exercises. If any practical section is unsatisfactory, the practicals will not be accepted.

By averaging the result of the theoretical written test and the result of the practical oral exam. During the oral examination, the teacher finalizes the grade.

Retake and correction are only possible orally.

Based on the completion of the e-learning material of the theoretical and practical materials, students can receive offered exam marks [82-91.4% good (4) and 92-100% excellent (5)].

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We primarily use AI to develop skills in interpreting laboratory findings and results. Machine learning can accurately interpret laboratory data and identify abnormal values. AI can be used to assess students' interpretation skills by developing specific algorithms that incorporate extensive test data on typical and atypical clinical presentations. By using AI to process cases found in the medical literature, we generate cases and discuss them with the students.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://semmelweis.hu/laboratorium/oktatas

Printed resources:

Type	Recommended
Author	Richard A. McPherson, Matthew R. Pincus
Title	Henry's Clinical Diagnosis and Management by Laboratory Methods 24th Edition
Publisher	Elsevier
Year of publication	2021

Type	Recommended
Author	Nader Rifa, Rossa WK., Ian Young, Carey-Ann D. Durnham and Carl T. Wittwer
Title	Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 9th ed.
Publisher	Elsevier - Health Sciences Division
Year of publication	2023

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Orvosi Képalkotó Klinika

Name of subject in Hungarian: Orvosi Képalkotás
Name of subject in English: Medical Imaging
Name of subject in German: Medizinische Bildgebung

Credit value of the course: 3
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
42.0	14.0	28.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKOKA750_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Prof. Dr. Maurovich Horvat Pál
Course coordinator location of work, telephone availability: SE Orvosi Képalkotó Klinika, tel.: 459-1500/61626 /61628
Course coordinator position: professor, chairman
Course coordinator Date and number of habilitation: 06/2020 Semmelweis Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the course is to: 1) introduce the role of medical imaging and interventional radiology in clinical practice, diagnostics and treatment of diseases; 2) teach the technical basis and clinical applications of the the different radiological modalities, 3) the delineation of the advantages and disadvantages of each modalities; 4) introduce the radiological appearance of most important and clinically relevant pathologies; 5) learn the professional teminology of imaging procedures; 6)

discuss the preliminary preparation and scheduling of diagnostic imaging for the patients; 7) introduce the radiological algorithms of the most frequent clinical symptoms and pathological conditions; 8) demonstrate the role of imaging examination in the patient care process and the importance of consultatons between clinician and radiologist

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Format of the course (lectures, group work, practical lessons, etc.):

lecture, practical lesson

Competencies acquired through completion of course:

Knowledge of the basics of medical imaging is now an essential part of almost every clinical profession. The most important goal is to equip the students with competencies to choose the adequate imaging modalities and procedures for the patients and to properly interpret imaging diagnoses. This requires basic understanding and knowledge of radiological methodology, rediological terminology, the role of radiology in the patient care, the role of the referring physician and also the most important radiological diagnoses.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Medical Biophysics II , Translational Medicine and Pathophysiology II., Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum number of students is 24 for each block.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

WEEK 1	1st day	2nd day	3rd day	4th day

morning	Introduction to Medical Imaging (2 hrs) Dr. Lénárd Zsuzsanna	Skill Ultrasonography I. (2 hrs)	Musculoskeletal Imaging (2 hrs) Dr. Gulácsi György, Dr. Marton Nikolett	Nuclear Medicine practice (2 hr)
	Basics of MRI (2 hrs) Dr. Békésy-Szabó Ádám	Skill Ultrasonography II. (2 hrs)	Emergency Radiology: Abdomen (1 hr) Dr. Dudás Ibolyka	MRI practice (2 hrs)
afternoon	Basics of Chest X-Ray (2 hrs) Dr. Tárnoki Dávid László	Nuklear Medicine case reviews (2 hrs) Dr. Györke Tamás	Emergency Radiology: Chest (1 hrs) Dr. Tárnoki Ádám Domonkos	Uroradiology (1 hr) Dr. Lénárd Zsuzsanna, Dr. Kecskés Kinga
	CT/MR anatomy (1 hrs) Dr. Beke Sámuel, Dr. Csákai-Szőke Péter	Hepatobiliary radiology (1 hr) Dr. Dudás Ibolyka	Emergency Neuroradiology Dr. Bíró István, Dr. Magyar Máté	Head and Neck Imaging (1 hr) Dr. Kiss Gergely
WEEK 2				
morning	X-Ray Practice (2 hrs)	Artificial Intelligence in Medical Imaging (1 hr) Prof. Dr. Maurovich Horvat Pál	test exam	oral exam
	CT Practice (2 hr)	Radiology Image Analysis (2 hrs) Dr. Bérczi Viktor, Dr. Lénárd Zsuzsanna, Dr. Kaposi-Novák Pál	oral exam	oral exam
afternoon	Basics of Breast Imaging (1 hr) Dr. Juharosi Gyöngyi, Dr. Zsuppán Richárd, Dr. Tóth Mónika, Dr. Kára-Cséplő Andrea	Consultation (1 hr) Dr. Kiss Gergely		
	Basics of Interventional Radiology (1 hr) Dr. Bérczi Viktor			

Instructors involved in practical education / examination:

Dr. Békésy-Szabó Ádám, Dr. Bérczi Viktor, Dr. Dudás Ibolyka, Dr. Gulácsi György, Dr. Gyebnár János, Dr. Györke Tamás, Dr. Hegedűs Péter, Dr. Juharosi Gyöngyi, Dr. Kalina Ildikó, Dr. Kaposi Novák Pál, Dr. Kecskés Kinga, Dr. Kiss Gergely,, Dr. Lénárd Zsuzsanna, Dr. Magyar Máté, Dr. Marton Nikolett, Dr. Maurovich Horvat Pál, Dr. Rónaszéki Aladár, Dr. Tárnoki Ádám Domonkos, Dr. Tárnoki Dávid László, dr. Vértes Miklós

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the current TVSZ regulations. Our educational-research unit provides sufficient opportunity for the make up on Thursdays and on-call times overnight. Making up absences is also possible in another block, if there is vacancy.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

We increase student interactivity with case discussions and related Kahoot and Slido assignments during the practices. Students can actively participate in examinations during skill ultrasonography practices. Practice tests are also available on Medical imaging Centre's Moodle site.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

According to the current TVSZ regulations. Attendance is registered on Neptun and on a Drive Excel sheet shared with the tutors.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Exam teaching material:

Lecture handouts, practice teaching materials and exam images, all available on Medical Imaging Centre's Moodle platform.

Topics:

1. Basics of conventional x-ray examinations (x-ray image, fluoroscopy). Advantages, disadvantages, clinical significance.

2. Basics of ultrasound (US). Advantages, disadvantages, clinical significance.

3. Basics of computer tomography (CT). Advantages, disadvantages, clinical significance.

4. Basics of magnetic resonance imaging (MRI). Advantages, disadvantages, clinical significance.

5. Basics of isotope diagnostics and hybrid imaging (PET/CT, PET/MRI). Advantages, disadvantages, clinical significance.

6. Vascular radiology

7. Uroradiology

8. Contrast materials in radiology, physical background, types, applications and adverse reactions.

9. Interpretation of Chest X-ray.

10. Radiological diagnostics of thoracic emergencies.

11. Radiological diagnostics of abdominal and pelvic emergencies.

12. Radiological diagnostics of neurological emergencies.

13. Basics of head and neck imaging

14. Basics of musculoskeletal imaging.

15. Basics of complex breast diagnostics.

16. Role of the referring physician, preexam preparation of the patient, execution of the examinations

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

radiology terminology

indications of iimaging studies

advantages and disadvantages of iimaging studies

chest and abdominal x-ray analysis

CT/MR anatomy

negative effects and contraindications of contrast agents

emergency radiological studies

FAST/eFAST ultrasonography

basic interpretation of CT, MRI and Nuclear Medicine images

role of the referring physician for imaging studies

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Medical Imaging exam is a complex exam consisting two parts: written and image-based oral exam. As the first part of the exam, students take a 30-min written exam, which is comprised of 30 questions for maximum of 30 points. After the written exam, an image-based, case-oriented oral exam is taken for maximum of 30 points.

*Written and oral exams provide 30-30 points, respectively, altogether maximum of 60 points.*Score-to grade conversion is as follows: 54-60: excellent (5), 48-53: good (4), 42-47: average (3), 36-41 pass (2), <36 fail (1).

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	http://oftankonyv.reak.bme.hu/tiki-index.php

Printed resources:

Type	Recommended
Author	Richard B. Gundermann
Title	Essential Radiology
Publisher	Thieme
Year of publication	2014

Type	Recommended
Author	W. Herring

Title	Learning Radiology
Publisher	Elsevier
Year of publication	2019

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szemészeti Klinika

Name of subject in Hungarian: Szemészet
Name of subject in English: Ophthalmology
Name of subject in German: Augenheilkunde

Credit value of the course: 4
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
56.0	24.0	20.0	12.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSZE1207_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Nagy Zoltán Zsolt (igazgató)
Course coordinator location of work, telephone availability: Department of Ophthalmology (H-1085 Budapest, Mária str. 39.), Tel.: +36-1/303-9435, +36-1/267-4951
Course coordinator position: director
Course coordinator Date and number of habilitation: 28/05/2003, 207/2003.

Objectives of the course, and its place in the curriculum of the medical training program:

Aims: The student should acquire the theoretical and practical knowledge that a non-ophthalmologist needs to recognize i.e. serious eye diseases that threaten with blindness. Should know prevention, screening and first aid of eye diseases. Should know appropriate knowledge of symptomatology of eye diseases those require specialized ophthalmologic treatment.

Place: The pathology, pathophysiology, symptomatology of ophthalmic diseases are not taught in any

other subjects. The language of ophthalmology, the diagnostic and therapeutic methods require special approach and knowledge. The ophthalmology associates with several subjects, eg recognition of ophthalmic problems of a patient with internal, neurological, otorhinolaryngological, stomatological, or dermatological etc diseases

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Format of the course (lectures, group work, practical lessons, etc.):

Small group, shadowing practical sessions, seminars, online case reports, online lectures.

Competencies acquired through completion of course:

Competencies gained upon the successful completion of the subject:

Competence assessment

1. Red eye: distinguishing serious, vision-threatening conditions from problems that can be managed by a general practitioner
2. Differentiation of conjunctivitis and keratitis
3. Differentiation of conjunctivitis and acute iritis
4. Recognition of conjunctival, corneal foreign body, corneal erosion
5. Recognition of cellulitis orbitae, knowledge of therapeutic approach
6. Signs of acute glaucoma, therapy
7. Causes of sudden visual loss, tasks after recognition
8. Causes of progressive deterioration of visual acuity
9. Recognition of visual field defect, knowledge of therapeutic approach
10. Recognition of amblyopia, strabismus
11. Possible causes of leucocoria
12. Acute treatment of lagophthalmos
13. Palsy of nerves responsible for eye movement, management
14. Clinical manifestation of papilledema, diagnosis and therapy
15. Aim and frequency of ophthalmic screening for diabetes mellitus
16. Management of penetrating/blunt eye injury
17. First aid for chemical injury of the eye

Competence in practice

1. Evaluation of near and far visual acuity
2. Confrontal examination of visual field
3. Examination of eye movement in 6 main directions
4. Examination of ocular alignment. Screening for amblyopia and strabismus in early childhood
5. Examination of pupillary reactions and size
6. Examination of anterior segment with pupillary and slit lamp
7. Appraisal of eye tension by touching
8. Eversion of upper eyelid
9. Removal of conjunctival foreign body
10. Red reflex, direct fundoscopy of optic nerve head, retinal vessels
11. Usage of eye drops, bandage
12. Optical coherence tomography: recognition of a problem
13. Retinal angiographies: indications, side effects

14. Modern diagnostic approaches of anterior segment
15. Ophthalmic ultrasonography

Practical knowledge: Recognition of ophthalmic problems:
1. Visual deterioration
2. Differential diagnosis of red eye (conjunctivitis, keratitis, anterior uveitis, acute glaucoma)
3. Papilledema
4. Visual field defect
5. Acute palsy of nerves III., IV. and VI.
6. Leucocoria
7. Recognition of amblyopia and strabismus in early childhood
8. Protrusion

Treatment alone
1. Conjunctivitis (viral, bacterial, allergic)

First aid
1. Chemical injury
2. Conjunctival foreign body
3. Acute glaucoma

Knowledge of indication for acute ophthalmic consultation
1. Non-traumatic sudden vision loss, visual field defect
2. Chemical injury
3. Acute angle closure glaucoma
4. Mechanical injuries
5. Corneal ulceration
6. Corneal foreign body
7. Acute (possibly within a few days/weeks) protrusio/dislocatio bulbi, reduced mobility, consequent double vision, vision-threatening orbital processes: postseptal cellulitis, spontaneous/traumatic haematoma, rapidly progressive tumours in children and adults; accompanying symptoms may include: inflammatory symptoms, pain, nausea, vomiting, fever (typical pathologies: in childhood: cellulitis, haematoma, rhabdomyosarcoma; in adulthood: spontaneous orbital haematoma, abscess, primary malignant tumours, intraorbital metastasis, endocrine orbitopathy causing optic compression)

I**ndication of regular ophthalmic screening, related areas**
1. Diabetes mellitus
2. Glaucoma
3. Vision screening for amblyopia in childhood
4. Interdisciplinary issues: endocrinology, autoimmune diseases, oral surgery, otorhynolaryngology, neurology

Knowledge of modern diagnostic and therapeutic tools for ophthalmology
1. Diagnostic tools: automatic refractometer, measurement of eye tension, optical coherence tomography, ultrasonography, angiography, corneal topography, endothel microscope, cornea and anterior segment cameras, electrophysiological methods, colour tests, examination of visual field
2. Therapeutic possibilities: laser treatment in anterior or posterior segments, essence of modern

microsurgical procedures, eyedrop families: action and side effect

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine – Propedeutics

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

The first 24 students registered in NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Ophthalmology is taught in a 3-week-block system, with the aim of facilitating the transfer of theoretical and practical knowledge in the first two weeks, followed by a final exam.

I. Practical training:

32 lessons (12 lessons: seminars, 16 lessons: practice, 4 lessons online case reports)

Seminars (6x 90 min)

1. anatomy, medical history, visual acuity
2. red eye
3. refractive surgery, cataract, glaucoma
4. sudden visual impairment, retina, eye trauma
5. neuroophthalmology, oncology
6. binocular vision, pediatric ophthalmology

The maximum number of students in a group is four. During the block, the group is assigned to a teacher. The schedule of the block is determined by the teacher (instructor) in accordance with the patient's care obligations.

Attendance in practical training: one group/one teacher. The schedule for the educational programme is determined by the instructor in accordance with their own work schedule.

1. Day 1: 2 x 60 minutes of basic knowledge

Introduction to the Department, in vivo anatomy, anamnesis, vision examination (automatic refraction, colour vision, contrast sensitivity), confrontal examination of visual field, examination of anterior segment, examination of pupillary reactions, assessment of intraocular pressure by palpation, eversion of upper eyelid

2. Day 1-7.: Patient presentation: 9x60 min
3. Pre-exam consultation: 1x60 min
4. +1x60 min make-up practice: in consultation with the teacher

Theoretical education: 24 lessons; online course materials via MOODLE interface

Checklist for students: What I should see during the practical sessions:

A: I need to learn simple manual methods (this will be tested in the practical exam)

1. Assessment of visual acuity
2. Estimating intraocular pressure with palpation
3. Opening the eyes manually
4. Examination of eye movements in the six cardinal directions
5. Cover test, recognising strabismus and ambylopia
6. Confrontal visual field testing, eyelid eversion
7. Pupil reactions
8. Examination of the anterior segment with pupil lamp
9. Examination of the red reflex using direct ophthalmoscope
10. Fundus examination using direct ophthalmoscope
11. Schirmer test and break up time
12. Usage of eye drops
13. Bandage

B: Instrumental tests

I would like to be as informed as possible about traditional and new ophthalmic diagnostic and therapeutic procedures.

1. automatic refractometer
2. slit lamp
3. Lang test
4. Hertel exophthalmometer
5. colour vision (Ishihara, Farnworth),
6. contrast sensitivity
7. Schirmer test, tear film break-up time
8. fluorescein corneal staining
9. critical fusion frequency (CFF)
10. IOP measurement with applanation
11. Goldman and automated perimetry
12. anterior segment testing
13. ophthalmic ultrasonography
14. optical coherence tomography
15. invasive angiographies
16. electrophysiological tests
17. intravitreal injection

18. visiting the operating theatre

Net-based practical knowledge: we present 3-5 minute case reports analyzing practical problems related to a specified topic electronically (goes from recording and in pdf)

Topics

1. Pain (pain in the eye, orbital pain, headache) Visual disturbances (loss, visual field defect): cases
2. Non-traumatic visual impairment/vision loss, temporary vision loss: cases
3. Red eye (cases)
4. Anterior segment, accessory structures: cases
5. “Orbita” patients
6. Incomitant or comitant strabismus, diplopia, nystagmus; cranial nerve palsies, ophthalmic aspects of diseases of the autonomic nervous system, eye movement disorders; non-paralytic causes of incomitant strabismus: cases
7. Glaucoma: diagnosis and detection of progression: cases
8. Cataract, ophthalmic oncology: cases
9. Diabetes mellitus, macular degeneration: cases
10. “Papillary" cases
11. Trauma cases
12. Pediatric eye problems, strabismus, amblyopia: examination methods, cases

Special Lab (extra work)

operating theatre for inpatient or outpatient departments
OCT-angiography
electrophysiology

II. Theoretical education

Net-based lectures on the Moodle interface

ANATOMY, VISION
Barcsay György: Visual rehabilitation
Ecsedy Mónika: Anatomy of the eyeball
Csákány Béla: Functional anatomy, ultrasound
Kiss Huba: Anamnezis status
Récsán Zsuzsanna: Pharmacology in Ophthalmology
Szentmáry Nóra: Pharmacology in ophthalmology antimicrobial treatment
Szamosi Anna: Refractive errors
Knézy Krisztina: Accommodation
Tapasztó Beáta: Contact lens
Nagy Zoltán Zsolt: Refraktive surgery of cornea
Nagy Zoltán Zsolt: Ocular diagnostics

RED EYE, ANTERIOR SEGMENT
Nagy Zoltán Zsolt: Red eye
Szamosi Anna: Conjunctivitis
Kerényi Ágnes: Scleritis
Géhl Zsuzsanna: Uveitis classification, anterior uveitis
Szepessy Zsuzsanna: Uveitis
Kiss Huba: Keratitis
Nagy Zoltán Zsolt: Bacterial keratitis
Füst Ágnes: Fungal keratitis
Szentmáry Nóra: Herpes keratitis
Nagy Zoltán Zsolt: Acanthamoeba keratitis
Szentmáry Nóra: Corneal surgeries
Kiss Huba: Dry eye disease
Nagy Zoltán Zsolt: Keratoconus
Szentmáry Nóra: Corneal degenerations, dystrophies
Füst Ágnes: Autoimmun eye diseases
Fodor Eszter: Orbital cellulitis
Kovács Illés: Endophthalmitis

EPIDEMIOLOGY, EYELIDS, PUPIL, CATARACT, GLAUCOMA, OPTIC NERVE
Knézy Krisztina: Pupillary reactions
Németh János: Causes of blindness
Lukáts Olga: Eyelid diseases
Szalai Irén: Diseases of lacrimal pathway
Holló Gábor: Glaucoma I.
Bausz Mária: Glaucoma surgery
Kóthy Péter: Glaucoma II.
Nagy Zoltán Zsolt: Types of cataract surgery
Knézy Krisztina: Optic disc swelling
Knézy Krisztina: Atrophy of optic nerve head

VITREORETINAL DISEASES
Récsán Zsuzsanna: Circulatory disorders of retina
Barcsay György: Hypertensive retinopathy
Resch Miklós: Retinal detachment
Ecsedy Mónika: Ocular complications of diabetes mellitus
Kovács Illés: Treatment of diabetic retinopathy
Papp András: AMD
Lesch Balázs: Genetic diseases of the posterior segment
Lesch Balázs: Electrophisiology and genetic aspects
Resch Miklós: Disorders of the vitreoretinal interface
Papp András: Vitreoretinal surgery
Szepessy Zsuzsanna: Intermediate uveitis
Szepessy Zsuzsanna: Posterior uveitis

TRAUMATOLOGY
Kovács Illés: Blunt trauma
Szabó Antal: Mechanical eye injuries
Füst Ágnes: Chemical and thermal burn

Gyenes Andrea: Orbital trauma

ONCOLOGY
Korányi Katalin: Tumors of the orbit
Korányi Katalin: Exophthalmos
Tapasztó Beáta: Tumors of the eyelid
Füst Ágnes: The tumors of the ocular surface
Csákány Béla: Intraocular tumors in adulthood
Maka Erika: Tumours in childhood

BINOCULAR VISION, STRABISMUS, AMBLYOPIA, PREVENTION OF MYOPIA
Szamosi Anna: Binocular vision
Horváth Hajnalka, Maneschg Otto: Strabismus
Knézy Krisztina: Lazy eye, amblyopia
Tapasztó Beáta, Knézy Krisztina: Prevention of myopia

PEDIATRIC OPHTHALMOLOGY, OCULAR MANIFESTATIONS OF SYSTEMIC DISEASES
Barcsay-Veres Amarilla: Pediatric red eye
Maka Erika: Developmental anomalies
Maka Erika: Leukocoria
Maka Erika: Retinopathy of prematurity
Récsán Zsuzsanna: Late complications of ROP
Dohán Judit: Uveitis in childhood
Farkas Alexandra: Child abuse
Ecsedy Mónika: Ocular manifestations of systemic diseases

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

- According to the valid Study and Examination Regulations.
- Successful OSCE exam

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Continous assessment of the students' progress, due to close connection between the ophthalmologist and student in shadowing system. The lectures are available online. According to the subject material short questions call the attention to the most important problems.

Number and type of individual assignments to be completed, submission deadlines:

Continuous assessment of practical skills to be acquired.

Requirements for the successful completion of the course:

According to the valid Study and Examination Regulations.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

successful practical exam
successful written exam

Practical exam material

In practice:
1. Anamnesis
2. Assessment of near and distance visual acuity in adults and in children
3. Confrontal visual field testing
4. Examination of eye movements in the six cardinal directions
5. Checking ocular alignment, screening for amblyopia
6. Examination of the pupil: pupil size, reactions
7. Examination of the eyelids, lacrimal apparatus, conjunctiva, cornea, anterior chamber, iris, and the pupil with pupil lamp
8. Estimating intraocular pressure with palpation
9. Examination of the upper tarsal conjunctiva by eyelid eversion
10. Red reflex, examination of the papilla, posterior segment, retinal vessels by direct ophthalmoscopy
11. Usage of eye drops, bandage
12. Examination methods of the posterior segment (Optical Coherence Tomography, ophthalmic ultrasound, invasive angiographies): problem identification, indication
13. Modern anterior segment diagnostics: problem identification, indication

Written exam (test) see before
We announce a test and and oral exam in the Neptun system.
Test exam: online on the MOODLE platform from 10:00 to 11:00.
Grades: 5 (excellent): 85%-; 4 (good): 84-66%; 3 (satisfactory): 65-56%; 2 (pass): 55-50%, 1 (fail) -49%
If someone wishes to improve their grade (satisfactory or good, 3-4): they can choose from the exam dates announced in Neptun and retake the written test.

The oral exam is compulsory only for those whose test result is "pass" or "fail" on the day of written test. at 14:00 at the Department of Ophthalmology.
Oral exam*: one question each from question sets A and B and competency question. Failure to answer the competency question results in failing the exam.

***Set of oral exam topics**

	Set A	**Set B**	**Competency questions**
1	Visual field and its examination, visual field defects	Refractive errors and correction options. Accommodation and presbyopia	Acute ocular motility disorders, lagophthalmos, exophthalmos
2	Prevention and complications of myopia	The hypermetropic eye	Differential diagnosis of red eye
3	Rules for wearing contact lenses, complications	Refractive surgical procedures	Endophthalmitis
4	Binocular vision, recognizing and preventing amblyopia	Dacryoadenitis. Dacryocystitis	Orbital cellulitis
5	Cataract types, symptoms, treatment	Infectious conjunctivitis in adults	Causes and acute management of sudden, non-traumatic vision loss
6	Endocrine orbitopathy	Malposition of the eyelids and eyelashes	Suspected penetrating eye injury — actions and consequences
7	Protrusion, orbital tumors	Inflammatory and neoplastic conditions of the eyelids	Suspected blunt eye injury — actions and consequences
8	Orbital injuries	Allergic conjunctivitis	Chemical burns and acid injuries — consequences, emergency actions
9	Pharmacology of the pupil, pathological pupil reactions	Neonatal conjunctivitis	Recognizing glaucomatous attack — causes, emergency actions
10	Classification and diagnostic tools of glaucoma	Ophthalmia photoelectrica, corneal erosion, corneal foreign body	Ophthalmological screening in diabetic patients
11	Recognizing primary open-angle glaucoma	Bacterial keratitis, corneal ulcer	Pediatric ophthalmologic screenings
12	Secondary glaucoma	HSV keratitis	Indications for urgent ophthalmologic referral
13	Most common causes of blindness in adults and children, prevention possibilities	Iritis, iridocyclitis	Corneal ulcer
14	Differentiation of keratitis	Toxoplasma, toxocara uveitis	Corneal foreign body

15	Classification, symptoms, treatment options of uveitis	Ophthalmological aspects of hypertension	Red reflex abnormalities and related causes
16	Ophthalmological implications of prematurity	Retinal detachment	
17	Ophthalmological complications of diabetes mellitus	Retinal venous circulation disorders	
18	Leukocoria	Retinal arterial circulation disorders	
19	Non-traumatic sudden vision loss	Papillitis, retrobulbar neuritis	
20	Prominent optic disc	Papilledema	
21	Optic disc atrophy	Anterior ischemic optic neuropathy	
22	Penetrating eye injuries	Age-related macular degeneration	
23	Contusio bulbi	Tetanus prophylaxis	
24	Chemical injuries and burns	Retinoblastoma	
25	Intraocular tumors in adults	Low vision, visual impairment. Visual aids and rehabilitation	
26	Intraocular tumors in children	Abused child. Non-accidental trauma in adults: recognition and actions	

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Required terminology:

1. Acute ocular motility disorders, lagophthalmos, exophthalmos
2. Differential diagnosis of red eye
3. Endophthalmitis
4. Orbital cellulitis
5. Causes and acute management of sudden, non-traumatic vision loss
6. Suspected penetrating eye injury — actions and consequences
7. Suspected blunt eye injury — actions and consequences
8. Chemical burns and acid injuries — consequences, emergency actions
9. Recognizing glaucomatous attack — causes, emergency actions

10. Ophthalmological screening in diabetic patients
11. Pediatric ophthalmologic screenings
12. Indications for urgent ophthalmologic referral
13. Corneal ulcer
14. Corneal foreign body
15. Red reflex abnormalities and related causes

Minimum practical skills:

1. Assessment of visual acuity
2. Estimating intraocular pressure with palpation
3. Opening the eyes manually
4. Examination of eye movements in the six cardinal directions
5. Cover test, recognising strabismus and ambylopia
6. Confrontal visual field testing, eyelid eversion
7. Pupil reactions
8. Examination of the anterior segment with pupil lamp
9. Examination of the red reflex using direct ophthalmoscope
10. Fundus examination using direct ophthalmoscope
11. Schirmer test and break up time
12. Usage of eye drops
13. Bandage

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Performance in the written test or, in the case of grade 1 or 2, performance in the oral exam (see above).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	Materials of lectures, consultations, seminars, and practical sessions published online in Moodle

Link	Moodle

Printed resources:

Type	Recommended
Author	John F. Salmon
Title	Kanski's Clinical Ophthalmology
Publisher	
Year of publication	2024

Type	Recommended
Author	Gerhard K. Lang
Title	Ophthalmology: A Pocket Textbook Atlas
Publisher	
Year of publication	

Type	Recommended
Author	C. A. Bradford
Title	Basic Ophthalmology for Medical Students and Primary Care Residents
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Arc- Állcsont- Szájsebészeti és Fogászati Klinika

Name of subject in Hungarian: Szájsebészet és Fogászat
Name of subject in English: Oral Surgery and Dentistry
Name of subject in German: Stomatologie

Credit value of the course: 2
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	0.0	20.0	8.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSZB976_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Németh Zsolt
Course coordinator location of work, telephone availability: SE, FOK, Arc-Állcsont-Szájsebészeti és Fogászati Klinika, 06-1-266 0456
Course coordinator position: tanszékvezető egyetemi tanár, igazgató
Course coordinator Date and number of habilitation: Dátum: 2010.06.07. száma: 305.

Objectives of the course, and its place in the curriculum of the medical training program:

The main aim of the „Oral surgery and Dentistry” course for 4th-year medical students is to introduce the most specific symptoms, recognition and treatment of the most common oral, maxillofacial and dental diseases. In addition, the knowledge of various specialisations of dentistry is important to medical students because later, as specialized medical doctors - regardless of their specialization – they will find numerous correlations and these skills will prove to be essential in case of many borderline diseases and to face diagnostic difficulties. During the course, students

learn the method of oral examination and stomato-oncological screening. The practice focuses on the oral and dental contexts of disciplines of medicine. Future medical doctors need to be aware of the symptoms of systemic diseases in the oral cavity and know which dental and oral diseases may lead to systemic diseases.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson (bedside and chairside clinical practice), group work during seminar

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Competencies acquired through completion of course:

As practising physicians they will have modern theoretical and practical skills and will be able to perform medical practice on their own and build correct human relationships with their patients and family members as well as other health professionals. They must receive a comprehensive picture of the concept of oral health. As practicing physicians they will be able to examine the oral cavity and the head and neck region, and interpret the lesions and altered functions, initiate the diagnostic and therapeutic process. Following the preventive approach that is characteristic of today's medicine, they will be able to prevent and detect teeth (oral) diseases with systemic effects in their early stage.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pathology II, Basic Surgical Techniques

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Students can choose the educational department based on their registration in the Neptun system. A minimum of 5 students can apply for small educational groups.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The course is educated in block system; the duration of the course is 1 week.

The English language practices will take place according to the schedule of the blocked education in the 2026-27 academic year.

The courses take place in the Department of Oro-Maxillofacial Surgery and Stomatology and in the Dental Training Centre of the Faculty of Dentistry during the educational period (according to the schedule of the academic year in the Faculty of Dentistry) based on the registration and group assignment in Neptun system.

The courses take place in the Department of Oro-Maxillofacial Surgery and Stomatology and in the Department of Community Dentistry of the Semmelweis University, Faculty of Dentistry during the exam period (according to the schedule of the academic year in the Faculty of Dentistry) based on the registration and group assignment in Neptun system.

The schedule of the one-week block:

one - week block					
	Monday	Tuesday	Wednesday	Thursday	Friday
from 8:00 am to 1:00 pm	education	education	education	day off (obligatory)	seminar
from 1:00 pm to 2:00 pm	lunch break	lunch break	lunch break		lunch break
from 2:00 pm to 3:00 pm	break	seminar	break		exam

About 20-25 students attend the clinics weekly. The students are divided into 4-5 groups (minimum 5 students per small group) based on the application and group assignment in the Neptun system. The small groups of students have practices on Monday, Tuesday and Wednesday. The practices and seminars are held in the educational period (according to the schedule of the academic year in the Faculty of Dentistry) in the Department of Oro-Maxillofacial Surgery and Stomatology and at the Clinics of Dental Training Centre of the Faculty of Dentistry, in the exam period (according to the schedule of academic year in Faculty of Dentistry) in the Department of Oro-Maxillofacial Surgery and the Department of Community Dentistry. The Department where the education is passed is chosen by the students based on the registration and group assignment in the Neptun system.

The students can choose the educational Department/Clinic with the application in Neptun-system. The Departments/Clinics can be selected in the educational period (according to the schedule of the academic year in the Faculty of Dentistry):

/1 – Department of Oro-Maxillofacial Surgery and Stomatology

/2 – Department of Restorative Dentistry and Endodontics

/3 – Department of Prosthodontics

/4 – Department of Pediatric Dentistry and Orthodontics

/5 – Department of Periodontology

/6 – Department of Oro-Maxillofacial Surgery and Stomatology, Subdivision of Dento-alveolar Surgery in Educational Center of Faculty of Dentistry

The Departments/Clinics can be selected in the exam period (according to the schedule of the academic year in the Faculty of Dentistry:

/1 – Department of Oro-Maxillofacial Surgery and Stomatology

/2 – Department of Community Dentistry

/3 – Department of Community Dentistry

/4 – Department of Community Dentistry

/5 – Department of Community Dentistry

/6 – Department of Community Dentistry

The Departments and Clinics are involved in education:

Department of Oro-Maxillofacial Surgery and Stomatology (Faculty of Dentistry, educational period and exam period)

Department of Restorative Dentistry and Endodontics (Faculty of Dentistry, educational period)

Department of Prosthodontics (Faculty of Dentistry, educational period)

Department of Periodontology (Faculty of Dentistry, educational period)

Department of Pediatric Dentistry and Orthodontics (Faculty of Dentistry, educational period)

Department of Oro-Maxillofacial Surgery and Stomatology, Subdivision of Dento-alveolar Surgery in Educational Center of Faculty of Dentistry (Faculty of Dentistry, educational period)

Department of Community Dentistry (Faculty of Dentistry, exam period)

The teachers/instructors of Clinics and Departments are involved in education:

Department of Oro-Maxillofacial Surgery and Stomatology:

Sándor Bogdán, Dr., Mihály Vaszilkó Dr., Tamás Huszár Dr., Iván Decker Dr., Péter Barabás Dr.,

Gergely Csókay Dr., Zsófia Somogyi Dr., Tamás Würsching Dr., Gábor Pintér Dr., Szófia Szentpéteri Dr., Péter Lillik Dr., Ákos Dora Dr., Lőrincz Zatik Dr. Anita Győrffi Dr., Zsolt Németh Dr.

Department of Restorative Dentistry and Endodontics:

Boglárka Szántai Dr., Petra Pap-Németh Dr., Dalma Pellei Dr., Andrea Demeter Dr.,

Department of Prosthodontics:

Máté Jász Dr. Emőke Takács Dr., Szandra Körmendi Dr., Anna Németh Dr., Péter Schmidt Dr.

Department of Periodontology:

Kristóf Forgó Dr., Kristóf Somodi Dr., Boldizsár Bartha, Orsolya Láng Dr., Kinga Kelemen Dr., Claudia Paár Dr., Eleonóra Sólyom Dr., Márk Czumbel Dr., Bálint Czufor Dr., Dominik Varga Dr., Petra Orosz Dr.

Department of Pediatric Dentistry and Orthodontics:

Réka Macsali Dr., Szilvia Baksa Dr., Bence Benedikti Dr., Laura Lipták Dr., Lili Rozgonyi Dr., Anita Beck Dr., Violetta Szabó Dr.,

Department of Oral Diagnostics:

Szabolcs Gyulai-Gaál Dr., László Simonffy Dr., Botond Bukovszky Dr.

Department of Community Dentistry:

Gergely Oláh Dr., Márk Répási Dr., Luca Nagy-Csoma Dr.

Topics of the individual subfields of dentistry:

Maxillofacial and dentoalveolar surgery:

Benign neoplasms of the orofacial region. Precancerous lesions, prevention of oral cancer, screening methods. Malignant oral tumours and their treatments. Developmental anomalies (craniofacial malformations, cleft lip and palate, dysgnathia). Reconstructive surgery. Traumatology. Inflammatory diseases and therapeutic options. Tooth extraction, dentoalveolar and preprosthetic surgery. Basics of dental implantology. Oral rehabilitation for patients with special needs.

Restorative Dentistry and Endodontics:

Medical and dental history recording. Correlations between medical conditions and dental, periodontal status. High-risk patients. Examination, evaluation of clinical findings and making diagnosis. Aspects of creating a treatment plan. Prevention options of oral diseases. Age-related changes in oral condition and its results. Diagnosis and treatment methods of caries. Importance of pulpal and periodontal diseases. Types of conservative dentistry procedures. Focal (dental) infection. Use of antibiotics in the field of conservative dentistry. Importance of regular dental examination considering medical status.

Prosthodontics:

Indications and contraindications of prosthodontics treatments. Making prosthodontic treatment plan: when and which type, fixed or removable and implant retained prosthetic appliances etc. Demonstration of the most frequently used fixed and removable prosthetic appliances emphasizing which types must be removed from the oral cavity of an unconscious patient. The significance of the control and care of patients after prosthetic treatment. Examination of the temporomandibular joint, its dysfunction (TMD), diagnosis and conservative treatment options. The clinical team of treating TMD patients. Detection and treatment of early and late outcomes of complete endentulousness.

Periodontology:

Survey of the patient's oral hygiene and setting professional oral hygiene. Examination of the oral mucosa and diagnosis. Opportunity to assist in subgingival depuration (in non-surgical pocket treatment) and surgical periodontic procedures.

Pediatric Dentistry and Orthodontics:

Dental examination in childhood, medical and dental history, dental screening. Opportunity to assist in pedodontics procedures e.g. sealant application, primary and permanent tooth filling, primary tooth extraction; alternative solutions to treatment of childhood caries. Characteristics of primary, mixed and permanent dentition. Difficulties and emergencies in pedodontics. Scanning and eliminating focal infections. Oral manifestations of childhood infections. Use of anaesthetics and drugs in childhood. The connection between pedodontics- orthodontics and other dentistry specialities. Opportunity to assist in the activation of removable and fixed orthodontic appliances. The most frequently used orthodontic appliances.

New methods of orthodontics, digitalized procedures and esthetic appliances. The importance of age in orthodontic treatment.

Oral diagnostics:

Patient with dental symptoms, recording dental and medical history, making diagnosis. Considering correlations between medical conditions and dental problems. Examination of head and neck, stomato-oncological screening. Steps of the intraoral examination, making the description of the clinical findings. Lesions of oral mucosa. Oral manifestation of systematic autoimmune diseases. Oral manifestation of infections. Symptoms of medicine side effects. Additional modalities in oral mucosa examination. Dentoalveolar and maxillofacial imaging techniques. Manifestations of medical conditions on dental X-ray. Imaging modalities in traumatic injuries. Imaging techniques in screening.

More specialities contain similar course topics:

Emergency cases and their treatments, the importance of prevention and its connection of medical specialities. Dental and dentoalveolar outpatient department connection to maxillofacial and otolaryngology departments work. Gerostomatology. Dental infectology.

The students (with the help of their tutor) are involved mainly in patient examination, elaboration and discussion of diagnostic-therapeutic plans. Related to the anamnesis and patient examination the students will discuss the general medical and interdisciplinary aspects of the given symptoms. In

the case of every examined patient, the symptoms, conditions, diagnostic and treatment options in dental co-disciplines will be discussed. An important element of oral surgery and dentistry education is that the tutor demonstrates the possible relationship of the symptom or condition to general medical practice.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

At least 90% participation is obligatory of the practices, according to the Study and Examination Regulations. Participation in the sessions is confirmed by the signature of both the student and the instructor on the attendance sheets.

It is possible to make up one day of the educational blokk during the practice of other group with the same language or during other practices educational breaks or during on-call hours on weekends, based on prior agreement. The entire educational blokk can be replaced on the signed weeks for replace in the academic schedule. The absence from the practice is possible to confirming with a medical certificate or other valid document from the absence.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the short modules of education, there will be no formal inquiry. All through the interactive practices and consultations, it is enabled to assess the students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

Need no individual work for students.

Requirements for the successful completion of the course:

At least 90% participation.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics

accepted as an exam)

Written test exam and complection of OSCE practical exam tasks on the subject's Moodle interface. The material of the written test exam is formed by the previously compiled, filtered, condensed syllabus of the seminars, which are available to students on the subject's Moodle interface. The OSCE practical exam tasks are also available on the subject's Moodle interface. Students can complete the exam on Friday of the given educational week between 2 and 4 pm. It is possible to make up/correct the exam based on prior agreement.

The test exam comtains 50 simple choice (simple choice, selecting one correct answer from 4 possible answers) questions, and the studenst must answer for it in 60 minutes. The OSCE practical exam consists of a situational tasks. The students must answer correctly to previously given simple and multiple choice questions in connection with the situations in 30 minutes.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Minimum requirements of the written test exam is the previously compiled, filtered, condensed syllabus of the seminars, which are available for students on the subject's Moodle interface.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The grade is based on the testexam's result with the following point limits: 45-50 points Excellent, 40-44 points Good, 35-39 points Average, 30-34 points Fair, 0-24 points Unsatisfactory

The complection of OSCE practical exam tasks are mandatory. The complection is successfull if the examiner get the earlier defined minimum score. The scores of OSCE practical exam tasks is not included in the grade based on the test exam.

According to the provisions of the study and examination regulations, if the applying this minimum score would result in a failure rate exceeding 30%, the threshold will be adjusted in such a way that, for students taking the examination on the given examination date, the failure rate does not exceed 30%.

The questtions and the answers to the testquestions of the testexam and OSCE exam are available for students on the Moodle interface of the subject.

The grade is based on the testexam's result with the following point limits: 45-50 points Excellent, 40-44 points Good, 35-39 points Average, 30-34 points Fair, 0-24 points Unsatisfactory

The complection of OSCE practical exam tasks are mandatory. The complection is successfull if the examiner get the earlier defined minimum score. The scores of OSCE practical exam tasks is not included in the grade based on the test exam.

According to the provisions of the study and examination regulations, if the applying this minimum score would result in a failure rate exceeding 30%, the threshold will be adjusted in such a way that, for students taking the examination on the given examination date, the failure rate does not exceed 30%.

The questtions and the answers to the testquestions of the testexam and OSCE exam are available for students on the Moodle interface of the subject.

There are no midterm results included in the end-term assessment

No offered grades

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Recommended
Author	Michael Miloro
Title	Peterson's Principles of Oral and Maxillofacial Surgery
Publisher	Decker
Year of publication	2004

Type	Recommended
Author	Michael Miloro, G.E. Ghali, Peter E. Larsen, Peter Waite
Title	Peterson's Principles of Oral and Maxillofacial Surgery
Publisher	Springer
Year of publication	2022

Type	Recommended

Author	James R. Hupp, Myron R. Tucker, Ellis, Edward, III, DDS, MS
Title	Contemporary Oral and Maxillofacial Surgery
Publisher	Elsevier Books
Year of publication	2018

Type	Recommended
Author	Peter A. Brennan (Author), Henning Prof. Dr. Schliephake (Author), G.E. Dr. Ghali DDS MD FACS (Author)
Title	Maxillofacial Surgery, 3rd Edition
Publisher	Churchill Livingstone
Year of publication	2017

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Fül-Orr-Gégészeti és Fej-Nyaksebészeti Klinika

Name of subject in Hungarian: Fül-orr-gégészet
Name of subject in English: Otorhinolaryngology
Name of subject in German: Hals-, Nasen- und Ohrenheilkunde

Credit value of the course: 2
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	1.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKFUL1116_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Polony Gábor (klinikaigazgató)
Course coordinator location of work, telephone availability: Department of Otorhinolaryngology, Head and Neck Surgery, +3613333316
Course coordinator position: associate professor, head of department
Course coordinator Date and number of habilitation: 2023.06.13., 16/2023

Objectives of the course, and its place in the curriculum of the medical training program:

Otorhinolaryngology deals with diseases of the ear, nose, throat and larynx and the surgery, oncology of head and neck cancer. Furthermore, it involves endoscopic surgery of the nose and paranasal sinuses, microscopic surgery of the ear and the larynx, LASER therapy and LASER surgery of the head and neck, reconstructive and plastic surgery of the head and neck as well as the endoscopic diagnostics of the larynx, trachea and the esophagus. It

embraces the the early diagnostics of childhood hearing disability just as the conservative and surgical rehabilitation of hearing e.g. cochlear implantation. Another important part of this field of medicine is the phoniatry that includes physiology and pathophysiology of phonation, diagnostics and therapy of hoarsness, rehabilitation of patients after treatment of laryngeal cancer. Otoneurology is responsible for diagnostics and treatment of the disturbances of balance sensing.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture and practical lesson

Competencies acquired through completion of course:

Students learn about the development, clinical appearance, course and treatment options of ear, nose and throat diseases. They learn the examination of patients, become familiar with the examination procedures, the diagnostics of individual diseases, as well as the possibilities and techniques of conservative treatment, open or endoscopic and microscopic surgery based on the appropriate anatomical foundations.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Basic Surgical Techniques, Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

min. 10, max. 23 students

The only selection method is to complete the prerequisite courses.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1. seminar: Introduction to otorhinolaryngology, patient examination

2. seminar: ENT imaging
3. lecture: Ear I. (Dr. Anita Gáborján)
4. lecture: Ear II. (diseases of cochleovestibular system) (Dr. Anita Gáborján)
5. lecture: Oncology I. (Dr. Péter Prekopp, Dr.Kornél Dános, Prof. László Tamás)
6. lecture: Benin neck tumors (Dr. Gábor Polony)
7. seminar: Oncology II.
8. lecture: Audiology (Dr. Anita Gáborján)
9. lecture: Rhinology I. (Dr. Helga Kraxner)
10. seminar: Rhinology II.
11. lecture: Pharynx infection, OSAS (Dr. Beáta Bencsik, Dr. Viktória Molnár)
12. lecture: Benign diseases of the larynx (Dr. Zoltán Fent)
13. seminar: Ear diseases, audiology
14. lecture: ENT emergency (Prof. Dr. László Tamás)

Practices:

Practices take place in groups of 3-4 students. The aim of these practices are to demonstrate the core physical examination techniques, diagnostic tools of otorhinolaryngology. It also aims to present a wide variety of conservative and surgical therapies. We put special emphasis on physical examination and endoscopic diagnostics. We present interventions and everyday otolaryngological activities. Attendance at lectures is needed. The presence on practices and lectures together minimum 90 %!

The teaching staff of the practical education is assigned in advance every semester, the person of the teaching staff changes/may change within the blocks in two/three week rotations.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Proof of absence may be provided only by an official document (medical or other official certificate). 90% of practical hours and lectures (all educational hours) must be completed. Max. absence can be max. 3 educational hours.

Max. absences of 2 practical hours can be made up before the block exam period. More exercises to make up for absences are only possible in the educational block of another group or during the supplementary examination period at the end of the year.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Prerequisites for passing the exam are obtaining a semester-end signature and registering it in the lesson book. The exam is oral.

Answer competency questions on the day of the exam.

Based on the knowledge of the topics mentioned in the topic, taking into account their theoretical and practical aspects.

Number and type of individual assignments to be completed, submission deadlines:

The subject does not include a mid-term check, or indoor thesis.

Requirements for the successful completion of the course:

Complete the 90% of the practice and lecture/seminar hours.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Minimum criteria for the ENT exam, competency questions before items

1. Symptoms and clinical features of diffuse otitis externa

2. Symptoms and clinical features of acute otitis media (AOM) – suppurative form

3. Causes of acute hearing loss

4. What is to be done in case of acute sensorineural hearing loss?

5. Recognition of hearing loss in childhood, newborn hearing screening

6. Causes of ear pain (list)

7. Complications of acute otitis media (AOM)

8. Clinical features and symptoms of acute mastoiditis

9. Causes of unilateral otitis media with effusion (OME) in adults and childhood

10. How to diagnose vertigo caused by vestibular disorders

11. Causes of peripherial facial palsy (list)

12. Differential diagnosis of central and peripheral facial nerve palsy

13. Primary management of epistaxis/nosebleeding (at home/ambulance/by GP)

14. Management of epistaxis/nosebleeding (anterior, posterior) by ENT professionals

15. Management and complications of nasal folliculitis and furuncles

16. Types of rhinitis (list)

17. Clinical features and management of angioedema (Quincke-edema)

18. Complications of paranasal sinus infections (list)

19. Where does the patient localize the pain in cases of frontal, maxillary, ethmoidal or sphenoidal sinusitis?

20. Causes of unilateral nasal obstruction and discharge in childhood and in adulthood

21. ENT diseases causing headache

22. Most frequent causes of dysphagia

23. Indications of tonsillectomy (absolute and relative)

24. Clinical features and symptoms of peritonsillar abscess

25. Peritonsillar abscess – treatment

26. Clinical features, symptoms and complications of para- and retropharyngeal abscesses

27. Pathogens of tonsillitis and pharyngitis, indication of antibiotic treatment

28. Causes of chronic hoarseness (Why is it necessary to visit an ENT specialist after 3 weeks of hoarseness?)

29. Symptoms of head and neck tumors

30. Swollen neck lymph nodes – causes:

31. Evaluation of neck lumps – diagnostic steps

32. Causes of dyspnea in the upper respiratory tract

33. Middle-aged, smoker patient presents with unilateral ear pain, but the examination of the ear does not reveal any disorders. What may be the cause, and what is obligatory to be examined?

34. Management of choking patients – if intubation cannot be carried out

ENT exam items:

I.

1. Anatomy and physical examination of the auricle, external auditory canal and tympanic membrane.

2. Anatomy and physiology of the middle ear, function and physical examination of the Eustachian tube.

3. Pure tone threshold audiometry, tympanometry. List of subjective and objective hearing tests. Tuning fork tests

4. Objective hearing tests. Tympanometry, Evoked Response Audiometry, otoacoustic emission.

5. Basic examination methods of otoneurology. Symptoms of central and peripheral imbalances.

6. Diseases of the auricle and external auditory canal.

7. Acute and chronic serous otitis media. Application of ventilation tube (Grommet).

8. Course and treatment of acute purulent otitis media. The paracentesis.

9. Types of chronic otitis media.

10. Complications of acute and chronic purulent otitis media

11. Differentiation of central and peripheral facial nerve palsy. Causes and differential diagnosis of peripheral facial nerve palsy.

12. Mastoidectomy, radical ear surgery (radical mastoidectomy).

13. The meaning and types of tympanoplasty

14. Fixations of auditory chain, tympanosclerosis, otosclerosis. Clinic, diagnosis, treatment.

15. Traumatic injuries of the external, middle and inner ear.

16. Damages of the inner ear caused by noise, infectious diseases and toxic lesions.

17. Differential diagnosis of BPPV, vestibular neuronitis and Ménière’s disease.

18. Acute and chronic sensorineural hearing loss.

19. The hard of hearing and deaf child’s symptoms, examination and treatment. Infant’s screening of

hearing.

20. Types and indications of hearing aids. Cochlear implantation

21. Functions of the nose, anatomy and physiology of the nose and paranasal sinuses.

22. Simple physical examination, endoscopy and modern imaging of the nose and paranasal sinuses.

23. Diseases, injuries, inflammations and tumors of the external nose.

24. Blood supply to the nasal cavity, causes and treatment of nasal bleeding.

25. Causes of reduced nasal ventillation. Septum deviation. Smelling disorders.

26. Types of rhinitides, their therapy.

27. Acute and chronic inflammations of the paranasal sinuses. Management principles.

28. Endoscopic sinus surgery, extended applications.

29. Complications of paranasal sinus infections.

30. Benign and malignant tumors of the paranasal sinuses, principles of treatment.
II.

31. Anatomy, physiology and examination of the pharynx.

32. Symptoms, causes and examination of sleep apnea syndrome.

33. Diseases occurring in the nasopharynx. Adenoid hyperplasia and its consequences. Tumors of the nasopharynx..

34. Inflammatory diseases of the oral cavity and the pharynx.

35. Tonsillitis, angina and mononucleosis.

II.

36. Complications of acute tonsillitis. Peritonsillar abscess.

37. Symptoms and diagnosis of chronic tonsillitis. Possible surgical complications of tonsillectomy.

38. Malignant tumors of the oral cavity, tongue and pharynx.

39. Anatomy of the neck, neck spaces, neck vessels, nerves and lymphatic system.

40. Malformations of the neck. Inflammatory diseases of the soft tissues of the neck.

41. Differential diagnosis of swelling at the neck.

42. Inflammatory diseases, degenerative diseases and tumors of the thyroid gland.

43. Inflammatory diseases of the salivary glands, sialadenopathies

44. Benign and malignant tumors of the salivary glands.

45. Anatomy and physiology of the larynx.

46. Examination of the larynx. Symptoms of the diseases of the larynx.

47. Causes, symptoms and investigation of vocal cord paralysis. Laterofixation.

48. Tracheotomy, cricothyrotomy (conicotomy). Indications and implementation of endotracheal intubation.

49. Acute and chronic inflammations of the larynx.

50. Causes, symptoms and treatment of chronic laryngitis.

51. Malignancies of the larynx and hypopharynx.

52. Care and follow-up of patients who have undergone laryngeal surgery. Possibilities of speech rehabilitation in patients who have undergone total laryngectomy.

53. Diseases of the trachea, foreign bodies in the respiratory tract. Examination and diseases of the esophagus. Swallowing disorders. Esophageal foreign bodies.

54. The role of HPV in oropharyngeal malignant diseases.

55. The cervical lymph node regions. Cervical lymph node dissections.

56.Partial laryngectomies.

57. Possibilities of complex treatment of head and neck tumors.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Competency-based questions and the ability to answer exam questions

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the

overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Answering the competence question is a prerequisite for continuing the exam. If student doesn't know the answer, she/he can draw an item, but a four or five grade cannot be given in this situation. If the student answered the competence questions, she/he can draw 2 items. If she/he does not know one of the items, max.a grade of two can be given.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We do not use artificial intelligence in our education.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php

Printed resources:

Type	Mandatory
Author	Prof. Dr. Répássy Gábor
Title	Fül-orr-gégészet, Fej-Nyak-Sebészet egyetemi tankönyv
Publisher	Medicina
Year of publication	2011

Type	Mandatory
Author	W. Arnold, V. Ganzer:
Title	Hals-Nasen-Ohren-Heilkunde
Publisher	Georg-Thieme Verlag
Year of publication	1997

Type	Recommended
Author	Prof. Dr. Répássy G
Title	Otolaryngology
Publisher	Radó Nyomda és Kiadó és Szolg. Kft
Year of publication	2000

Type	Recommended
Author	Dr. Gáborján Anita
Title	Audiológiai diagnosztika
Publisher	Semmelweis Kiadó és Multimédia Stúdió Budapest,
Year of publication	2018

Type	Recommended
Author	Prof. Dr. Szirmai Ágnes
Title	Az egyensúlyzavarok differenciáldiagnosztikája
Publisher	Semmelweis Kiadó és Multimédia Stúdió
Year of publication	2006

Type	Recommended
Author	Dr. Hirschberg Jenő, Dr. Hacki Tamás, Dr. Mészáros Krisztina
Title	Foniatria és társtudományok
Publisher	Elte Eötvös Kiadó Eötvös Loránd Tudományegyetem
Year of publication	2013

Type	Recommended
Author	Dr. Ribári Ottó, Dr. Répássy Gábor, Dr. Hirschberg Andor, Dr. Rezek Ödön:
Title	Fül-orr-gégészet fogorvos hallgatók részére
Publisher	Medicina
Year of publication	2004

Type	Mandatory
Author	Becker, H.H. Naumann, C.R. Pfaltz:
Title	Ear, Nose and Throat Diseases
Publisher	Georg-Thieme Verlag
Year of publication	1994

Type	Recommended
Author	Dr. Gerlinger Imre
Title	Tünetorientált fül-orr-gégészet
Publisher	Medicina
Year of publication	2016

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés VII.; Testnevelés VIII.
Name of subject in English: Physical Education VII; Physical Education VIII
Name of subject in German: Körpererziehung VII; Körpererziehung VIII

Credit value of the course: 0
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI009_7A, AOKTSI009_8A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Upon completion of the course the student will be able to carry out regular physical activity.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) V*, Physical Education (PE) VI*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 2. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 60 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Within the framework of compulsory regular physical activity, the requirements of the subject can be fulfilled as free of charge and self-financed student as well. The former is available during classes and courses organized by the Semmelweis University's Centre for Physical Education and Sports (TSK), and the latter is available at SE-TSK accredited partner locations.

Free of charge:

60 minute classes held at the same time on a weekly basis, on the premises of the TSK facilities and other locations.

1107 Bp, Zágrábi utca 14.

1x60 min./week sessions:

Aerobics, BlessYou Gym, boulder, functional circuit training, golf, beginner Yoga, male football, salsa, step aerobics, badminton, beginner ultimate frisbee, advanced ultimate frisbee, zumba

1 x 90 mins./week sessions: women's football, ice hockey, beginner tennis, beginner tennis 2,

4 x 3 hrs. and 1x 2 hrs. session packages: Golf, Hiking 1, Hiking 2.

2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, men'sand and women football, handball, basketball, volleyball, waterpolo

Fee-based:

at the sports venues specified on www.semmelweis.hu/sportkozpont, which will also be advertised on the Neptun system. The list of these locations may vary per school year.

Teachers/coaces:

Várszegi Kornélia
Nagy-Kismarci Bence
Rimay István
Jánka Zsolt
Kéri Mózes
Weisz Miklós
Jókai Mátyás
Balogh Noémi
Dr. Kovács Attila
Kalanovics BAlázs
Karácsonyi Vazul
Kiss Valéria
Katona László
Lehel Zsolt
Kalmus Dániel
Dr. Herbert-Minkó Krisztina
Kinál Ágnes
Tóth Balázs
Balogh Orsolya
Gréczi Benedek
Szeredás Bálint Kende
Kovács Imre

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The number of active participations for physical education classes is 10 (once a week), regardless of the number of school breaks, which is to be completed during the hours assigned to the group. Two hours can be recovered in the first week of the exam period, on two separate days. Lessons missed do not need to be certified; however, catching up is mandatory. The days of study breaks do not qualify as automatic attendance. Practice leaders follow an online presence registration at the

beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Except for the Sport Hiking courses, where you have to attend 4 times due to blocking. 3 of these are on your own course and 1 can be made up by arrangement with the instructor!

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times (trainings 15 times) under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

2. a sports exemption.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

signature

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Pulmonológiai Klinika, Mellkassebészeti Klinika (Országos Onkológiai Intézet)

Name of subject in Hungarian: Pulmonológia és mellkassebészet
Name of subject in English: Pulmonology and thoracic surgery
Name of subject in German: Pulmonologie und Thoraxchirurgie

Credit value of the course: 4
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	1.5	2.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKPUL751_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Müller Veronika
Course coordinator location of work, telephone availability: Pulmonology Clinic, +36-1-355-9733
Course coordinator position: professor of medicine, head of department
Course coordinator Date and number of habilitation: 2019.06.06. 06/2019

Objectives of the course, and its place in the curriculum of the medical training program:

Teaching course on diagnostics and treatment of respiratory diseases.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture + Exercise

Competencies acquired through completion of course:

Interpretation of the results of complex lung function studies, blood gas studies, allergic studies and ergospirometry in respiratory diseases, administration of inhaled and oxygen therapy, principles of non-invasive mechanical ventilation in sleep disorders and the acute exacerbations of obstructive airway diseases, principles of the invasive and non-invasive diagnostic methods and the treatment of lung cancer and interstitial lung diseases. Clinical diagnostics and treatment of respiratory infections.

Indications and techniques of chest surgical interventions, emergency chest surgery interventions, practical skills.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine - Propedeutics, Pharmacology II, Basic Surgical Techniques

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

NA

The number of students required to start the course (minimum, maximum), method of selecting participants:

According block assignment

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:

(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest lecturers, however, must be attached.)

Summary

From the first semester of 2019/2020 - in accordance with the School of Medicine's instructions - the Pulmonology subject will be taught in a 3-week block format at the Department of Pulmonology (Tömő str. 25-29., Budapest 1083). and the Department of Thoracic Surgery (Ráth Gy. str. 7-9, Building III, Budapest 1122).

During the 3-week clinical block course, students will attend 21 hours of lectures (1.5 credits) and 35 hours of practices (2.5 credits) to acquire the required knowledge and practice in pulmonary patient examination, as well as basic diagnostic and therapeutic procedures. The course will include classes on thoracic surgery diagnostics and therapy. The lectures and exercises will be scheduled according to a uniform timetable, however, the exact thematic order may vary from block to block, and will be released at the beginning of the 3-week course.

1. Clinical skills development lecture

2. Thematic practical demonstration

3. Interactive practice

4. Bedside practice

Week 1.

Monday Tuesday Wednesday Friday (Pulmonology)

8:00-9:30 1/2/3/4

10:00-11:30 1/2/3/4

11:30-12:30 Lunch break

12:30-13:30 1/2/3/4

14:00-16:00 1/2/3/4

Week 2.

Monday

8:00-16:45 Thoracic surgery

Tuesday Wednesday (Pulmonology)

8:00-9:30 1/2/3/4

10:00-11:30 1/2/3/4

11:30-12:30 Lunch break

12:30-13:30 1/2/3/4

14:00-16:00 1/2/3/4

Week 3.

Exam start 10:00 and 13:00

Exact timepoints and dates will be opened at the start of the block according study and examination regulations.

Detailed course description - Pulmonology (The schedule of individual lectures and practices is based on the educational schedule of the school year, taking into account public holidays, and based on the availability of education rooms.)

Lecture topics (18 x 45')

- Bronchial asthma
- Interstitial lung disease
- Lung cancer
- Chronic obstructive pulmonary disease
- Pneumonia. Tuberculosis
- Sleep related breathing disorders
- Pulmonary embolism
- Respiratory insufficiency. Non-invasive mechanical ventilation
- Pulmonary rehabilitation. Smoking cessation
- Lung transplantation. Cystic fibrosis

Thematic practical demonstration topics (8 x 45')

- Lung function and arterial blood gas interpretation (2x)
- Pulmonary diagnostics (2x)

· Non-invasive ventilation methods

· Oxygen therapy methods

· Inhalation therapy methods, nebulisator use in acute care

· Pulmonary hypertension

Interactive practice topics (9 x 45')

· Lung function laboratory

· Bronchology/skill laboratory laboratory (2x)

· Non-invasive ventilation patient care (2x)

· Allergology

· Sleep laboratory

· Pulmonary rehabilitation care

· Pleural drainage and thoracic ultrasound

General/specific patient examinations (12 x 45')

· Pulmonary department

· Pulmonary-oncology department

· Transplantation department

Teachers responsible for lectures and practices - Pulmonology:

Prof. Dr. Veronika Müller, Prof. Dr. Lilla Tamási, Prof. Dr. György Losonczy, Prof. Dr. János Tamás Varga, Dr. med. habil. Gábor Horváth, Dr. Enikő Bárczi, Dr. Anikó Bohács, Dr. Lilla Bűdi, Dr. Balázs Csoma, Dr. Györgyi Csósza, Dr. Noémi Eszes, Dr. Dorottya Fekete, Dr. Dorottya Fésü, Dr. Krisztina Guth, Dr. Dániel Hammer, Dr. Edit Hidvégi, Dr. Péter Horváth, Dr. Péter Jalsovszky, Dr. Kristóf Karlócai, Dr. Zsuzsanna Kováts, Dr. Zsófia Lázár, Dr. Bernadett Mák, Dr. Júlia Mihály, Dr. Alexandra Nagy, Dr. Dóra Oroszi, Dr. Erik Palmer, Dr. Lőrinc Polivka, Dr. András Südi, Dr. Zoltán Süttő, Dr. Zsófia Tassó, Dr. Nóra Melinda Tóth, Dr. Rita Varga, Dr. Viktória Varga, Dr. Krisztina Vincze, Dr. Gabriella Zsámboki

Detailed course description - Thoracic surgery

Skill development lecture topics (3 x 45')

· Lung cancer

· Emergency thoracic surgery

· Pneumothorax, pleural effusion

· Lung transplantation

Interactive practice topics (5 x 45')

· Evaluation, diagnostics and treatment of a lung cancer case

· Evaluation, diagnostics and treatment of a metastatic lung cancer case

· Evaluation, diagnostics and treatment of a pleural effusion case

· Evaluation, diagnostics and treatment of a pneumothorax case

· Live stream from the operating room

· Pleural drainage

General/specific patient examinations (1 x 45')

· Transplantation outpatient clinic/department

· Thoracic surgery outpatient clinic/department

Teachers responsible for lectures and practices - Thoracic surgery:

Prof.Dr. Ferenc Rényi-Vámos, Dr. Péter Radeczky, Dr. Balázs Döme, Dr. Krisztina Bogos, Dr. László Agócs, Dr. Levente Bogyó, Dr. Klára Török, Dr. László Tibor Mészáros, Dr. Áron Ghimessy, Dr. Balázs Gieszer, Dr. Kristóf Csende, Dr. Hanna Tihanyi, Dr. Gábor Tarsoly, Dr. Márton Csaba

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Classes will be held according to the at pre-announced timetable. Absence according study and examination regualtions is allowed. Additional absence must be made up preceedingly based on previous consultation with the tutor or his/her deputy.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the teaching block, there are no interim tests or examinations. However, having completed certain training practices, teachers may assess the practical knowledge of the students.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

According study and examination regulations.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

1./ attendance on the block practice, practical examination at the time of oral exam: lung function and blood gas result analyis

2./ completion of the thoracic surgery exam

3./ adequate knowledge of the 3 questions (oral exam) (Topics: 1-15; 16-30; 31-45)

Information on the chest surgery examination is available on the website of the Department of Thoracic Surgery under the Education tab:

http://semmelweis.hu/mellkassebeszet/education/.

The Department of Thoracic Surgery self-made lecture notes and online course materials are available on the university's moodle e-learning page:

http://semmelweis.hu/mellkassebeszet/education/. or on the Thoracic Surgery Module (MODDLE)

The exam format will be an online test exam. Students will be able to prepare using notes written by the staff of the Department of Thoracic Surgery. Notes will be available online for students enrolled in the course. Related information is also available on the Department of Thoracic Surgery's website.

Exam topics - Pulmonology:

1. Respiratory physiology
2. Arterial blood gas test and acid-base testing
3. Exercise testing
4. Respiratory mechanics and energetics
5. Bronchial provocation tests
6. Dyspnea
7. Chest pain
8. Cough and sputum
9. Physical examination of pulmonary patients
10. Emergency conditions of the respiratory tract
11. Bronchoscopy
12. Thoracocentesis
13. Imaging modalities in pulmonology
14. Microbiological, laboratory, cytological and histological tests
15. Inhalation drug therapy
16. Pulmonary aspects of systemic pharmacotherapy
17. Oxygen therapy
18. Pulmonary rehabilitation and palliative care
19. Lung transplantation
20. Bronchial asthma
21. COPD and emphysema
22. Acute exacerbation of COPD
23. Asthma and COPD pharmacotherapy
24. Bronchitis and bronchiectasis
25. Pneumonia
26. Viral lung infections
27. Tuberculosis
28. Upper respiratory tract infections
29. Pathology and molecular pathology of lung tumors and molecular profile
30. Diagnosis and staging of lung tumors
31. Treatment modalities for lung cancer
32. Systemic therapy for lung cancer: target, immune and chemotherapy
33. Diagnostics of sleep-related breathing disorders
34. Treatment of sleep-related breathing disorders
35. Respiratory failure
36. Non-invasive ventilation
37. Idiopathic interstitial pneumonias
38. Idiopathic pulmonary fibrosis
39. Interstitial lung diseases of known etiology
40. Sarcoidosis
41. Acute pulmonary embolism
42. Pulmonary hypertension
43. Pleural effusion
44. Pneumothorax
45. Rare genetic lung diseases

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Knowledge of the textbook . Successful analysis of one pulmonary function test and one blood gas analysis.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

During the oral exam, the student's knowledge will be evaluated using a scale of 1 to 5 mark. Practical exam must be at least sufficient (2) for entering theroretical exam. The final exam mark is the result of 5/6 pulmonology 1/6 thoracic surgery exams, where all sub-exam marks are at least grade 2.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Recommended
Author	Prof. Dr. Müller Veronika
Title	Pulmonary Medicine
Publisher	Semmelweis Publishing House
Year of publication	2025

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sebészeti, Transzplantációs és Gasztroenterológiai Klinika

Name of subject in Hungarian: Sebészet nyári gyakorlat
Name of subject in English: Summer Practice – Surgery
Name of subject in German: Chirurgie (Famulatur im Sommer)

Credit value of the course: 3
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
168.0	0.0	168.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKNSG1134_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szijártó Attila (Klinika Igazgató)
Course coordinator location of work, telephone availability: Department of Surgery, Transplantation and Gastroenterology, 1082 Budapest, Üllői út 78., +3613335343
Course coordinator position: professor, head of department
Course coordinator Date and number of habilitation: 2015.06

Objectives of the course, and its place in the curriculum of the medical training program:

The primary goal of the fourth-year surgery summer practice course is to introduce students to the general symptomatology, diagnosis, and specific characteristics of decision-making in surgical diseases. Beyond the fundamentals of surgery, we teach students about the surgical diseases of various organ systems, their recognition, and surgical treatment options. Our primary task is to teach clinical thinking in collaboration with other specialties, guiding students from outpatient care through surgery to post-operative care.

Format of the course (lectures, group work, practical lessons, etc.):

Practice

Competencies acquired through completion of course:

Our goal is that by the end of the internship, students will be able to assess the basic perioperative needs of patients awaiting surgery; be familiar with most basic emergency surgical conditions; be able to prepare a treatment plan; be familiar with the operating room; master operating room rules; be able to scrub in independently, participate in the postoperative care of patients, and perform basic related procedures under supervision, such as drain removal and wound dressing. In addition to the above, the goal is to learn and practice professional communication with staff, patients, and their relatives.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Surgery I-II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students spend 8 hours a day, 5 days a week for one month on the practice.

They also participate in one evening or weekend on-call shift lasting 6 hours.

General topics:

Getting to know the surgical department and the hospital.

Getting to know the structure and operation of the surgical department and surgical units, as well as the staff and frequently used equipment.

Overview of the surgical patient care process, with a special focus on surgical planning, preparation, and follow-up care. Getting to know documentation processes, practicing patient admission, participating in the patient information process.

Taking medical history and examining patients, summarizing medical history, describing it using professional surgical medical terminology.

Perioperative tasks - selection and indication of necessary medications (e.g., antibiotics, painkillers, anticoagulants), significance and care of catheters and drains.

Wound care, wound dressing practice.

Indications for basic surgical imaging procedures, interpretation of findings - ultrasound, X-ray, CT.

Participation in organ-specific working group meetings.

Surgical participation: learning and applying basic surgical behavior norms and rules, scrub nursing, surgical assistance.

Participation in consultations and the evaluation of emergency surgical cases.

Schedule:

07:15-07:45 – morning ward rounds

07:45 – morning conference

08:15 – operating room, outpatient, or ward activities, team discussions

14:00 – afternoon ward rounds

14:30 – afternoon conference

Tutors:

Dr. Al-Sheraji Nada Mohamed

Dr. Bánky Balázs

Dr. Bárdos Dávid

Dr. Bencze Viktória

Dr. Benke Márton

Dr. Bennemann Stephan

Dr. Bihari László Ádám

Dr. Csuja Nándor

Dr. Daradics Noémi

Dr. Deák-Ilkó Zoltán

Dr. Doleviczényi Levente

Dr. Drexler Tímea

Dr. Erdályi Péter

Dr. Eitler Katalin

Dr. Fülöp András

Dr. Hamar Mátyás

Dr. Herczeg András

Dr. Huszty Gergely Dénes

Dr. Illés Kristóf

Dr. Klárik Zoltán

Dr. Kóbori László

Dr. Kokas Bálint

Dr. Kolostyák Zsuzsanna

Dr. Kovács János Balázs

Dr. Lakatos Lóránd

Dr. Lehoczki Csaba Ferenc

Dr. Lengyel Bóra Blanka

Dr. Lukász Péter

Dr. Marjai Tamás

Dr. Meltzer Anna

Dr. Mester Zsófia

Dr. Mózer Andreas Rajmund

Dr. Nyirády Loretta

Dr. Pálházy Tímea

Dr. Pekli Damján

Dr. Rózsa Balázs

Dr. Scutaru Tabita Timeea

Dr. Szabó József

Dr. Szelle Bálint Tibor

Dr. Szepesi Ágnes

Dr. Szlávik Rezső

Dr. Szőke Szilvia

Dr. Telkes Gábor

Dr. Ulmann Lőrinc

Dr. Vass Tamás

Dr. Völcsei Norbert

Dr. Voniatis Konstantinos

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Absences are kept by a signing presence during the practices.

Based on the Semmelweis University Study and Examination Regulations Chapter 3, § 17, § 7, absences can be maximum of 10% from the practice period.

In addition, general information regarding attendance at lectures and practices can be found in the Semmelweis University "Study and Examination Regulations" (Section 17.7; Paragraph 8!).

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no assessment during the education period. However, the interactive nature of the pracitces and consultations enables continuous monitoring of the students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

At least 90% participation in the surgery practice.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The surgery summer practice exam consists of two parts.

1. Test exam in the Moodle system

(25 multiple-choice questions, for which the student has 25 minutes).

2. Preparation of a case presentation based on what was seen during the surgery summer practice

The case presentation can be a minimum of half page, maximum of 1 page in length. Students should prepare it about a patient case they encountered during their summer surgical practice. The student must present this case study at the practical exam, which needs to be pre-registered in the Neptun system.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum

requirements of the course.

A minimum score on the Moodle test according to the Study and Examination Regulations and presentation of the case study to the examiner.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The student's final grade is determined by the result of the Moodle test exam and the case presentation evaluation.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI is permitted during the preparation of assignments for outlining, brainstorming, or language improvement; however, the student is responsible for the final content and its interpretation.

If AI-generated content is used as a source, it must be properly indicated and critically reviewed.

The use of AI tools is not permitted during assessments.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sebészeti, Transzplantációs és Gasztroenterológiai Klinika

Name of subject in Hungarian: Sebészet I-II.
Name of subject in English: Surgery I-II
Name of subject in German: Chirurgie I-II

Credit value of the course: 6
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
6.0	3.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSB1704_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szijártó Attila (Klinika Igazgató)
Course coordinator location of work, telephone availability: Department of Surgery, Transplantation and Gastroenterology. 1082 Budapest, Üllői út 78., +36208258925
Course coordinator position: professor, head of department
Course coordinator Date and number of habilitation: 2015.06

Objectives of the course, and its place in the curriculum of the medical training program:

The main goal of the subject is to familiarize students with the general symptomatology, diagnosis and therapeutic decision-making specifics of surgical pathologies. In addition to the basics of surgery, we teach students about surgical diseases of the various organ systems, their recognition and their surgical treatment options. Our primary task is to teach clinical thinking in cooperation with fellow clinicians. Throughout the practices we guide and teach students from outpatient clinic to operation and post-surgical care.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures and practical lessons on educational days.

Competencies acquired through completion of course:

The subject of surgery begins in the 4th grade and the entire curriculum last through the 6th grade. forming the backbone of basic clinical training. During this time, our main aim is to combine theoretical subjects, knowledge provided by associated clinical subjects with the surgical way of thinking and decision-making.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Basic surgical techniques

Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The subject is taught in as part of the block system. During a 4-week block, students 11 days. Have to be present on 11 days at the clinic for the theoretical and practical sessions. The final exams take place during the last week. As several different topics are covered during the block, the students are taught on a weekly basis in a rotating system, so that fewer students deal with one subspecialty at the same time. These students are further divided into smaller groups for bedside practice.

Schedule:

The daily schedule includes lectures for the entire block, case discussions, consultations for 1/3 block and bedside practice for 1/12 block.

Lectures, seminars and case discussions are held in the following topics:

The concept, types and indications of surgery. Surgical preparation, risk assessment - Dr. Fülöp András, Dr. Hamar Mátyás

Types of wounds, principles of wound treatment, surgical infections - Dr. Bennemann Stephan, Dr. Szabó József

Acute surgical cases, bleeding and haemostasis - Dr. Marjai Tamás, Dr. Pőcze Balázs

Intraoperative and postoperative complications. Perioperative care

Principles of surgical oncology

Basics of organ transplantation - Dr. Bihari László, Dr. Huszty Gergely, Dr. Piros László,Dr. Toronyi Éva, Dr. Kovács János, Dr. Rózsa Balázs, Dr. Telkes Gábor, Dr. Szabó József

Robotic surgery - Dr. Szijártó Attila, Dr. Fülöp András, Dr. Pekli Damján

Principles of organ-specific surgery:

- Surgery of the oesophagus and diaphragm - Dr. Vass Tamás, Dr. Bennemann Stephan

- Surgery of the stomach - Dr. Vass Tamás, Dr. Bennemann Stephan

- Surgery of benign pancreatic diseases - Dr. Szücs Ákos, Dr. Piros László, Dr. Marjai Tamás

- Surgery of malignant pancreatic diseases - Dr. Szücs Ákos, Dr. Piros László, Dr. Marjai Tamás

- Surgery of abdominal wall hernias. Surgery of the retroperitoneum - Dr. Rózsa Balázs, Dr. Pekli Damján

- Proctological diseases. Benign diseases of the colon - Dr. Ónody Péter, Dr. Ferreira Gábor

- Surgery of colon and rectal tumors - Dr. Bánky Balázs, Dr. Bihari László, Dr. Lukász Péter

- Surgery of the liver portal hypertension - Dr. Hahn Oszkár, Dr. Pekli Damján, Dr. Kokas Bálint, Dr. Szijártó Attila

- Surgery of the gallbladder and bile ducts- Dr. Hahn Oszkár, Dr. Pekli Damján, Dr. Kokas Bálint, Dr. Szijártó Attila, Dr. Máthé Zoltán

- Surgery of endocrine organs - Dr. Szlávik Rezső, Dr. Huszty Gergely, Dr. Eitler Katalin

- Breast surgery - Dr. Pálházy Tímea, Dr. Klárik Zoltán

- IBD, diverticulitis – Dr. Miheller Pál, Dr. Horváth Miklós, Dr. Hritz István

Recommended practical activities:

- Examination of an acute surgical patients

- Examination of elective surgery patients

- Changing wound dressings

- Participation in the work of the surgical ambulance

- Surgical assistance during operation (Second assistant)

- Surgical administration

- Postoperative treatment, medication management

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In case of participation in the lectures and practices, signing the catalog/attendance sheet is mandatory.

In the case of more than 10% absences, it is mandatory to make up the missed practices in order to obtain a signature and to be admitted to the exam.

Absences of more than 10% due to illness and other reasons: in all cases, students must write a request to the head of department with the reasons why the student missed (or will miss) more than 10% of the block practices. Attaching necessary documents (e.g. medical certificate, etc.)

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course

grade, opportunities for make-up and improvement of marks)

-

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

At least 90% participation in the lectures and practices (signing the catalogue/attendance form is mandatory at the practices).

A maximum of 10% absence is allowed to obtain a signature.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

We ask for knowledge of the following items based on the textbooks and lectures and practices

General surgery topics

1. Classification of wounds, principles of wound treatment

2. Soft tissue infections, wound infections, NPWT, antiobiotic prophylaxis

3. Indications and contraindications of surgery, surgical incisions

4. Preparation of patients for surgery, ERAS protocol, perioperative nutrition

5. Postoperative care and complications

6. Surgical oncology (basic concepts, importance of TNM staging, neoadjuvant and adjuvant oncological treatment, concept of onco-team, importance)

7. Ileus (differential diagnosis, treatment)

8. Peritonitis (differential diagnosis, treatment)

9. Significance of minimally invasive surgery, common surgical techniques

10. Transplantation basic concepts (basic concepts, brain death, indications, immunosuppression)

11. Forms of surgical deviations of the intestinal system: stomas (main types, indications)

12. Types of bleeding, blood control, transfusion

13. Thromboembolism, thromboprophylaxis

14. Anatomy of abdominal visceral vessels

Specific surgery topics

1. Disease of the adrenal glands, surgical consequences

2. Benign diseases of the thyroid gland (symptoms, diagnostics,treatment)

3. Malignant diseases of the thyroid gland (symptoms, diagnostics,treatment)

4. Surgery of the parathyroid gland (symptoms, diagnostics,treatment)

5. Hiatal hernia, GERD

6. Oesophagus diverticulum, achalasia

7. Esophageal injuries (perforation, corrosive injuries)

8. Malignant diseases of the oesophagus (symptoms, diagnosis, treatment)

9. Gastric-, and duodenal ulcer (symptoms, complications, perforation)

10. Malignant diseases of the stomach (symptoms, diagnosis, treatment)

11. Gallstones (symptoms, diagnosis, treatment)

12. Gallstones (complications, treatment)

13. Malignant disease of the biliary system (bile ducts, gall bladder)

14. Benign tumours of the liver (symptoms, differential diagnosis, treatment)

15. Primary and metastatic tumours of the liver tumours (symptoms, diagnosis, treatment)

16. Acute pancreatitis (symptoms, diagnosis, treatment, complications)

17. Chronic pancreatitis (symptoms, diagnosis, treatment)

18. Malignant diseases of the pancreas (curative and palliative, surgical and interventional options)

19. Colorectal polyps, polyposis syndromes

20. Colon diverticulosis, diverticulitis (symptoms, diagnosis, conservative treatment, surgical indications)

21. Malignant diseases of the large intestine (symptoms, diagnosis, treatment)

22. Anorectal benign diseases (haemorrhoids, perianal fistula, anal fissure, anorectal abscesses)

23. Anorectal tumors (symptoms, diagnosis, treatment)

24. Inflammatory bowel diseases - surgical consequences of IBD

25. Inguinal and femoral hernias (definition, anatomy, symptoms, treatment)

26. Abdominal and rare type hernias (definition, anatomy, symptoms, treatment)

27. Benign diseases of the breast (symptoms, diagnosis, treatment),

28. Malignant tumours of the breast (symptoms, diagnosis, treatment)

29. Acute appendicitis (differential diagnosis, treatment)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Achieve a passing grade, the student must possess the following fundamental theoretical knowledge:

General Surgery

- Understands the classification of wounds and the basic principles of wound management.
- Is familiar with the process of wound healing, as well as the basic characteristics and management principles of wound infections and soft tissue infections.
- Knows the basic indications and contraindications for surgical procedures, as well as the most common surgical approaches.
- Has a basic understanding of preoperative and postoperative care steps, as well as the most common postoperative complications.
- Understands the basic concepts of surgical oncology (e.g., the significance of the TNM system, the role of the tumor board).
- Recognizes acute surgical conditions (e.g., ileus, peritonitis) and knows their basic principles of management.
- Is familiar with the types of bleeding, basic methods of hemostasis, and the fundamentals of blood transfusion.
- Understands the significance and prevention of thromboembolic complications.
- Has a basic understanding of the importance of minimally invasive surgery and the fundamental indications for stoma formation.

Specific surgery

The student is able to:

- recognize the symptoms of the most common surgical diseases,
- name the basic diagnostic steps,
- describe the main principles of treatment guidelines.

With particular emphasis on the following conditions:

- acute abdomen: acute appendicitis, ileus, peritonitis
- cholelithiasis and its complications
- gastric and duodenal ulcer, perforation
- acute pancreatitis
- hernias (inguinal, femoral hernia)
- colonic diverticulosis/diverticulitis
- basics of colorectal tumors
- basics of breast cancer

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grade (1-5)

The final surgery exam grade, which is included in Neptun, is made possible by the result of the theoretical assessment.

Oral assessment from two topics (general surgery, organ-specific surgery)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Traumatológiai Klinika, Ortopédiai Klinika

Name of subject in Hungarian: Traumatológia és ortopédia
Name of subject in English: Traumatology and Orthopedics
Name of subject in German: Traumatologie und Orthopädie

Credit value of the course: 5
Semester: 7th semester, 8th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
5.0	1.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTRA1115_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bodzai Tamás János (klinikaigazgató)
Course coordinator location of work, telephone availability: Semmelweis University Clinic for Traumatology, e-mail: office.trauma@semmelweis.hu, Tel: 06 20/825-8680
Course coordinator position: Head of department, associate professor
Course coordinator Date and number of habilitation: 2025.03.12. 37995/HABIZ/2025

Objectives of the course, and its place in the curriculum of the medical training program:

Traumatology as a specialty deals with the treatment of injured patients, independent of the injured organ, patient’s age or previous diseases. In developed countries, the 4-5th leading cause of death is injury, while in the actively working population, the rate of death is even higher. Morbidity in children and in the elderly is also high. Traumatology treatment for the most part deals with extremity surgery in correlation to orthopedics, however cranial, thoracic, abdominal, spinal and pelvic injuries as well as the treatment of polytraumatized patients also belong to the field of trauma

care.

Orthopedics is an integral part of the limb surgery branch of the surgical curriculum. Practitioners of almost any discipline encounter orthopedic issues, making it essential to understand the diagnosis and treatment options for fundamental conditions. Equally important is the timely recognition of specific, urgent, or potentially surgically treatable conditions. The field of orthopedics intertwines with and organically integrates knowledge from other disciplines, requiring above-average "lateral thinking" skills and synthetic thinking from students. This is what we aim to focus on.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture + practice. Small group work during the practice sessions. Clinical practice at the bedside.

During the 14 hours of lectures, the topics of the subject are presented, which the student supplements with the required literature and the lecture materials available on Moodle.

The lecture materials can be found on the Semmelweis University E-learning portal (Moodle).

https://itc.semmelweis.hu/moodle/

Competencies acquired through completion of course:

Traumatology

During practices, students will have the opportunity to learn the following: physical examination of injured patients, bandaging, suturing, casting techniques, and the uses of orthesises and splints. Students will have the opportunity to enter the operating theater, scrub in for operations, and become acquainted with special instruments used in Traumatology. Consultation of typical and the more frequent trauma cases, radiologic diagnostics, as well as videos in the operative theater are also part of the curriculum. During on duty shifts, students will have an opportunity to examine and participate in the trauma care of patients under supervision.

Orthopedics

Clinical examination competency. Proficiency in the indications for non-physical diagnostics in orthopedics. Confident group diagnosis and therapy of urgent and/or severely damaging conditions. Surgical and conservative treatment options for orthopedic conditions, their advantages and disadvantages, and limitations. Upon completing the course, the student will be able to use examinations to identify patients in need of urgent orthopedic care. They will be able to select patients who do not require urgent care but will need assistance from an orthopedic specialist in the

future. The student will also be able to conservatively manage basic conditions that do not require orthopedic intervention. They will understand the correlations of major orthopedic conditions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Basic Surgical Techniques, Pathology II, Internal Medicine – Propedeutics

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Since Traumatology is a compulsory subject, there is no minimum number of students.

Maximum number of students is 18 students/block

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Traumatology lectures are available on Semmelweis University’s E-learning portal (Moodle)

Lectures

Traumatology lectures are available on Semmelweis University’s E-learning portal (Moodle)

1. Introduction to Traumatology

2. Soft tissue injuries, wound healing, and bone healing

3. Polytrauma - Chest, rib fractures, abdominal trauma - Neurotrauma

4. Pelvic and femur fractures - Lower leg and ankle fractures - Upper and lower ankle joint and foot injuries

5. Shoulder, upper arm, and elbow injuries - Forearm and wrist injuries - Hand injuries

6. Pediatric Trauma

7. Open fractures, septic and non-septic complications

Orthopedics Orthopedics e-learning material is available on Semmelweis University's e-learning portal (Moodle system).

1. General Orthopedics
2. Metabolic Bone Diseases
3. Diseases of the Spine
4. Diseases of the Shoulder Girdle
5. Diseases of the Wrist and Hand
6. Hip Joint Diseases in Adulthood
7. Diseases of the Knee Joint
8. Diseases of the Foot
9. Developmental Abnormalities of the Skeletal System
10. Neuromuscular Diseases
11. Pediatric Orthopedics
12. Tumors of the Musculoskeletal System

Mixed theoretical and practical days, and 1 practical exam day.

The Department reserves the right to make changes in the lecture schedule and practical lessons schedule during the academic year.

Lecturers

Dr. Abonyi Bence
Dr. Aminy Amanullah
Dr. Antal Imre
Dr. Asztalos András
Dr. Balsai Tamás
Dr. Bartha Lajos
Dr. Bejek Zoltán
Dr. Bodzai Tamás János
Dr. Boros Roxána Krisztina
Dr. Cséka Botond Ákos
Dr. Dobrean Levente
Dr. Domos Gyula Tamás
Dr. Dorony Balázs
Dr. Drajkó Balázs Márk
Dr. Faragó Bence

Dr. Fehér Milán
Dr. Gömöri Kristóf
Dr. Gresits Orsolya Zsuzsanna
Dr. Holnapy Gergely
Dr. Kaszap Balázs
Dr. Keszég Miklós Attila
Dr. Kiss János
Dr. Kiss Sándor
Dr. Koczka Dániel
Dr. Kocsis András Bernát
Dr. Lazáry Áron
Dr. Lepár Gábor
Dr. Moghaddam Amin Maysam
Dr. Pahlavanyali Afshin
Dr. Pánics Gergely
Dr. Pap Károly
Dr. Poór Valentin
Dr. Posta András Zoltán
Dr. Sallai Imre
Dr. Skaliczki Gábor
Dr. Stubnya Bence Gusztáv
Dr. Szabó Miklós Károly
Dr. Szabó Sándor
Dr. Szalay Krisztián
Dr. Szatmári Attila
Dr. Szendrői Miklós
Dr. Szilágyi Gábor Sándor
Dr. Szmola Dániel
Dr. Sztrinkai Gergely
Dr. Terebessy Tamás
Dr. Varga Csaba
Dr. Vezér Mátyás Attila
Dr. Virág-Tulassay Eszter Éva
Dr. Weninger Viktor
Fehér Ágnes Anna
Herpai Áron Ambrus
Horváth Csenge
Nemes Blanka
Sármay Dorottya

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Based on the 39/2023. (V.25.) Semmelweis University Organizational and Operating Regulations amended by university's Senate – III. BOOK Student Requirements – III.2. PART Academic and Examination Regulations, Section 29. § 4, which states: „ ……absences must be assessed together for lectures, seminars and practices requiring attendance, and may not exceed 10% during the block schedule of 4th-5th year Faculty of Medicine students…"

Only 7 academic hours of absence can be accepted in Traumatology and orthopedics for 4th year students during their Traumatology and orthopedics block of 70 hours!,

The date of signing the attendance sheets for the given day is the responsibility of the hospitals' department.

Any student who, for whatever reason, needs to be absent for a maximum of 7 academic hours, but whose attendance has not yet been checked that day, should notify the teacher that he/she wishes to sign the attendance sheet and indicate the exact time spent at the department on that day (the exact time of arrival and departure).

Make up of absences:

- Make up of absences can be done in a later block, but only within the semester. Students need to make up the same day they were absent in the original block (practice day or lectures). The student can only take the semi-final exam after make-up of the absence - at the earliest in that block that he/she made up in. Scheduling of make-up of absence during traumatology days and making an appointment for the postponed examination needs to be confirmed by e-mail through the Clinic for Traumatology. Scheduling of make-up of absence during orthopedic days and making an appointment for the postponed examination needs to be confirmed by e-mail through the Clinic for Orthopedics.
- If the absence were to occur in the last block of the first semester, then make-up of the absence can be done in the second semester, but the student needs to reapply for the course as "only exam" in the second semester. The earliest at which a student can take the exam is at the end of the block in which the student made-up the absence. Scheduling of absence during traumatology days and making an appointment for the postponed examination needs to be confirmed by e-mail through the Clinic for Traumatology. Scheduling of make-up of absence during orthopedic days and making an appointment for the postponed examination needs to be confirmed by e-mail through the Clinic for Orthopedics.
- If the absence were to occur in the last block of the second semester, then make-up of the absence can be done in the first semester of the following year. In this case, the student needs to reapply for the course as "only exam" in the following year. The earliest at which a student can take the exam is at the end of the block in which the student made-up the absence. Scheduling of absence during traumatology days and making an appointment for the postponed examination needs to be confirmed by e-mail through the Clinic for Traumatology. Scheduling of make-up of absence during orthopedic days and making an appointment for the

postponed examination needs to be confirmed by e-mail through the Clinic for Orthopedics.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Within the short course of the Traumatology and Orthopedics block, there will be no formal assessment of students. The interactive practices and seminars allow for evaluation of students' knowledge of the subject.

Number and type of individual assignments to be completed, submission deadlines:

Practical exam: Patient examination

Completing the practical exam is required for the signature, and for the final exam.

Evaluation of the practical exam: successful/ not successful.

Due to holidays the date of the practical exam may change.

Requirements for the successful completion of the course:

Minimum required active attendance of the block seminars and practices and completion of the practical exams.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The knowledge of the given textbook, uploaded lecture material in Moodle and practice material.

Topics: see "Detailed course syllabus "

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

See points 26. and 29.

0% - 49% Fail (1)

50% - 63% Pass (2)

64% - 75% Satisfactory (3)

76% - 87% Good (4)

88 - 100% Excellent (5)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Completing the practical exam is required for the signature, and for the final exam.

Evaluation of the practical exam: successful/ not successful (Practice test available.) In case of a failing (1) or satisfactory (2) grade, the Clinic provides the possibility of an oral exam.

Written MCQ electronic exam. 5 scale grading (1-5).

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Mandatory
Author	Editors: Andrew B. Peitzman Michael Rhodes C. William Schwab Donald M. Yealy Timothy C. Fabian
Title	The Trauma Manual: TRAUMA AND ACUTE CARE SURGERY Third edition
Publisher	Wolters Kluwer / Lippincott Williams & Wilkins
Year of publication	1

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Genomikai Medicina és Ritka Betegségek Intézete, Gyermekgyógyászati Klinika - Bókay utcai részleg, Gyermekgyógyászati Klinika - Tűzoltó utcai részleg

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Name of subject in Hungarian: Klinikai genetika
Name of subject in English: Clinical Genetics
Name of subject in German: Klinische Genetik

Credit value of the course: 2
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	0.0	20.0	8.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKGRI966_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Molnár Mária Judit (igazgató)
Course coordinator location of work, telephone availability: SE Genomikai Medicina és Ritka Betegségek Intézete
Course coordinator position: intézetigazgató egyetemi tanár
Course coordinator Date and number of habilitation: 38/ 2006 Debreceni Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the Clinical Genetics course is to familiarize medical students with the clinical significance of human genome variations and to teach them the fundamentals of diagnosing and managing genetic diseases. The course is centered around clinical cases and everyday medical situations, with special emphasis on the physician's role in recognizing and managing inherited

diseases and developing effective patient communication.

During the two-week intensive course, students gain insight into the specific features of both pediatric and adult clinical genetics care. Genetics plays a crucial role in pediatrics, as many severe genetic disorders manifest in childhood, making their recognition and treatment an integral part of pediatric practice. In adult care, clinical genetics is increasingly important in the diagnostics and personalized treatment of neurogenetic disorders, hereditary cancer syndromes, and cardiogenetic conditions.

The course not only introduces the diagnostic application of genetic testing but also emphasizes the preventive, predictive, and patient management roles of genetics. The impact of genetic knowledge ranges from supporting therapeutic decisions to shaping public health strategies—such as targeted screening in high-risk groups and the possibilities of newborn genetic screening.

Particular attention is given to ethical and communication challenges, especially in situations specific to genetics—such as interpreting presymptomatic results or variants of uncertain significance.

Clinical genetics is one of the most rapidly evolving fields in medicine and has become a transdisciplinary science. There is no area of medicine where recognizing and interpreting genetic factors is not relevant. Therefore, this course is a fundamental element of modern medical education and is essential in preparing future physicians for the era of personalized and data-driven medicine.

Format of the course (lectures, group work, practical lessons, etc.):

Seminars and practical sessions involving group work and the use of interactive educational materials

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Competencies acquired through completion of course:

The presentation of disease models related to inherited disorders through real clinical situations, integrated into a problem-based learning framework, enhances students' independent and group problem-solving abilities. Due to the extraordinary heterogeneity of inherited diseases, it is not our goal to comprehensively cover the entire subject matter during the two-week course. This is exactly what makes the course special: it offers students the opportunity to experience the process of problem-solving, overcoming new challenges, and successfully handling previously unknown situations. Problem-based learning not only maintains interest and makes the learning process enjoyable, but it also fosters professional development and the formation of a mindset for lifelong learning, which is essential in healthcare professions.

After successfully completing the course, students will possess knowledge of the most common genetic and genomic predictive, preventive, diagnostic, and pharmacogenomic concepts. They will understand the purpose and methodology of genetic counseling and become familiar with the principles, professional guidelines, and ethical dilemmas involved in diagnostic and therapeutic decision-making.

In practice, students will learn how to: (1) identify clinically relevant family history and when to consider a genetic disorder, (2) select and interpret the most appropriate genetic tests, (3) ntegrate genomic information into treatment decision-making.

Through various real and synthetic clinical cases, and direct involvement in outpatient and inpatient care, students will learn how to: (1) collect relevant information from various sources, (2) use artificial intelligence-based decision-support systems to recognize phenotypic patterns, (3) communicate with patients and their families living with inherited diseases in a counseling role, (4) collaborate in multidisciplinary teams while addressing real diagnostic challenges.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II , Pathology II; Genetics and Genomics OR Medical Genetics and Immunology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

min.5 max. 22

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

According to the syllabus, the course sessions follow the sequence outlined below for the Hungarian and foreign language student groups participating in the paediatric rotation of the 1st term. In the 2nd term, the order of the Clinical Genetics modules related to adult and paediatric care is reversed, as detailed in the attached schedule.

1. The role of clinical genetics in patient care |90'| day 1 GRI <sem> --- Prof.Dr. Molnár Mária Judit, Dr. Grosz Zoltán

2. Outpatient/Inpatient unit |90'| day 1 GRI <pra> --- Prof.Dr. Molnár Mária Judit, Dr. Varga Noémi

Ágnes, Dr. Palásti Ágnes, Dr. Benedek Péter, Prof.Dr. Molnár Mária Judit

3. Diagnostic strategies and interpretation of genetic test results |90'| day 2 GRI <sem> --- Dr. Balicza Péter, Dr. Molnár Viktor

4. Outpatient/Inpatient unit |90'| day 2 GRI <pra> --- Dr. Grosz Zoltán, Dr. Szegedi Márta, Dr. Palásti Ágnes, Dr. Benedek Péter

5. Personalized medicine and management of hereditary diseases |90'| day 4 GRI <sem> --- Prof.Dr. Molnár Mária Judit, Dr. Csányiné Sági Judit

6. Genetic counseling with dramatized role-play |90'| day 4 GRI <pra> --- Dr. Szegedi Márta, Dr. Csendes Barbara

7. Team competition |90'| day 4 GRI <pra> --- Dr. Csendes Barbara, Dr. Molnár Viktor

8. Dysmorphology (recognizing syndromes based on malformations) |45'| day 5 Gyer2 <sem> --- Dr. Pinti Éva, Dr.Lengyel Anna

9. Assessing the pathogenicity of copy number variations |45'| day 5 Gyer2 <sem> --- Dr. Pinti Éva

10. Importance of tumor predisposition syndromes in childhood |45'| day 5 Gyer2 <sem> --- Dr. Pinti Éva, Dr.Lengyel Anna

11. Relevance of identifying somatic variants in childhood malignancies |45'| day 5 Gyer2 <sem> --- Dr. Egyed Bálint, Dr. Erdélyi Dániel

12. Role of genetics in pediatrics, distinguishing main childhood mechanisms |45'| day 6 Gyer1 <sem> --- Dr. Tory Kálmán, Dr. Fekete Anett

13. When to suspect a genetic disorder: pediatric spot diagnoses, mechanism and inheritance, ethical challenges |45'| day 6 Gyer1 <sem> --- Dr. Tory Kálmán, Dr. Antal-Kónya Violetta

14. Metabolic disorders associated with intoxication |45'| day 6 Gyer1 <sem> --- Dr. Zsidegh Petra, Dr. Pálmay Andrea

15. Inborn errors of metabolism with substrate deficiency and lisosomal storage disorders |45'| day 6 Gyer1 <sem> --- Dr. Zsidegh Petra, Dr. Pálmay Andrea

16. Chromatograms, analysis of QMPSF |45'| day 6 Gyer1 <pra> --- Dr. Jávorszky Eszter, Némethi Zaránd

17. Evaluating variant pathogenicity in pediatric practice |45'| day 6 Gyer1 <pra> ---

18. Ward practice (hereditary liver, kidney, intestinal, neurological diseases, malformations, presentation) |90'| day 7 Gyer1 <pra> --- Dr. Fekete Anett

19. Metabolic workshop |45'| day 7 Gyer1 <pra> --- Dr. Kerti Andrea

20. Pediatric ethical issues and research opportunities |45'| day 7 Gyer1 <sem> ---

21. Exam |30'| day 10

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the Academic and Examination Regulations, in the case of block teaching, obtaining the course signature requires participation in at least 90% of the organized practical sessions and seminars. This allows for absence from a maximum of one 90-minute and one 45-minute module. Make-up opportunities are available during an educational week agreed upon in advance with the academic coordinator.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Due to the short duration of the course, there will be no interim formal assessments. However, the interactive nature of the practical sessions and consultations provides opportunities to monitor students' knowledge and the application of information, as well as to offer feedback. In certain sessions, questions may arise that presuppose familiarity with previously assigned background materials.

Number and type of individual assignments to be completed, submission deadlines:

According to the flipped classroom model, independent preparation is required for certain sessions (The role of clinical genetics in patient care, Diagnostic strategies and interpretation of genetic test results, Personalized medicine and management of hereditary diseases), using the provided preparatory materials. During the solution of the tasks assigned to each student group, students will also familiarize themselves with half of the exam questions (not pre-published), which are related to the focus diseases (approximately 10 per course).

Requirements for the successful completion of the course:

At least 90% attendance is required for course completion. Attendance is verified through registration combined with evaluation at the end of each session. The link required for the evaluation is provided in a shared document sent via the Neptun system to group members during

the week prior to the course.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Successful completion of the course requires obtaining the course signature (with no more than 10% absence, including make-up sessions) and passing the written exam. The exam includes problem- and practice-oriented questions that comprehensively cover the course curriculum.

In accordance with §30 of Senate Resolution 26/2025. (III.27.) (53720/AOADH/2025), which governs course requirements for the 2025/2026 academic year, the written test includes only written tasks, and both the test questions and corresponding answers are made available to all students in advance.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Description and minimum assessment requirements for the Clinical Genetics course:
https://semmelweis.hu/genomikai-medicina/en/education/clinical-genomics-i/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The written test consists of 30 multiple-choice questions, with a total of 100 points available.

Grading is based on the following scale:

88% and above: Excellent (5)

74–87%: Good (4)

64–73%: Satisfactory (3)

50–63%: Pass (2)

Below 50%: Fail (1)

During the written test, students are expected to demonstrate not only their theoretical knowledge but also its practical application.

Not applicable

Not applicable

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	Assignments and background material published on the course Moodle site.
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Recommended
Author	Peter D Turnpenny, Sian Ellard, Ruth Cleaver
Title	Emery's Elements of Medical Genetics and Genomics
Publisher	Elsevier
Year of publication	2020

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Patológiai, Igazságügyi és Biztosítási Orvostani Intézet

Name of subject in Hungarian: Igazságügyi orvostan
Name of subject in English: Forensic Medicine
Name of subject in German: Rechtsmedizin

Credit value of the course: 2
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
28.0	0.0	10.0	18.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKPIB1002_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kiss András (igazgató)
Course coordinator location of work, telephone availability: Department of Pathology, Forensic and Insurance Medicine
Course coordinator position: Head of Department, professor
Course coordinator Date and number of habilitation: 2007.05.30., 248/2007

Objectives of the course, and its place in the curriculum of the medical training program:

Forensic medicine is a science forming a bridge between medicine and law, aiming to communicate medical findings to aid jurisdiction. In our course we go beyond morphology and diagnoses and try to reveal the underlying causes of the current state of a body, through providing a foundation for the understanding of changes, injuries, and disease states at the molecular, cellular, tissue, organ, and organism levels.

The purpose of the subject is to achieve the qualities of a medical doctor, within the framework of forensic medicine, and for the students to become (a) independent, (b) critically thinking, (c) able to make decisions, and (d) take further necessary actions, (e) recognize emergency situations and (f) respects the boundaries of their competency.

During this course our goal is to pass over the knowledge substantial in everyday clinical practice, making the main objective of this subject to help acquire the following practical skills:

I. Attain the skillset of on-scene inspection of cadavers and familiarize with the procedure of processing cases of the deceased.

II. Examining injuries, and injury-patterns in the clinical practice, with the ability to individually evaluate, and professionally document them.

Format of the course (lectures, group work, practical lessons, etc.):

Autopsy room preactices are held around the autopsy table with the groups of students observing the process of autopsy, alongside with the presentation of the thoughts of the examiner regarding the case.

Seminars are held in a lecture-like setting, for a group of 20-25 students, with the opportunity of a back and forth between the lecturer and the listeners.

The **seminar room practice** requires solo work of the students that is then presented and discussed with the rest of the group.

Competencies acquired through completion of course:

Successfully completing the subject will result in the attainment of the following practical skills and knowledge:

Sufficient data about basic disease reactions and organ specific reactions so that you can:

-Interpret signs and symptoms appearing in a patient’s history and create a differential diagnosis.

Sufficient knowledge of forensic pathology and histopathology at large so that you can:

- Interpret findings at autopsy

- Interpret reports of forensic pathology

- Intelligently review forensic pathology slides and images with a consulting forensic pathologist

Awareness of the role of autopsy in medicine.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pathology II, Pharmacology II; Genetics and Genomics OR Medical Genetics and Immunology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

N/A

The number of students required to start the course (minimum, maximum), method of selecting participants:

The announcement of the courses is based upon the orders of the Dean’s Office of General Medicine.

Maximum headcount of the course: 26

Minimum headcount of the course: 10

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The course is organized in the block-based education system, throughout 40 weeks, in blocks of 2 weeks. Practical classes are preceded by short theoretical preparation sessions, followed by a gradual introduction to the clinically oriented practices, emphasizing the importance of examination of cadavers for every student. During the sessions we organize the students into small groups, challenging them to examine and process cases, while the theoretical preparation classes are held in bigger groups. Regular oral and written contribution of the students (case reports, and independent documentation) is substantial during the course. All sessions are required to contain feedback elements. At the end of the course an oral exam is conducted on the second week (see details below).

Detailed schedule

Week A

Monday (A/I)

- Introduction to Forensic medicine. Violent death and post mortem changes (2 periods – Dr. Almádi Zsófia)
- Types and patterns of injuries (2 periods – Dr. Törő Klára)
- Documentation of injuries (2 periods – Dr. Almádi Zsófia)
- Sudden death (number of classes: 1 period – Dr. Bokor János)

- Head trauma (1 period – Dr. Fejes Tamás, Dr. Almádi Zsófia)

Tuesday (A/II)

- Autopsy room practice (2 periods – Dr. Marcsa Boglárka, Dr. Almádi Zsófia, Dr.Fejes Tamás)
- General toxicology (1 period – Dr. Bányász Tamás - Dr. Almádi Zsófia)
- Medico-legal aspects of traffic accidents (1 period – Dr. Bányász Tamás, Dr. Almádi Zsófia)
- Examination on the scene of death (1 period – Dr. Marcsa Boglárka)
- Firearm injuries (1 period – Dr. Jámbor-Hegedüs Panna, Dr. Almádi Zsófia)
- Asphyxia and drowning (1 period – Dr. Jámbor-Hegedüs Panna, Dr. Törő Klára)
- The role of histopathology in forensic medicine (1 period – Dr. Jámbor-Hegedüs Panna, Dr. Danics Krisztina)

Wednesday (A/III)

- Autopsy room practice (2 periods – Dr. Bokor János, Dr. Bányász Tamás, Dr. Danics Krisztina)
- Identification (2 periods – Dr. Magyar Lóránt)
- Electrical fatalities, burns and scalds (1 periods – Dr. Németi Balázs)
- DNA analysis (1 periods – Dr. Németi Balázs, Dr. Lászik András)
- External examination practice (2 periods – Dr. Magyar Lóránt, Dr. Marcsa Boglárka, Dr. Németi Balázs, Dr. Hegedüs Panna)

Friday (A/IV)

- Autopsy room practice (2 periods – Dr. Magyar Lóránt, Dr. Jámbor-Hegedüs Panna, Dr. Fejes Tamás)
- Consultation and summary (2 periods – Dr. Almádi Zsófia, Dr. Jámbor-Hegedüs Panna)

The names of tutors listed above is given for information purposes only, the actual roster of tutors may change in accordance with the rules for substituting tutors on classes.

Week B

Wednesday

- Oral exam

Friday

- Oral exam

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance requirements; conditions under which students can make up for absences and the method of absence justification:

Students are required to be present on 75% of all classes, and thus allowed to miss 7x45 minutes of education, as long as they attend at least one autopsy room practice during their rotation. The names of students listed on the attendance sheet or make up sheet of practices, signed by the appointed instructor of the class classifies as a proof of their verified presence on the session.

Making up for absences can be done by joining other, subsequent groups in which case missed classes must be made up for in accordance with their original topics. Attending another group has to be arranged with the resident educational advisor of the department in advance!

The make-up classes must be registered and presented to the secretary of the department by 2 days before the exam at latest. Presenting a written certificate of the makeup classes is the responsibility of the students attending the course! If the number of missed classes exceeds 7, and the make-up classes have not been verified, the subject cannot be completed.

The rules above may vary in accordance with rules and regulations due to the pandemic situation.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

No mid-term examination takes place, and homework is not given. Assigned groups all take their exams on the B week of their periods, on the given specific days provided above.

Number and type of individual assignments to be completed, submission deadlines:

N/A

Requirements for the successful completion of the course:

Attendance will be monitored on each class of the course individually and registered on the attendance sheet at the beginning or end of classes. Taking attendance is the responsibility of the tutor.

Students with the required number of attendances (see segment *Requirements for participation in classes and the possibility to make up for absences* for more information) will be given signature by the end of the first week of their rotation.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination requirements:

(*list of examination topics, subject areas of tests / examinations, lists of mandatory parameters, figures, concepts and calculations, practical skills and the optional topics for exam-equivalent coursework projects, their criteria of completion and assessment)*

List of topics

1. Definition of death. Post mortem changes.
2. The early post-mortem interval.

3. The late post-mortem interval. Estimation of post-mortem interval.
4. Estimating the time of death.
5. Determining the cause of death. Medico-legal investigation of death.
6. The autopsy.
7. Methods of identification. Identification of decomposed or skeletonized remains.
8. Sudden death of cardiovascular disorders.
9. Sudden death of respiratory and gastrointestinal disorders.
10. Sudden infant death.
11. Child abuse. Safeguarding children.
12. Terminology of injuries. Types of injuries.
13. Self-inflicted injury.
14. Injury patterns. Documentation of injuries and marks of injury.
15. Head and neck injuries.
16. Spinal, chest and abdominal injuries.
17. Gunshot injuries.
18. Differentiation of accident, suicide or murder in gunshot injuries.
19. Sexual assault: examination requirements, evidential samples and documentation.
20. Transportation under influence. Drink and drive problems. Widmark's formula.
21. Road traffic injuries.
22. Railway injuries, aircraft fatalities.
23. Classification of asphyxia. Signs of asphyxia.
24. Types of mechanical asphyxial mechanism.
25. Immersion deaths: evidence of immersion. Post-mortem artefact and immersion.
26. Pathological diagnosis of drowning. The role of alcohol in drowning.
27. Injury caused by heat. Cold injury, hypothermia.
28. Electrical injury.
29. Principles of toxicology.
30. Commonly misused drugs and drug related death.
31. Carbon-monoxide poisoning. Arsenic, cyanide, lead and methanol poisoning.
32. Scene examination and evidence recovery. Examination on the scene
33. Forensic DNA analysis.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

During the oral exam the students a required to **speak for at least 3 minutes on each of the two randomly assigned topics**. During the exam, they are expected to speak unprompted, without the examiner having to ask leading questions. They are expected to demonstrate informed use of the terms below, without making major errors on general medical knowledge.

Terms and information that students have to be familiar with:

- Death and related terminology, biological and clinical death

- Definite signs of death
- When is resuscitation not necessary
- Manner of death: natural vs. non-natural (violent) death
- Vital signs in forensic medicine - especially the importance of haematomas
- Terminology and mechanism of injury
    - cuts, slashes and stab wounds= sharp force trauma
    - abrasions, haematomes and lacerations = blunt force trauma
    - shot wounds, bites = combined forces

Students who fail to use the above terms correctly, or who demonstrate a general lack of knowledge in these areas, may fail the exam.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The subject concludes with an **oral exam**. Students are required to pick two randomly chosen topics from the list below and talk about them after a brief preparation time.

The preparation time only applies if the exam is held in person.

N/A

N/A

N/A

Artificial intelligence systems used in the teaching of the subject and the manner of their application

AI is not used in any substancial way during the teaching of this subject. Some presentation may contain minor illustrations generated with AI.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/course/view.php?id=7394

Type	Recommended
Title	
Link	www.forensicmed.co.uk

Printed resources:

Type	Recommended
Author	Bernard Knight
Title	Simpson's forensic medicine
Publisher	Hodder Arnold Publishing
Year of publication	1991

Type	Mandatory
Author	Péter Sótonyi, Éva Keller
Title	Lecture notes on forensic medicine
Publisher	Semmelweis
Year of publication	2008

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Aneszteziológiai és Intenzív Terápiás Tanszék

Name of subject in Hungarian: Intenzív terápia és aneszteziológia
Name of subject in English: Intensive Therapy and Anaesthesiology
Name of subject in German: Intensivmedizin und Anästhesiologie

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Credit value of the course: 4
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	1.5	2.5	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANE759_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Lorx András (klinikai főorvos)
Course coordinator location of work, telephone availability: Department of Anesthesiology and Intensive Therapy (AITT), Semmelweis University
Course coordinator position: Head / Director, Long Term Ventilation Unit; Deputy Director, Intensive Care Clinic
Course coordinator Date and number of habilitation: 11/2025. Semmelweis Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

***Intensive therapy* is a comprehensive medical discipline.**

During this course, we emphasize the relevance of physiological, pathophysiological and pharmacological knowledge in a clinical and patient-oriented context at the bedside and in the operating theatre. The knowledge that students acquired in surgery and internal

medicine is also applied during the course. We will discuss, in detail, conditions requiring intensive therapy related to the fields of internal medicine, cardiology, surgery, neurology, obstetrics and gynecology and traumatology.

Intensive therapy includes intensive monitoring, intensive nursing care and intensive medical care. Conditions requiring intensive therapy, we replace, support and restore damaged, absent or endangered vital functions, while we also use extensive monitoring, diagnostic and therapeutic systems to provide causative therapy.

This course will make students familiar with the first steps required in the assessment of a critically ill patient, the conditions causing cardiac and respiratory arrest, and also the current Hungarian and international resuscitation guidelines.

It will be demonstrated how anesthesiology maintains the homeostatic balance of the patient's organ systems during the perioperative period. This includes the assessment of potential perioperative risks, preoperative optimalization, intraoperative anesthesia, analgesia, muscle relaxation,, and the reduction of possible postoperative complications.

Lectures focus on the details of important aspects of the subject in order to enhance each student's knowledge development.

During the practicals, a problem-based approach is used to represent the complexity of clinical decision-making . The stressed points of the practicals are a general therapy-oriented approach which is based on a symptom-oriented differential diagnosis-making. Equipment and devices used in intensive therapy are also introduced. Bedside practice enables students to engage in patient care, while practices in a high-fidelity simulation environment will provide opportunities for analyzing diagnostic and therapeutic options by simulating time-dependent situations. In situational simulation practices students can also develop their non-technical skills e.g. team-work, decision-making.

Due to the nature of this course, the knowledge and experience acquired during the course can be meaningful to students choosing any medical specialty.

Location (address of lecture hall, seminar room, etc.):

Department of Anesthesiology and Intensive Therapy (AITT), Central Ward (Központi Intenzív Osztály)

1082 Budapest, Üllői Stree t78/B.

Institute of Anaesthesiology and Perioperative Care

1082 Budapest, Üllői Street 78/B.

Division of Clinical Simulation, Semmelweis Simulation Center

1096 Budapest, Ernő Street 7.

Dr. Manninger Jenő Traumatology Centre in Budapest

Department of Anaesthesiology and Intensive Therapy

1081 Budapest, Fiumei Street 17.

Learning elements that do not require personal contact may be delivered via online learning, depending on the actual educational conditions.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures per block (max. 21 people), bedside and simulation practices in small groups (max. 7 people), and PBL-sessions.

Competencies acquired through completion of course:

	Competency	Level
1.	Skills and devices required in emergency situations (airway management, venous/arterial access devices, catheters, gastric tubes etc.)	S/AP
2.	The intensive care unit: its structure, functions and areas of care	S
3.	The ABCDE assessment of critically ill patients	PP
4.	monitoring devices in intensive care and their application	S
5.	The importance and limitations of point-of-care testing (PoCT) in intensive care	S/AP
6.	How to recognize medical conditions requiring intensive therapy	S/SSS
7.	Fluid therapy in the care of clinically ill patients, its application; the methods, indications and application of enteral and parenteral nutrition	S
8.	competencies in preoperative assessment, risk assessment and physical assessment	S/
9.	The basics of preoperative assessment and premedication	S/
10.	The structure and functions of anesthetic devices	S/
11.	The induction and maintenance of general anesthesia	S/
12.	The basics of the indications, importance, advantages and disadvantages of regional anesthesia techniques	S/
13.	The aspects of postoperative care and its application	S
14.	How to recognize and treat different types of respiratory failure	S
15.	The aspects and main indications for non-invasive and invasive ventilation (principles, methods, devices and the structure of ventilators)	S/SSS
16.	Recognition and treatment of acid-base disorders	S/AP

17.	O_2 therapy and inhalational agents; the importance and forms of respiratory physiotherapy	S
18.	Treatment of acute hemodynamic collapse	S/AP
19.	Options for hemodynamic monitoring, tools of pharmacological and mechanical circulatory support	S
20.	Aspects and application of perioperative care in severely injured patients	S
21.	The relevance of ultrasound in intensive care	S
22.	The relevance of ultrasound in anesthesiology	S
23.	Indication and application of blood purification techniques in intensive care	S
24.	The in-hospital basic life support algorithm in simulation	SSS
25.	The use of the automated external device (AED) under simulated conditions	S/SSS
26.	Safe use of defibrillator with a simulation device	SSS
27.	The advanced life support (ALS) algorithm and its application in simulation	SSS
28.	Teamwork and communication in ALS and in peri-arrest situations	SSS
29.	The application of the ABCDE assessment tool in high-risk patients	SSS
30.	The recognition and treatment of acute and life-threatening conditions in a high-fidelity simulated environment	SSS
31.	Non-technical skills (teamwork, task management, communication, situational awareness, decision-making, etc.) in a high-fidelity simulated environment	SSS
32.	Patient-referral using the SBAR technique	SSS

Abbreviations:

L: level of acquisition
S (Seen): students observe the procedure
AP (Active Participation): students actively participate in the procedure
SSS (Skill, Simulation or Situation): students gain experience during a skill, simulation or situation practice
PP (Procedure Performed): students perform the procedure themselves

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Cardiology, Heart Surgery, Angiology, Vascular Surgery, Clinical Pharmacology, Emergency Medicine and Oxyology

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In the case of multi-semester courses, position on the possibility of and conditions for

concurrent registration:

N/A

The number of students required to start the course (minimum, maximum), method of selecting participants:

This course is compulsory, so the limit of students in the course matches the number of students in the current year. This number varies according to the language of the course.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Depending on current educational conditions, educational elements that do not require direct personal contact may be delivered through distance learning, including—and thus considered equivalent to in-person, face-to-face lectures—live online lectures or any format of material that students can view in video format.

The topic of the lectures:
1) The description of intensive therapy and anesthesiology and their approach to care. The symptoms and identification of organ failure, introduction to organ supporting/substituting therapies. The ABCDE and SBAR methods. Intensive monitoring.
2) Introduction to cardiopulmonary resuscitation (CPR, BLS and ALS), the peri-arrest period and the post-resuscitation (PCAS) period.
3) Definition and classification of respiratory failure, ARDS. The most common post-operative respiratory complications.
4) Respiratory support: options, therapeutic aims, indications, and strategy. Weaning. Classification of ventilators. Oxygen therapy.
5) Components of homeostasis. Correction and blood gas analysis.
6) Clinical feeding. Volume therapy.
7) Classification of circulatory failure (shock). Pharmacological and device-based options for circulatory support.
8) Renal and hepatic failure. Diagnosis, biomarkers, and prognosis. Blood purification techniques.
9) Sepsis and septic shock. Multi-organ failure.
10) Transfusion strategies. Diagnosis and management of life-threatening coagulopathies.
11) Preoperative risk assessment, optimalization for surgery, and premedication.
12) Anaesthetic management, securing airways. Applied perioperative pharmacology.
13) Spinal and peripheral anaesthetic procedures. Anatomy, techniques and skills, indications, and complications. Local anaesthetics. Pain management.
14) Anaesthetic considerations in the management of severely injured patients, intensive care management in severe injury.
15) Thromboembolic and neurologic diseases leading to critical illness
16) Consultation

Topics of the practices and examination:
The aim of the practical lessons is to acquire the following knowledge and skills:
1. **to be able to recognize a critically ill patient;**
2. **to be aware of the time constraints in intensive therapy and the importance of quick allocation of patients;**
3. **to be able to start the emergency treatment of critically ill patient critical care and provide care for the initial 15 minutes;**
4. **to know the basics of preoperative preparation, anesthesia care and pain management of a patient awaiting surgery;**
5. **to be aware of critical significance of pre-, intra- and postoperative anaesthetic care on the postoperative period**
6.

In order to achieve these objectives, the course will focus on practical skills rehearsed in bedside practices, simulation practices and problem-based learning (PBL) practicals .
The course will be completed with an objective, structured clinical examination (OSCE) before students proceed to the theoretical examination, during which, in a simulation environment, they can demonstrate the application of the acquired basic concepts and skills.

	lesson (hours)	Bedside	Skill	Simulation	PBL	OSCE
1.	2	BEV				
2.	2	RespInt 1.				
3.	2		CPR-Basics			
4.	2			CPR-Sim-1.		
5.	2		ABC-skills			
6.	2	Shock 1.				
7.	2	Shock 2.				
8.	2				Homeostasis	
9.	2				Pain management	
10.	2			CPR-Sim-2.		
11.	2			HiFiSim		
12.	2	GivMet				
13.	2	RespInt 2.				
14.	2	TraumIA				
15.	4	Anesthesiology practical				
16.	2				Complex case in intensive care	
17.	1	Consultation				
gyv1						OSCE-1. IH-BLS, bad- mask ventilation
gyv2						OSCE-2.: airway management, laryngeal mask, intraosseous needle
gyv3						OSCE-3.: ABCDE and SBAR

The instructors of the course

Prof. Dr. Zsolt Molnár
Prof. Dr. Andrea Székely
Prof. Dr. Endre Zima
Dr. András Lorx med. habil.
Dr. Szabolcs Baglyas
Dr. Máté Berczi
Dr. Dávid Brenner
Dr. Cecília Czifra
Dr. Gergely Csikós
Dr. László Erdélyi
Dr. Gábor Élő
Dr. János Fazakas
Dr. Szabolcs Fábry
Dr. Gábor Fritúz
Dr. Balázs Füle
Dr. Gergely Göbl
Dr. Pál Gyombolai
Dr. Hajnalka Gyüszi
Dr. Balázs Hauser
Dr. Enikő Holndonner-Kirst
Dr. László Horváth
Dr. Petronella Hupuczi
Dr.Dilán Karim
Dr. Réka Kapui
Dr. Hajna Katona
Dr. András Kállai
Dr. Annamária Kis
Dr. Nikolett Kiss
Dr. Enikő Kovács
Dr. Bernadett Lonkai
Dr. Csaba Maár
Dr. Krisztina Madách
Dr. Ádám Marczin
Dr. Gábor Marics
Dr. Bence Mogyoródi
Dr. Vivien Móró
Dr. Mária Nagy
Dr. Gábor Nardai
Dr. Endre Németh
Dr. Szabolcs Nyul
Dr. Mátyás Orosz
Dr. Márton Papp
Dr. Kristóf Rácz
Dr. Zoltán Ruszkai
Dr. Ádám Soltész
Dr. Dalma Skultéti
Dr. Anikó Smudla
Dr. István Székács
Dr. Melinda Széll
Dr. Szilárd Szűcs
Dr. Eszter Tamáska
Dr. Krisztián Tánczos
Dr. Gyula Tövisházi
Dr. Zsolt Turóczi
Dr. Luca Valkó
Dr. Alexandra Vereb
Dr. László Zubek

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKSGO891_1A, AOKBOK784_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance requirements determined according to the study and examination regulations (TVSZ).

Late arrival, over 15 minutes, constitutes non-attendance, the lesson must be made up for.

Make-up is possible by joining another rotation or in the period designated for this purpose, given there are free places left.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

At the end of the rotation, the knowledge of students will be tested using the objective structured clinical exam (OSCE) method.

Number and type of individual assignments to be completed, submission deadlines:

Continuous reflection on questions that arise during lectures and practicals throughout the course.

Requirements for the successful completion of the course:

The attendance requirements specified in accordance with TVSZ and a successful OSCE exam.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

List of oral topics:

During the course of the examination, students will discuss one topic of each block (A and B). Then ten questions will be asked that require prompt answers. The final grade will be awarded according to the percentage of scores achieved. However, the examination can result in an immediate 'fail' if the candidate demonstrates a general lack of knowledge in any topic.

Block A

A1. The general definition of homeostasis, examples of its disturbances.

A2. The general description of acid-base balance, metabolic and respiratory acidosis and alkalosis, and their therapy.

A3. Shock: symptoms, pathophysiology, diagnosis, and therapy.

A4. Cardiogenic shock: symptoms, diagnosis and therapy.

A5. Anaphylactic shock: symptoms, diagnosis and therapy.

A6. Hypovolemic shock: symptoms, diagnosis and therapy.

A7. Obstructive shock: symptoms, diagnosis and therapy.

A8. Disturbances of fluid homeostasis and their therapy. Types of intravenous fluids: pharmacology, clinical aspects.

A9. Sepsis, septic shock, multiple organ dysfunction syndrome: pathophysiology, diagnosis, and therapy.

A10. Respiratory failure: pathophysiology, diagnosis, and therapy.

A11. Acute exacerbation of COPD: pathophysiology, intensive care. Acute bronchial asthma: pathophysiology, intensive care.

A12. Indications of ICU admission in pneumonia, its therapy.

A13. ARDS: pathophysiology, symptoms, diagnosis, and therapy.

A14. Postoperative respiratory failure: pathophysiology, symptoms, diagnosis and therapy.

A15. In-hospital basic life support (BLS) and advanced life support (ALS): decision-making, electric and pharmacological therapy.

A16. Postresuscitation care.

A17. Physiotherapy in intensive care. Psychological aspects of intensive care.

A18. The main vasopressors and inotropes.

A19. Pharmacology of the respiratory system.

A20. Enteral and parenteral feeding; supplementation of energy, proteins and micronutrients.

Block B

B1. Acute kidney injury in the ICU: pathophysiology, diagnosis, and therapy.

B2. Acute pancreatitis: pathophysiology, diagnosis, and therapy.

B3. Acute complications of diabetes in the ICU: diabetic ketoacidosis, hyperosmolar hyperglycemic syndrome: pathophysiology, diagnosis, and therapy.

B4. Acute bleeding and hemorrhagic shock management in the ICU.

B5. Acute liver failure.

B6. Acute right- and left-sided heart failure: pathophysiology, diagnosis, and therapy.

B7. Peri-arrest arrhythmias: diagnosis, and therapy.

B8. Intensive care of the severely injured patient.

B9. Life-threatening disorders of the coagulation system, thrombotic microangiopathies and disseminated intravascular coagulation: pathophysiology, diagnosis, and therapy.

B10. Pulmonary embolism: pathomechanism, diagnosis, and therapy.

B11. Intensive care of life-threatening neurological disorders.

B12. The role of ultrasound in anesthesiology and intensive care.

B13. Correction of life-threatening electrolyte disorders.

B14. Anesthesiology I.: Perioperative care and risk assessment.

B15. Anesthesiology II.: Premedication.

B16. Anesthesiology III.: Intravenous anesthetics.

B17. Anesthesiology IV.: Inhalation anesthetics.

B18. Anesthesiology V.: Opioids and muscle relaxants.

B19. Anesthesiology VI.: Regional anesthesia.

B20. Pain management.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as

an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The minimum requirement for the exam is to complete 2 items in the item series based on the text of the current textbook, and to achieve 50% of the 30 (10-10-10) points that can be obtained by answering 10 short questions correctly. The official textbook can be purchased, the short questions and the lectures are available in the university's e-learning system.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade will be awarded according to the percentage of scores achieved.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Bersten, Andrew D; Handy, Jonathan M
Title	Oh’s Intensive Care Manual
Publisher	Elsevier Limited Eighth Edition
Year of publication	2019

Type	Recommended
Author	László Zubek - Zsolt Molnár
Title	Anaesthesiology and Intensive Therapy
Publisher	Medicina Könyvkiadó
Year of publication	2026

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika

Name of subject in Hungarian: Belgyógyászat II. (hematológia, infektológia, immunológia, reumatológia, laboratóriumi medicina)
Name of subject in English: Internal Medicine II (Hematology, Infectology, Immunology, Rheumatology, Laboratory Medicine)
Name of subject in German: Innere Medizin II (Hämathologie, Infektologie, Immunologie, Rheumatologie, Labormedizin)

Credit value of the course: 7
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
7.0	2.0	5.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKBHK1118_2A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Masszi Tamás Pál (Klinika igazgató)
Course coordinator location of work, telephone availability: Belgyógyászati és Hematológiai Klinika +3613754364
Course coordinator position: egyetemi tanár, klinikaigazgató
Course coordinator Date and number of habilitation: 2010.06.07., száma: 305

Objectives of the course, and its place in the curriculum of the medical training program:

The primary objective of the course in internal medicine for fifth-year students is the symptom-based and patient-oriented education of **haematology, immunology, rheumatology, and infectology.** Students become familiar with the diagnostics and treatment of the most common disorders of the

above disciplines.

Besides the above mentioned, integrative medicine, the holistic approach to medicine is also taught. This means the presentation of the coordinated patient care between internal medicine subspecialities and other related professionals and the illustration of the complexicity of real life cases. **Differential diagnosis** also requires utilization of knowledge aquired from different specialties in the diagnostic phase of a case. With this complex program we emphasize the practical importance of internal medical approach and pursuit and teach its application in the real world.

Format of the course (lectures, group work, practical lessons, etc.):

lecture, bedside and simulation practices, small group work or individual tasks during the exercises

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Competencies acquired through completion of course:

Education of internal medicine commences in third year by teaching propedeutics and finishes in the final year – providing a backbone for medical education. Our major objective throughout this period is the integration of knowledge provided by preclinical and clinical subjects into our curriculum. By the time of graduation, our students – the future doctors – should have up-to-date theoretical and practical knowledge, as well as an ability to make appropriate interpersonal relationship with patients, relatives, and medical personnel that together, provides the basis of independent medical decisions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I. (Metabolism, Endocrinology, Gastroenterology, Nephrology), Laboratory Medicine, Medical Imaging

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Students are registered in the NEPTUN System to the blocks.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Internal Medicine II is taught in a block system. During the 5-week block, students spend 14 days (8 hours/day) in the Department. Theoretical and practical (bedside) classes are taught. Students are assigned into smaller groups for bedside practices, case discussions and consultations that are held in rotation resulting in fewer students learning about a given topic at a time.

According to the topics below, classes are taught also dependent on the available patients.

Hematology

Topic list of the lectures:

1. Cellular therapies
2. Blood count evaluation
3. White blood cell abnormalities
4. B signs, lymphadenopathies
5. Acute myeloid leukemias
6. Myelodysplastic syndromes
7. Thrombocytopenias and thrombocytopathy. Haemophilias. Increased coagulation (thrombophylias). Coagulopathies.

Topic list of the practices:

1. Neutropenic fever
2. Palliative and curative treatment of acute leukaemia
3. NHL low-grade / NHL high-grade
4. Patient with anaemia. Transfusion.
5. Bone marrow sampling. Presentation of sampling
6. Complex cases at bedside

Topic list of the consultations:

1. Ph negative myeloproliferative diseases
2. Myeloma
3. Anaemia – case based discussion
4. CML
5. Hemophilia/DIC
6. AIHA/ITP
7. Hodgkin

Infectology

Topic list of the lectures:

1. Emergencies in infectology
2. HIV/AIDS, tropical diseases in Hungary
3. Invasive mycosis
4. Primary immundeficiencies
5. Vaccination
6. Multiresistent pathogens, infection control and antimicrobial stewardship

Topic list of the practices:

1. Urinary tract infections
2. Airway tract infections
3. Skin and soft tissue infections
4. Infectological situations in practice (sepsis, meningitis, Lyme, pharyngitis)

Topic list of the consultations:

1. Introduction to infectology
2. FUO
3. Sepsis
4. Infective endocarditis
5. Antibiotics, microbiological sampling, assessment of the culture results

Immunology

Topic list of the lectures:

1. Autoimmunity
2. Vasculitides
3. HANO
4. Autoimmune myopathies
5. Sjögren's syndrome – progressive systemic sclerosis
6. Osteoarthrosis and degenerative diseases of the spine
7. Rheumatoid arthritis and spondylarthritides

Topic list of the practices

1. Therapy of autoimmune diseases.
2. Rheumatoid arthritis
3. Spondylarthropathies
4. Gout, arthrosis
5. Physiotherapy

Topic list of the consultations:

1. Examination of the rheuma patient
2. Laboratory tests in rheumatology and immunology
3. Imaging in rheumatology and immunology
4. Targeted therapies in the rheumatological practice
5. Emergencies and intensive care in inflammatory rheumatological diseases
6. Osteoporosis

Dr. Agárdi Annamária, Dr. Ambrus Viktória, Dr. Babici Klaudia, Dr. Barsi Ádám, Dr. Bátai Bence Dr. Bíró Eszter, Dr. Bodó Imre, Dr. Farkas Péter, Dr. Fehér Ágnes, Dr. Franka János, Dr. Gráf László, Dr. Hankó László, Dr. Horváth Anna, Dr. Horváth Eszter, Dr. Horváth Laura, Dr. Hosszúfalusi Nóra, Dr. Huszár Máté, Dr. Illés Sarolta, Dr. Jakab László, Dr. Jenei Zsigmond, Dr. Juhász Renáta, Dr. Kalabay

László, Dr. Kalabay Márton, Dr. Karádi István, Dr. Kárpáti Ágnes, Dr. Katona Gábor, Dr. Keltai Katalin, Dr. Kempler Miklós, Dr. Lohinszky Júlia, Dr. Lukács Krisztina, Dr. Mihály Emese, Dr. Müller Gábor, Dr. Műzes Györgyi, Dr. Nagy Ákos, Dr. Nagy Géza, Dr. Nagy Viktor, Dr. Nagy Zsolt, Dr. Nagy-Czirok Kálmán, Dr. Nebenführer Zsuzsanna, Dr. Nemcsics Balázs, Dr. Pálmai Dóra, Dr. Peskó Gergely, Dr. Pozsonyi Zoltán, Dr. Pusztai Péter, Dr. Sármán Beatrix, Dr. Sipos Ferenc, Dr. Sipter Emese, Dr. Svorenj Szabolcs, Dr. Szakszon Eszter, Dr. Szombath Gergely, Dr. Tari Noémi, Dr. Tárkányi Ilona, Dr. Tegze Bálint, Dr. Varga Éva, Dr. Varga Gergely, Dr. Várkonyi Judit, Dr. Vereckei András, Dr. Vida Ádám, Dr. Wiedemann Ádám, Dr. Zemplényi Zsófia, Dr. Zsáry András

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the Study and Examination Regulations, students are required to participate on at least 90% of all sessions.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

None

Number and type of individual assignments to be completed, submission deadlines:

None

Requirements for the successful completion of the course:

Participate on at least 90% of all sessions, proven by attendance sheets

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Hematology

1. Investigation of an anemic patient

2. Iron-deficiency anemia

3. Macrocytic anemia

4. Anaemia associated to chronic diseases

5. Hemolytic anemia

6. Aplastic anemia

7. Checking of the coagulation system

8. Evaluation of thrombosis

9. Acquired thrombophylias

10. Antiphospholipid syndrome

11. Hereditary hemophylias (Hemophylia A and B)

12. Von Willebrand disease

13. Anticoagulant therapy (indications, implementations)

14. DIC

15. Investigation of a thrombocytopenic patient

16. Thrombocythosis

17. TTP/HUS

18. ITP

19. Symptomatology of the lymphoproliferative diseases

20. Evaluation of lymphadenopathy

21. Non-Hodgkin lymphomas

22. Follicular lymphoma

23. Diffuse large B-cell lymphoma

24. Chronic lymphocytic leukemia/ Small lymphocytic lymphoma

25. Myeloma multiplex

26. Hodgkin-lymphoma

27. Symptomatology of myeloproliferative diseases

28. Acute myeloid leukemia

29. Acute lymphoid leukemia

30. Ph-negative myeloproliferative neoplasia (PV, ET, MF)

31. Chronic myeloid leukemia

32. Myelodysplasia syndroma

33. Autologous stem cell transplantation

34. Allogenic stem cell transplantation

Infectology

1. Basic principles of infectology and antimicrobial therapy (infectious disease anamnescit history and physical examination, targeted, empirical and prophylactic therapy, importance of source control, blood stream infections)

2. Common antibiotics, groups of antibiotics and their clinical use (penicillins, cephalosporins, carbapenems, glycopeptids, metronidazol; bacteriostatic and bactericid antibiotics, expected susceptibility – natural resistance; important factors: host, pharmacokinetics, mechanism of action)

penicillinek, cephalosporinok,

3. Common antibiotics, groups of antibiotics and their clinical use (lincosamids, macrolids, rifampin, tetracyclins, fosfomycin, nitrofurantoin, fluoroquinolones: bacteriostatic and bactericid antibiotics, expected susceptibility – natural resistance; important factors: host, pharmacokinetics, mechanism of action)

4. FUO – fever of unknown origin

5. Upper respiratory tract infections (sore throat, pharyngitis, otitis media, sinusitis, acute bronchitis)

6. Mononucleosis syndrome

7. Community acquired pneumonia

8. Nosocomial pneumonia

9. UTI (asymptomatic bacteriuria, cystitis, prostatitis)

10. UTI (pyelonephritis, catheter associated UTI)

11. Sepsis, septic shock

12. Intraabdominal infections (cholangitis/cholecystitis, abdominal abscess [liver, spleen,

psoas], diverticulitis, peritonitis)

13. Endocarditis.

14. Lyme

15. Acute bacterial meningitis, brain abscess, neurotop viral infections

16. Erysipelas, cellulitis, fasciitis necrotisans, toxic shock syndrome, infectious arthritis, osteomyelitis

17. Neutropenic fever, systemic mycosis, infections of the immunsuppressed patient

18. Infective diarrhoea (bacterial, viral, Cl.diff.), food poisoning

19. HIV. AIDS and AIDS related diseases

20. Vaccines for adults and their importance. The flue.

21. Antimicrobial resistance, resistant microorganisms and their clinical importance; antimicrobial stewardship.

Immunology/rheumatology

1. *SLE clinical picture*
2. *SLE diagnostics and treatment*
3. *Rheumatoid arthritis clinical picture*
4. *Rheumatoid arthritis diagnostics and treatment*
5. *Seronegative spondylarthritises*
6. *Gout*
7. *Vasculitises of the small arteries*
8. *Vasculitises of the middle and great arteries*
9. *Polyarteritis nodosa*
10. *Sjögren's syndrome*
11. *Autoimmune myopathies*
12. *Progressive systemic sclerosis*
13. *Primary and secondary immundeficiencies*
14. *Allergy*
15. *Differential diagnosis of arthritis*

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Knowledge acquired through lectures and practical sessions in hematology, infectious diseases, immunology, rheumatology, and laboratory medicine.

The list of topics is available at the following link: https://semmelweis.hu/belhema/oktatas/aok/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Forming a grade at the end of the course is based on a 5-grade result system reflecting on the performance on the oral exam. Based on the exam results, the students will be awarded grades of Excellent (5), Good (4), Satisfactory (3), Pass (2), or Fail (1).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Recommended
Author	McGraw-Hill,
Title	Harrison's Principles of Internal Medicine 21st Ed.
Publisher	
Year of publication	2022

Type	Recommended
Author	Weatherall, Ledingham, Warrel
Title	Oxford Handbook of Clinical Medicine 11th Ed.
Publisher	
Year of publication	2024

Type	Recommended
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking. 13th Ed.
Publisher	

Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Fizikális Medicina és Rehabilitáció Tanszék

Name of subject in Hungarian: Orvosi rehabilitáció
Name of subject in English: Medical Rehabilitation
Name of subject in German: Rehabilitationsmedizin

Credit value of the course: 2
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
32.0	0.0	32.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKREH1020_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szőke György
Course coordinator location of work, telephone availability: SE Ortopedic Clinic,1 Tel: 20 8258326
Course coordinator position: professor
Course coordinator Date and number of habilitation: Prof. Dr. György Szőke 257/2007. 2007. május 30. Semmelweis Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

Special medical knowledge required for recognizing and managing disabilities is summarized in the field of Rehabilitation Medicine. According to WHO about 10 % of the world's population lives with some form of disability. All medical students need to gain a basic knowledge of Rehabilitation Medicine for completion of the graduate program and to practice later as a physician. According to

the new curriculum, fifth year students will participate in a one-week clinical rotation in Rehabilitation Medicine.

Format of the course (lectures, group work, practical lessons, etc.):

block course, practical lesson,

Competencies acquired through completion of course:

Rehabilitative approach, rehabilitation-oriented patient evaluation, functional approach, rehabilitation planning.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Cardiology, Heart Surgery, Angiology, Vascular Surgery; Traumatology and Orthopedics

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The course is a one-semester block, one week long (32 hours).

The number of students required to start the course (minimum, maximum), method of selecting participants:

Students have to use Neptun System for registration. 10-50 students / group are accepted.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The course will be one week long and consist of lectures on basics followed by clinical practice. Students will participate in daily clinical activities, such as bedside visits and multidisciplinary team meeting. Moreover, they will perform patient assessment, physical examination. Getting familiar with basic rehabilitation methods is part of the course: physiotherapy, physical and other treatment modalities, occupational therapy, psychotherapy, speech therapy, neuropsychology, sport therapy, hydro therapy, advaned technologies (robotic devices). Students will also gain experience in ambulatory care.

Detailed schedule:

1. Rehabilitation Medicine (RM): core competencies, the field of RM, definition, philosophy, objectives and methods, concept of ICF, quality of life.

2. Clinical and functional assessment in RM.

3. Interventions in RM: medical treatments, physical and other treatment modalities, therapeutic exercises, orthoses and prostheses.

4. Musculoskeletal and orthopedic rehabilitation: upper limb dysfunctions (including hand- and nerve injuries), lower limb dysfunctions (including nerve injuries and amputation).

5. Neurorehabilitation: stroke, brain injury, spinal cord injury.

Rehabilitation in other disabling conditions: geriatric-, pediatric-, cardiovascular- and pulmonary rehabilitation and rehabilitation in malignancy.

Lecturers: Dr. Dénes Zoltán, Dr. Fazekas Gábor, Dr. Cserháti Péter, Dr. Masát Orsolya, Dr. Fórián-Szabó Mihály, Dr. Zsiga Katalin, Dr. Csépány Éva, Dr. Tavaszi Ibolya, Dr. Papp Edit, Dr. Herczeg Eszter, Dr. Jancsó Ági, Dr. Donyec Mihály, Dr. Szögi Bea, Dr. Paulina Andrea, Dr. Boldis Márti, Dr. Márialigeti Zsuzsa, Dr. Gombos Zsófi, Dr. Vass Ildikó, Dr. Markotics Attila, Dr. Farkas Péter, Dr. Both Béla, Dr. Putz Miki, Dr. Fehér Melinda, Dr. Hampel Kati, Dr. Szikói Virág, Dr. Boros Erzsi, Dr. Kenéz Juli, Dr. Szabó Dávid, Dr. Holpár Margit, Dr. Dalos Margit

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students need to attend at least 90% of the training hours. Making up absences is possible with the next groups.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There will be no assessment in the study period.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Students must attend the block course, and confirm their attendance with their signature tendance on the attendance sheets.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Lectures provided by the Department. The students will get exam questions, in order to help to prepare for the exam.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

https://semmelweis.hu/rehab/files/2026/04/Medical-Rehabilitation-Block-Course_General-Information_ver_24.10.12.pdf

2.3 Course acceptance requirements 1.) Participation in the course. This will be confirmed by signing the collective attendance sheets in the morning and the attendance sheets later at the departments. 10% absence from classes is allowed in order to obtain a signature. 2.) Successful oral exam. The exam will take place at the departments, at the end of Thursday's training day. We have completed a series of questions from the lectures and practical days for helping to prepare. 3.) After finishing the block course, students have to write a short essay (around 1/2 A4 page) about their experiences at the Institute. The essay should be sent via email to the chief physician of the department (where the students spent their practice on Thursday), and to Gabriella Tápay (g.tapay@rehabint.hu), not later than one week after finishing the course. The email addresses of the chief physicians are shown below, at the contact details.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the

overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

1.) Succesful oral exam. 2.) Students are required to write a report on their experiences gained at the rehabilitation wards. The grade in the Neptun will be calculated from the grades of the report and the oral exam.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	UEMS
Title	White Book on Physical and Rehabilitation Medicine in Europe
Publisher	European Journal of Physical and Rehabilitation Medicine 2018 April;54(2):125-321.
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Neurológiai Klinika

Name of subject in Hungarian: Ideggyógyászat és idegsebészet
Name of subject in English: Neurology and Neurosurgery
Name of subject in German: Neurologie und Neurochirurgie

Credit value of the course: 6
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
96.0	24.0	48.0	24.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNEU963_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bereczki Dániel (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Neurology, 0612100337
Course coordinator position: tanszékvezető egyetemi tanár
Course coordinator Date and number of habilitation: 12/1999. DOTE

Objectives of the course, and its place in the curriculum of the medical training program:

Acquisition of theoretical and practical neurological knowledge required in general medical education.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture, seminar, practice.

Competencies acquired through completion of course:

The student learns the technique of neurological physical examination and the interpretation of the findings. Detects when examining a patient in need of urgent care. Knows the most common neurological and borderline disorders.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I. (Metabolism, Endocrinology, Gastroenterology, Nephrology), Medical Imaging

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum and maximum number of students registering for the course:

Minimum 10.

Maximum:50

Student selection method: Via the NEPTUN system, in order of application

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Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The timetable of the given block may vary slightly depending on the circumstances (e.g. due to the teaching day falling on a day off, currently available patient material, number of teaching rooms)!

1.week						
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	

8:30 – 9:15	Introduction	Sensory system	Sensory system examination	Day off	Cerebellar examination
9:15 -10:00	Introduction	Sensory system	Sensory system examination		Cerebellar examination
10:00-10:15					
10:15 - 11:00	Cranial nerves I-VI.	Motor system examination I.	Cerebellum		Disorders of consciousness, neurological emergencies
11:00-11:45	Cranial nerves VII-XII.	Motor system examination I.	Cerebellum		Disorders of consciousness, neurological emergencies
LUNCH BREAK					
12:45 - 13:30	Motor system I.	Motor system examination II.	Brainstem		Cortical functions, aphasias
13:30 - 14:15	Motor system I.	Motor system examination II.	Brainstem		Cortical functions, aphasias
14:15 - 14:30					
14:30 - 15:15	Patient examination	Patient examination	Patient examination		Patient examination
15.15-16:00	Case presentation	Case presentation	Case presentation		Case presentation

2.week

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
8:30 – 9:15	Movement disorders	Meningitis, encephalitis	Headache and neuralgias		Spinal cord disorders
9:15 -10:00	Movement disorders	Meningitis, encephalitis	Headache and neuralgias		Spinal cord disorders
10:00-10:15					
10:15 - 11:00	Neuropsychological assessment	Patient examination	Patient examination		Patient examination
11:00-11:45	Neuropsychological assessment	Patient examination	Patient examination	Day off	Patient examination
LUNCH BREAK					
12:45 - 13:30	Approach to the unconscious patient	Cerebrovascular disorders	Multiple sclerosis and immune-mediated disorders		Peripheral nervous system disorders
13:30 - 14:15	Approach to the unconscious patient	Cerebrovascular disorders	Multiple sclerosis and immune-mediated disorders		Peripheral nervous system disorders
14:15 - 14:30					
14:30 - 15:15	Patient examination	Patient examination	Patient examination		Patient examination
15.15-16:00	Case presentation	Case presentation	Case presentation		Case presentation

3.week

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**

8:30 – 9:15	Dementia	Encephalopathies	Neurosurgery SE INK	Day off	Neurosurgery SE INK	
9:15 -10:00	Dementia	Encephalopathies	Neurosurgery SE INK		Neurosurgery SE INK	
10:00-10:15						
10:15 - 11:00	Patient examination	Patient examination	Neurosurgery SE INK		Neurosurgery SE INK	
11:00-11:45	Patient examination	Patient examination	Neurosurgery SE INK		Neurosurgery SE INK	
LUNCH BREAK						
12:45 - 13:30	Epilepsy	Neurogenetics and muscle disorders	Neurosurgery SE INK		Neurosurgery SE INK	
13:30 - 14:15	Epilepsy	Neurogenetics and muscle disorders	Neurosurgery SE INK		Neurosurgery SE INK	
14:15 - 14:30						
14:30 - 15:15	Patient examination	Patient examination	Neurosurgery SE INK		Neurosurgery SE INK	
15.15-16:00	Case presentation	Case presentation	Neurosurgery SE INK		Neurosurgery SE INK	
	4.week					
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	
8:00 - 16:00			**Practical exam**		**Test exam**	

Lecture

Seminar

Practice

Instructors

Department of Neurology)

Dr. Arányi Zsuzsanna, Dr. Balicza Péter, Dr. Béres-Molnár Katalin (Szt.János Kórház), Dr. Bokor Magdolna (Nyírő Gy. Kórház), Dr. Böjti Péter, Dr. Bereczki Dániel, Dr. Bozsik György, Dr. Csillik Anita, Dr. Dabasi Loránd, Dr. Debreczeni Róbert, Dr. Dénes Kitti, Dr. Dobronyi Levente, Dr. Farkas Zsuzsanna, Dr. Farsang Marianna, Dr. Fazekas Ferenc (Szt.János Kórház), Dr. Folyovich András (Szt. János Kórház), Dr. Gulyás Szilvia, Dr. Gunda Bence, Dr. Hornyák Csilla, Dr. Iljicsov Anna, Dr. Ilniczky Sándor, Dr. Jakab Gábor (Uzsoki u. Kh.), Dr. Kelemen Andrea, Dr. Kollai Sarolta, Dr. Kovács Tibor, Dr. Lambertus Iván, Dr. Mezei Zsolt, Dr. Milanovich Dániel, Dr. Palotai Marcell, Dr. Pál Hanga, Dr. Pánczél Gyula, (Kistarcsai Flór F. Kh.) Dr. Rózsa Csilla (Jahn Ferenc Dél-pesti Kh.), Dr. Saftics Katalin, Dr. Simó Magdolna, Dr. Salacz Pál (Péterfy Kh.), Dr. Sipos Ildikó, Dr. Sisak Dominika, Dr. Soós Krisztina, Dr. Magyar-Stang Rita, Dr. Szatmári Szabolcs, Dr. Szőcs Ildikó, Dr. Szőke Kristóf, Dr. Szupera Zoltán (Szent Imre Kh.), Dr. Takáts Annamária, Dr. Takács Tímea Tünde, Dr. Tamás Gertrúd, Dr. Tegze Nárcisz, Dr. Tóth Adrián, Dr. Vastagh Ildikó (Bajcsy Kh.)

SE Neurosurgery and Neurointervention Clinic:

Neurosurgery:

Dr. Bagó Attila, Dr. Bagó Máté, Prof. Dr. Banczerowski Péter, Dr. Balogh Attila, Dr. Benkő Zsolt, Dr. Berényi György, Prof. Dr. Erőss Loránd, Dr. Gácsi Kristóf, Dr. Gál Erika, Dr. Halász László, Dr. Klimaj Zoltán, Dr. Kopa Miklós, Dr. Kővári Ádám, Dr. Markia Balázs, Dr. Mezei Tamás, Dr. Nagy Dávid, Dr. Nagy Gábor, Dr. Nagy Zoltán, Dr. Orbay Péter, Dr. Padányi Csaba, Dr. Papp Zoltán Attila, Dr. Pánczél András, Dr. Sipos László, Dr. Várady Péter, Dr. Vitanovics Dusán,

Neurology:

Prof. Kamondi Anita, Dr. Áfra Judit, Dr. Barcs Gábor, Dr. Győrfy Orsolya, Dr. Hajnal Boglárka, Dr. Éltes Tímea, Dr. Jordán Zsófia, Dr. Kelemen Anna, Dr. Kovács Andrea, Dr. Dutkai- Papp Anikó, Dr. Sákovics Anna, Dr. Szirmai Danuta, Dr. Újvári Ákos, Dr. Benkő-Zaja Gréta, Dr. Nyerges Miklós, Dr. Damó-Csorba Borbála, Dr. Ódri Abigél, Dr. Szabó Johanna

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance at lectures and practices is compulsory. Absence may not exceed 10% of the lectures and practices. Replacement is subject to individual assessment.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

At the beginning of the practices, the instructor checks the preparedness.

In the last week of the block, students take a practical exam, which is a condition for applying for the written theoretical exam. The prerequisite for the practice exam is the ability to use the correct examination technique and the recognition of pathological symptoms. In addition to teaching in contact classes, we help the students' preparation with a book on neurological examination techniques and course material available in the e-learning system.

The written exam takes place in the Moodle system.

The exam consists of 50 computer-randomized multiple-choice questions. The minimum requirement for passing the exam is 60% correct answers.

After an unsuccessful test, one can take an oral test for repair.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Attendance at lectures and practices is compulsory. Absence may not exceed 10% of the lectures and practices. Replacement is subject to individual assessment.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The prerequisite for the practice exam is the ability to use the correct examination technique and the recognition of pathological symptoms. In addition to teaching in contact classes, we help the students' preparation with a book on neurological examination techniques and course material available in the e-learning system.

In the last week of the block, students take a practical exam, which is a condition for applying for the written theoretical exam. The prerequisite for the practice exam is the ability to use the correct examination technique and the recognition of pathological symptoms. In addition to teaching in contact classes, we help the students' preparation with a book on neurological examination techniques and course material available in the e-learning system.

The written exam takes place in the Moodle system.

The exam consists of 50 computer-randomized multiple-choice questions. The minimum requirement for passing the exam is 60% correct answers.

After an unsuccessful test, one can take an oral test for repair.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The written exam consists of 50 computer-randomized multiple-choice questions. The minimum requirement for passing the exam is 60% correct answers.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Passing the practical exam is a condition for passing the theory exam. The overall evaluation is based upon the achievement of the multiple choice test in five grade rating system.

Comprehensive examination

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php

Printed resources:

Type	Recommended
Author	Arányi-Kamondi-Kovács-Szirmai: Investigation of neurological patients
Title	University note
Publisher	
Year of publication	

Type	Recommended

Author	Lindsay,Bone,Callender: Neurology and Neurosurgery Illustrated. Churchill Livingstone
Title	book
Publisher	
Year of publication	

Type	Recommended
Author	Adams: Principles of Neurology. McGraw-Hill
Title	book
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szülészeti és Nőgyógyászati Klinika - Baross utcai részleg

Name of subject in Hungarian: Szülészet- nőgyógyászat
Name of subject in English: Obstetrics and Gynecology
Name of subject in German: Geburtshilfe und Gynäkologie

Credit value of the course: 6
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
6.0	2.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNO1755_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ács Nándor (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Obstetrics and Gynecology (H-1082, Budapest Üllői str. 78/A.) Tel: 06-1-210-0290
Course coordinator position: Professor, Clinic Director
Course coordinator Date and number of habilitation: 245/2007.05.30

Objectives of the course, and its place in the curriculum of the medical training program:

The main goal of the obstetrics and gynecology block in the fifth year is to show the clinical signs and symptoms of the most common diseases in obstetrics and gynecology, and to teach the mentality and everyday routine of the subject.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures, practical lessons, practices

Competencies acquired through completion of course:

Obstetrics and gynecology studies start in the fifth year and – throughout the whole curricula – finishes at the end of the sixth year as part of the clinical education. During this period, our goal is to set the knowledge of obstetrics and gynecology together with the knowledge of other theoretical and clinical subjects of medicine. Our goal is to have graduated doctors with up-to-date theoretical knowledge and practical skills, who are able to build correct human relationships with patients, relatives and colleagues, and are able to work in medicine independently.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Medical Imaging, Surgery I-II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Finishing 4th year studies.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Associate professor, leading tutor : Gyula Richárd Nagy MD, PhD, med.habil

Practices

The education of the subject is based on a block system. During the two weeks block, students are visiting the Department for 8 days for the theoretical and practical courses and for the exams.

Exams closing the block system are on the last week. As there are different topics during the block, students are educated rotating weekly, so at the same time, fewer students are studying a subspeciality. These students are further divided into smaller groups for practices next to the patient bed and for practices at the gynecological and obstetrical outpatient wards and delivery room.

Practice themes

Prenatal care

Ultrasonography

Neonatal intensive care

Neonatal resuscitation

Pathological pregnancy

Malformations

Delivery room

Skill lab

Family planning

Outpatient clinic

Colposcopy

Amniocentesis

Gynecology

Oncology

Assisted reproduction

Preparation for labor

Lectures and Lecturers

Periconceptional period - Gyula Richárd Nagy MD, PhD, med.habil

Maternal changes during pregnancy - Gyula Richárd Nagy MD, PhD, med.habil; Ákos Csaba MD PhD

Prenatal care - Artúr Beke MD, PhD, med.habil

Ultrasonography, Fetal monitoring- -Gábor Szabó MD, PhD

Labor and delivery - Ákos Csaba MD PhD

Pathological delivery - Ákos Csaba MD PhD

Operative delivery - Ákos Csaba MD PhD

Puerperium . - Sára Balogh MD

Pregnancy pathology I-III. - Gyula Richárd Nagy MD, PhD, med.habil

Malformations - Tamás Gyula Marton MD, PhD

Twin gestation – Ervin Hruby MD, PhD

Neonatology - Gyula Richárd Nagy MD, PhD, med.habil

Genetics I-II. - Gyula Richárd Nagy MD, PhD, med.habil

Gynecological endocrinology –Prof. János Urbancsek MD, PhD

Inflammatory diseases in OB&GYN- Sára Balogh MD, András Mihály Géczi MD

Infertility problems- Prof. János Urbancsek MD, PhD

Endometriosis- -Attila Bokor MD, PhD

Major gynecological benign diseases - Gyula Richárd Nagy MD, PhD, med.habil

Gynecological oncology I-III. - Gyula Richárd Nagy MD, PhD, med.habil

Contraception - Gyula Richárd Nagy MD, PhD, med.habil

Menopause - Attila Bokor MD, PhD

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the study and examination rules of Semmelweis University.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

As the education course is short, no interim exams will take place during the study period. Interactive practices and visits will allow checking the knowledge of the students.

Number and type of individual assignments to be completed, submission deadlines:

No such.

Requirements for the successful completion of the course:

According to the study and examination rules of Semmelweis University.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Oral questions:

check the list of questions on the homepage of the Department

List of examination topics:

OBSTETRICS

1. Obstetric and gynecologic evaluation
2. Physiologic changes in pregnancy (cardiovascular-, respiratory system)
3. Physiologic changes in pregnancy (renal system, hormonal changes)
4. Hypertensive disorders in pregnancy. Eclampsia. HELLP-syndrome
5. Signs and symptoms of pregnancy
6. Pregnancy care, pregnancy counseling
7. Pregnancy and cardiovasular diseases
8. Pregnancy and diabetes mellitus. Gestational diabetes
9. Pregnancy and kidney diseases. Urinary tract infections
10. Pregnancy and gastrointestinal disorders
11. Pregnancy and hematologic disorders
12. Spontaneous abortion
13. Preterm labor and delivery
14. Intrauterine growth retardation (IUGR)

15. Uterine activity during labor. Characteristics of contractions, their anomalies. Treatment
16. Dystocia caused by abnormal presentation and position of the fetus
17. Dystocia caused by abnormalities of fetal structure or maternal pelvic alterations
18. Stages of delivery. Management of the first and second stage
19. Stages of delivery. Management of the third and fourth stage
20. Preparation for delivery. Obstetric anesthesia
21. Induction and augmentation of labor
22. Cephalopelvic disproportion and its consequences
23. Breech presentation
24. Malpresentations
25. Anomalies of rupture of membranes
26. Placenta previa. Other placental abnormalities
27. Multiple gestation
28. Placental abruption
29. Amniotic fluid and its disorders. Polyhydramnios and oligohydramnios
30. Postpartum hemorrhage
31. Lesions of the birth canal. Uterine rupture
32. Infectious diseases in pregnancy. Bacterial and parasite infections
33. Infectious diseases in pregnancy. Viral infections
34. Intrauterine fetal death. Postterm pregnancy
35. Detection of fetal jeopardy during pregnancy
36. Cardiotocography
37. Genetic counseling – Teratology
38. Licit and illicit drug use in pregnancy
39. Obstetrical examinations
40. Ultrasound diagnosis during gestation
41. Physiologic puerperium
42. Pathologic puerperium. Puerperal sepsis
43. Management of the newborn after delivery
44. Main forms of congenital malformations
45. Obstetric operations. Cesarean section (indications)
46. Obstetric statistics
47. Breast feeding
48. Pregnancy complicated by surgical diseases (appendicitis, ileus, cholelithiasis
49. Advices during pregnancy

GYNAECOLOGY

1. Primary amenorrhea
2. Secondary amenorrhea
3. Stein-Leventhal syndrome (PCOS)
4. Dysfunctional uterine bleeding
5. Dysmenorrhea. Premenstrual tension
6. Causes of infertility. The infertile couple
7. Examinations and treatment in infertility
8. Hormonal contraception. Intrauterine devices
9. Barrier and chemical contraceptives. Natural contraceptive methods

10. Puberty
11. Pediatric gynecology
12. Perimenopause
13. Inflammatory disorders of the vulva and vagina
14. Sexually transmitted diseases in female
15. Benign lesions of the vulva and vagina
16. Malignant tumors of the vulva and vagina
17. Etiology and precancerous states of cervical cancer
18. Symptoms, signs and screening of cervical cancer
19. Staging and therapy of cervical cancer. Pathology
20. Benign diseases of the uterus
21. Etiology and precancerous states of corporal cancer (hyperplasias)
22. Symptoms signs and screening of corporal cancer
23. Staging and therapy of corporal cancer. Pathology
24. Functional cysts of ovaries
25. Benign neoplasms of ovaries
26. Etiology, clinical presentation and screening of ovarian tumors
27. Staging and therapy of ovarian neoplasms. Pathology
28. Endometriosis and adenomyosis
29. Normal and abnormal positions of the vagina and uterus (genital prolapse) and their treatment
30. Urinary incontinence
31. Pelvic inflammatory disease
32. Pelvic pain
33. Ectopic pregnancy
34. Breast diseases
35. Breast cancer
36. Gynecologic operation technics (D and C, conisation)
37. Virilism and hirsutism
38. Hydatidiform mole
39. Choriocarcinoma
40. Principles of cancer therapy

OSCE exam elements required for Ultrasound:

Skill	Expected level of the skill
Estimation of the fetus' in intrauterine position by ulrtasound	O,P
Determining the location of the placenta by ultrasound	O,P
Determining the volume of the amniotic fluid by ultrasound	O,P

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirements for completing the course are attendance at lectures and practical sessions (in accordance with university regulations), as well as passing the oral examination. The topic list for Obstetrics and Gynecology is available under point 29 and on our website.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

According to the study and examination rules of Semmelweis University.

(90-100% excellent, 80-89% good, 70-79% average, 60-69% satisfactory, 0-59% failed)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory
Author	N.F. Hacker and J.G. Moore
Title	Essentials of Obstetrics and Gynecology 5th Edition
Publisher	Elsevier - Health Sciences Division
Year of publication	2015

Type	Mandatory
Author	Louise Kenny
Title	Obstetrics by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	2017

Type	Mandatory
Author	Louise Kenny
Title	Gynecology by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	2017

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Klinikai Onkológiai Tanszék

Name of subject in Hungarian: Onkológia
Name of subject in English: Oncology
Name of subject in German: Onkologie

Credit value of the course: 4
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
4.0	1.0	3.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKKOT1122_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Dank Magdolna (igazgatóhelyettes)
Course coordinator location of work, telephone availability: +36 1 224 8600
Course coordinator position: Head of Department, University Professor
Course coordinator Date and number of habilitation: 07 June 2010, No. 294

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the Clinical Oncology course is to provide students with modern, up-to-date, and comprehensive knowledge on the recognition, diagnosis, and treatment of malignant diseases.
During the course, students will become familiar with the most important etiological and epidemiological factors of cancer, the possibilities for early detection, and the fundamentals of oncological diagnostics. Special emphasis is placed on modern oncological therapies, including the principles, indications, and side effects of chemotherapy, targeted therapy, and immunotherapy. Students will learn about multidisciplinary and personalized treatment strategies for solid tumors, as well as opportunities for rehabilitation and long-term follow-up.

The course also offers insight into the operation of multidisciplinary tumor boards and the practice of precision medicine, enabling students to competently engage in the complex decision-making processes of oncological patient care. The training aims to provide a solid foundation for the development of clinical oncological thinking and for future practical medical work.

Radiotherapy Day

- The objective of this section of the course is for students to acquire knowledge on:
- the physical and chemical principles and biological effects of radiotherapy,
- external beam radiotherapy and brachytherapy,
- radiotherapy treatment planning,
- the basic principles of radiotherapy equipment operation,
- the role of radiotherapy in the treatment of malignant tumors,
- current radiotherapeutic approaches for the most common solid tumors, including radiochemotherapy and radiobiotherapy,
- early and late side effects of radiotherapy and their possible prevention and management,
- palliative irradiation and the use of radiotherapy in oncological emergencies.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures (14x 45 mins) and Practical lessons (41x45 mins) written exam (1x45)

Competencies acquired through completion of course:

- **Acquisition of modern oncological core knowledge:**
  Comprehensive understanding of the epidemiology, etiology, early detection, diagnostics, and therapy of malignant diseases.
- **Application of the fundamentals of precision medicine:**
  Clinical interpretation of molecular diagnostic methods and biomarkers in therapeutic decision-making.
- **Practical knowledge of medical oncology treatments:**
  Recognition of indications, application, and adverse effects of chemotherapy, targeted therapy, immunotherapy, and biological treatments.
- **Understanding of multidisciplinary, tumor board–based decision-making:**
  Mastery of the logic and function of multidisciplinary patient management.
- **Development of communication and psycho-oncological skills:**
  Empathetic physician–patient communication, managing difficult situations, and delivering bad news.
- **Palliative care approach and basic rehabilitation knowledge:**
  Fundamentals of comprehensive, holistic cancer patient management.
- **Use of digital tools and artificial intelligence in oncology:**
  Interpretation of digital data and familiarity with AI-based decision support systems.

Radiotherapy Day (for 5th-year medical students)

- Building on prior studies, students acquire general knowledge of radiotherapy and understand the indications and role of radiotherapy in the treatment of malignant diseases.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Basic Surgical Techniques, Pathology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on Neptun system registration: 1/8 of the year group.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Lectures (12 hours)

Block 1:

1. Etiology and epidemiology of tumors, methods of prevention and screening (45 min) (Prof. Dr. Magdolna Dank/ Dr. Zsófia Küronya)

2. Imaging diagnostics of tumors (45 min) (Dr. Ádám Tárnoki/ Dr. Dávid Tárnoki/ Dr. Mátyás Ujlaki)

3. Histological and molecular pathological diagnosis of tumors (45 min) (Dr. Erika Tóth/ Dr. János Szőke)

4. Basics of oncological surgery. Surgical considerations in tumor board discussions (45 min) (Dr. Tamás Mersich/ Dr. Dániel Horányi/ Dr. Zsolt Dubóczki)

5. Oncological surgical reconstruction, palliation, and interventions in the era of technological advancement (45 min) (Dr. Dániel Horányi/ Dr. Tamás Mersich)

6. Clinical drug trials and experimental oncological therapies (45 min) (Dr. habil. Erika Hitre

Block 2:

7. Chemotherapy, biological, and endocrine treatments (45 min) (Dr. Gábor Rubovszky/ Dr. Zsófia Küronya)

8. Immunological treatments in oncology (45 min) (Dr. Zsófia Küronya/ Dr. habil. Erika Hitre)

Block 3:
9. Clinical psycho-oncology – Dr. Péter Kovács

Block 4 – Radiotherapy:
10. Principles of radiotherapy and radiochemotherapy in the treatment of tumors (45 min) (Prof. Dr. Csaba Polgár, Dr. habil. Zoltán Takácsi-Nagy)

Block 5:
11. Artificial intelligence in oncology (45 min) (Dr. Norbert Mészáros/Dr. Kliton Jorgo)
12. Oncological emergencies / Rehabilitation and follow-up in oncology (45 min) (Prof. Dr. Magdolna Dank/ Dr. Gyöngyvér Szentmártoni/ Dr. Zsófia Küronya)

Practical sessions (21 hours)

Block 1:

· Tumor diagnostics I: Cytological, histological, molecular pathology practical (2×45 min)

Block 2:

· Systemic treatment of tumors I: Oncology in practice – outpatient clinic with real patients, small group experience (2×45 min)

· Systemic treatment of tumors II: First encounter with the oncology patient, bedside practice (2×45 min)

· Systemic treatment of tumors III: The role of early palliative care in oncology (1×45 min)

· Systemic treatment from a pharmacist’s perspective (1×45 min)

Block 3:

· Tumor diagnostics II: Imaging diagnostics practical (4×45 min; mammography/ultrasound 45 min, CT 45 min, MRI 45 min, PET-CT 45 min)

· Psycho-oncology practical (2×45 min)

· Consultation

Block 4 - Radiotherapy:

· Tumor radiotherapy I: Treatment planning practical (2×45 min)

· Tumor radiotherapy II: Practice of external beam radiotherapy (2×45 min)

· Tumor radiotherapy III: Brachytherapy practical (2×45 min)

· Written test (1×45 min)

Block 5:

· Tumor surgery (operating theatre practice) (4×45 min)

Tumor board practice (2×45 min)

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the Study and Examination Regulations, attendance is compulsory for at least 90% of the classes.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Throughout the course, students' knowledge is assessed not through formal examinations, but by using modern, interactive tools. At the end of each lecture, a digital Quizlet questionnaire—accessible via QR code—is used to evaluate whether students have mastered the key "take-away" messages of that session. This method enables immediate feedback and helps reinforce the material, while also supporting active participation and deeper understanding.

Number and type of individual assignments to be completed, submission deadlines:

None.

Requirements for the successful completion of the course:

Attendance of at least 90% of all lectures and practical sessions. Attendance is checked at every class via a roll call.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics

accepted as an exam)

Preparation for the examination is supported by a detailed set of 150 questions covering the current, practically relevant knowledge base of the Clinical Oncology course. The questions have been compiled by the lecturers in accordance with the course syllabus, highlighting the key topics and competency areas essential for mastering the subject and developing a comprehensive oncological approach.

Topic: Etiology, epidemiology, prevention, and screening of tumors

1. What is the difference between the incidence and prevalence of tumors, and why is it important to understand this in oncology practice?
2. Name three major modifiable risk factors that significantly contribute to the development of cancer.
3. What is the role of oncogenes and tumor suppressor genes in tumor formation, and what processes can lead to their dysfunction?
4. Why is cancer considered a multifactorial process? Give an example of the interaction between genetic and environmental factors.
5. How does socioeconomic status influence the incidence and outcome of tumors?
6. List at least three types of tumors whose incidence can be significantly reduced by primary prevention!
7. What is the difference between primary, secondary, and tertiary prevention? Give an example of each!
8. Why are the sensitivity and specificity of screening tests important when they're used at the population level?
9. What principles can be used to decide whether it's worth starting a public health screening program for a certain type of cancer?
10. Name two types of cancer for which organized public health screening is available in Hungary!
11. What is the role of the HPV vaccine in cancer prevention, and what are its public health implications?
12. Why is it important to raise public awareness of health issues in cancer prevention?
13. What options are available for preventing or detecting tumors early in cases of genetic predisposition?
14. What role do obesity and an inactive lifestyle play in the development of tumors? Name at least one type of tumor that supports this correlation.
15. What is the purpose and main benefit of early diagnosis from an oncological point of view?

Topic: Imaging diagnostics of tumors

1. What is the role of imaging in the diagnosis and staging of tumors? What information does a contrast-enhanced and native CT scan provide in characterizing a tumor?
2. Which imaging procedure should be the first choice when investigating a new suspected tumor, and why? What factors should be considered when assessing radiation exposure during imaging examinations?
3. What is the difference between anatomical and functional imaging methods? Give examples of both.
4. For which types of tumors is MRI primarily recommended, and why?

5. What is the role of PET/CT in oncological diagnostics, and what are its advantages over other modalities?
6. What is the role of nuclear medicine in the detection and treatment of tumors?
7. How does isotope therapy work, and for which tumors can it be used?
8. What is the concept of radiomics, and how can it be used in clinical practice?
9. How can artificial intelligence help in the imaging diagnosis of tumors?
10. Why is standardization and uniform evaluation of imaging (e.g., RECIST criteria) important in assessing therapeutic response?
11. What are the advantages and limitations of ultrasound in oncological examinations?
12. What is the role of chest CT in lung cancer screening, and for whom is it recommended?
13. How can imaging be used to determine biopsy targets?
14. What factors should be considered in relation to radiation exposure from imaging tests in cancer patients?
15. Why is multidisciplinary interpretation of diagnostic imaging results important within the oncology team? What does the term "radiological downstaging" mean, and what are its potential therapeutic implications?

Topic: Histological and molecular pathological diagnosis of tumors

1. What is the role of biopsy in the diagnosis of cancer, and what types are there?
2. Why is histological diagnosis necessary before starting any oncological treatment?
3. What is the difference between cytological and histological sampling, and when is each recommended?
4. How is the histological classification (grading) of tumors performed, and what is its clinical significance?
5. What is the role of the TNM system, and why is knowledge of the histological type alone insufficient to determine treatment?
6. What is the role of immunohistochemistry in tumor diagnosis? Give an example of a typical marker!
7. What clinical decisions can be influenced by hormone receptor status in breast cancer?
8. Why is it important to determine HER2 status, and what methods are used to test for it?
9. What is the concept of molecular pathology, and how does it differ from classical histological examination?
10. Give an example of a molecular abnormality that opens up targeted therapeutic options!
11. What is the significance of microsatellite instability (MSI) and mismatch repair (MMR) testing in colorectal tumors?
12. Why is it important to detect EGFR mutations in lung cancer?
13. What role does molecular diagnostics play in predicting therapeutic resistance?
14. How is sample quality assured for molecular testing?
15. Why is close collaboration between the pathologist and the oncology team important in diagnosis and treatment decisions?

Topic: Fundamentals of oncological surgery. Surgical considerations in the oncology team

1. What is the main goal of oncological surgery in tumor treatment, and how does it fit into

multimodal therapy?
2. What do we mean by radicality (R0–R2), and why is it essential to document this accurately?
3. What is the difference between the goals of curative and palliative oncological surgery?
4. What surgical considerations should be taken into account when planning tumor resection?
5. How do the stage and location of the tumor determine the possibility of surgical intervention?
6. Why is the presence of a surgeon particularly important in the decision-making process of the oncology team?
7. What is the concept of "downstaging" and when may neoadjuvant therapy be necessary to achieve it?
8. What complications should be considered before major oncological surgery and how do they influence the decision?
9. Why may reconstruction procedures be necessary at the same time as resection, and what professions need to collaborate to achieve this?
10. How does the patient's general condition (e.g., nutrition, comorbidity) affect surgical treatability?
11. What is the role of sentinel lymph node biopsy, and for which types of tumors is it used?
12. Why is it important to determine the appropriate surgical margin (safety margin), and how can it be evaluated during pathological processing?
13. What role do minimally invasive (laparoscopic, robot-assisted) techniques play in oncological surgery?
14. What does "multivisceral resection" mean, and what are its indications?
15. What criteria are used to determine whether a tumor is resectable, and what role do imaging and the surgeon's opinion play in this decision?

Topic: Oncological reconstruction, palliation, and oncological intervention in the age of technological revolution

1. What is the purpose of oncological reconstruction, and why is it important to treat it as an integral part of surgical planning?
2. What anatomical and functional aspects should be considered during reconstruction following tumor removal?
3. Why is multidisciplinary collaboration (surgeon, plastic surgeon, oncologist) essential in complex reconstructive surgeries?
4. What reconstruction techniques are available for breast cancer patients, and how do we choose the optimal solution?
5. What does the concept of palliation mean in oncology, and when is surgical intervention for palliative purposes justified?
6. What surgical palliative procedures are available for tumors causing obstructive symptoms (e.g., stomach, colon, pancreas)?
7. What is the purpose of interventional radiology and endoscopic procedures in oncological palliation?
8. How do new technologies (robotic surgery, 3D printing, intraoperative navigation) help to achieve more accurate tumor removal and reconstruction?
9. What is the difference between a procedure that improves quality of life and a treatment with curative intent? Give a clinical example.
10. What ethical considerations may arise when a procedure no longer has oncological benefits but can improve the patient's quality of life?

11. What role does interventional radiology play in the treatment of tumor-related pain or bleeding?
12. Why is it important to consider patient preferences when making palliative surgical decisions?
13. How has technological advancement changed the treatability of previously inoperable tumors?
14. What is the place of the surgical "damage control" approach in advanced, complicated oncological conditions?
15. What future technological trends (e.g., artificial intelligence, robotics, bioprinting) may influence oncological surgical practice in the next decade?

Topic: Drug clinical trials and experimental oncology therapies

1. What is the purpose of clinical trials in oncology, and how do they differ from routine treatment?
2. What are the phases of clinical trials (I–IV), and what is the most important objective of each?
3. What is informed consent, and why is it essential for participation?
4. How do clinical trials ensure patient safety and ethical compliance?
5. Why is not every experimental treatment automatically considered a "better" option than standard therapy?
6. What is the role of randomization in clinical trials, and why is it important for the validity of the results?
7. What is a placebo-controlled trial, and in what oncological situations is this approach ethical?
8. What is the difference between "off-label" treatment and the use of drugs in clinical trials?
9. What types of patients may be suitable for experimental oncological treatments?
10. What role does molecular diagnostics play in the clinical testing of targeted therapies?
11. How are therapeutic responses and side effects monitored in patients participating in clinical trials?
12. Why is cooperation between the principal doctor and the multidisciplinary team important?
13. How can clinical trials influence the development of oncology treatment guidelines?
14. What ethical dilemmas may arise in relation to the inclusion of patients with incurable diseases in clinical trials?
15. What is the role of patient information and motivation in the success of experimental therapies?

Topic: Chemotherapy, biological and endocrine treatments

1. What is the difference between the mechanisms of action of chemotherapy, biological therapy and endocrine treatment?
2. For what purposes can chemotherapy be used: neoadjuvant, adjuvant or palliative?
3. Why is it important to know the biological characteristics of a tumor (e.g., receptor status, mutations) in order to select targeted therapies?
4. What is cytotoxic chemotherapy, and what is its main mechanism of action?
5. What is the role of endocrine therapy in hormone-sensitive tumors, and what types of drugs are used for this purpose?
6. What is the essence of HER2-targeted therapy, and for which tumor types is it used?
7. What are the common side effects of cytotoxic chemotherapy, and how can they be treated?
8. What is the purpose of targeted (biological) therapy, and what are its advantages over conventional chemotherapy?

9. Why is it important to assess the patient's general condition (e.g., ECOG status) before starting systemic treatment?
10. How do angiogenesis inhibitors work, and for which tumors is this therapeutic approach effective?
11. What is a "hormone-dependent" tumor, and how does it influence therapeutic decision-making?
12. What types of biomarkers can influence the indication for biological therapies?
13. What factors should be considered when planning treatment breaks and cycles during chemotherapy?
14. Why is toxicity monitoring crucial, and what role does the oncology team play in this?
15. Why can't certain targeted or hormone therapy drugs be given to all patients whose tumors are positive for a given marker?

Topic: Immunological treatments in oncology

1. What is the basic principle of tumor immunology, and how can it be used in cancer treatment?
2. What is immune checkpoint blockade, and which molecules are the targets of these therapies?
3. What is the difference between PD-1 and PD-L1 inhibitors, and in which tumor treatments are they used?
4. What is CTLA-4 inhibition, and how does its mechanism of action differ from that of PD-1/PD-L1 inhibitors?
5. What is the biggest advantage of immunotherapy over classic chemotherapy, and when can it be used?
6. Which patient groups can benefit most from immunotherapy? Name at least one type of tumor!
7. What is the role of TILs (tumor-infiltrating lymphocytes), and how do they indicate response to treatment?
8. What are the typical side effects of immunotherapy, and how do they differ from chemotherapy toxicity?
9. Why is early recognition and treatment of immune-mediated side effects important?
10. What is the role of MSI (microsatellite instability) or TMB (tumor mutational burden) in the selection of immunotherapy?
11. What is the phenomenon of "pseudo-progression" and how does it influence therapeutic decision-making?
12. Why is the active participation of a multidisciplinary team necessary during immunotherapy treatments?
13. Which clinical or laboratory signs may indicate immune-mediated endocrinopathies (e.g., hypophysitis, thyroiditis)?
14. Why should immunotherapy treatment be carefully considered in patients with autoimmune diseases?
15. What future directions do you see in the development of immuno-oncology (e.g., CAR-T, vaccine-based therapies)?

Topic: Clinical oncopsychology

1. What is the purpose of clinical oncopsychology, and why is it an essential part of complex oncological care?

2. What psychological reactions are typical after a cancer diagnosis?
3. What is the difference between normal psychological adaptation and psychopathological reactions in cancer patients?
4. What is the role of the oncologist in providing psychological support to patients, and when should a patient be referred to a psychologist?
5. How can an oncology psychologist help improve treatment compliance?
6. What is the concept of distress in oncology, and how can it be recognized and measured?
7. What forms of psychological support are available to cancer patients?
8. What role do family and relatives play in the development of the patient's mental state?
9. How can cancer patients be helped to remain active participants in their own therapy?
10. Why is oncopsychological support particularly important for young patients or parents?
11. How can a serious, life-threatening diagnosis be communicated effectively to the patient?
12. What is the role of grief support in the final stages of oncological care and among relatives?
13. What psychological challenges can communicating tumor recurrence or metastasis present?
14. How can cancer change identity and self-esteem?
15. What role can psychoeducation and support communities play in long-term oncological rehabilitation?

Topic: Oncological emergencies

1. Why is it important for oncologists to recognize emergencies in cancer patients?
2. What is the most common cause of spinal cord compression, and what symptoms should raise suspicion?
3. How can superior vena cava syndrome be recognized, and what urgent measures should be taken?
4. Which oncological emergencies can be associated with rapid neurological deterioration?
5. What is acute tumor lysis syndrome, and what laboratory abnormalities characterize it?
6. What is the diagnostic and therapeutic approach to neutropenic fever?
7. How can malignant hypercalcemia be treated, and what are the risks?
8. What is the significance of rapid imaging and laboratory diagnostics in oncological emergencies?
9. When is urgent radiation therapy or steroid treatment justified?
10. How can treatment-related side effects (e.g., pneumonitis) be distinguished from progression?
11. What respiratory emergencies can occur in patients with head and neck or mediastinal tumors?
12. What is the role of interdisciplinary collaboration in emergency oncology care?
13. When and how should empirical antibiotic treatment be started in neutropenic patients?
14. What is the differential diagnostic significance of new symptoms in cancer patients (progression vs. complication)?
15. Why is it important to inform patients and their relatives about the risks of emergency conditions and early symptoms?

Topic: Oncological rehabilitation and follow-up

1. What is the purpose of oncological rehabilitation, and what are its components?
2. How can the patient's physical condition be improved after treatment?
3. Why is psychosocial rehabilitation important, and what forms does it take?

4. What is the purpose of follow-up after treatment, and what aspects does it cover?
5. Which factors influence the frequency and content of follow-up?
6. Why is early detection of secondary tumors important during follow-up?
7. How can the quality of life be objectively measured among survivors?
8. What role do general practitioners and specialists play in long-term follow-up?
9. How can cancer patients be helped to return to work?
10. Why is it critical to monitor long-term side effects (e.g., neuropathy, cardiotoxicity)?
11. How can dietetics and exercise therapy help the rehabilitation process?
12. Which screening tests are recommended for long-term survivors?
13. What is the role of oncopsychological support during and after rehabilitation?
14. How can anxiety and uncertainty due to relapse be managed during the follow-up period?
15. What new directions are emerging in oncology survivorship programs?

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

https://semmelweis.hu/onkologiai-tanszek/en/education/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

According to the prevailing Study and Examination Regulations

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Bókay utcai részleg

Name of subject in Hungarian: Gyermekgyógyászat
Name of subject in English: Pediatrics
Name of subject in German: Kinderheilkunde

Credit value of the course: 7
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
7.0	0.0	5.0	2.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKGY11120_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Attila József (Klinika igazgató)
Course coordinator location of work, telephone availability: 06-1-334-3186
Course coordinator position: head of department
Course coordinator Date and number of habilitation: Budapest, June 7.2010. , No: 310

Objectives of the course, and its place in the curriculum of the medical training program:

To understand the typical symptoms and common diseases in pediatrics, to master theoretical and practical knowledge.

Format of the course (lectures, group work, practical lessons, etc.):

Seminar, case report, group work, bedside practice, skill practice

Competencies acquired through completion of course:

To be able to recognize childhood illnesses and treat them in a basic level

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I. (Metabolism, Endocrinology, Gastroenterology, Nephrology), Laboratory Medicine, Medical Imaging

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in Neptun, maximum 24 people per five-week course.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Timetable

<table>
<tr><td></td><td></td><td colspan="5">1. Week</td></tr>
<tr><td></td><td>Group</td><td>Monday</td><td>Tuesday</td><td>Wednesday</td><td>Thursday</td><td>Friday</td></tr>
<tr><td>8:45-9:30</td><td rowspan="2">A, B, C, D</td><td>General information (Krikovszky D.)</td><td>Fluid therapy (Ádámi/Lódi, Mahdi)</td><td rowspan="2">Neonatology (Seri I.)</td><td></td><td rowspan="2">Cardiology (Horváth Zs.)</td></tr>
<tr><td>9:30-10:15</td><td>9:30-9:45 Safety education (Agócs)</td><td>Resuscitation (Legeza/Ádámi)</td><td></td></tr>
<tr><td>10:15-10:30</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">10:30-12:00</td><td>A</td><td rowspan="2">(A, B, C, D) 10:00-10:30 Introduction to pediatrics
10:00-11:15 Normal development, physical examination (Arató A.)</td><td>A, Cardiology (Horváth Zs.)</td><td rowspan="2">Interactiv case reports about emergency (Becsei)</td><td></td><td>A, Emergency (monitoring, oxigen, Astrup…) Tian</td></tr>
<tr><td>B</td><td>B, Emergency (monitoring, oxigen, Astrup…) Legeza</td><td></td><td>B, Local skill (Berta/Agócs/Elblinger/Muzslay)</td></tr>
<tr><td>C</td><td rowspan="2">(A, B, C, D) 11:15-12:00 Communication in Pediatrics (Várnai)</td><td rowspan="2">Practical skills (Horváth É/Rohács/Mikó)</td><td>C, Cardiology (Horváth Zs.)</td><td></td><td>C, Pulmonology (Hérák)</td></tr>
<tr><td>D</td><td>D, PIC (Barndt)</td><td></td><td>D, Cardiology (Tölgyesi)</td></tr>
<tr><td>12:00-12:45</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

12:45-14:15	A	A, Examination of normal child and infant (normal status, percentile) - diabetology (Tél)	A, Pulmonology (Boczkó)	A, SKILL (Tian/Rohács/Horváth É/Seidl)		A, Local skill (Berta/Agócs/Elblinger/Muzslay)
	B	B, 12:45-13:30 Presentation of the clinic (Bojtár) 13:30-14:15 Fever (Vicenc)	B, Infancy (Bojtár)	B, SKILL (Tian/Rohács/Horváth É/Seidl)		B, Nephrology (Mikes)
	C	C, Local skill (Berta/Agócs/Elblinger/Muzslay)	C, Examination of normal child and infant (Perneczki)	Interactiv case reports about emergency (Bednárik)		C, PIC (Szász)
	D	D, 12:45-13:30 Presentation of the clinic (Bojtár) 13:30-14:15 Fever (Vicenc)	D, Gastroenterology (Prehoda)			D, Emergency (monitoring, oxigen, Astrup…) Legeza
14:15-14:30						
14:30-16:00	A	A, 14:30-15:15 Presentation of the clinic (Mikó Á) 15:15-16:00 Fever (Vicenc)	A, Infancy (Zsidegh)	Practical skills (Horváth É/Rohács/Mikó)		
	B	B, Examination of normal child and infant (normal status, percentile) - nephrology (Péter R)	B, Hepatology (Hazay)			
	C	C, 14:30-15:15 Presentation of the clinic (Mikó Á?) 15:15-16:00 Fever (Vicenc)	C, Emergency (monitoring, oxigen, Astrup…) Bednárik	C, SKILL (Tian/Rohács/Horváth É/Seidl)		
	D	D, Local skill (Berta/Agócs/Elblinger/Muzslay)	D, Examination of normal child and infant - USI (Vicenc)	D, SKILL (Tian/Rohács/Horváth É/Seidl)		

		2. Week

	Groups	Monday	Tuesday	Wednesday	Thursday	Friday
8:45-9:30	A, B, C, D	Nephrology (Mikes)	Pulmonology (Czövek)	Child psychiatry (Pászthy B.)		Infectology (Kis A.)
9:30-10:15			GP (Bence Zs.)			
10:15-10:30 break						
10:30-12:00	A	(A,B,C,D) 10:30-11:15 Fever, antipiretic treatment, febrile seizure (Vicenc)	Surgery (Nagy Cs., Pápai, Tallós)	A, Pulmonology (Krikovszky)		A, Infectology (Farkas F.B.)
	B			B, Gastroenterology (Arató)		B, Cardiology (Bokodi)
	C	(A,B,C,D) 11:15-12:00 Laboratory diagnosis (Kenesei)		C, Emergency (Hegedüs P.)		C, ICU (Ádámi)
	D			D, Infectology (FFB)		D, Hepatology (Dezsőfi)
12:00-12:45 break						
12:45-14:15	A	A, Hepatology (Dezsőfi)	Differencial diagnostic workshop (Székács, Boczkó)	A, Gastroenterology (Cseh)		A, PIC
	B	B, Infectology (Kiss)		B, PIC		B, Emergency (Vojcek)
	C	C, Infancy (Kincs)	C, Diabetology (Tél)	Differencial diagnostic workshop (Székács, Boczkó)		C, Nephrology (Kaucsár)
	D	D, Nephrology (Péter R)	D, Gastroenterology (Arató)			D, Pulmonology (Czövek)
14:15-14:30 break						
14:30-16:00	A		A, Emergency (Vojcek)	A, Nephrology (Mikes)		
	B		B, ICU (ITO)	B, Pulmonology (Boczkó)		
	C		C, Infectology (Kardics)	C, Gastroenterology (Arató)		
	D		D, Infancy (Ungvári-Veres A)	D, Diabetology (Botlik D)		

			3. Week

		Monday	Tuesday	Wednesday	Thursday	Friday
8:45-9:30	A, B, C, D	Oncology (Szabó S)	Hepatology (Dezsőfi)	Gastro (Cseh Á.)		Endocrinology/ Diabetology (Halász/Tóth-Heyn/Luczay)
9:30-10:15		Hematology (Müller)		Gastro (Arató A.)		
10:15-10:30 break						
10:30-12:00	A	Hematology (Benyó)	Surgery of facial developmental disorders (Nagy K.)	A, Neonatal surgery (Vicenc)		A, Infancy (Kincs)
	B			B, Infancy (Zsidegh)		B, Diabetology (Botlik D)
	C	Oncology (Brückner)	Allergology (Balogh Á) (Koós)	C, Surgery (Nagy Cs., Pápai, Tallós)		C, Neonatal surgery (Elblinger)
	D			D, Diabetology (Tél)		D, Emergency (Vojcek)
12:00-12:45 break						
12:45-14:15	A	Reumatology (Horváth Zs)	A, Surgery (Nagy Cs., Pápai, Tallós)	12:45-14:15 Pulmonology (Krikovszky)		Metabolic disorders (Zsidegh P.)
	B		B, Neonatal surgery (Vicenc)			
	C	Neurology (Farkas K)	Metabolic disorders (Zsidegh P.)	13:30-14:15 Microbiom (Arató)		C, Diabetology (Botlik)
	D					D, Neonatal surgery (Szűcs-Székács)
14:15-14:30 break						
14:30-16:00	A	Neurology (Kiss T)		A, Nephrology (Mikes)		
	B			B, Surgery (Nagy Cs., Pápai, Tallós)		
	C	Reumatology (Ponyi)		C, Infectology (Kardics)		
	D			D, Infancy (Bojtár)		

		4. Week				
		Monday	Tuesday	Wednesday	Thursday	Friday

<table>
<tr><td>8:45-9:30</td><td rowspan="2">ABCD</td><td>Dermatology (Plázár D.)</td><td rowspan="2">Genetic disorders (Tory K.)</td><td rowspan="11">Exam</td></tr>
<tr><td>9:30-10:15</td><td>Interactiv case reports (Seri I.)</td></tr>
<tr><td colspan="4">10:15-10:30 break</td></tr>
<tr><td rowspan="4">10:30-12:00</td><td>A</td><td rowspan="4">Radiology (Várkonyi)</td><td>A, Diabetology (Mikó)</td></tr>
<tr><td>B</td><td>B, Pulmo (Czövek)</td></tr>
<tr><td>C</td><td>C, Infancy (Kincs)</td></tr>
<tr><td>D</td><td>D, ICU (ITO)</td></tr>
<tr><td colspan="4">12:00-12:45 break</td></tr>
<tr><td rowspan="4">12:45-14:15</td><td>A</td><td>A, ICU (ITO)</td><td rowspan="2">Consultation about topics, questions (Arató) (Koós)</td></tr>
<tr><td>B</td><td>B, Infectology (Kiss)</td></tr>
<tr><td>C</td><td>C, Hepatology (Dezsőfi)</td><td rowspan="2">Practical exam</td></tr>
<tr><td>D</td><td>D, Surgery (Nagy Cs., Pápai, Tallós)</td></tr>
</table>

5. Week: Exam

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

It is compulsory to bring a phonendoscope for the practices, without a phonendoscope the practices will not be considered as completed. Students will record their attendance on an individual practical attendance sheet. Attendance is certified by the instructor with stamp and signature. Absence and makeup are based on the Study and Examination Regulations.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Following each teaching week, you are required to complete the assignments based on that week's material on the Moodle platform.

Number and type of individual assignments to be completed, submission deadlines:

Please see point 25.

Requirements for the successful completion of the course:

Based on Study and Examination regulations.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Exam requirements:

- **Practical exam:** bedside examination, during which the trainer asks you about your basic knowledge of practical paediatric patient care.

Pediatrics 5th year semi final topic list (2 topics from the list)

1. Definitions in perinatology, gestational and mortality data, birth related concepts

2. Aspects of newborn care, Apgar scoring system

3. Physiologic growth, anthropometric features, normal development from newborn to school age

4. Nutrition and feeding of a healthy infant and child, nutrition and feeding of premature babies, energy needs. Physiologic growth of a healthy infant

5. Newborn and genetic screening, prevention

6. Neonatal respiratory adaptation disorders and lung disease

7. Neonatal infections

8. Neonatal jaundice

9. Complications of prematurity (BPD, ROP, NEC, IVH)

10. Sudden infant death syndrome (SIDS), infant mortality, demographic data

11. Neonatal and infant CPR (cardiaopulmonary resuscitation)

12. Meconium ileus, intestinal atresia, pyloric stenosis, diaphragmatic hernia

13. Ileus, intussusception, volvulus, incarcerated hernia, appendicitis.

14. Obstipation. Hirschsprung disease.

15. Testicular and ovarian torsion. Cryptorchism.

16. Coagulopathies

17. Anaemia: signs and symptoms and evaluation

18. Leukaemia.

19. Prevention of infectious diseases. Vaccination

20. Signs of sepsis. Management of sepsis in the first few hours

21. Herpes virus infections

22. Measles, rubella, scarlet fever

23. Systemic autoimmune disease

24. Allergic disease in infancy and childhood. Definition of atopy

25. Diseases affecting the ear

26. Pneumonia. Age related most common pathogens

27. Cystic fibrosis.

28. Obstructive bronchitis, asthma bronchiale, acute subglottic laryngitis

29. Alarming signs of CNS diseases. Necessary examinations. Lumbar puncture

30. Inflammatory disease of the nervous system

31. Facial nerve palsy

32. Seizures in childhood. Febrile seizure

33. Diabetes mellitus. Treatment of diabetic ketoacidosis

34. Congenital adrenal hyperplasia

35. Disease of the thyroid gland

36. Endocrine disorders of calcium and phosphate metabolism. Rickets.

37. Growth disorders (short stature, tall stature)

38. Disorders of pubertal growth and sexual maturation

39. Henoch-Schönlein purpura

40. Kawasaki syndrome, MISC.

41. Urinary tract infection. (localization, course of the disease, treatment, complications)

42. Congenital disorders of the kidney and urinary tract

43. Glomerular kidney disease

44. Nephrosis syndrome

45. Cyanotic congenital heart disease

46. Acyanotic congenital heart disease

47. Malabsorption. Celiac disease

48. Cholestatic liver disease in childhood

49. Hepatitis in childhood

50 Most common infectious enteritises

51. Inflammatory bowel disease: ulcerative colitis, Crohn’s disease

52. Alarming signs of abdominal diseases

53. Enuresis. Polyuria and polydipsia

54. Oedema

55. Acid-base homeostasis, treatment of acid-base balance disorders

56. Fever, management of fever, antipyretics

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum

requirements of the course.

PEDIATRICS Course material – Faculty of General Medicine 5th year

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Practical mark: passed/not passed

Final mark is assessed by a five-level mark (excellent (5), good (4), average (3), fair (2), unsatisfactory (1) based ont he oral examen.

No possibilities for offered grades.

No possibilities for offered grades.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of learning aids supported by artificial intelligence is permitted; however, they are not considered official sources of information or educational material and may not be used during the exams.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	Illustrated Textbook of Paediatrics (Fourth Edition), Seminars, Case Reports, Picture collection on Moodle: https://itc.semmelweis.hu/moodle/course/view.php?id=2724

Type	Recommended
Title	PEDIATRICS Course material – Faculty of General Medicine 5th year
Link	https://itc.semmelweis.hu/moodle/pluginfile.php/593880/mod_resource/content/1/ANGOLegyetemijegyzettiszt%C3%A1zott.pdf

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Tűzoltó utcai részleg

Name of subject in Hungarian: Gyermekgyógyászat
Name of subject in English: Pediatrics
Name of subject in German: Kinderheilkunden

Credit value of the course: 7
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
7.0	0.0	5.0	2.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKGY21121_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kovács Gábor (klinikai főorvos)
Course coordinator location of work, telephone availability: SE Pediatrics Center Tűzoltó Street Department 06-20-825-9265
Course coordinator position: professor
Course coordinator Date and number of habilitation: 02.06.2009. Number: 279.

Objectives of the course, and its place in the curriculum of the medical training program:

The main aim of the fifth-year block of paediatrics is to teach the most typical clinical symptoms and the most common diseases, as well as the special features of the specialty and its everyday routine, and to acquire practical knowledge.

Format of the course (lectures, group work, practical lessons, etc.):

Ward practices, seminars, problem-oriented workshops.

Competencies acquired through completion of course:

Paediatrics is a speciality dealing with specific problems and diseases of a large population. Our aim is to ensure that newly graduated doctors have up-to-date theoretical and practical knowledge in paediatrics.

Course outcome (names and NEPTUN ID of related subjects):
AOKGY2849_SA, AOKGY1848_SA

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I.: AOKBOK784_1A

Laboratory Medicine: AOKLM1079_1A

Medical Imaging: AOKOKA750_1A

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in Neptun, maximum 25 people per five-week course.

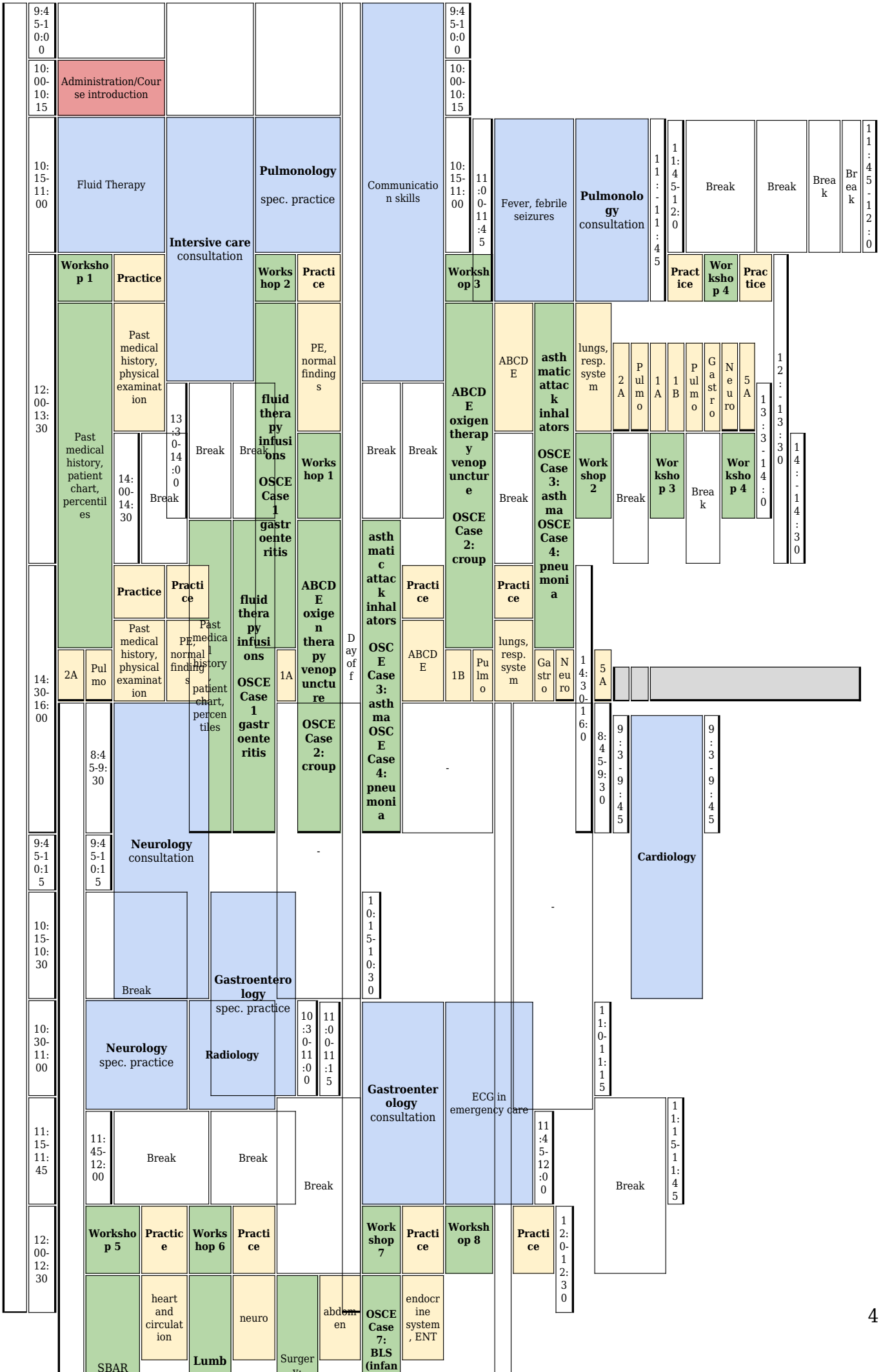
Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

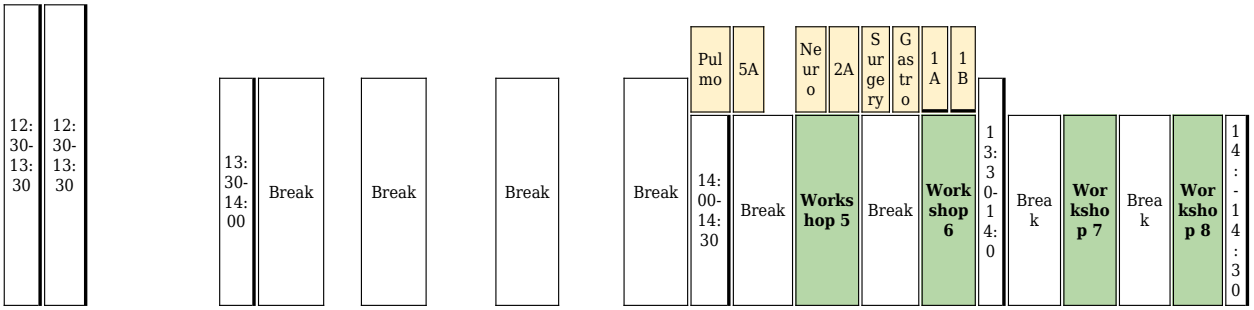
The subject is taught in a block system. During the 5-week block, students attend 14 days of theoretical and practical sessions at the Department. The final examination will take place in the last week of the course. The daily schedule includes bedside practices, special practices, consultations and seminars.
Students will participate in small groups in bedside practices. During these practices, they acquire basic knowledge of the physical examination of children and discuss the problems, differential diagnosis and therapeutic options for patients.

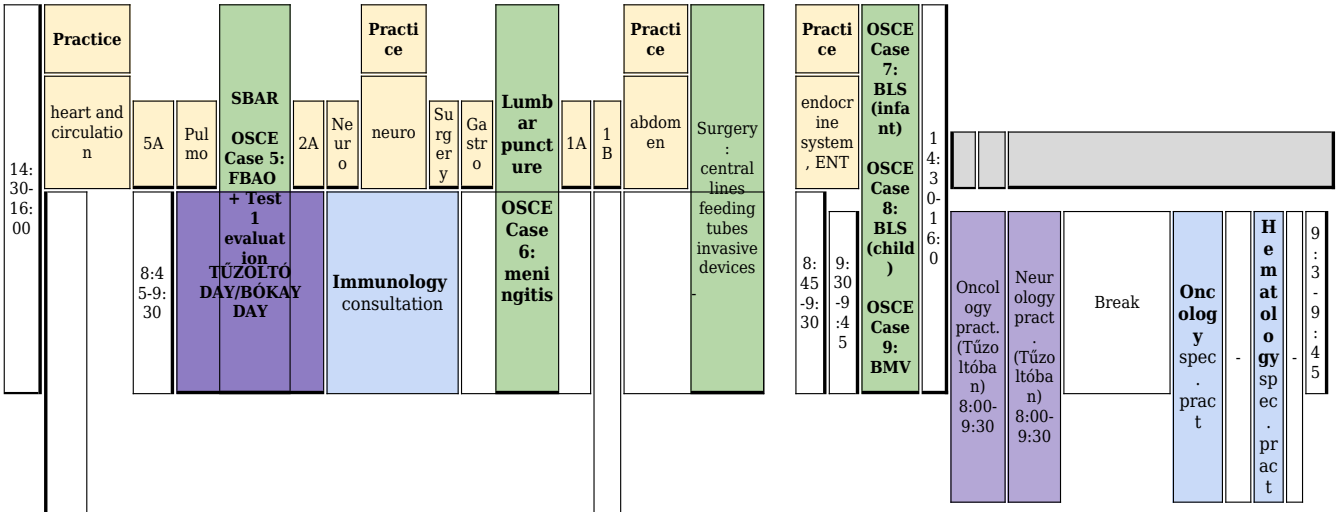
During the special practices, a specialist of a subspecialty will present the key issues of their field.

The aim of the consultations is a practice-oriented, small group discussion of the given topic with the active involvement of the students. The pediatric aspects of emergency care will be highlighted.

English 5th year 2026-27																			
	Time	Monday				Tuesday				Wednesday				Thursday	Friday				Time
	Group	A/1.	A/2.	B/1.	B/2.	A/1.	A/2.	B/1.	B/2.	A/1.	A/2.	B/1.	B/2.		A/1.	A/2.	B/1.	B/2.	Group

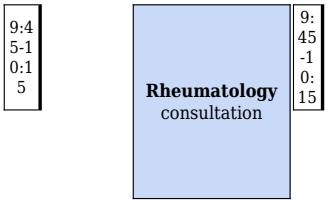

9:45-10:00
10:00-10:15
Administration/Course introduction
10:15-11:00
Fluid Therapy
Intersive care consultation
Pulmonology spec. practice
Communication skills
11:00-11:45
Fever, febrile seizures
Pulmonology consultation
11:45-12:00
Break
12:00-13:30
Workshop 1
Practice
Workshop 2
Practice
Workshop 3
Practice
Workshop 4
Practice
Past medical history, patient chart, percentiles
Past medical history, physical examination
PE, normal findings
fluid therapy infusions
OSCE Case 1 gastroenteritis
Workshop 1
ABCDE oxigen therapy venopuncture
OSCE Case 2: croup
ABCDE
asthmatic attack inhalators
OSCE Case 3: asthma
OSCE Case 4: pneumonia
lungs, resp. system
Workshop 2
Workshop 3
Workshop 4
13:30-14:00
Break
14:00-14:30
14:30-16:00
2A
Pulmo
1A
1B
Pulmo
Gastro
Neuro
5A
Day of
8:45-9:30
9:45-10:15
Neurology consultation
Cardiology
9:30-9:45
10:15-10:30
Gastroenterology spec. practice
10:30-11:00
Neurology spec. practice
Radiology
10:30-11:15
11:15-11:45
Gastroenterology consultation
ECG in emergency care
11:45-12:00
12:00-12:30
Workshop 5
Practice
Workshop 6
Practice
Workshop 7
Practice
Workshop 8
Practice
12:00-12:30
SBAR
heart and circulation
neuro
abdomen
OSCE Case 7: BLS (infan
endocrine system, ENT


12:30-13:30
12:30-13:30
13:30-14:00
Break
Break
Break
Break
Pulmo
5A
Neuro
2A
Surgery
Gastro
1A
1B
14:00-14:30
Break
Workshop 5
Break
Workshop 6
13:30-14:0
Break
Workshop 7
Break
Workshop 8
14:-14:30



Week 3

Day off


9:45-10:15
Rheumatology
consultation
9:45-10:15

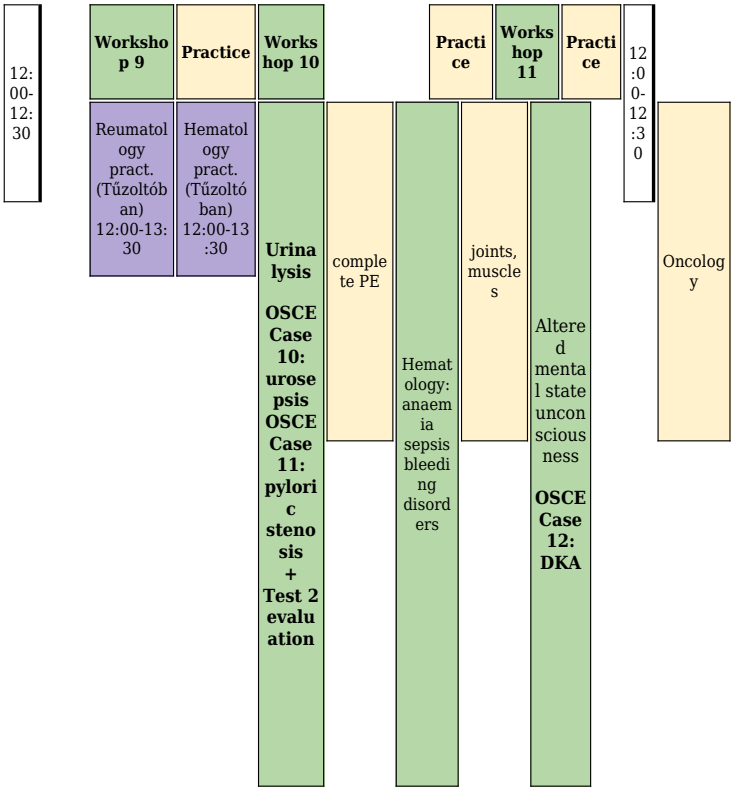
10:15-10:30	PIC pract. (Bókay,Üllői út,Baross u) 8:45-10:15	**Oncology** consultation	**Hematology** consultation	10:15-10:30

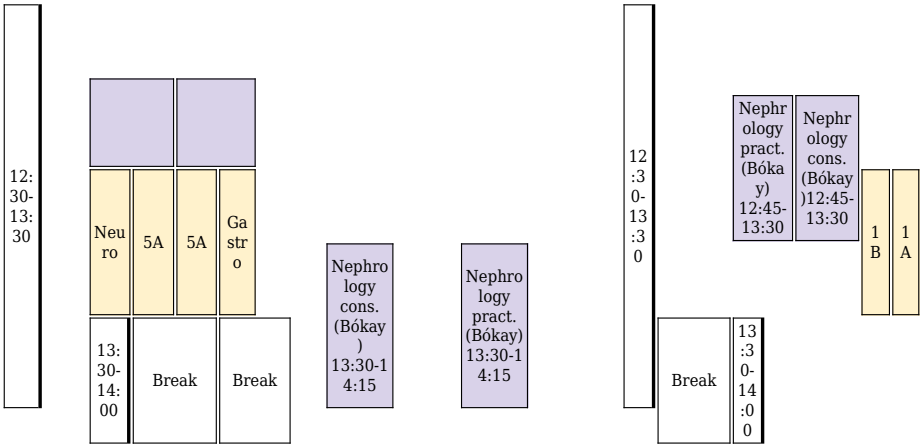
10:30-11:00		Neurology pract. (Tűzoltóban) 9:45-11:15	Oncology pract. (Tűzoltóban) 9:45-11:15	**Rheumatology** spec practice	10:30-11:00

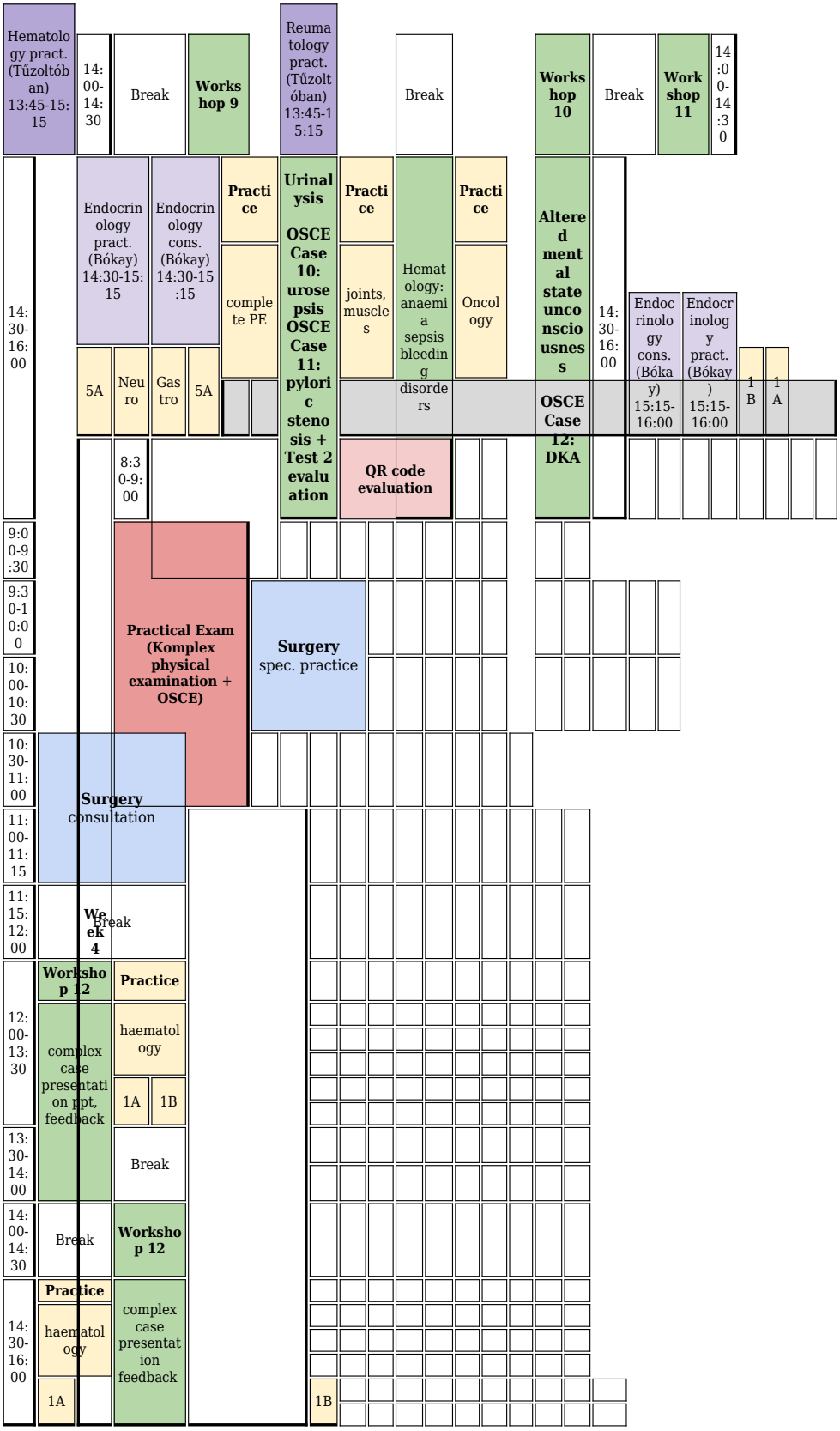
11:00-11:15	Break	**Oncology** spec. pract	Break	**Hematology** spec. pract	11:00-11:15

11:15-11:45	Infectious diseases pract. (Bókay) 10:30-11:15	Infectious diseases cons. (Bókay) 10:30-11:15	Break

11:00-11:45	11:45-12:00	Infectious diseases cons. (Bókay) 11:15-12:00	Infectious diseases prac. (Bókay) 11:15-12:00	Break	Break	11:45-12:0


12:00-12:30
Workshop 9
Practice
Workshop 10
Practice
Workshop 11
Practice
12:00-12:30
Reumatology pract. (Tűzoltóban) 12:00-13:30
Hematology pract. (Tűzoltóban) 12:00-13:30
Urinalysis
OSCE Case 10: urosepsis
OSCE Case 11: pyloric stenosis + Test 2 evaluation
complete PE
Hematology: anaemia sepsis bleeding disorders
joints, muscles
Altered mental state unconsciousness
OSCE Case 12: DKA
Oncology


12:30-13:30
Neuro
5A
5A
Gastro
13:30-14:00
Break
Break
Nephrology cons. (Bókay) 13:30-14:15
Nephrology pract. (Bókay) 13:30-14:15
12:30-13:30
Break
13:30-14:00
Nephrology pract. (Bóka y) 12:45-13:30
Nephrology cons. (Bókay)12:45-13:30
1B
1A


Hematology pract. (Tűzoltóban) 13:45-15:15
14:00-14:30
Break
Workshop 9
Rheumatology pract. (Tűzoltóban) 13:45-15:15
Break
Workshop 10
Break
Workshop 11
14:00-14:30
14:30-16:00
Endocrinology pract. (Bókay) 14:30-15:15
Endocrinology cons. (Bókay) 14:30-15:15
Practice
Urinalysis
OSCE Case 10: urosepsis
OSCE Case 11: pyloric stenosis + Test 2 evaluation
Practice
Hematology: anaemia sepsis bleeding disorders
Practice
Altered mental state unconsciousness
OSCE Case 12: DKA
14:30-16:00
Endocrinology cons. (Bókay) 15:15-16:00
Endocrinology pract. (Bókay) 15:15-16:00
1B
1A
complete PE
joints, muscles
Oncology
5A
Neuro
Gastro
5A
8:30-9:00
QR code evaluation
9:00-9:30
9:30-10:00
10:00-10:30
Practical Exam (Komplex physical examination + OSCE)
Surgery spec. practice
10:30-11:00
Surgery consultation
11:00-11:15
11:15-12:00
Break
Week 4
Workshop 12
Practice
12:00-13:30
complex case presentation ppt, feedback
haematology
1A
1B
13:30-14:00
Break
14:00-14:30
Break
Workshop 12
14:30-16:00
Practice
haematology
1A
complex case presentation feedback
1B

Main topics of the practices:

- Medical history taking
- Assessment of presenting complaints
- Pediatric physical examination
- Physical examination of infants
- Documentation of physical status
- Pediatric ABCDE assessment
- Examination of the respiratory system
- Examination of the cardiovascular system
- Pediatric neurological examination
- Examination of the abdomen and abdominal organs
- Examination of the head and neck
- Examination of lymph nodes
- Examination of the integumentary system
- Examination of the musculoskeletal system
- Examination of the genital organs
- Pulmonology special practice
- Gastroenterology special practice
- Neurology special practice
- Oncology special practice
- Hematology special practice

- Rheumatology special practice
- Surgery special practice
- Radiology special practice
- Endocrinology special practice (Pediatric Center, Bókay Street Department)
- Nephrology special practice (Pediatric Center, Bókay Street Department)
- Infectious Diseases special practice (Pediatric Center, Bókay Street
- Department)
- Neonatology special practice (Pediatric Center, Bókay Street Department;
- Department of Obstetrics and Gynecology, Baross Street Unit)

Main topics of the seminars:

- Fluid therapy
- Fever and febrile seizures
- Principles of emergency and critical care
- Pediatric pulmonology
- Pediatric cardiology
- Emergency ECG interpretation
- Pediatric gastroenterology
- Pediatric neurology
- Pediatric oncology
- Pediatric hematology
- Pediatric immunology
- Pediatric rheumatology
- Pediatric surgery
- Pediatric radiology
- Communication

Main topics of the workshops:

- Medical history taking, basic communication skills, percentile charts, fever
- chart documentation
- Fluid therapy, types of infusions, gastroenteritis scenario
- ABCDE assessment, oxygen support therapies, venous access, croup scenario
- Asthma management, bronchodilators, asthma and pneumonia scenario
- SBAR handover, foreign body airway obstruction scenario
- Lumbar puncture, meningitis scenario
- Urinalysis interpretation, urosepsis and pyloric stenosis scenario
- Bag-mask ventilation, infant and pediatric BLS scenario
- Invasive devices
- Hematology case discussions
- Unconscious child, altered mental status, diabetic ketoacidosis scenario
- Discussion of complex pediatric cases

Tutors:

Dr. Andrási Noémi, Dr. Bakó Dorottya, Dr. Balázs Dóra, Dr. Bartha Áron, Dr. Bagyuráné Dr. Frank Veronika, Dr. Benyó Gábor, Dr. Bertalan Rita, Dr. Botlik Dóra, Dr. Botos Péter, Dr. Bots Bianka, Dr. Brückner Edit Ágota, Dr. Bűdi Tamás, Dr. Constantin Tamás, Dr. Czövek Dorottya, Dr. Csóka Monika, Dr. Csordás Katalin, Dr. Dobner Sarolta, Dr. Egyed Bálint, Dr. Erdélyi Dániel, Dr. Erdélyi-Nagy Blanka, Dr. Farkas Márk Kristóf, Dr. Felkai Luca, Dr. Frank Veronika, Dr. Garan Diána, Dr. Gács Zsófia, Dr. Garami Miklós, Dr. Goschler Ádám, Dr. Hegedűs Katalin, Dr. Hegyi Márta, Dr. Horváth Bertalan, Dr. Horváth Klára, Dr. Horváth Zsuzsanna, Dr. Hosszú Éva, Dr. Jenővári Zoltán, Dr. Juhász Orsolya, Dr. Kemény Viktória, Dr. Kiss Tamás, Dr. Klaus Laura, Dr. Koch Dóra, Dr. Kónya Sárma Sultana, Dr. Koós Olivér, Prof. Dr. Kovács Gábor, Dr. Kovács Janka, Dr. Lengvári Lilla, Dr. Lengyel Anna, Dr. Liptai Zoltán, Dr. Müller Judit, Dr. Naghizadeh Farzaneh, Dr. Nemes-Csertő Alinka, Dr. Németh Ágnes, Dr. Osztermayer Dorka Réka, Dr. Pálinkás Annamária, Dr. Papp-Bozzai Barbara, Dr. Párkányi Rebeka, Dr. Pásztor Borbála, Dr. Petes Cintia, Dr. Petró Anna, Dr. Péter Réka, Dr. Pfeffer Anita, Dr. Pinti Éva, Dr. Podráczky Noémi, Dr. Pomlényi Petra, Dr. Ponyi Andrea, Dr. Prokopp Tamás Benedek, Dr. Ranyák Márta Szilvia, Dr. Repkényi Dorottya, Dr. Sándor Réka Zsuzsanna, Dr. Sükösd Zita, Dr. Szabados Márton, Dr. Szabó András Lajos, Dr. Szabó Léna, Dr. Szabó Sándor, Dr. Szarvas Gábor Zsombor, Dr. Szikszay Orsolya, Dr. Tomsits Erika, Dr. Tóth-Szumutku Fanni, Dr. Turi Alexandra, Dr. Varga Martin István, Dr. Váncza Lóránd, Dr. Velkey Ábel, Dr. Vojnisek Zsuzsanna, Damó Eszter, Durst Anna, Bagó György, Kalmárné

Rikker Zsuzsanna, Magyar Emma,

Dr. Agócs Róbert, Dr. Balogh Dóra Csenge, Dr. Bán-Kovács Nóra, Dr. Berecz Botond, Dr. Brandt Ferenc, Dr. Csizek Zsófia,. Dr. Fanczal Eszter, Dr. Farkas Ferenc Balázs, Dr. Gayerhossz Katalin, Dr. Harmath Ágnes, Dr. Kalocsai Krisztina, Dr. Kardics Kinga, Dr. Kaucsár Tamás, Dr. Kiss András, Dr. Kollár Kinga, Dr. Liptovszky Janka, Dr. Luczay Andrea, Dr. Kovács Lajos, Dr. Körner Anna, Dr. Krikovszky Dóra, Dr. Krivácsy Péter, Dr. Lódi Csaba, Dr. Lóth Szendile, Dr. Mikes Bálint, Dr. Nagy Zsuzsanna, Dr. Pék Tamás, Dr. Pékli-Tóth Fanni, Prof. Dr. Reusz György, Dr. Sallay Péter Gergely, Dr. Seri István, Dr. Szász Barbara, Dr. Szűcs-Szakács Liliána, Prof. Dr. Szabó Miklós, Dr. Tóth-Heyn Péter

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKGRI966_1A, AOKBOK784_1A, AOKBHK1118_2A, AOKNO1755_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Students are required to bring a stethoscope and a lab coat to all practical sessions; attendance cannot be credited without a stethoscope. Participation is recorded individually on a practical attendance sheet and must be validated by the instructor. Absences are subject to the applicable provisions of the Study and Examination Regulations (TVSZ).

Missed sessions may be completed in consultation with the instructors, primarily during designated Thursday make-up sessions. Alternatively, students may attend equivalent sessions during the relevant block’s examination week, join another group’s corresponding session, or make up the missed content during weeks specifically allocated for this purpose in the timetable.

Students will have the opportunity to evaluate both the course and its instructors through an online platform during the rotation period, using the link provided during the sessions. Active participation in providing feedback is strongly encouraged in order to support the continuous improvement of the program.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The interactive nature of the exercises and consultations allows students to check their

knowledge

Number and type of individual assignments to be completed, submission deadlines:

Students are required to complete two written test series independently on the Moodle platform, which must be presented during the Monday workshops of the second and third teaching weeks. In addition, within small-group work, they are expected to analyze pre-assigned complex cases and present their findings at the Monday workshop of the fourth teaching week.

Requirements for the successful completion of the course:

The requirements for obtaining credit and eligibility for the theoretical exam include full participation in both theoretical and practical sessions according to the prescribed standards, as well as the successful completion of the two written test series available on the Moodle platform and the presentation of the pre-assigned complex cases.

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical Exam:

· Bedside Patient Examination: The instructor assesses the student’s knowledge of fundamental pediatric clinical care during a direct patient evaluation.

· OSCE (Objective Structured Clinical Examination): Students are tested on randomly selected scenario-based cases encountered during the workshops.

Oral examination: Students are evaluated on the knowledge outlined in the prescribed topic list, drawing and discussing two topics orally.

List of topics for the oral examination:

1. Definitions in perinatology, gestational and mortality data, birth related concepts

2. Aspects of newborn care, Apgar scoring system

3. Physiologic growth, anthropometric features, normal development from newborn to school age

4. Nutrition and feeding of a healthy infant and child, nutrition and feeding of premature babies, energy needs. Physiologic growth of a healthy infant

5. Newborn and genetic screening, prevention

6. Chromosomal abnormalities

7. Neonatal respiratory adaptation disorders and lung disease

8. Neonatal infections

9. Neonatal jaundice

10. Complications of prematurity (BPD, ROP, NEC, IVH)

11. Cardiopulmonary resuscitation (CPR) in infants and children

12. Neonatal and infant CPR (cardiaopulmonary resuscitation)

13. Meconium ileus, intestinal atresia, pyloric stenosis, diaphragmatic hernia

14. Ileus, intussusception, volvulus, incarcerated hernia, appendicitis.

15. Obstipation. Hirschsprung disease.

16. Testicular and ovarian torsion. Cryptorchism.

17. Coagulopathies

18. Anaemia: signs and symptoms and evaluation

19. Leukaemia.

20. Prevention of infectious diseases. Vaccination

21. Signs of sepsis. Management of sepsis in the first few hours

22. Herpes virus infections

23. Measles, rubella, scarlet fever

24. Systemic autoimmune disease

25. Allergic disease in infancy and childhood. Definition of atopy
26. Pneumonia. Age related most common pathogen
27. Cystic fibrosis
28. Obstructive bronchitis, asthma bronchiale, acute subglottic laryngitis
29. Alarming signs of CNS diseases. Necessary examinations. Lumbar puncture
30. Inflammatory disease of the nervous system
31. Facial nerve palsy
32. Seizures in childhood. Febrile seizure
33. Diabetes mellitus. Treatment of diabetic ketoacidosis
34. Congenital adrenal hyperplasia
35. Disease of the thyroid gland
36. Endocrine disorders of calcium and phosphate metabolism. Rickets.
37. Growth disorders (short stature, tall stature)
38. Disorders of pubertal growth and sexual maturation
39. Henoch-Schönlein purpura
40. Kawasaki syndrome, MISC
41. Urinary tract infection. (localization, course of the disease, treatment, complications)
42. Congenital disorders of the kidney and urinary tract
43. Glomerular kidney disease
44. Nephrosis syndrome
45. Cyanotic congenital heart disease
46. Acyanotic congenital heart disease
47. Malabsorption. Celiac disease
48. Cholestatic liver disease in childhood
49. Hepatitis in childhood
50. Most common infectious enteritises

51. Inflammatory bowel disease: ulcerative colitis, Crohn’s disease

52. Alarming signs of abdominal diseases

53. Enuresis. Polyuria and polydipsia

54. Edema

55. Acid-base homeostasis, treatment of acid-base balance disorders

56. Fever, management of fever, antipyretics

57. Pertussis, infuenza, RSV and COVID

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The notes available on the Moodle platform cover the knowledge required for the topics.

Minimum requirements:

1. Definitions in perinatology, gestational and mortality data, birth related concepts (Dr. Andrea Valek)

· Mature newborn: born between 37 and 42 completed gestational weeks.

· Preterm infant: born before 37 completed gestational weeks.

· Low birth weight: <2500 g, very low birth weight: <1500 g, extremely low birth weight: <1000 g.

· SGA (small for gestational age): birth weight <10th percentile for gestational age.

· Infant mortality: the number of children who die before 1 year of age, per 1000 live births.·

2. Aspects of newborn care, Apgar scoring system (Dr. Zsuzsanna Nagy)

· Physiological basis of adaptation

o Respiratory and circulatory adaptation is initiated by the first breaths and the expansion of the lungs.

· Principle of umbilical cord care

o Delayed cord clamping (at least 1 minute) is recommended if resuscitation is not needed.

· Normal vital signs

o Respiration: 20–60/min

o Pulse: 100–160/min

o Capillary refill: ≤ 3 s

· Vitamin K prophylaxis

o 2 mg orally within 2 hours for prevention of neonatal bleeding tendency.

· Examination of peripheral pulse

o Palpation is mandatory, especially on the lower extremity; its absence may indicate coarctation of the aorta.

3. Physiological growth, anthropometric features, normal development from newborn to school (Dr. Zsüliet Bojtár)

· What does the percentile curve show, what is its definition?

o It expresses what percentage of the measured population belongs to a given value of a variable, e.g. body weight.

· Average body weight measured at birth and its change until puberty based on Hungarian data.

o In Hungary the average is 3400 g; it doubles by 6 months of age, triples by 1 year of age, then increases by 2 kg/year until puberty.

· What should be considered when speech development is delayed?

o It must be considered whether the child's hearing is intact; if it is, autism spectrum disorder and/or global developmental delay should be investigated.

4. Nutrition and feeding of healthy infants and children, nutrition and feeding of preterm babies, energy needs. Physiological growth of a healthy infant (Dr. Tímea Kollár)

· Optimal nutrition of a healthy newborn in the first 6 months is on-demand, responsive, exclusive breastfeeding, without time restriction, ideally directly from the breast.

· Breastfeeding is recommended to continue alongside complementary feeding after 6 months of age until 1–2 years of age, or even longer.

· List at least 4 beneficial effects of breast milk!

o Its composition is constantly changing and is the most optimal for newborn/infant development.

o It helps the postnatal adaptation of the gastrointestinal system.

o It supports the development of the age-appropriate microbiome of the intestinal tract, thereby reducing the risk of atopic/allergic diseases and chronic intestinal diseases (Crohn's disease, ulcerative colitis).

o It protects against infectious diseases (gastrointestinal infections, otitis media).

o It reduces the risk of certain pediatric hematologic malignancies (AML, ALL).

o It supports proper development of the eye and nervous system.

o It reduces the risk of obesity, hypertension, and diabetes mellitus.

· Contraindications to breastfeeding

o Maternal causes: HIV infection, active tuberculosis, medications with absolute contraindication (e.g. cytostatics).

o Infant causes: PKU, galactosemia.

· Physiological growth: the infant's birth weight doubles by 6 months of age and triples by 1 year of age; the postnatal 7–10% weight loss stops by day 3–5, and birth weight is regained by day 10–14.

· Due to catch-up growth, preterm infants require higher protein and calorie intake; appropriate weight and head circumference gain are prerequisites for favorable neurologic outcome.

· In preterm infants, enteral feeding with colostrum and the mother's own milk is of outstanding importance, because it reduces the incidence and severity of NEC, ROP, and late sepsis (LOS).

5. Neonatal and genetic screening, prevention (Dr. Petra Zsidegh)

· Definition of neonatal metabolic screening

· When and how newborn screening is performed

· Why do we screen? Name at least 4–6 diseases among the screened disorders.

6. Neonatal respiratory adaptation disorders and lung diseases (Prof. Dr. Miklós Szabó)

· Characteristic signs of dyspnea in neonatal respiratory distress:

o Nasal flaring, intercostal and sternal retractions, paradoxical breathing, expiratory grunting.

· Three questions used for rapid assessment to decide on the state of the newborn and the need for action:

o Is the newborn mature?

o Is the baby crying or breathing effectively?

o Is muscle tone good?

o If the answer to all three questions is yes, there is no immediate medical intervention needed.

· Mandatory neonatal prophylaxis in Hungary currently:

o Vitamin K administration, BCG vaccination.

· Stages of germinal matrix–intraventricular hemorrhage

o Stage I: germinal matrix hemorrhage.

o Stage II:

§ Bleeding into the lateral ventricle without acute ventricular dilatation.

§ The hemorrhage occupies <50% of the ventricular volume.

o Stage III:

§ Bleeding into the lateral ventricle with acute ventricular dilatation.

§ The hemorrhage occupies >50% of the ventricular volume.

o Stage IV:

§ Intraventricular hemorrhage associated with ipsilateral periventricular hemorrhagic infarction (PHH).

· Most effective method for prevention of RDS in preterm infants, and when it should be used?

o Antenatal steroid treatment in threatened preterm birth during the 23–35 weeks of gestation period.

7. Neonatal infections (Dr. András Kis)

· Through which routes can newborns become infected?

· Definition of neonatal sepsis, early and late sepsis.

· Causative agents of early and late sepsis, empirically chosen antibiotics.

· Clinical symptoms.

8. Neonatal jaundice (Dr. Lilla Sassi)

· Cause and typical timing of physiologic icterus

· Cause and typical timing of breast milk jaundice

· Indications and options for the treatment of hyperbilirubinemia

9. Complications of prematurity: BPD, ROP, NEC, IVH (Dr. Ákos Gasparics)

· What symptoms may bronchopulmonary dysplasia (BPD) cause?

· What are the risk factors for retinopathy of prematurity (ROP)?

· What options do we have for prevention of intraventricular hemorrhage (IVH)?

· What long-term consequences may intraventricular hemorrhage (IVH) have?

10. Sudden infant death (SIDS), infant mortality, demographic data (Dr. Erzsébet Várady)

· Options for the prevention of SIDS

11. Cardiopulmonary resuscitation (CPR) in infants and children (Dr. Ádám Goschler)

· What is the fundamental difference in the etiology of out-of-hospital cardiac arrests between children and adults?

· Steps of basic life support (without equipment) in infancy and childhood according to the ERC 2025 guidelines.

· Technique of performing chest compressions in infants and children.

· Steps of advanced life support if the initial rhythm is asystole.

· Steps of advanced life support if the initial rhythm is ventricular fibrillation.

· Adrenaline dose during resuscitation in infancy and childhood.

12. Meconium ileus, intestinal atresias, pyloric stenosis, diaphragmatic hernia (Dr. Zsuzsa Tallós)

· Differential diagnosis of mechanical neonatal ileus

o NEC, meconium ileus, volvulus, Hirschsprung disease, intestinal atresias.

· Meaning of the VACTERL association

o Vertebral developmental anomaly, Anal atresia, Cardiac developmental anomaly, Tracheoesophageal atresia, Renal developmental anomaly, Limb developmental anomaly.

· Symptoms of congenital pyloric stenosis

o non-bilious projectile vomiting after feeding, dehydration, metabolic alkalosis.

· Management of congenital diaphragmatic hernia:

o in severe cases intrauterine intervention, after birth stabilization of the newborn, lung-protective ventilation, treatment of pulmonary hypertension, surgical intervention.

13. Ileus, intussusception, volvulus, incarcerated hernia, appendicitis (Dr. Zsuzsa Tallós)

· Diagnosis of childhood ileus

o after physical examination, plain abdominal X-ray, contrast passage study if indicated, and abdominal ultrasound.

· Symptoms of intussusception

o periodic crampy abdominal pain, stool may be bloody, “currant jelly”-like, ileus symptoms.

· Meaning and treatment of volvulus:

o intestinal twisting, often developing on the basis of malrotation, associated with circulatory compromise of the bowel and risk of bowel necrosis; urgent surgical intervention is required, time is critical.

· Management of incarcerated inguinal hernia

o first attempt reduction of the incarcerated bowel; if unsuccessful, urgent surgical intervention is required.

14. Constipation. Hirschsprung disease (Dr. Zoltán Jenővári)

Constipation:

· Normal meconium passage in the newborn.

· Normal stool passage in infancy.

· Normal stool passage in toddlers.

· Definition of constipation

· Symptoms of constipation

· Treatment options.

· Some causes leading to constipation.

Hirschsprung disease:

· Which part of the intestinal tract is affected, and what is its pathological background?

· What neonatal abnormality may it cause?

· Forms of Hirschsprung disease?

· Symptoms of HD?

· Treatment options for HD

15. Testicular and ovarian torsion. Cryptorchidism (Dr. Zoltán Jenővári)

Ovarian torsion:

· Triggering causes

· Possible consequences

· How it is recognized in the neonatal period?

· What symptoms it causes in adolescence?

· Management, indications for surgery, possibilities of prevention

Cryptorchidism:

· Difference between retractile testis, undescended testis and nonpalpable testis.

· Causes in unilateral and bilateral cases

· What is the physiological state in preterm boys?

· Treatment options

· At what age should undescended and nonpalpable testis be operated on?

· When should retractile testis be operated on?

16. Coagulopathies (Prof. Dr. Gábor Kovács)

· Basic types and forms of coagulopathies.

· Management of critical bleeding states and the need for treatment.

· Life-threatening complications in bleeding disorders.

· Recognition and treatment of DIC.

17. Anaemia: Signs and symptoms, and evaluation (Dr. Judit Müller)

· Laboratory signs of hemolysis

· Normal RBC count, hemoglobin value, and MCV in a newborn and a 5-year-old child.

· The two most common causes of macrocytic anemia in children.

· Possible causes of normocytic anemia.

· Consequences of negative iron balance, and their laboratory confirmation.

18. Leukemias (Dr. Dániel Erdélyi)

· Which is the most common leukemia subtype in childhood?

· List at least 3 common presenting symptoms of leukemia

o from these 4: fever, symptoms of anemia, symptoms of thrombocytopenia, bone pain; alternatively, 2 rarer presenting symptoms may be accepted instead of one of these

· Blood count abnormalities seen in leukemias.

· List at least 4 elements of ALL treatment

o from these 7: intensive multi-agent chemotherapy, steroids, intrathecal chemotherapy, maintenance oral chemotherapy, cranial irradiation, allogeneic stem cell transplantation, new targeted therapies).

19. Prevention of infectious diseases, vaccinations (Dr. Tamás Pék)

Basic concepts of vaccination:

Active immunization:

· Antigens of the pathogen enter the body and trigger an immune response, which ideally results in protection against that pathogen.

· Immune memory is formed, so upon repeated exposure to the same antigen, the immune response becomes faster and stronger.

Passive immunization:

· Protective antibodies are administered which bind to the pathogen and block infection without generating an immune response.

· In contrast to active immunization, this provides short-term protection, usually for a maximum of 6 months.

Vaccine reaction:

· After vaccination, a symptom complex occurring:

o within 72 hours for vaccines containing inactivated antigens,

o 7–14 days after vaccination for vaccines containing live attenuated antigens and occurring in a significant proportion of vaccinated individuals as expected.

o local: swelling, redness, pain at the injection site, possibly numbness, pain resembling muscle soreness in the vaccinated limb.

o systemic: fever, discomfort, loss of appetite, fatigue, drowsiness after vaccination.

Vaccine complications:

· Allergic reaction, anaphylaxis.

Basic rules:

· Vaccination does not automatically mean protection.

· Inactivated vaccines may be administered with any other vaccine, either at the same time or with any time interval.

· Live-virus vaccines may be administered either at the same time or at least 4 weeks apart.

20. Signs of sepsis, management of sepsis in the first few hours (Dr. Klára Horváth)

· Definition of sepsis.

· Clinical signs of sepsis (respiratory, circulatory, neurologic).

· In sepsis management, mention the following: 100% oxygen, fluid bolus, antibiotics

21. Herpes virus infections (Dr. Kinga Kardics)

· Complications, clinical pictures, and treatment of HSV infection.

· Complicated forms of VZV infection.

· Differential diagnosis of EBV infection.

22. Measles, rubella, scarlet fever (Dr. Krisztina Kalocsai)

Measles:

· Characteristics of the pathogen, incubation period.

· Typical clinical symptoms (at least 3–5 symptoms should be mentioned)

o 2–4 days of high fever

o conjunctivitis

o rhinorrhea

o Koplik spots, maculopapular rash starting behind the ears on day 14, becoming confluent, and the course of the disease.

· The most common complications (at least 3 should be mentioned)

o In one third of cases

o interstitial giant-cell pneumonia, myocarditis, hepatitis, meningoencephalitis, late subacute sclerosing panencephalitis (SSPE), purulent bacterial otitis media, bacterial pneumonia.

· Differential diagnosis (at least 3 disorders with rash that must be distinguished):

o Epstein-Barr virus (EBV) infection, Parvovirus B19 infection, enterovirus infection, scarlet fever,

and non-infectious conditions such as Kawasaki syndrome, serum sickness, SLE.

· Prevention: vaccination.

Rubella:

· Importance of the disease.

· Cause and symptoms of congenital rubella syndrome.

· Prevention: vaccination.

Scarlatina:

· The cause of scarlet fever, S. pyogenes producing pyrogenic exotoxin A (SpeA) should be mentioned

· Typical age: 3–15 years

· Clinical picture (at least 4 symptoms should be mentioned):

o GAS pharyngitis: bright red pharynx, tonsillar exudate, petechiae on the soft palate, uvulitis, anterior cervical lymphadenitis, strawberry tongue (white strawberry tongue)

o fine maculopapular rash spreading centrifugally from the neck and chest wall, sparing the palms and soles, Pastia sign. The face is spared from rash.

o desquamation.

· Basic microbiological diagnosis: antigen detection, culture.

· The goal of treatment: at least 2 should be mentioned

· First-line antibiotic: penicillin.

· Complications (at least 2–3 should be known)

o suppurative complications and immune-mediated forms.

o Potentially life-threatening invasive forms: at least 2 should be known.

· At least 3 infectious and non-infectious diseases with rash to be distinguished.

23. Systemic autoimmune diseases (Dr. Tamás Constantin)

· List at least 2 childhood systemic autoimmune diseases

o systemic lupus erythematosus (SLE), juvenile dermatomyositis, scleroderma, antiphospholipid syndrome.

· Most common symptoms of SLE (at least 5)

o fever, weight loss, characteristic skin symptoms (butterfly erythema), lymphadenopathy, hepatosplenomegaly, renal involvement (nephrosis, nephritis), serositis, myocarditis, pneumonitis, blood count abnormalities (anemia, leukopenia), neurologic symptoms.

· Characteristic symptoms of juvenile dermatomyositis

o characteristic skin symptoms such as Gottron papules, heliotrope rash, proximal muscle weakness.

· Two major groups of juvenile scleroderma

o localized (morphea) and systemic scleroderma.

24. Allergic diseases in infancy and childhood. Defination of atopy (Dr. Ádám Balogh)

· Definition and treatment of anaphylaxis.

· Principles of prevention.

· Concept of component testing.

25. Diseases of the ear (Dr. Zoltán Fent)

26. Pneumonia. Age related most common pathogen (Dr. Dóra Krikovszky)

· Most common pathogens by age.

· Distinction between typical and atypical (differential diagnosis, characteristics and therapy).

27. Cystic fibrosis (Dr. Dorottya Czövek)

· Cause of the disease and mode of inheritance

o the most common autosomal recessive disease in the Caucasian population. It is caused by mutation of the CFTR gene.

· Most common symptoms (at least 5):

o chronic respiratory infections, fatty stools, poor weight gain, chronic sinusitis, nasal polyposis, pancreatic insufficiency, diabetes mellitus, liver involvement/cirrhosis, infertility.

· What may suggest CF in the newborn period?

o Meconium ileus.

28. Obstructive bronchitis, asthma bronchiale, acute subglottic laryngitis (Dr. Lajos Kovács)

· Cause, clinical picture, and treatment of obstructive bronchitis.

· Diagnosis and treatment of bronchial asthma.

· Subglottic laryngitis: cause, clinical picture, and treatment.

29. Alarm signs of CNS diseases, necessary examinations. Lumbar puncture (Dr. Zoltán Liptai)

· What are the 6 alarming symptoms of acute disease of the central nervous system?

o Meningeal irritation, diffuse encephalopathy, paresis or plegia, cerebellar ataxia, epileptic seizures, psychiatric symptoms.

· How should lumbar puncture be performed?

o Under sedation or anesthesia, by inserting between the spinous processes of L3–L4 or L4–L5 (at the level of the upper iliac crests) and collecting the necessary amount of sample from the subarachnoid space.

· Possible causes of meningeal irritation signs?

o Meningitis, pleuropneumonia, neck abscess, abdominal conditions, discopathies, myelitis, Guillain-Barré syndrome.

30. Inflammatory diseases of the nervous system (Dr. Zoltán Liptai)

· Most common causative agents of purulent meningitis after 3 months of age?

o S. pneumoniae, N. meningitidis, H. influenzae b.

· What is the CSF like in purulent meningitis?

o Increased pressure, turbid or opalescent, high cell count (up to several thousand/µL), neutrophil predominance, low glucose (0–2.2 mmol/L), high protein (1.0–5.0 g/L). Bacteria are often visible in the sediment smear.

· First-line empiric antibiotic in purulent meningitis beyond the newborn period, in an immunocompetent patient:

o Ceftriaxone or cefotaxime.

· What are the main initial symptoms of encephalitis?

o Headache, altered consciousness/mental status change, convulsions, focal signs.

· What are the presenting symptoms of Guillain-Barré syndrome?

o Progressive, symmetric, ascending weakness, hypo- or areflexia.

31. Facial nerve palsy (Dr. Léna Szabó)

· What are the most common causes of peripheral facial nerve palsy?

· What examinations are necessary in case of facial nerve palsy?

· What is the treatment of facial nerve palsy?

32. Seizures in childhood, febrile seizures (Dr. Léna Szabó)

· What are the most common provoking factors for seizures?

· Management of seizures.

· Definition of simple and complicated febrile seizure.

33. Diabetes mellitus. Treatment of diabetic ketoacidosis (Dr. Péter Tóth-Heyn)

· Definition of diabetes mellitus in numerical terms.

· Definition of diabetic ketoacidosis in numerical terms.

· In the management of DKA, the following must be mentioned:

o volume of fluid bolus, type of infusion.

o Maintenance fluid: type and volume.

o Insulin dose.

34. Congenital adrenal hyperplasia (Dr. Andrea Luczay)

· Features of salt-wasting crisis.

· Glucocorticoid replacement in emergency situations.

35. Diseases of the thyroid gland (Dr. Zita Halász)

· Causes and clinical symptoms of congenital and acquired hypothyroidism.

· Diagnostic methods for assessing thyroid function and thyroid structure.

· Definition of goiter and its WHO grading.

36. Endocrine disorders of calcium and phosphate metabolism. Rickets (Prof. Dr. András Szabó)

· Mechanism of hormonal regulation of calcium and phosphate metabolism.

· Diseases associated with low or high serum calcium levels and their pathomechanisms.

· Diseases associated with low or high phosphate levels and their pathomechanisms.

· Types of rickets and their pathomechanisms. Clinical symptoms and laboratory abnormalities of rickets.

· Treatment of disorders of calcium and phosphate metabolism.

37. Growth disorders: short stature, tall stature (Dr. Janka Liptovszky, Dr. Zsófia Gács)

· Definition of pathological height/growth rate.

· Calculation of parental target height.

· Physical abnormalities to look for in pathological short or tall stature.

· Use of percentile charts, BMI.

38. Disorders of pubertal growth and sexual development (Dr. Rita Bertalan)

· When do we speak of a disorder of sexual differentiation?

o In cases where there is a discrepancy between chromosomal, gonadal, external and internal genital, and psychosocial sex.

· When do we speak of early puberty in girls and boys?

o In girls if puberty starts before the age of 8, in boys before the age of 9.

· What do the Tanner stages describe?

o Description of pubertal stages. A: axillary hair, B: breast development, P: pubic hair, G: genitalia.

· What are the most common chromosomal DSDs?

o Turner syndrome, Klinefelter syndrome.

39. Henoch–Schönlein purpura (Dr. Andrea Ponyi)

· Symptoms of HSP.

· Examinations to be performed in a patient with HSP.

· Treatment of HSP.

· Possible complications of HSP.

40. Kawasaki syndrome. MISC (Dr. Zsuzsanna Horváth)

· Diagnostic symptoms of Kawasaki syndrome: fever, conjunctivitis, rash, lymphadenopathy, oral mucosal symptoms, hand-foot edema.

· Complications: coronary aneurysm, thrombosis.

· Main pillars of treatment: aspirin, IVIG.

41. Urinary tract infections: localization, course of the disease, treatment, complications (Prof. Dr. Attila Szabó, Dr. Bálint Mikes)

· **Leukocyturia:** more than 5–10 white blood cells are visible per microscopic field.

· **Symptoms of acute cystitis:** pollakiuria, dysuria, urgency, NO FEVER.

· **Symptoms of acute pyelonephritis:** FEVER, flank/low back pain, nausea/vomiting, feeding difficulties.

· **First-line antibiotic for acute pyelonephritis:** 2nd- or 3rd-generation cephalosporin; first-line imaging: abdominal ultrasound.

· **Duration of antibiotic treatment in acute pyelonephritis:** 10 days.

· **VUR evaluation is recommended:** in recurrent febrile urinary tract infections.

42. Congenital disorders of the kidneys and urinary tract (Prof. Dr. Attila Szabó, Dr. Bálint Mikes)

· **Multicystic kidney:** always unilateral, affecting one kidney.

· **Polycystic kidney:** cysts are present in both kidneys.

· **Hydronephrosis:** dilation of the renal pelvis and calyces.

43. Glomerular kidney diseases (Prof. Dr. Attila Szabó, Dr. Bálint Mikes)

· Nephritic syndrome: edema, hypertension, proteinuria, hematuria, impaired renal function.

44. Nephrotic syndrome (Prof. Dr. Attila Szabó, Dr. Bálint Mikes)

· Nephrotic syndrome: edema, hypoalbuminemia, nephrotic-range proteinuria, hyperlipidemia.

45. Cyanotic congenital heart diseases (Dr. Viktória Kemény)

· Definition of cyanotic heart defects.

· Groups of cyanotic heart defects: right-to-left shunt, complete mixing, separated circulation; mention at least one defect belonging to each group.

· Anatomy and therapeutic options of Tetralogy of Fallot and transposition of the great arteries.

· Importance of endocarditis prophylaxis.

46. Acyanotic congenital heart diseases (Dr. Andrea Tölgyesi)

· List of heart defects with left-to-right shunt.

· Symptoms of VSD: clinical findings, auscultation, chest X-ray, therapy.

· Clinical picture of coarctation of the aorta in infancy (early type) and in adulthood (late type); this latter form may also occur in childhood.

47. Malabsorption. Celiac disease (Dr. Zsuzsanna Vojnisek)

· Malabsorption may be suggested by:

o diarrhea, steatorrhea, weight loss, growth retardation.

· Celiac disease:

o gluten-induced autoimmune enteropathy in genetically susceptible individuals.

· What contains gluten?

o wheat, rye, and barley.

· Treatment is a lifelong gluten-free diet.

48. Cholestatic liver diseases childhood (Dr. Antal Dezsőfi-Gottl)

· What is the difference between hepatocellular and obstructive cholestasis? Give one example of each.

· When and how should neonatal jaundice be investigated? What is the diagnostic threshold for conjugated bilirubin, and what is the most common cause of neonatal cholestasis?

· What is the essence of the Kasai operation (portoenterostomy), when is it indicated, and what is the most common early postoperative complication?

· List at least 4 diagnostic criteria for the diagnosis of Alagille syndrome. Which organ system involvement increases mortality the most?

49. Hepatitis in childhood (Dr. Antal Dezsőfi-Gottl)

· Compare the childhood features of HAV, HBV, and HEV infection with regard to route of transmission, risk of fulminant course, and chronic progression.

· Based on which autoantibody pattern do we distinguish type I and type II autoimmune hepatitis, and which type is more typical in younger childhood?

· Describe the standard pediatric treatment protocol for autoimmune hepatitis (AIH): which drugs are used, at what dose, and for how long, and what are the conditions for stopping therapy?

· What histologic changes characterize AIH? What is “interface hepatitis”?

50. Most common infectious enteritises (Dr. Nóra Judit Béres, Dr. Kata Gayerhosz)

· When is hospital treatment necessary for a patient with diarrhea?

· Most common viruses causing gastroenteritis.

· Most common bacteria causing gastroenteritis.

· When should antibiotic treatment be considered in diarrhea?

51. Inflammatory bowel diseases: ulcerative colitis, Crohn disease (Dr. Áron Cseh)

· What is the difference between Crohn disease and ulcerative colitis based on the affected

segment of the digestive tract and the extent/depth of inflammation?

Correct answer: Crohn disease can affect any part of the digestive tract from the oral cavity to the anus in a segmental distribution, and the inflammation is transmural, involving the full thickness of the bowel wall. Ulcerative colitis affects only the large intestine, most often distally (rectum and sigmoid) in more severe forms, and the inflammation is limited to the mucosa.

· What is the most characteristic differentiating clinical leading symptom of ulcerative colitis and Crohn disease in childhood?

Correct answer: The leading symptom of ulcerative colitis is bloody stool and diarrhea, whereas Crohn disease is characterized mainly by abdominal pain, weight loss, and, in children, growth retardation as an important warning sign.

· What is the induction treatment of childhood Crohn disease that is as effective as steroid treatment?

Correct answer: Exclusive enteral nutrition or, based on the latest data, a specific exclusion diet such as Crohn exclusion diet (CDED).

· Which drug group provides the maintenance therapy of ulcerative colitis and is also the main tool for prevention of colorectal carcinoma with long-term use?

Correct answer: 5-aminosalicylates, which are practically ineffective in Crohn disease.

· In therapy-resistant cases not responding to conservative treatment, what surgical solution is considered in the two diseases?

Correct answer: In Crohn disease: limited bowel resection or stricturoplasty, with special attention to avoiding short bowel syndrome due to extensive small-bowel resection. In ulcerative colitis: colectomy, followed by creation of a J-pouch from the small intestine.

52. Alarming signs of abdominal disorders (Dr. Péter Krivácsy9

· Acute abdominal pain in childhood can range from a benign condition to an urgent surgical indication; severe “red flag” conditions such as appendicitis, intussusception, volvulus, incarcerated hernia, and peritonitis must be ruled out.

· Bilious vomiting or prolonged, persistent vomiting, persistent fever, poor general condition, severe dehydration, or signs of shock/sepsis (tachycardia, poor perfusion) are in themselves alarming and require immediate evaluation.

· Bloody or mucous stool may suggest intussusception or bacterial infection, but in infants a common cause is allergic colitis.

Important pediatric conditions in the differential diagnosis of acute abdomen and their common symptoms:

· Appendicitis: initial peri-umbilical pain, later localized to the right lower quadrant; McBurney point is tender, and coughing, movement, or deep inspiration worsen the pain.

· Intussusception: should be considered between 2 months and 6 years of age, with a peak at 5–9 months; intermittent colicky abdominal pain with completely symptom-free intervals, characteristic “currant jelly”-like bloody stool, vomiting.

· Volvulus: occurs in early infancy with feeding difficulties, bilious vomiting, abdominal distension, poor general condition; abdominal examination may be deceptively negative, but it is a surgical emergency.

· Testicular torsion: abdominal pain may be misleading, therefore in boys with abdominal complaints testicular examination is mandatory; it is time-critical and requires immediate surgical management.

· Ovarian torsion: pain in the lower quadrant on the same side; ultrasound is important in diagnosis; it is a time-critical condition requiring immediate surgical management.

· Peritonitis: severe diffuse abdominal pain with guarding, vomiting, fever, tachycardia; should always be considered a serious condition.

· Ileus: may be mechanical or paralytic; symptoms are dominated by abdominal distension, vomiting, most often bilious vomiting, poor general condition, hypovolemia, and signs of poor perfusion. It is a severe, life-threatening condition. In a previously operated abdomen, mechanical ileus must always be considered.

53. Enuresis. Polyuria and polydipsia (Dr. György Reusz)

· Definition of enuresis: recurrent involuntary urination after 5 years of age.

· Definition of polyuria: abnormally increased urine output.

· Definition of polydipsia: abnormally increased fluid intake.

· Two main diagnoses that must be excluded in the background of polyuria and polydipsia, and which require treatment: diabetes mellitus, diabetes insipidus.

54. Edema (Dr. Gábor Szarvas)

· Definition of edema.

· Typical diseases or situations in which it may develop.

· Treatment options, e.g. causal treatment, fluid restriction, diuretic therapy, CRRT, albumin therapy.

55. Acid-base homeostasis, treatment of acid-base balance disorders (Dr. Lilla Ádámi, Dr. Mihály Bednárik, Dr. Csaba Lódi)

· Definition of acidosis.

· Definition of alkalosis.

· Classification of acid-base disorders.

· Formula for calculating the anion gap.

56. Fever, management of fever, antipyretics (Dr. Tamás Pék)

Benefits of fever:

· Some immune responses accelerate at higher body temperature.

· Replication of certain pathogens with narrow temperature preferences is inhibited.

Disadvantages:

· Discomfort.

· Increased metabolic rate and oxygen consumption, with increased burden on the lungs, heart, and circulation. In a healthy child it is not dangerous, but it may be harmful in a child with shock, pulmonary disease, or cardiac disease.

· Fluid loss and electrolyte loss increase because of sweating.

Fever measurement:

· Rectal temperature is 0.5 C higher than axillary; axillary, oral, and ear measurements can be used; ear temperature measurement may be higher in inflammation and may be painful; forehead measurement is for orientation only.

Antipyretic drugs in childhood: paracetamol, ibuprofen, metamizole.

Fever of unknown origin (FUO):

· The definition is not uniform. In general, FUO is considered when fever has been present daily for at least 8 days (according to some authors, for 2–3 weeks), and the underlying cause cannot be clarified even after adequate outpatient and inpatient evaluation.

· Differential diagnosis: infection, rheumatologic disease, malignant disease.

57. Pertussis, influenza, RSV and COVID (Dr. Tamás Pék, Dr. Krisztina Kalocsai, Dr. Ferenc Balázs Farkas, Dr. András Kis)

Pertussis (Dr. Tamás Pék)

· Highly contagious.

· Incubation period: 4–21 days.

· Catarrhal phase - paroxysmal phase (coughing fits) - convalescent phase.

· In newborns and unvaccinated infants, apnea and malignant pertussis (pulmonary hypertension, circulatory failure) may develop.

· Treatment should be started as early as possible, but definitely within 21 days: azithromycin,

co-trimoxazole.

· Newborns and infants should be treated even if pertussis is only suspected.

· Newborns can be protected by active immunization of pregnant women (third trimester).

RSV (Dr. Ferenc Balázs Farkas)

· There is passive and maternal active immunization against RSV.

· The main risk groups are BPD, congenital heart disease, and prematurity.

· RSV therapy is primarily supportive; HFNC should be mentioned.

Influenza (Dr. Krisztina Kalocsai)

· Typical clinical symptoms of seasonal influenza.

· Factors predisposing to severe disease: at least 4 should be mentioned, including age under 5 years.

· Complications: at least 4 should be known, including direct viral pneumonia, ARDS, encephalitis, acute toxic-metabolic encephalopathy, myelitis, Guillain-Barré syndrome, myositis, rhabdomyolysis, myocarditis, pericarditis, and bacterial pneumococcal complications.

· Indications for antiviral treatment: at least 3 risk factors.

· Prevention: who is vaccination recommended for? Routine immunization for everyone over 6 months of age.

Non-examination minimum requirements:

33. Neuromuscular diseases in childhood

· SMA, Duchenne muscular dystrophy

58. General pediatric nephrology knowledge

· eGFR calculation in childhood: calculated with the Schwarz formula based on serum creatinine and height.

· Creatinine value depends on age, sex, and muscle mass.

· Definition of chronic renal failure: GFR <60 ml/1.73 m2/min for at least 3 months.

· Hematuria: >4–5 red blood cells per microscopic field.

· Hemolytic uremic syndrome: hemolytic (mechanical) anemia, thrombocytopenia, renal failure.

· Diagnosis of hypertension: values above the 95th percentile for age/height/sex measured on 3 different occasions, and/or similarly elevated values on 24-hour blood pressure monitoring.

· Most common cause of secondary hypertension: kidney disease.

· Antihypertensive drug classes that may be used: at least four groups, ACEI/ARB, calcium channel blocker, diuretic, beta-blocker.

Fluid therapy:

· Fluid requirements in premature infants, newborns, and childhood (calculation).

· Planning and calculation of fluid therapy in disease states (fluid loss, bolus).

Physical examination:

· Examination of the skin, pharynx, lymph nodes, heart and circulation, lungs and breathing, abdomen.

Failing to perform any life-saving intervention (or performing any life-threatening intervention) in a patient results in a failed exam.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is determined by considering performance in both the practical and theoretical exams. The grades obtained in the bedside practical exam and the theoretical exam each contribute 50% to the overall exam grade; in cases where the average is inconclusive, the oral exam grade will be decisive. Student performance is evaluated using a five-point scale: Excellent (5), Good (4), Satisfactory (3), Pass (2), Fail (1).

For the OSCE, students receive a pass (based on the prevailing Study and Examination Regulations) or fail based on a pre-determined scoring system. Successful completion of the course requires a minimum grade of Pass (2) in both the bedside practical and theoretical exams, as well as a passing result in the OSCE (based on the prevailing Study and Examination Regulations).

See above.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI-based tools for learning purposes is permitted; however, they may not be considered official sources of information or study materials, and their use is also prohibited during examinations.

Printed resources:

Type	Recommended
Author	Karen Marcdante, Robert M. Kliegman, Abigail M. Schuh
Title	Nelson Essentials of Pediatrics 9ed
Publisher	Elsevier
Year of publication	

Type	Recommended
Author	Robert C. Tasker, Carlo L. Acerini, Edward Holloway
Title	Oxford Handbook of Paediatrics
Publisher	Oxford Univerity Press
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés IX.; Testnevelés X.
Name of subject in English: Physical Education IX; Physical Education X
Name of subject in German: Körpererziehung IX; Körpererziehung X

Credit value of the course: 0
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI009_9A; AOKTSI009_10A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Upon completion of the course the student will be able to carry out regular physical activity.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) VII*, Physical Education (PE) VIII*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If you have not completed the course you may be readmitted in the 2. semester of the following academic year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 60 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

You can register for the “independent sports activity” course as part of the Physical Education course in the Neptune system.

Every week, a questionnaire is sent to the students through the Neptune system:

– The questionnaire can be filled in from Monday to Sunday in a semester (no entries can be made in advance or afterwards).

– Students must assure themselves that they have completed the questionnaire truthfully.

–It is a minimum requirement for the signature that a training of 1 × 60 minutes per week is completed (to be 10 times

responses) and this is recorded in the questionnaire.

Other way, Free of charge:

2x90 mins./week sport training (competitive sport, for qualified only): cheerleader, female"s football, men's football, handball, basketball, volleyball, waterpolo

Teachers/coaces:

Várszegi Kornélia
Nagy-Kismarci Bence
Rimay István
Jánka Zsolt
Kéri Mózes
Weisz Miklós
Jókai Mátyás
Balogh Noémi
Dr. Kovács Attila
Kalanovics BAlázs
Karácsonyi Vazul

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The student who completes the independent sport activity course is also supposed to attend 10 classes and record their participation in the weekly sent UniPoll questionnaire.. Practice leaders follow an online presence registration at the beginning and end of the lessons, which can be individually tracked on semmelweis.hu/sportkozpont homepage.

Another way to complete the Physical Education course is to 15 times actively participate in the trainings of university teams. As teams take part in championships during the school year, we only accept applications from professional athletes!

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 10 times (trainings 15 times) under the conditions described above.

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

2. a sports exemption.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

signature

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Pszichiátriai és Pszichoterápiás Klinika

Name of subject in Hungarian: Pszichiátria, pszichoterápia
Name of subject in English: Psychiatry and Psychotherapy
Name of subject in German: Psychiatrie - Psychotherapie

Credit value of the course: 6
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
98.0	38.0	60.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
AOKPSI1019_1A Psychiatry. Psychotherapy

Course code:
AOKPSI1019_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Réthelyi János (Klinika igazgató)
Course coordinator location of work, telephone availability: +3612100336
Course coordinator position: Head of the Department, clinical director
Course coordinator Date and number of habilitation: 24 June 2015, registration number: 05/2015.

Objectives of the course, and its place in the curriculum of the medical training program:

The objectives of the subject of *Psychiatry, Psychotherapy* is to acquire an in-depth knowledge about the diagnostics, symptoms and treatment of psychiatric disorders at the level of a general medical practice. It is expected from students to be able to identify the basic elements of psychopathology and the conditions requiring emergency psychiatric interventions. Furthermore, students’ communication skills are developed in order to be able to examine patients and explore psychiatric

conditions independently.

Psychiatry, Psychotherapy is taught in the fifth year of the general medical undergraduate training, in the semesters of 9-10 within the curriculum.

Format of the course (lectures, group work, practical lessons, etc.):

Lectures + practices, practices include patient examination, development of diagnostic competences, development of psychotherapeutic competences based on role-playing.

Competencies acquired through completion of course:

1. Recording the patient's history (general, somatic, psychiatric, pharmacological and family history)
2. Complex psychiatric examination (assessing the consciousness, perception, orientation, thought, intellect; emotional and memory functions; mood, and psychomotor functions of the patient; assessment of attitude towards examiner, motivation system and personality functions)
3. Suicide risk assessment
4. Family consultation to uncover the patient's problems
5. Exploration of patients after suicide attempts or in crisis situations.
6. Interpretation of the Mini Mental State Examination results
7. Indication of psychiatric inpatient treatment
8. First steps of emergency psychiatry care
9. Identification of different intoxications
10. Recognition of somatic disorders underlying psychiatric symptoms
11. Recognition and management of immediately dangerous behaviours
12. Psychoeducation (regarding the disorder, therapy, prodromal signs, patient care)
13. Differential diagnosis of psychiatric disorders; making a diagnosis
14. Development of psychopharmacological treatment plan
15. Understanding the psychotherapeutic methods

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Psychiatry, Psychotherapy is a single semester subject

The number of students required to start the course (minimum, maximum), method of selecting participants:

We instruct the entire fifth year, therefore, there is no limit on number of subscribing students in the Neptun System.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st WEEK Monday			**1st WEEK Monday**		
8:00-10:15	L1		Introductory lecture. What we teach in psychiatry, curriculum, objectives, exams. The history of psychiatry. Psychiatric epidemiology.	Professor Jázsa Bethlehi	in person
10:45-12:00	L2		Lecture. Psychopathology. Mental status examination. Transcultural psychiatry. Gene-environment interactions in psychiatry.	Professor Jázsa Bethlehi	in person
13:30-14:60		P1.	Practice. Psychiatric patient examination, psychiatric status, preparation of psychiatric medical history, psychopathology		
14:30-16:00		P2.	Practice. Psychiatric patient examination, psychiatric status, preparation of psychiatric medical history, psychopathology		
1st WEEK Tuesday			**1st WEEK Tuesday**		
8:30-8:45	L3		Lecture. Anxiety disorders: diagnosis and treatment. Eating disorders: diagnosis and treatment. Sexual disorders.	Szilárd Hunyadi MD	in person
10:15-11:30	L4		Lecture. Affective disorders: diagnosis and treatment	Professor Zoltán Rihmer	in person
12:30-14:00		P3.	Practice. Psychopathological reports of students, Organic diseases, affective diseases, anxiety disorders		
14:30-16:00		P4.	Practice. Psychopathological reports of students, Organic diseases, affective diseases, anxiety disorders		
1st WEEK Wednesday			**1st WEEK Wednesday**		
8:30-8:45	L5		Lecture. Schizophrenia and other psychotic disorders	Professor Jázsa Bethlehi/ Professor Herma Bitter	in person
10:15-11:30	L6		Lecture. Classification of mental disorders.	György Szekeres MD	in person
12:30-14:00		P5.	Practice. Psychopathological reports of students, general patient presentation, psychiatric exam, request for consultation		
14:30-16:00		P6.	Practice. Student Psychopathological Reports, Schizophrenia and Psychotic Disorders, Emergency Care, Psychiatric Risk Assessment, Voluntary and Compulsory Treatment		
1st WEEK Friday			**1st WEEK. Friday**		
8:30-8:45	L7		Lecture. Neurocognitive disorders - diagnosis and treatment. Geriatric Psychiatry	Zoltán Rihmer / Mária Fullajtár/László Tombor MD	in person
10:15-11:30	L8		Lecture. Emergency psychiatry. Legal and ethical issues in psychiatry. Suicide	Ferenc Ádám Szabó MD	in person
12:30-14:00		P7.	Practice. Psychopathological reports of students, general patient presentation, psychiatric exam, request for consultation		
		P8.			
2d WEEK Monday			**2d WEEK. Monday**		
08.45-10.00	L9		Lecture. Introduction to psychotherapy. Definition, indications, effects, main trends, basic competencies of psychotherapy	Prof. Zsolt Unoka	in person
10.15-11.30	L1 0.		Lecture. Stages of motivational interview and behaviour change. addiction, eating disorders, lifestyle changes required due to chronic diseases; management of compliance problems. Sleep disorders: diagnosis and treatment	Professor Gáspár Pintér	in person
12.30-13.45	L1 1.		Lecture. The cognitive model- anxiety disorders, depression, somatization, sleep disorders, psychotherapeutic approach to sexual disorders	Professor Ilona Kovacs Fabrizio	recorded
14.15-15.45	L. 12.		Lecture. Suicide prevention, crisis intervention, aggressive, psychotic, psychotherapeutic approach for patients with personality disorders	Róbert Magdolna Dér MD	recorded
2d WEEK Tuesday			**2d WEEK Tuesday for the group of the lower number within the rotation**		
8.00-8.30		P9. 9.	Introductory session, the process of group formation, the presentation of the group's functions through turning a string, sensitization to psychotherapeutic work and role-plays. Practicing-empathic reflection, feedback.		
10.00-11.30		P9. 10.	Presentation and application of a cognitive model to conceptualize everyday anxieties. Someone comes face to face on the street and doesn't say goodbye through a conversation of imagination. Three-column method; logical errors, 7-column method; cognitive model of panic attack, education, anchor of progressive relaxation.		
12.30-14.00		P9. 11.	Depression, cognitive conceptualization of deep disorders (three-column method; logical errors, 7-column method, behavior activation). psychotherapeutic approach		
14.30-16.00		P9. 12.	Exploration of sexual disorders, basic techniques for treatment		
2d WEEK Tuesday			**2d WEEK Tuesday for the group of the higher number within the rotation**		
8.15-8.30		P9. 8.	Addictology practice	Dr István Vályi-Nagy MD	
10.00-11.30		P9. 10.	Addictology practice	Dr. István Vályi-Nagy MD	
12.30-14.00		L8 P.	Lecture. Neuropsychology. Clinical Psychology (Theoretical Introduction)	Dr. Eva Szokolszka Gonda	in person
14.30-16.00		P9. 11.	Practice. Neuropsychology. Clinical Psychology Practice (Case Study)		
2d WEEK Wednesday			**2d WEEK. Wednesday**		
8.30-8.45	L. 13.		Lecture. Pharmacotherapy in psychiatry	Prof István Bitter / Gábor Csukly MD	in person
8.45-10.15	L1 4.		Lecture . Consultation on the online materials	Professor Jázsa Bethlehi	in person
10.15-11.45	L1 5.		Lecture. Transcultural psychiatry	Professor Jázsa Bethlehi/Dr. Szilágyi Szilárd	in person
12.30-13.45	L1 6.		Lecture. Posttraumatic stress disorder. Somatoform disorders, Somatization and Conversion disorders, Hypochondriasis	Professor Jázsa Bethlehi	recorded
14.00-15.15	L1 7.		Lecture. EEG and event related potentials in psychiatry	Pál Czobor MD	recorded
2d WEEK Friday			**2d WEEK Friday for the group of the lower number within the rotation**		
8.00-8.30		P9. 13.	Motivational interview and identification of stages of behavior change, practice of intervention: addictions, eating disorders, required due to chronic diseases		
10.00-11.30		P9. 14.	Treatment of lifestyle changes and compliance problems required due to chronic diseases		
12.30-14.00		P9. 15.	Suicide prevention, practice of crisis intervention steps, basic techniques. Psychotherapeutic interventions in aggressive, psychotic, borderline personality disorder		
2d WEEK Friday		P9. 16.	**2d WEEK Friday for the group of the higher number within the rotation**		
8.15-8.45		P9. 12.	Child psychiatry practice	Ildikó Baji MD	
10.00-11.15		P9. 13	Child psychiatry practice	Ildikó Baji MD	
12.30-14.00		P9. 14.	Community Psychiatric Practice (Day Hospital)	Judit Harangozó MD	
		P9. 15.			
			3d WEEK. 22-26 May2023.		
3d WEEK Monday			**3d WEEK Monday**		
12.45-14.00	L1 8.		Lecture. Diagnosis and treatment of alcohol and substance use disorder	Erika Szlávik MD	in person
14.45-15.45	L1 9.		Lecture. Adult ADHD (symptoms, comorbidity, course, therapy)	Attila Nagy / Attila Balogh MD	in person
	L2 0.		Lecture. Child and adolescent psychiatry (ADHD, autism, tic disorders)	Professor Judit Balázs	recorded
	L2 1.		Lecture. Electroconvulsive therapy and repetitive transcranial magnetic stimulation in psychiatry	Gábor Gazdag/Lenka Is Hermán MD	recorded
3d WEEK Tuesday			**3d WEEK. Tuesday for the group of the lower number within the rotation**		
8.15-8.30		P9. 17.	Addictology practice	Dr István Vályi-Nagy MD	
10.00-11.30		P9. 18.	Addictology practice	Dr. István Vályi-Nagy MD	
12.30-14.00		L1 9P.	Lecture. Neuropsychology. Clinical Psychology (Theoretical Introduction)	Éva Szokol Nónia Gonda	in person
14.30-16.00		P1 9.	Neuropsychology. Clinical Psychology Practice (Case Study)		
3d WEEK Tuesday			**3d WEEK Tuesday for the group of the higher number within the rotation**		
8.00-8.30		P9. 16.	Introductory session, the process of group formation, the presentation of the group's functions through turning a string, sensitization to psychotherapeutic work and role-plays. Practicing-empathic reflection, feedback.Empathic reflection, transcription, alexithymia.		
10.00-11.30		P9. 17.	Presentation and application of a cognitive model to conceptualize everyday anxieties. Someone comes face to face on the street and doesn't say goodbye through a conversation of imagination. Three-column method; logical errors, 7-column method; cognitive model of panic attack, education, anchor of progressive relaxation.		
12.30-14.00		P1 8.	Depression, cognitive conceptualization of deep disorders (three-column method; logical errors, 7-column method, behavior activation). psychotherapeutic approach		
14.30-16.00		P9. 19	Exploration of sexual disorders, basic techniques for treatment		
3d WEEK Wednesday			**3d WEEK Wednesday**		
	L2 2.		Lecture. Personality disorders	Prof. Zsolt Unoka/ Lucia Zagyvai MD	recorded
	L. 23.		Lecture. Community psychiatry, rehabilitation of psychiatric patients. Consultation and liaison psychiatry	Judit Harangozó/ László Tombor MD	recorded
12.30-14.00		P1 4.	Practice. Patient presentation, differential diagnosis, discussion of drug and psychotherapeutic treatment strategies, writing a medical history		
14.30-16.00		P1 5.	Practice. Patient presentation, differential diagnosis, discussion of drug and psychotherapeutic treatment strategies, writing a medical history		
3d WEEK Friday			**3d WEEK Friday for the group of the lower number within the rotation**		
8.15-8.45		P1 20.	Child psychiatry practice	Ildikó Baji MD	
10.00-11.15		P1 21.	Child psychiatry practice	Ildikó Baji MD	
12.30-14.00		P1 22.	Community Psychiatric Practice (Day Hospital)	Judit Harangozó MD	
		P1 23.			
3d WEEK Friday			**3d WEEK Friday for the group of the higher number within the rotation**		
8.00-8.30		P9. 20	Motivational interview and identification of stages of behavior change, practice of intervention: addictions, eating disorders, required due to chronic diseases		
10.00-11.30		P9. 21	Treatment of lifestyle changes and compliance problems required due to chronic diseases		
12.30-14.00		P9. 22.	Suicide prevention, practice of crisis intervention steps, basic techniques. Psychotherapeutic interventions in aggressive, psychotic, borderline personality disorder		
		P9. 23			
4th WEEK Monday			**4th WEEK Monday**		
8.00-9.00	L2 4.		Lecture. Consultation	Professor Jázsa Bethlehi/Dr. Attila Nyáry	in person
9.30-11.00		P9.	Practical exam in person	Professor Jázsa Bethlehi/	
		P.	Written Semi-final Exam on Thursday and Friday.	Professor Jázsa Bethlehi/	

Teachers of the subject entitled Psychiatry, Psychotherapy:

SE PPK			SE Klinikai Pszichológiai Tanszék
Dr. Rétlaki Jánosné	L, P		Dr. Perczel-Forintos Dóra L.
Dr. Balogh Lívia	L, P		Kele Tímea P
Dr. Csukly Gábor	L, P		Lenkovi Anthónia P
Dr. Egervári Luca	L, P		SE Magatartástudományi Intézet
Dr. Farkas Kinga	P		Dr. Purebl György L
Dr. Hajtmanka-Dér Balint	L, P		Dr. Stauder Adrienne L
Dr. Hanyvan Szilárd	L, P		SE Közösségi Pszichiátriai Centrum
Dr. Herman Levente	L, P		Dr. Harangozó Judit L,P
Dr. Hidasi Zoltán	L, P		Dr. Rodrigó Andrea L, P
Dr. Menus Ádám	L, P		Vasdunkert Kórház
Dr. Mersich Beatrix	L, P		Dr. Baji Ildikó P
Dr. Orbán-Szigeti Boglárka	P		Dr. Madarasné-Szűcs Anna P
Dr. Pipp Szilvia	P		Dr. Bálint Benedek P
Dr. Pulay Attila	L, P		Egyéb külső intézmény:
Dr. Sárosi Andrea	P		Dr. Rihmer Zoltán L
Dr. Seres Imola	P		Dr. Gazdag Gábor L,P
Dr. Simon Viktória	P		Dr. Balázs Judit L,P
Dr. Sinay Attila	P		Dr. Lazányi Judit P
Dr. Szabó Gyöngyi	P		Dr. István Vályi-Nagy P
Dr. Szabó-Farenc Ádám	L, P		Dr. Szilágyi Györgyi L,P
Dr. Szakarosi György	L,P		
Dr. Szily Erika	L,P		
Dr. Tombor László	L,P		
Dr. Treuer Tamás	P		
Dr. Unoka Zsolt	L,P		
Dr. Zsigmond Réka	P		
Dr. Kapcsik Fanny	P		
Dr. Brindza Nóra	P		
Dr. Kruk Ernese	P		
Dr. Karakai Soma	P		
Dr. Rácz Benedek	P		
Dr. Szentes Ádám, Dr. Schein Dávid	P		
Pszichológusok			
Dr. Jekkel Éva	L, P		
Dr. Gonda Kétia	L, P		
Bálint Sára	P		
Kőszecz Tünde	P		
Dr. Vass Edit, Szoó Alexandra	P		

L= LECTURE P= PRACTICE SESSION

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Like other subjects, the course is considered completed if the absences do not exceed 25% of practice sessions that is equivalent to missing a 2-hour-long and a 4-hour-long practice block session at most.

Teachers record absences on an attendance sheet at each practice occasion together with the following data: the ID number of the group, topic of the practice sessions, the demonstrated diagnosis. It is not possible to certify absences. Therefore, making up missing practice time is mandatory either by attending practice sessions of another rotation or the substitute practice sessions during the 3-weeks after the last (8th) rotation. Alternatively, short absences might be made up by performing extra tasks such as writing a case report that is examined and signed by one of our practice teachers. In the case of mass absences because of exceptional cases (i.e. grave disease) the permission of the head of the department is necessary. Based on the Regulations for Learning and Examination in power, 10% of the lectures and practice sessions (counted together) can be missed, which means 10 x 45 minutes in total.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There are no mid-semester tests or oral reports.

Number and type of individual assignments to be completed, submission deadlines:

None required

Requirements for the successful completion of the course:

The semester is acknowledged if the student has actively participated in the practice sessions covering the theory and practice of examining a patient and case discussion, as well as in the special practice sessions (child psychiatry, addictology, clinical psychology-psychodiagnostics, neuropsychology).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Preparation for the written semi-final exam includes presence at the lectures, studying the textbook, the drafts, and PowerPoint presentations of lectures made available for students on the e-learning interface MOODLE of Semmelweis University.

The practical exam evaluates the students' clinical knowledge and skills obtained during the practice sessions and from the corresponding e-learning study material. To pass the practical evaluation students are required to be able to conduct a 20-30 mins long patient examination by adhering to the following aspects:

1. Commencing the examination appropriately (introduction, handshake, communication)
2. Empathic communication (attentiveness, reciprocity, giving feedbacks)
3. Understanding the most important interview techniques (open-ended vs closed-ended questions, mandatory questions, etc.)
4. Ability to identify important psychiatric signs and symptoms and to explore them in satisfactory details
5. Ability to finish the interview appropriately and conceptualize the diagnosis and to develop further diagnostic plans
6. Ability to describe and document the patient's mental status and to write a referral about the findings
7. Regarding the examined case have sufficient knowledge of:
8. suicide risk assessment
9. violence risk assessment
10. emergency psychiatry
11. most important psychotropic medicine groups (antidepressants, antipsychotics, anxiolytics, mood stabilizers, dementia medications)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Compulsory concepts and practical skills to be learnt during the course are the following:

Examination of the psychiatric patient

• Additional examinations in psychiatric practice

• Assessment of suicide risk among psychiatric patients

• Assessment of the risk of aggression among psychiatric patients

• Types of antidepressants, their range of indications, mechanism of action, side effects

• Types of anxiolytics, their range of indications, mechanism of action, side effects

• Types of mood stabilizers, their range of indications, mechanism of action, side effects

• Types of antipsychotics, their range of indications, mechanism of action, side effects

• Types of nootropics, drugs used in the treatment of dementia, their range of indications, mechanism of action, side effects

• Other non-pharmacological biological treatment forms (ECT, sleep deprivation, light therapy)

• Basic characteristics of psychotherapy

• Differences between psychotherapy trends

• Emergency psychiatric admission requiring conditions

• The most common psychiatric conditions in other medical fields - requesting a consultation

• Legal aspects of psychiatry, the practice of compulsory treatment

• Community psychiatric care

• The psychiatric institutional system

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

On Monday, week 4, the teaching of psychiatry ends with a practical report, during which the students demonstrate their practical knowledge (psychiatric status writing, case referral). The report is evaluated by the teacher on a two-point scale (pass, fail) and it is a prerequisite for taking the semi-final exam at the end of the course. The exam is a written, computer-based test (randomized 50 items, consisting of multiple-choice test questions and multiple-choice questions for

case vignettes). The duration of the written exam is 60 minutes. An oral semi-final exam is only allowed with permission from the head of the department.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We do not use artificial intelligence-based systems in the teaching of our subject. Students may use generative AI tools during their learning, however, their use is not permitted in the test exam.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Printed resources:

Type	Mandatory
Author	Rebecca McKnight, Jonathan Price, John Geddes
Title	Psychiatry 5th edition
Publisher	Oxford University Press
Year of publication	2019

Type	Mandatory
Author	Unoka, Zsolt, György Purebl, Ferenc Túry, István Bitter, Alan Campbell, Gábor Szőnyi, and Gerard J. Butcher
Title	The Basics of Psychotherapy
Publisher	Semmelweis Kiadó
Year of publication	2018

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Megelőző Orvostani és Népegészségtani Intézet

Name of subject in Hungarian: Népegészségtan
Name of subject in English: Public Health
Name of subject in German: Hygiene und Präventivmedizin

Credit value of the course: 6
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
6.0	2.0	4.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKNEI1123_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ungvári Zoltán (igazgató)
Course coordinator location of work, telephone availability: Megelőző Orvostani és Népegészségtani Intézet,Tel:06-1-210-2954
Course coordinator position: kutatóprofesszor
Course coordinator Date and number of habilitation: 2020.11.23., 26/2020.

Objectives of the course, and its place in the curriculum of the medical training program:

Public health deals with human health issues at a population level. As an applied science, its basic goal is to preserve and improve health and to prevent diseases. To achieve these goals public health covers several areas of health. Epidemiology (of communicable diseases) deal with infectious diseases, with a special focus on infection control. Traditional public health describes the role of environmental factors in the development of diseases. Occupational medicine aims to maintain the health of employees through the prevention of occupational diseases. Physicians of the 21st century

should be able to perform individual health promotion techniques and also should be aware of the concept of community health promotion. Epidemiology as a methodology in public health is essential for all these activities.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture, practical lesson, group work.

Competencies acquired through completion of course:

The main competences students acquire are abilities for assessment of various epidemiological studies and for comprehensive reading of scientific evidence-based literature as well. Other competences: ability to design and implement research by selecting the most appropriate epidemiological methods; ability to conduct individual health promotion based on lifestyle factors and to have basic info of community health promotion. Skills for application the practical knowledge related to epidemiology and infection control.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Cardiology, Heart Surgery, Angiology, Vascular Surgery; Medical Statistics, Informatics and Telemedicine

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum 24 students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1st week	1.	2.	3.		4.
	Monday	Tuesday	Wednesday	Thursday	Friday

8.00-11.30	Health promotion programs – basics, situation mapping, identyfication of needs, action plan. Dr. Árva Dorottya	Epidemiology I: basic statistics, morbidity measurements. Types of epidemiologic studies. Clinical decisionmaking. Dr. Horváth Ferenc	Mental health / Prevention. Illegal drugs use and their prevention. Dr. Árva Dorottya/Dr. Terebessy András	BREAK	Epidemiology of communicable diseases. Epidemiologic measures in outbreak investigation. Dr. Major Dávid
12.30-16.00	Aging population / gerohygiene. The elderly as a vulnerable group. Social situation of the elderly. Role play with ability tools. Dr. Major Dávid	Epidemiology II: screening. Dr. Horváth Ferenc	People with disabilities. Dr Major Dávid/Dr. Péterfi Anna	BREAK	Infection control / epidemiology of communicable diseases. Dr. Major Dávid
2nd week	5.	6.	7.		8.
	Monday	Tuesday	Wednesday	Thursday	Friday
8.00-11.30	Smoking. Brief intervenfion for smoking cessation. Role play studying. Dr. Terebessy András	Environmental medicine. Air / soil / water hygiene. Climate change. Chemical safety. Dr. Hung Wei Yi	Alcohol use, public health significance. Brief intervention for alcohol use. Role play studying. Dr. Terebessy András	BREAK	Critical reading, evaluation of scientific articles (STROBE / PRISMA / CONSORT statement) Dr. Fazekas-Pongor Vince
12.30-16.00	Physical activity, possible therapies. Brief intervention for sports, role play studying. Dr. Péterfi Anna	Occupational medicine, work risk assessment. Dr. Horváth Ferenc	Evaluation of nutritional status. Lifestlye advice for nutrition, brief intervention. Food safety. Dr. Péterfi Anna	BREAK	Infection control / epidemiology of communicable diseases. Dr. Fazekas-Pongor Vince
3rd week	9.				
	Monday	Tuesday	Wednesday	Thursday	Friday
8.00-11.30	Structure of healthcare, healthcare financing. Dr. Horváth Krisztián	STUDY PERIOD	EXAM	BREAK	EXAM
12.30-14.00	Quality assurance in healthcare. Dr. Horváth Krisztián				

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

10 % of the classes.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

none

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

participation on practicals and lectures and finishing the e-learning material

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical Exam Topics:

1. Assessment methods for lifestyle-related risk factors. Creating a personal health plan (CV score, recommended screening tests, vaccinations, lifestyle advice)

2. Prioritization and elements of motivational interviewing in preventive counseling

3. Criteria for evaluating a health promotion program

4. Critical reading and analysis of a given scientific article

5. Analysis of an epidemic using descriptive epidemiological methods. Evaluation of the epidemic curve. Analysis of an epidemic using analytical epidemiological methods

6. Calculation of incidence, prevalence, mortality, and lethality through examples. Calculation of risk indicators (relative risk, attributable risk, attributable risk fraction, population attributable risk fraction, odds ratio)

7. Evaluation of a screening test (calculation of sensitivity, specificity, predictive values)

8. Brief intervention for smoking through role play

9. Alcohol-related screening: understanding and interpreting the CAGE and AUDIT

questionnaires

10. Brief intervention for physical activity. Disease-specific physical activity recommendations

11. Nutritional counseling

12. Problem-solving using quality assurance methods

13. Preconception health care and antenatal care

14. Health of the elderly (programs, individual plans)

15. Hand hygiene: alcohol-based hand disinfection, knowledge of WHO's 5 Moments for Hand Hygiene

16. Proper use of personal protective equipment

17. Manual handling of patients/materials: knowledge of ergonomic risks among healthcare workers and ways to reduce them

18. Administration of vaccines (intramuscular, subcutaneous), knowledge of EpiPen use

19. Vaccination-related counseling

20. Performing and evaluating screening audiometry

21. Spirometry in occupational health practice

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

https://semmelweis.hu/nepegeszsegtan/oktatas/gradualis-kepzes/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

based on the results of the written test and the oral exam

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Sportorvostan Tanszék

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Name of subject in Hungarian: Sportorvostan
Name of subject in English: Sports Medicine
Name of subject in German: Sportmedizin

Credit value of the course: 2
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	0.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKSPR763_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Vágó Hajnalka
Course coordinator location of work, telephone availability: SE Városmajori Szív-és Érgyógyászati Klinika, +36-1-458-6844
Course coordinator position: tanszékvezető, egyetemi tanár
Course coordinator Date and number of habilitation: habilitációs bizonyítvány dátuma: 2022.06.02. anyakönyvi szám: 17/2022

Objectives of the course, and its place in the curriculum of the medical training program:

The goal of sports medicine education is to provide and hold the future generation of doctors to account for a wide range of up-to-date, usable practical sports medicine basic knowledge within the framework of general medical education. For students interested in sports medicine, we also provide the opportunity for advanced training.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture and practical lesson.

Competencies acquired through completion of course:

Knowledge of the development and course of structural and functional sports adaptation processes.

Knowledge of basic sports adaptation changes. Knowledge of the symptoms, diagnostic and therapeutic possibilities of diseases that endanger athletes. Basic knowledge of care and rehabilitation treatment of sports injuries.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I. (Metabolism, Endocrinology, Gastroenterology, Nephrology), Cardiology, Heart Surgery, Angiology, Vascular Surgery

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system. There is no minimum headcount.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1. Physiological foundations and energy sources of muscle function. 2. Movement control, movement learning. Warming up, deadlock, fatigue, muscle fever. 3. Energy circulation, daily energy balance. Sports nutrition. Legal performance-enhancing drugs, procedures. Doping. 4. Blood composition and role in sports. Sports adaptation processes of circulation and breathing. Athlete’s heart. 5. Strength, speed, endurance. Age characteristics in acute and chronic sports adaptation. Checking the condition status. Physiological tests for improving sports performance. 6. History taking, physical examination, urine examination: sports medicine specialties. Sports medicine eligibility and periodical examination guidelines. Indications for refusal/withdrawal of a sports medicine license. 7. The role of physical activity in the primary and secondary prevention and treatment of internal medicine diseases. Obesity, hypertension, diabetes, and sports. 8.

Electrocardiography in sports medicine screening. Rhythm disorders and their treatment in athletes. 9. Imaging procedures in the investigation of sports-related cardiac remodeling. 10. The importance of sports cardiology screening. Sudden cardiac death in athletes. 11. Concept, division, etiology, prevention, and diagnostics of sports injuries. General principles of care for acute and overuse sports injuries. Sports injuries of the head, neck, chest, and abdomen. 12. Typical sports injuries and damage of the upper limb. 13. Typical sports injuries and damage to the lower limb. 14. Rehabilitation, movement therapy, and scientific methods in the conservative treatment of sports injuries.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The condition for participation in the courses is the student's application submitted and accepted by the end of the exam period preceding the subject semester.

Absence according to TVSZ. Missed practical sessions must be made up at a time agreed upon in advance with the consultant.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the practical training in sports medicine, we hold interactive exercises. The grade at the end of the semester results from the combined evaluation of the marks for participation in the exercises and the exam on the last day.

Number and type of individual assignments to be completed, submission deadlines:

there is no such condition

Requirements for the successful completion of the course:

The condition for obtaining a signature at the end of the semester is participation in the practical sessions according to the prescribed requirements, as well as successful completion of the exam (getting a grade better than " insufficient" on the exam).

Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics

accepted as an exam)

Exam requirements:

It is a practice-oriented exam, during which the examiner asks about basic knowledge of sports adaptation processes and practical sports medicine patient care.

Knowledge of the symptoms and clinical signs of cardiological pathologies that endanger the athlete, as well as the basic knowledge of the acute treatment of sports injuries, are given priority in the exam.

Exam topics:

Locomotor (Dr Pavlik Attila)

1. Concept, classification, and etiology of sports injuries. 2. Prevention of sports injuries. 3. Diagnosis of sports injuries. 4. General principles of care for acute sports injuries. 5. General principles of care for overuse injuries. 6. Sports injuries of the head and neck. 7. Sports injuries of the chest and abdomen. 8. Sports injuries of the shoulder girdle. 9. Sports injuries of the elbow. 10. Sports injuries of the forearm, wrist, and hand. 11. Sports injuries of the pelvis, hips, and thighs. 12. Acute sports injuries of the knee joint. 13. Knee joint ligament injuries and chronic instability. 14. Meniscus injuries. 15. Damage and damage to the hyaline cartilage. 16. Knee overuse injuries. 17. Sports injuries of the leg. 18. Sports injuries of the ankle. 19. Sports injuries of the foot. 20. Scheuermann's disease, scoliosis, spondylolysis. 21. Arthrosis and sports. 22. Sports injuries of children and adolescents.

Sports physiology: (Dr. Pavlik Gábor)

1. Movement control, movement learning. 2. Sports aspects of endocrine regulation. 3. Mechanical properties of muscle action: isometric, an isometric muscle work. 4. Sources of energy for muscle activity. 5. Concept of fatigue, possible causes. 6. Warm-up, dead center, muscle fever. 7. The concept of power, its types, and development principles. 8. The components of speed, the concept, and the development of endurance. 9. Blood composition and role in sports. 10. The effect of regular exercise on breathing. 11. Signs of fitness of the heart. 12. Circulation under load, the blood supply to some organs. 13. Energy circulation, daily energy balance. 14. The role of proteins, carbohydrates, and fats in the nutrition of athletes. 15. Legal performance-enhancing substances, and procedures. 16. Importance of routine urine tests in sports medicine. 17. Checking the conditional status. 18. Spiroergometric tests. 19. Doping question. 20. Peculiarities of youth sports. 21. Senior sports. 22. Load-physiological tests to improve sports performance.

Sports Medicine/Cardiology: (Demeterné Dr. Kiss Orsolya)

1. History taking and physical examination: sports medicine specialties. 2. Evaluation of the athlete's ECG. 3. The most common causes of sudden cardiac death in athletes under the age of 35. 4. The most common causes of sudden cardiac death in athletes over 35 years of age. 5. The role of physical activity in the prevention of some internal diseases. 6. The role of physical activity in the treatment of some internal diseases. 7. Sports I. and II. type diabetes. 8. Diagnosis and treatment principles of obesity. 9. Drug treatment and doping test. 10. The role of physical activity in the preservation and development of health/fitness. 11. Hypertension and sports. 12. Possibilities of preventing sudden cardiac death during sports. 13. Cardiological classification of sports loads. 14. Assessing disorders

of stimulus formation and driving from the point of view of sports. 15. Sports cardiology assessment of heart valve defects. 16. Ischemic heart disease and sports. 17. Evaluation of cardiomyopathies by sports medicine. 18. Sports medicine assessment of tachyarrhythmias. 19. Dangers of acute infectious diseases for athletes. 20. Guidelines for sports medicine suitability and periodical examination. 21. Harmful effects of doping agents. 22. Indications for refusal/withdrawal of a sports medicine license.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

A minimum score of 51% is required on the test questions. The test questions and answers are available on the Moodle platform.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The evaluation of the student's performance has five levels: excellent (5), good (4), average (3), sufficient (2), and insufficient (1). The assessment of the performance in the exam.

At the end of the block there is a practice-oriented exam - there is no oral part, only a written one.

No inter-block exam.

There is no offered grades.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://academic.oup.com/eurheartj/article/40/1/19/5248228

Type	Recommended
Title	
Link	https://academic.oup.com/eurheartj/article/39/16/1466/2965923?login=true

Type	Recommended
Title	
Link	https://academic.oup.com/eurjpc/article/24/1/41/5926661?login=true

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Urológiai Klinika

Name of subject in Hungarian: Urológia
Name of subject in English: Urology
Name of subject in German: Urologie

Credit value of the course: 3
Semester: 9th semester, 10th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
3.0	1.0	2.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKURO060_1A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Horváth András egyetemi adjunktus
Course coordinator location of work, telephone availability: Urológiai Klinika 20/825-8753
Course coordinator position: senior lecturer
Course coordinator Date and number of habilitation: 1791/2013

Objectives of the course, and its place in the curriculum of the medical training program:

Our aim is to teach our students for the basic knowledge of the most important differential diagnostic steps, physical examination of urology and to educate them to perform the most important, minor urological procedures, such as urethral catheterization.

Format of the course (lectures, group work, practical lessons, etc.):

During the 3 -weeks block- educational period, there are thematic lectures held by experts in all field of urology and also practices in small groups (max. 5-10 students). During these practices patient examination, ultrasound examination, performing catheterisation on models and practice on laparoscopic pelvitrainer is required.

Competencies acquired through completion of course:

Knowledge of management of urological diseases (examination, diagnostic algorithms, nomenclature, therapeutic options), ability to perform basic therapeutic methods (urological physical examination, catheterization, urological ultrasound).

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pharmacology II, Surgery I-II

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Urology subject is taught in 1 semester.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system, half of the 4th grade students in a semester. Students apply to each block via Neptune, up to 10 people per group.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The subject is educated in a block system. During the 3-weeks block students have 6 days for the theoretical and practical sessions at the department. The exams take place at the end of the second week and on the third week.

During the block all field of urology is covered in a rotation education system. The lectures are given for the entire block, while for practices students are divided into smaller groups for bedside exercises.

Lectures

1.History of Urology. Symptoms, Diagnostic Measures	Prof. Nyirády
2.Male Infertility	Dr. Kopa
3.Prostate Cancer	Prof. Nyirády
4.Embryology of the uro-genital tract	Prof. Nyirády
5.Benign Prostatic Hyperplasia	Dr. Bécsi
6.Renal Tumours	Dr. Keszthelyi
7.Injuries to the GU Tract	Dr. Bánfi
8.Urolithiasis. Diagnosis and Treatment	Dr. Horváth
9.Tumours of the Urinary Bladder	Dr. Riesz
10. Testicular and Penile Tumours	Dr. Szűcs
11. Management of Urological Diseases in Childhood	Prof. Nyirády
12. Endourology	Dr. Romics
13. Incontinence, Neurogenic Bladder	Dr. Majoros

Practices (in 2-week-courses)

Tutors: Dr. Bánfi, Dr. Bécsi, Dr. Horváth, Dr. Vargha, Dr. Hüttl, Dr. Riesz, Dr. Szalontai, Dr. Juhász, Dr. Fazekas, Dr. Molnár, Dr. Széles, Dr. Dér, Dr. Ács, Dr. Szabó A., Dr. Lénárt, Dr. Vass

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the educational and examination rules.of the university. Only official medical certificate is accepted.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the educational period we have a daily, continuous monitoring of theoretical and practical

skills that allows the continuous control of students' knowledge. On the last day of education blocks students will give a lecture on all oral exam topics, which is a prerequisite for the exam.

During the practices our students take part the work of all subspecialities at our department (uro-oncology, andrology, urodynamics, ultrasound examination, cystoscopy, stone management (ESWL), and surgical activities.)

Number and type of individual assignments to be completed, submission deadlines:

On the last day of education block students are required to give a 5 minutes lecture on one of the oral exam topics, which is a prerequisite for the exam.

Requirements for the successful completion of the course:

In accordance with the educational and examination rules.of the university

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Type of assessment:
terminal examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Exam requirements5:
Topics:
Urology
1. Most important surgical interventions in urology
2. Developmental disorders of the kidney, the ureter and the bladder
3. Developmental disorders of the urethra and the male genitalia
4. Injuries to the kidney, the ureter and the bladder
5. Lesions of the urethra and the genital organs, their early and late consequences
6. Stenoses and fistulas in the urinary tract
7. Differential diagnosis of acute abdomen (with particular attention to urologic diseases)
8. Urological emergency
9. Urine leaks, urodynamics
10. Painful and difficult voiding
11. Acute and chronic renal failure
12. Ultrasound examination of the kidney and the ureter, X-ray and isotopes
13. Imaging techniques of examination the bladder, the prostate and the male genitals
14. Non-specific infections of the kidney parenchyma and of the capsules
15. Cystitis and urethritis
16. Inflammations of the prostate and the male genitals
17. Development of urolithiasis, its types, prevention
18. Diagnostics and treatment of urinary stones
19. Diseases of the male genitalia, their diagnostics and treatment
20. Symptoms and differential diagnosis of BPH (benign prostatic hyperplasia)
21. Conservative and surgical treatment of BPH (benign prostatic hyperplasia)
22. Male sexual disorders of fertility
23. Male sexual dysfunctions
24. Pediatric urology

Urooncology
1. Groups of antineoplastic drugs in urology
2. Renal tumours
3. Tumours of the pyelon and ureter
4. Superficial bladder cancer
5. Muscle-invasive bladder cancer
6. Incidence, symptoms and diagnosis of prostate cancer
7. Localized prostate cancer
8. Treatment of advanced prostate cancer
9. Penile tumours
10. Testicular tumours
11. Haematuria

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

- Preparation and delivery of a 10-minute presentation

- The required number of attendances as defined in the Study and Examination Regulations

- Professional requirements: the absence of any of the basic urological knowledge contained in the

extremely concise notes may result in a failing grade

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The grade depends on the practice score given by the tutor of the student (10%) and on the examiner’s opinion, which is determined by the student’s performance on the spot (90%).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Peter Nyirády, Imre Romics
Title	Textbook of Urology
Publisher	Semmelweis Kiadó
Year of publication	2009

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Transzfuziológiai Tanszék, Laboratóriumi Medicina Intézet, Aneszteziológiai és Intenzív Terápiás Tanszék

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Name of subject in Hungarian: Transzfuziológiai alapok
Name of subject in English: Basics of transfusion medicine
Name of subject in German: Grundlagen der Transfusionsmedizin PJ

Credit value of the course: 1
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
40.0	40.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKTRF1142_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Tordai Attila Árpád (tanszékvezető)
Course coordinator location of work, telephone availability: 06206632334
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2014. 06. 30. Semmelweis University, diploma number: 08/2014.

Objectives of the course, and its place in the curriculum of the medical training program:

To provide basic theoretical and practical knowledge in the field of clinical transfusion medicine. Emphasis is placed on the key elements of the core activity of transfusion medicine namely the production and the provision of blood products donor and recipient testing procedures, compatibility procedures, indications, and possible complications. In addition, important and relevant topics are

discussed including clinical aspects of blood coagulation, Patient Blood Management, transplantation, apheresis, stem cells and regenerative medicine and genetics of blood group antigens. Transfusion medicine is one of the most interdisciplinary fields of clinical medicine with substantial overlap with internal medicine, hematology, anesthesiology and intensive therapy, surgery and emergency medicine.

Format of the course (lectures, group work, practical lessons, etc.):

lecture, practical lesson

Competencies acquired through completion of course:

Familiarity and insight into practical elements of blood component production and clinical use as well as mechanisms and treatment of potential transfusion complications. Insight into neighbouring special fields such as transplantation, apheresis, stem cells and regenerative medicine.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Intensive Therapy and Anaesthesiology, Internal Medicine II. (Hematology, Infectology, Immunology, Rheumatology)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

Not applicable

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description: *(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest*

lecturers, however, must be attached.)

1	Introduction, the history of transfusion medicine	Tordai Attila	SU Transf. Med.
2	Immunological introduction: basic mechanisms important in transfusion medicine, immune response to incompatible transfusion	Tordai Attila	SU Transf. Med.
3	Organ donation and transplantation programs in Hungary and Europe	Mihály Sándor	HNIBT
4	Blood donors, bloodletting for donation, donor screening, risk assessment and reduction, international trends	Kalász László	HNIBT
5	The molecular structure and physiological role of red cell antigens	Andrikovics Hajnalka	DPC-St. László Hosp.
6	Infectious diseases transmitted by transfusion, epidemiology, screening, prevention	Barabás Éva	HNIBT
7	Red cell, platelet and granulocyte antigen systems	Tordai Attila	SU Transf. Med.
8	The blood group serology compatibility	Tordai Attila	SU Transf. Med.
9	Immunological complications of transfusions: hemolytic and non hemolytic	Tordai Attila	SU Transf. Med.
10	Non immunological complications of transfusions: circulatory and iron overload, infections	Farkas Péter	SU Int. Med. & Hematol.
11	Unstable blood products: Red cell, platelet, granulocyte and plasma: manufacturing, storage, quality parameters	Baróti-Tóth Klára	HNIBT
12	Challenges and approaches of blood supply management, international examples	Nagy Sándor	HNIBT
13	Steps and practices of transfusion execution, international outlook	Hauser Balázs	SU Anest.
14	Transfusion aspects of the coagulation system, generation and clinical application of coagulation factor products, substitution therapies	Hauser Balázs	SU Anest.
15	Effects of massive transfusion, factor substitution in acquired bleeding disorders	Hauser Balázs	SU Anest.
16	Introduction of the HLA system, diagnostics in transplantation immunogenetics	Tordai Attila	SU Transf. Med.
17	Generation and clinical use of albumin and immunoglobulin blood products	Kriván Gergely	DPC-St. László Hosp.
18	Solid organ transplantation and its transfusion aspects: complications, case reports	Fazakas János	SU Transpl.
19	Stem cells, regenerative medicine	Tordai Attila	SU Transf. Med.
20	Patient blood management: restrictive transfusion approaches	Tordai Attila	SU Transf. Med.

21	Indications of red cell transfusion, stimulation of red cell formation	Réti Mariann	DPC-St. László Hosp.
22	Indication of platelet and granulocyte transfusions	Réti Mariann	DPC-St. László Hosp.
23	Apheresis and photopheresis	Réti Mariann	DPC-St. László Hosp.
24	Hungarian and international legal aspects of transfusion medicine	Dósa Ágnes	SU Behav. Sc.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Personal attendance at lectures is not compulsory, in accordance with the Study and Examination Regulations

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Computer-based (moodle) test examination after the lecture series

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Number and type of individual assignments to be completed, submission deadlines:

Not applicable

Requirements for the successful completion of the course:

Successful theoretical and practical examination

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The computer-based (moodle), single choice type test examination covers all topics of the lecture series. The subject does not have oral examination.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Test results exceeding 50% at the electronic, moodle-based test examination based on the theoretical lecture series.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

According to Semmelweis University Study and Examination Regulations (TVSZ).

100% theoretical

Included

51-65%: pass (2), 66-79%: fair (3), 80-89%: good (4), 90-100% excellent (5)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Klein HG & Anstee DJ eds.
Title	Mollison's Blood Transfusion in Clinical Medicine. 12th ed.
Publisher	Wiley Blackwell
Year of publication	2014

Type	Recommended
Author	Blaney KD and Howard PR eds.
Title	Basic and applied concepts of blood banking and transfusion practices. 3rd ed.
Publisher	Mosby
Year of publication	2013

Type	Recommended
Author	Harmening D. ed
Title	Modern blood banking and transfusion practices. 7th ed
Publisher	Philadelphia EA Davis Co.
Year of publication	2019

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Családorvosi Tanszék

Name of subject in Hungarian: Családorvostan gyakorlat (Belgyógyászat)
Name of subject in English: Family Medicine in Daily Practice
Name of subject in German: Praktikum bei einem Hausarzt

Credit value of the course: 0
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
40.0	0.0	40.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKCSA645_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Torzsa Péter (tanszékvezető)
Course coordinator location of work, telephone availability: SE, Faculty of Medicine, Dpt. of Family Medicine (06-1) 355-85-30
Course coordinator position: Head of Department
Course coordinator Date and number of habilitation: 2020.07.21, 11/2020

Objectives of the course, and its place in the curriculum of the medical training program:

Health care is based on the family practice system in many countries, General Practitioners are the gatekeepers in most healthcare systems. It will be introduced on a one-to-one tutoring basis that family care, the GP’s work is an integrating profession. Medical students will be given an insight into the ways of approaching holistic, complex bio-psycho-social and somatic problems, prevention

and the differential diagnostics of frequent diseases. The aim is to show them through certain patient cases how and when to apply the basic diagnostic and therapeutic procedures and tools, how to develop the patient-doctor relationship, improve communication skills or work with short interventions.

Objectives of the course:

- to introduce the medical care outside the hospital giving an opportunity to study the characteristics of work in this environment.
- to help manage patients as people and as a member of a family who present with problems (not diseases) along with their physical, psychological and social points of view
- to provide an opportunity to improve clinical skills

Format of the course (lectures, group work, practical lessons, etc.):

Practice work beside a GP tutor in primary healthcare.

Competencies acquired through completion of course:

Basics of a preventive approach, screening methods.
Approach for the holistic patient care, managing complex bio-psycho-social-health problems.
Frequent acute and chronic illness care in the primary care.
Differential diagnostics.
Using basic diagnostic tools, assessing test results.
Improved skills in communication and motivation of patients.
Improved skills in physical examination, injections etc.
History taking, medical notes and reports. Patient referral.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Medical Imaging, Pulmonology and Thoracic Surgery

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum 1.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Structure of the course:

1 week = 5 workdays – working together with your tutor in the practice (including at least 4 consulting office hours/day). Accompanying the tutor on home visits is encouraged but not mandatory.

Topics to observe and concentrate on during the course:

– patient-doctor communication (structure and methods of interviewing)

– problem based care, problem oriented solutions

– decision making, professional responsibility

– common acute problems AND complex care of patients with chronic illnesses

– taking medical history, physical examination

– making medical records

Examine a few patients before your tutor; then observe his/her consultation with the patient and spend a few minutes after the patient has left the room, comparing notes.

The diary should contain at least 2 short case reports per working day so in total 10 in the form of a medical record (patient’s age, gender, social background, job/retirement; actual/main complaints and problems, disorders in the physical status. Diagnosis, therapy solution/advice, referral etc.

During the rotation program you have to choose one of the most interesting cases for composing a detailed case report on it. The detailed case report should contain the basic information about the patient (patient profile: age, marital

status, family, occupation, housing), the present illness or complaint, significant family or past history, the problem list, the assessment and the final solution. Please mention why you found that chosen case interesting. At the end of the program please write a final comment and summarize your opinion and experiences about the Family Medicine practice gained during the rotation.

English program GP tutors:

Anikó Ambrus, Mihály Bak, Eszter Bánhidi, Judit Bárdos, Ádám Becze, Dalma Csatlós, Árpád Cserti, Vilmos Dani, Réka Fodor, Tibor Zoltán Görcs, Adrien Havas, Kornél Hintalan, Krisztián Kádár-Németh, Noémi Cintia Kis, Melinda Kiss, Gabriella Kókai, Péter Kotányi, Beáta Kőrösi, Zoltán Lakó-Futó, Beáta Lamboy, Annamária Leviczky, Tünde Mária Magyar, János Nagy, Judit Katalin Nagy, János Nemcsik, Emese Németh, Károly Pecze, Ábel Perjés, Imre Rurik, Judit Simon, Éva Somos, Endre Szabó, Róbert Timár, András Terebessy, Katalin Török, Péter Torzsa, Gabriella Virágh, Krisztián Vörös, Gábor Xantus, János Zsuffa

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Missed session duration must be below 4 hours/ one week according to the study rules.
Makeup hours/days must be re-scheduled by the assigned GP tutor, please contact yours.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Your tutor will provide a short report on your work of the following aspects:

- theoretical: medical, pharmaceutical knowledge
- practical abilities – physical examination, making medical records
- your attitude and communication skills

Number and type of individual assignments to be completed, submission deadlines:

Completed Logbook with 10 short case reports, 1 detailed case presentation and a summary about the Family Medicine rotation as an experience.

Requirements for the successful completion of the course:

Missed hours must be below 4 hours/ one week according to the valid study rules.
Completion: certified attendance and sending the completed Logbook with 10 short case reports and 1 detailed case presentation and a summary about the Family Medicine rotation as well.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Certified 90% participation on the training week beside the GP tutor - certified by the stamp and signature of the tutor.
Sending the completed Logbook with 10 short cases, and 1 long detailed case report and the summary of impressions about Family medicine and primary healthcare.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

no grading, just a signature is given

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important

technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	Family medicine for medical students
Link	https://semmelweis.hu/csot/en/english-program/e-book-download/
Other/Comment	see on the Department’s Homepage and on MOODLE

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika - Infektológiai Tanszéki Csoport

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Name of subject in Hungarian: Infektológia gyakorlat (Belgyógyászat)
Name of subject in English: Infectology (rotation)
Name of subject in German: Infektologie Praktikum (Innere Medizin)

Credit value of the course: 0
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
40.0	0.0	40.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKSZL644_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kriván Gergely Pál (egyetemi docens)
Course coordinator location of work, telephone availability: Department of Pediatric Hematology and HSCT Central Hospital of Southern Pest - National Institute of Haematology and Infectious Diseases St. Laszlo Campus, Building 11, 5-7 Albert Florian str., 1097 Budapest, Hungary +36 1 455 8100
Course coordinator position: Head of the Department of Pediatric Hematology and HSCT
Course coordinator Date and number of habilitation: 2017, University of Pécs

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Objectives of the course, and its place in the curriculum of the medical training program:

Nearly 70% of everyday patients-healthcare encounters are due to conditions related to infections. This is why infectological knowledge is considered to be essential for every clinician. Infectology as a compulsory subject primarily helps to acquire a specific approach to cases of infectious nature

("considering possible pathogens"). During this week of infectology practice interactive case presentations are mainly used to demonstrate concise diagnostic workup and therapeutic options of real-life cases. Epidemiological situations, students' and patients' safety permitting, ward bedside visits will also be organized.

Format of the course (lectures, group work, practical lessons, etc.):

practical

Competencies acquired through completion of course:

NA

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Medical Imaging, Pulmonology and Thoracic Surgery.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

NA

The number of students required to start the course (minimum, maximum), method of selecting participants:

Compulsory subject, no limit on the number of students. Large group sizes, however, limit the interactivity of programs.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The subject is infectology as a whole. The exact spectrum of presented patients and cases cannot be predetermined. In general, the following topics will be discussed:

1. Fever, sepsis, severe infections, acute care in infectology, differential diagnosis.
2. Use of blood cultures, interpretation of results, basics in microbiological diagnostics.
3. Antimicrobial therapy, antibiotic stewardship, infection control.

4. Infections in immunocompromised patients, HIV/AIDS.
5. Care of respiratory tract infections and pandemic preparedness.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKMIK736_1A, AOKFRM1108_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Active participation on all five days of the practical week. Generally, no substitution is possible. Otherwise, any problems concerning participation should be discussed with the Secretariat of the Departmental Group.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

NA

Number and type of individual assignments to be completed, submission deadlines:

NA

Requirements for the successful completion of the course:

At least 90 % participation in the exercises, attendance is checked and recorded by the internship leaders every day.

Type of assessment:
no examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

NA

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade,

as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

NA

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

NONE

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	John E, Bennett, Raphael Dolin, Martin J. Blaser. Elsevier
Title	Mandell, Douglas, and Benett's
Publisher	Principles and Practice of Infectious Diseases
Year of publication	2019
Other/Comment	www.uptodate.com relevant chapters

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Kardiológiai Tanszék - Kardiológiai Központ

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Name of subject in Hungarian: Belgyógyászat
Name of subject in English: Internal Medicine
Name of subject in German: Innere Medizin

Credit value of the course: 8
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
magyar, német, angol

Course code:
AOKKAR662_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Merkely Béla Péter (Klinika igazgató)
Course coordinator location of work, telephone availability: Heart and Vascular Centre of Semmelweis University +361458 6844
Course coordinator position: Director, Head of Department, University Professor
Course coordinator Date and number of habilitation: 26 May 2006; registration number: 234

Objectives of the course, and its place in the curriculum of the medical training program:

During the compulsory internal medicine practice of the sixth-year medical students at the Semmelweis University Heart and Vascular Center, students can practice and integrate the cardiovascular-focused knowledge and skills acquired in the previous quarters under the supervision of an assigned mentor specialist. The practice primarily involves hands-on medical work, such as patient examination, evaluation of test results and therapeutic plans, referrals, and understanding

the practical aspects of communication and collaboration with other specialties. Additionally, students regularly gain insight into both the procedures performed in the department and the work of the appropriate operating room, or imaging diagnostic department in relation to the patients they examine.

Format of the course (lectures, group work, practical lessons, etc.):

Bedside practice, participation in patient care under specialist supervision.

Competencies acquired through completion of course:

Our goal is that upon completing their university studies, newly graduated doctors, equipped with up-to-date theoretical and practical knowledge in internal medicine, become capable of performing medical activities in inpatient care under specialist supervision, while collaborating with patients, their relatives, and healthcare workers.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Medical Imaging, Pulmonology and Thoracic Surgery

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the terms of the current Study and Examination Regulations (TVSZ), based on registration in the Neptun system, in a rotation-based schedule. Max. 2 people per rotation

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Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The course is taught in 8-week rotations, which include 1 week of family medicine and 1 week of infectology. Students rotate in a two-week split system, allowing fewer students to spend longer periods at each workstation at the bedside. The daily schedule includes morning clinical briefings, ward rounds, mentoring consultations, and emphasizes participation in bedside inpatient care.

The workstations can be the Cardiology Intensive Care Unit, the One-Day Cardiology Unit, the

Matrix Ward, and the 2nd and 3rd floor inpatient departments of the Cardiovascular Center. The instructors include the Clinic's teaching staff, specialists, and residents. In addition to cardiovascular diseases, students will also focus on other internal medicine-related comorbidities of patients in these departments. Subjects such as hematology, infectology, immunology, gastroenterology, nephrology, endocrinology, and pulmonology aspects related to a given patient will be discussed depending on patient cases.

- Structured recording of patients' medical histories and complaints
- Detailed physical examination
- Based on the above, establishing a preliminary working diagnosis, creating a diagnostic and therapeutic plan, exploring differential diagnostic possibilities
- Continuous monitoring of patients' conditions, evaluating test results, and modifying diagnostic and therapeutic plans accordingly
- Active participation in necessary visits and consultations
- Actively learning and practicing commonly performed medical procedures under supervision, such as:
    - Insertion of peripheral venous cannulas
    - Venous blood sampling
    - Arterial blood gas sampling and analysis from the radial artery (“Astrup”)
    - ECG preparation and evaluation
    - Non-invasive blood pressure measurement
    - Use of acoustic mini-Doppler for peripheral circulation examination
    - Application and removal of pressure bandages, vascular external compression devices
- Evaluation of routine laboratory results
- Evaluation of radiological results
- Participation in various examinations (ultrasound, CT, MRI, angiography, etc.) depending on local availability
- Understanding the functioning of special cardiology workstations (hemodynamic lab, electrophysiological lab, pacemaker lab, etc.)
- Learning the administration related to patient care activities (progress notes, discharge summaries, consultation requests, requesting and documenting examinations, maintaining temperature charts and medical records, using the e-MedSol and PACS systems, etc.)
- Weekend and night shifts, which count toward practical hours
- Learning and practicing ethical and professional communication with patients, their relatives, nurses, doctors, and other staff.

Tutors:

Demeterné Dr. Kiss Orsolya
Dr. Apponyi Györgyi Júlia
Dr. Bárczi György Erik
Dr. Becker Dávid
Dr. Bogdola Emese
Dr. Dohy Zsófia
Dr. Drobni Zsófia Dóra
Dr. Édes István Ferenc

Dr. Fábián Alexandra
Dr. Fülöp Gábor Áron
Dr. Gellér László Alajos
Dr. Hajas Ágota Helga
Dr. Herczeg Szilvia
Dr. Hizoh István
Dr. Horváthné Dr. Nagy Andrea
Dr. Jambrik Zoltán
Dr. Kiss Anna Réka
Dr. Kiss Dénes Zsolt
Dr. Kosztin Annamária
Dr. Kulyassa Péter Márton
Dr. Lakatos Bálint Károly
Dr. László János Marcell
Dr. Merkely Béla Péter
Dr. Mervai-Kuthi Luca Katalin
Dr. Molnár Andrea Ágnes
Dr. Nagy Anikó Ilona
Dr. Nagy Klaudia Vivien
Dr. Németh Balázs Tamás
Dr. Németh Marianna
Dr. Oláh Attila
Dr. Osztheimer István
Dr. Perge Péter
Dr. Ruppert Mihály
Dr. Sax Balázs
Dr. Sydó Nóra
Dr. Szegedi Nándor
Dr. Szilveszter Bálint
Dr. Szűcs Andrea
Dr. Tanai Edit
Dr. Tarjányi Zoltán
Dr. Vámosi Péter
Dr. Zima Endre István

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance is mandatory for 90% of the sessions. Missing sessions can be made up through duty or weekend work, or by participating in the next rotation.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the practical period, no formal assessments take place. However, the interactive nature of the practice sessions and mentoring consultations allows the verification of students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

NA

Requirements for the successful completion of the course:

At least 90% attendance (monitored via attendance sheets).

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

A practical exam at the bedside is followed by an oral exam, where three questions are drawn from the list available below and on the website. Graded on a five-point scale.

Final Exam Questions – 6th Year

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PULMONOLOGY

1. Obstructive lung disease.
2. Bronchial asthma.

3. Acute bronchitis
4. Chronic bronchitis.

ENDOCRINOLOGY

5. Diabetic complications. Treatment of diabetes mellitus.
6. Hypoglycemic disorders. Pancreatic islet cell tumors.
7. Hyperthyreoidism.
8. Hypothyroidism.
9. The disorders of lipid metabolism.
10. Obesity.
11. Disorders of purine metabolism. Gout.
12. Osteoporosis

HAEMATOLOGY

13. The classification and differential diagnosis of anemias.
14. Hemolytic anemias.
15. Hodgkin's lymphoma.
16. Non-Hodgkin's lymphoma.
17. Multiple myeloma.
18. Thrombocytopenia. ITP. Purpura Henoch-Schönlein
19. The thrombophylias. Factor V Leiden. Antiphospholipid syndrome
20. The hemophilias.
21. Antithrombotic therapy.

GASTROENTEOROLOGY

22. Acute abdominal catastrophes.
23. Gastrointestinal hemorrhage.
24. Dysphagia, heartburn, gastrointestinal reflux.
25. Ulcer of the stomach. Duodenal ulcer.
26. Crohn's disease.
27. Ulcerative colitis.
28. Ischemic colitis. Diverticulitis.
29. Acute hepatitis. Fulminant hepatic failure.
30. Chronic hepatitis. Drug induced liver disorders.
31. Alcohol related liver disease. Cirrhosis of the liver.
32. Cholelithiasis. Cholecystitis.
33. Acute pancreatitis.
34. Chronic pancreatitis.

NEPHROLOGY

35. Acute renal failure.
36. Chronic renal failure.
37. Nephrotic syndrome

INFECTIONS

38. Fever of unknown origin.
39. Nosocomial infections.
40. Bacteremia, septicemia.
41. Herpes virus infections.
42. Infectious mononucleosis.

43. Cytomegalovirus infections.

44. Lyme disease.

45. Pneumonia.

46. HIV infection and AIDS.

47. Thrombophlebitis of the deep veins.

48. Thrombophlebitis of the superficial veins. Erysipelas

MISCELLANEOUS

49. The differential diagnosis of thoracic pain.

50. The differential diagnosis of abdominal pain.

51. The differential diagnosis of diarrhea.

CARDIOLOGY

1. Origin of heart murmurs. Diastolic murmurs.

Acute and chronic systolic murmurs.

2. Risk factors. Primary and secondary prevention.

3. Manifestations and evaluation of Ischaemic Heart Disease.

4. Stable coronary artery disease.

5. Non ST segment elevation Acute Coronary Syndrome I. Etiology, manifestations, diagnosis.

6. Non ST segment elevation Acute Coronary Syndrome II. Treatment.

7. ST segment elevation Acute Coronary Syndrome I. Etiology, pathomechanism, diagnosis.

8. ST segment elevation Acute Coronary Syndrome II. Treatment.

9. Complications of Myocardial Infarction.

10. The heart cycle . Hemodynamic evaluation.
11. Percutaneous coronary intervention.
12. Coronary revascularization. (CABG, PCI)
13. Heart Failure. Etiology, diagnosis.
14. Dilatative cardiomyopathy.
15. Hypertrophic cardiomyopathy.
16. Acute Heart Failure. Etiology, symptoms, diagnosis.
17. Acute Heart Failure.
18. Chronic Heart Failure. Etiology, symptoms, diagnosis.
19. Chronic Heart Failure.
20. Non-pharmacological treatment of Heart Failure.
21. Bradyarrhythmias.
22. Supraventricular arrhythmias.
23. Atrial Fibrillation.
24. Cardioversion.
25. Ventricular arrhythmias.
26. Non-pharmacological treatment of arrhythmias.
27. Pacemaker
28. ICD.
29. Infective Endocarditis.
30. Pericarditis, pericardial effusion.
31. Aortic valve stenosis.
32. Aortic valve regurgitation.
33. Mitral valve stenosis.
34. Mitral valve regurgitation.

35. Mitral Valve Prolapse syndrome (MPS).
36. Congenital heart diseases in adults.
37. Atrial and ventricular septal defects.
38. Hypertension I. Etiology, diagnosis.
39. Hypertension II. Treatment. Hypertensive Heart Disease.
40. Aortic dissection.
41. Pulmonary embolism.
42. Differencial diagnosis of chest pain syndromes.
43. Anticoagulant and anti-platalet treatment.
44. Stress test in cardiology
45. Anatomy of the heart.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Correct execution of a bedside physical examination, preparation and evaluation of an ECG. Possession of internal medicine knowledge related to the subject line: https://semmelweis.hu/varosmajor/en/education/cardiology/?dir=1787

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The grade for the comprehensive exam is the average of the grades for the three questions. If any individual grades fail, the entire exam must be retaken.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Feather – Randall– Waterhouse
Title	Kumar and Clark’s Clinical Medicine 10th ed
Publisher	Elsevier
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika

Name of subject in Hungarian: Belgyógyászat
Name of subject in English: Internal Medicine
Name of subject in German: Innere Medizin

Credit value of the course: 8
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKBHK785_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Masszi Tamás Pál (Klinika igazgató)
Course coordinator location of work, telephone availability: Belgyógyászati és Hematológiai Klinika +3613754364
Course coordinator position: egyetemi tanár, klinikaigazgató
Course coordinator Date and number of habilitation: 2010.06.07., száma: 305

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the subject is to enable the student to

1.) recognize and diagnose major (common) internal medicine diseases

2.) raise suspicions of less common problems and carry out differential diagnosis

3.) know and apply basic internal medicine therapeutic options

4.) be able to decide on the need for specialist care or on the need for guidance towards associate professions

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Format of the course (lectures, group work, practical lessons, etc.):

practice, shadowing, practicing the everyday tasks of patient care under supervision

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Competencies acquired through completion of course:

The primary objective of the course is the symptom-based and patient-oriented education of internal medicine. Students become familiar with the diagnostics and treatment of the most common disorders.

Besides the above mentioned, integrative medicine, the holistic approach to medicine is also taught. This means the presentation of the coordinated patient care between internal medicine subspecialities and other related professionals and the illustration of the complexicity of real life cases. Differential diagnosis also requires utilization of knowledge aquired from different specialties in the diagnostic phase of a case. With this complex program we emphasize the practical importance of internal medical approach and pursuit and teach its application in the real world.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II (Hematology, Infectology, Immunology, Rheumatology, Laboratory Medicine), Medical Imaging, Pulmonology and Thoracic Surgery

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Students are registered in the NEPTUN System in rotations.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Activities should include the following subjects: general survey of hospital/department organization, examination of patients in the Medical Department, with special emphasis to case history taking and full physical examination.

The students should gain practice in patient documentation, problem-oriented medical record keeping, taking of pulse, blood pressure. of patients, making 12-lead ECG.

Participate in the preparation of diagnostic and therapeutic plan for patients.

Be present at invasive and semi-invasive interventions (taps of abdominal and chest fluid, preparation of bone marrow smear etc.).

To spend time at the outpatient department.

To practice basic laboratory techniques needed in bedside diagnosis (urinalysis, stool examination, use of dip sticks etc.).

To be on night duty once during the period.

Consultations in gastroenterology, diabetes, hematology, endocrinology, cardiology, sonography, X-ray, ECG etc.

Watch endoscopy performed.

See the intensive coronary care unit.

Regular consultations with the doctor responsible for the student.

All these activities should be carefully supervised by members of the medical staff.

The students should also practice communication with patients and their relatives, while giving them relevant medical information on the disease but avoiding conflicts with medical confidentiality.

Students should take an active part in medical consultations concerning their patients, as well as in the medical conferences in the department.

Dr. Bodó Imre, Dr. Hosszúfalusi Nóra, Dr. Jakab László, Dr. Kalabay László, Dr. Karádi István, Dr. Keltai Katalin, Dr. Masszi Tamás, Dr. Műzes Györgyi, Dr. Nagy Zsolt, Dr. Sármán Beatrix, Dr. Varga Gergely, Dr. Várkonyi Judit, Dr. Vereckei András

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Student can be absent for up to 10% of the practical time, but even this absence must be agreed in advance with the supervisor. Make-up is possible on weekends and during night shifts.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no intermediate formal assessment.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

According to the Study and Examination Regulations, students are required to participate on at least 90% of all practices

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Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The final exam consists of two parts:

1. practical part: complex patient examination

2. theoretical part: 3 items from the predetermined topic list

"Big" topics - 2 topics per student - diseases that every general practitioner should know in detail, because they are often encountered in daily clinical practice

1. Heart failure

2. Acute coronary syndrome

3. Atrial fibrillation

4. Chronic diseases of the aortic and the mitral valve

5. Infective endocarditis

6. Differential diagnosis and management of patients with bradycardia

7. Differential diagnosis and management of patients with tachycardia

8. Peripheral arterial disease

9. Superficial and deep vein thrombosis

10. Pulmonary embolism

11. Diagnosis of hypertension, assessment of its complications. Pharmacological and nonpharmacological treatment of hypertension. Resistant hypertension.

12. Hypertensive emergency, hypertensive urgency.

13. Differential diagnosis of chest pain

14. Chronic obstructive pulmonary disease (COPD)

15. Bronchial asthma

16. Pneumonia

17. Pleural effusion

18. Differential diagnosis of dyspnoea

19. Types of diabetes mellitus. Diagnosis of carbohydrate metabolism disorders.

20. Diet and oral antidiabetics in the management of diabetes mellitus.

21. Insulin therapy, insulin analogues

22. Micro- and macrovascular complications of diabetes mellitus

23. Management of hyperglycaemic patients

24. Hypoglycaemia

25. Dyslipidaemia

26. Obesity

27. Differential diagnosis of unintentional weight loss

28. Hyperthyroidism

29. Hypothyroidism

30. Adrenocortical insufficiency

31. Cushing's syndrome

32. Amenorrhoea

33. Osteoporosis

34. Acute kidney injury

35. Chronic kidney disease, uremia syndrome

36. Urinary tract infections, asymptomatic bacteriuria

37. Differential diagnosis and management of hypo- and hypernatraemia

38. Differential diagnosis and management of hypo- and hyperkalaemia

39. Differential diagnosis and management of hypo- and hypercalcaemia

40. GERD. Differential diagnosis of dysphagia.

41. Peptic ulcer, H.pylori infection

42. Inflammatory bowel diseases

43. Acute appendicitis

44. Liver cirrhosis

45. Differential diagnosis of jaundice

46. Cholelithiasis, cholecystitis, cholangitis.

47. Acute pancreatitis

48. Acute abdomen, differential diagnosis of abdominal pain

49. Gastrointestinal bleeding

50. Differential diagnosis of diarrhoea

51. Evaluation of the anaemic patient

52. Myeloproliferative diseases

53. Chronic lymphocytic leukaemia

54. Multiple myeloma

55 Differential diagnosis of thrombocytopenia

56. Congenital and acquired thrombophilias

57 Emergencies in haematology and oncology: neutropenic fever, tumour lysis syndrome, superior vena cava syndrome

58. Indications and rules of blood transfusion

59 Systemic autoimmune diseases: SLE, Sjögren's syndrome

60. Rheumatoid arthritis

61. Osteomyelitis

62. Differential diagnosis of fever. Fever of unknown origin (FUO).

63. Septicaemia

64. General aspects of the care of a poisoned patient

65. Alcohol-induced internal medicine diseases

66. Internal medicine causes of unconsciousness

67. Tumours of the oesophagus and the stomach, precancerous conditions.

68. Tumours of the colon

69. Benign and malignant tumours of the liver

70. Tumours of the pancreas and bile ducts

71. Tumours of the thyroid gland

72. Tumours of the lung

"Small" topics - 1 topic per student –

A general practitioner should know about this diseases in general terms. Their detailed knowledge is rather the task of those working in the special fields of internal medicine. Diseases seen less often in everyday medical practice OR less "comprehensive" items in the case of more common diseases

1. Cardiomyopathies

2. Differential diagnosis of syncope

3. Primary and secondary pulmonary hypertension

4. Hypopituitarism

5. Anterior pituitary hyperfunction: acromegaly, prolactinoma

6. Diabetes insipidus, SIADH

7. Thyroiditis

8. Evaluation and treatment of thyroid nodules

9. Phaeochromocytoma

10. Male hypogonadism

11. Carcinoid syndrome

12. Gout

13. Nephritis syndromes: acute, rapid progressive and chronic glomerulonephritis

14. Nephrosis syndrome, kidney diseases with proteinuria

15. Acute tubulointerstitial kidney diseases: acute tubular necrosis, acute interstitial nephritis

16 Chronic diseases of the tubulointerstitium

17. Renal replacement therapies: dialysis, kidney transplantation

18. Differential diagnosis of haematuria

19. Gastritis

20. Irritable bowel syndrome

21. Malabsorption and maldigestion

22. Diverticulosis, diverticulitis

23. Clostridium difficile infection

24. Viral hepatitis

25. Autoimmune diseases of the liver and biliary tract: autoimmune hepatitis, primary biliary cirrhosis, primary sclerosing cholangitis

26. Chronic pancreatitis

27. Haemochromatosis. Wilson's disease

28. Acute leukaemias

29. Hodgkin's disease

30. Non-Hodgkin lymphomas

31. Chronic lymphocytic leukaemia

32. Myelodysplastic syndrome

33. Haemophilias

34. Thrombotic microangiopathies (TTP, HUS)

35. Autologous and allogeneic bone marrow transplantation in the treatment of malignant haematological diseases

36. Systemic autoimmune diseases: progressive systemic sclerosis, polymyositis/dermatomyositis,

37. Vasculitis

38. Seronegative spondylarthritis

39. Osteoarthritis, arthrosis, differential diagnosis of joint pain

40. Internal medicine causes and differential diagnosis of muscle weakness

41. Immunodeficiencies

42. Influenza

43. EBV and CMV infection

44. Lyme disease

45. Tuberculosis

46. Internal medicine aspects of HIV infection

47. Erysipelas, cellulitis

48. Protozoan infections: giardiasis, toxoplasmosis, amoebiasis, malaria.

49. Helminthiasis

50. Drug poisoning: digitalis, opioid, benzodiazepine and paracetamol overdose

51. Special poisonings: ethylene glycol, methanol, heavy metal and fungal poisoning.

52. Carbon monoxide and carbon dioxide poisoning

53. Internal medicine aspects of hypothermia

54. Neuroendocrine tumours

55. Internal medicine aspects of nephrolithiasis

56 Mineralocorticoid overproduction

Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Complex patient examinations, taking medical histories, referrals, and documenting test results.

The list of topics is available at the following
link:https://semmelweis.hu/belhema/en/education/facultyofmedicine/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final exam (5 scale grade)

Each course is concluded by a bedside practical skill exam followed by clinical oriented oral exam. During the exam the students are required to answer questions based on the knowledge acquired during practical sessions and by reading the compulsory chapters of the theoretical curriculum, by elaborating on 3 themes of the titles above.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://itc.semmelweis.hu/moodle/

Printed resources:

Type	Recommended
Author	Weatherall, Ledingham, Warrel
Title	Oxford Handbook of Clinical Medicine 10th Ed.,
Publisher	
Year of publication	2020

Type	Recommended
Author	McGraw-Hill
Title	Harrison's Principles of Internal Medicine 21st Ed.
Publisher	
Year of publication	2022

Type	Recommended
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking. 12th Ed.
Publisher	
Year of publication	2017

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Onkológiai Klinika

Name of subject in Hungarian: Belgyógyászat
Name of subject in English: Internal Medicine
Name of subject in German: Innere Medizin

Credit value of the course: 8
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKBOK786_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Takács István (igazgató)
Course coordinator location of work, telephone availability: Department of Internal Medicine and Oncology, Semmelweis University, Tel: +06-1-459-1500/51520
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2011, 328 (Semmelweis University)

Objectives of the course, and its place in the curriculum of the medical training program:

Sixth-year practice in internal medicine aims to summarize and synthetize the knowledge acquired during the previous years in internal medicine as well as related subjects in the frame of work at a general medical ward. Students are able to deepen and complete their knowledge and competences and learn to work with gradually increasing independence. The present practice completes the curriculum in internal medicine. Students, however, can select a field, in which further six weeks

can be spent in the form of an elective practice.

Format of the course (lectures, group work, practical lessons, etc.):

bedside work on a medical ward, consultations

Competencies acquired through completion of course:

History taking (family, social, self-history, previous illnesses)

Evaluation of present symptoms

Evaluation of the patient’s condition by Karnofsky

Knowledge / ideas required for up-to-date medical therapy

The use of electronic databases (MedSol, Cochrane, PubMed)

Basic knowledge of Hungarian language

Physical examination

General physical examination

Examination of the stature

Weight, height, body mass index and body surface area

Examination of the skin

Examination of the visible mucous membranes

Examination of the thorax

Examination of the heart (palpation, percussion, auscultation)

Examination of the lungs (percussion, auscultation)

Examination of the thyroid glands (palpation)

Examination of the breasts

Examination of the abdomen

Examination of the liver (percussion, palpation)

Examination of the spleen (percussion, palpation)

Rectal examination

- Examination of the extremities
- Examination of the circulation
- Palpation of the peripheral pulse, pulse qualities
- Examination of the oral cavity (without equipment)
- Basic neurological examination
- Examination of the mental state

Instrumental and imaging techniques

- Blood pressure measurement
- ECG (12-lead)
- Chest X-ray
- Ultrasonic investigations
- Echocardiography
- CT, MRI, PET-CT
- Isotope investigations, scintigraphy
- Angiography
- Endoscopic techniques (gastroscopy, colonoscopy, ERCP)
- Other invasive instrumental examinations (bone marrow biopsy, cerebrospinal fluid sampling)

Laboratory evaluation

- CBC (automatic and qualitative)
- Urine (test strip, sediment)
- Fecal occult blood test
- Kidney function tests
- Liver function tests
- Examination of electrolytes and the acid-base homeostasis
- Parameters of glucose metabolism
- Endocrine function tests

- Investigation of infections (culture, serology)
- Hemostasis

Interventions

- Insertion of a Foley’s catheter
- Subcutaneous, intramuscular and intravenous injections
- Blood drawing
- Enema
- Intubation
- Cardiopulmonary resuscitation
- Biopsy
- Bronchoscopy
- Hemodialysis
- Declaration of death, filling death certificate

Therapeutic skills

- Consulting, patient education (diabetes, thrombosis, hypertension)
- Dietary consultation
- Nursing patients with inability of self-care
- General nursing skills (changing diapers, assistance with food intake)
- Signing informed consent
- Management of an allergic reaction
- Recognition of medical side-effects, drug overdose
- Preparing discharge summary
- Being familiar with the most common medications, making prescription
- Transfusion
- Preparation of a diagnostic and therapeutic plan

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Medical Imaging, Pulmonology and Thoracic Surgery

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

The 8-week course includes one week Infectology and one week Family Medicine practice.

Sixth-year students must work under the supervision of a tutor (Internal Medicine specialist). Students work at the ward and participate on consultations that aim to help the preparation for the final exam.

Students spend 6 weeks (5 days / week, 8 hours / day, between 8:00 AM - 4:00 PM) at a medical ward.

Tasks to be performed:

· patient admission: taking patients' medical history, evaluation of signs and symptoms, physical examination

· making a preliminary diagnosis, consideration of differential-diagnostic possibilities, preparation of a diagnostic and therapeutic plan

· evaluation and follow-up of the patients' general condition, and changing diagnostic and therapeutic plan according to new findings

· patient referral on rounds (at least one patient / week)

· participation on consultations with specialists

· practicing common medical interventions under supervision (venous blood draw, injections,

infusion, ECG, digital rectal examination, catheter insertion)

· observing transfusion, nasogastric tube / central line insertion, removal of pleural / ascetic fluid

· observation of imaging techniques (US, CT, angiography, endoscopies, biopsies, isotope scans etc.)

· evaluation and interpretation of laboratory parameters and radiologic findings

· becoming familiar with special units of the teaching hospital (dialysis center, plasmapheresis center, osteodensitometry, endoscopy laboratory, echocardiography)

· becoming familiar with patient documentation (daily follow-up, discharge summary, consent forms, consultation requests)

· becoming familiar with team work (joint work of nurses and doctors) in emergency and crisis situations (resuscitation, septicemia, shock, coma, myocardial infarction)

· participation on consultations aimed for students' preparation for the final exam

· performing one case presentation in written form

· optional stay in the teaching hospital for an evening shift

Tutors:

Takács István dr. Lakatos Péter dr. Kempler Péter dr. Igaz Péter dr. Tislér András dr. Demeter Judit dr Horváth Csaba dr. Tóth Miklós dr. Szathmári Miklós dr. Putz Zsuzsanna dr.
Ármós Richárd dr
Bakos Bence dr.
Barkai László dr.
Békeffy Magdolna dr.
Domján Beatrix
Ferencz Viktória dr.
Garam Nóra dr.
Gönczi Lóránt dr.
Hajdú Noémi dr.
Horváth Viktor dr.

Iliás Ákos dr.
Jávorfi Tamás dr.
Kálmánné Istenes Ildikó dr
Kiss András dr.
Kollár Réka dr.
Körei Anna dr.
Kövesdi Annamária dr.
Kuczyné dr. Folhoffer Anikó
Ledó Nóra dr.
Mészáros Szilvia dr.
Németh Dániel dr.
Perge Pál dr.
Pethő Ákos dr.
Reismann Péter dr.
Schnabel Karolina dr.
Stark Júlia dr.
Studinger Péter dr.
Sumánszki Csaba dr.
Sümegi Liza dr
Svébis Márk dr. 6 órás állás
Szabó Gergely dr.
Szili Balázs dr.
Szücs Nikolette dr.
Tordai Dóra dr.
Tőke Judit dr.
Vági Orsolya dr.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 90% of the practice. This is evaluated through attendance sheets signed by tutors.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the course coordinator (studinger.peter@semmelweis.hu), with the permission of the course director.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no formal midterm evaluation. Throughout the practice the interaction between students and the tutor provides an opportunity to assess the knowledge of students.

Number and type of individual assignments to be completed, submission deadlines:

A case presentation in written form must be completed by the end of the course.

Requirements for the successful completion of the course:

Participation on at least 90% of the practice, and preparation of the case presentation. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Large topics: 2 topics / student (Detailed description of the topic is required.)

1. Heart failure

2. Acute coronary syndrome

3. Atrial fibrillation

4. Chronic diseases of the aortic and the mitral valve

5. Infective endocarditis

6. Differential diagnosis and management of patients with bradycardia

7. Differential diagnosis and management of patients with tachycardia

8. Peripheral arterial disease

9. Superficial and deep vein thrombosis

10. Pulmonary embolism

11. Diagnosis of hypertension, assessment of its complications. Pharmacological and nonpharmacological treatment of hypertension. Resistant hypertension.

12. Hypertensive emergency, hypertensive urgency.

13. Differential diagnosis of chest pain

14. Chronic obstructive pulmonary disease (COPD)

15. Bronchial asthma

16. Pneumonia

17. Pleural effusion

18. Differential diagnosis of dyspnoea

19. Types of diabetes mellitus. Diagnosis of carbohydrate metabolism disorders.

20. Diet and oral antidiabetics in the management of diabetes mellitus.

21. Insulin therapy, insulin analogues

22. Micro- and macrovascular complications of diabetes mellitus

23. Management of hyperglycaemic patients

24. Hypoglycaemia

25. Dyslipidaemia

26. Obesity

27. Differential diagnosis of unintentional weight loss

28. Hyperthyroidism

29. Hypothyroidism

30. Adrenocortical insufficiency

31. Cushing's syndrome

32. Amenorrhoea

33. Osteoporosis

34. Acute kidney injury

35. Chronic kidney disease, uremia syndrome

36. Urinary tract infections, asymptomatic bacteriuria

37. Differential diagnosis and management of hypo- and hypernatraemia

38. Differential diagnosis and management of hypo- and hyperkalaemia

39. Differential diagnosis and management of hypo- and hypercalcaemia

40. GERD. Differential diagnosis of dysphagia.

41. Peptic ulcer, H.pylori infection

42. Inflammatory bowel diseases

43. Acute appendicitis

44. Liver cirrhosis

45. Differential diagnosis of jaundice

46. Cholelithiasis, cholecystitis, cholangitis.

47. Acute pancreatitis

48. Acute abdomen, differential diagnosis of abdominal pain

49. Gastrointestinal bleeding

50. Differential diagnosis of diarrhoea

51. Evaluation of the anaemic patient

52. Myeloproliferative diseases

53. Multiple myeloma

54. Differential diagnosis of thrombocytopenia

55. Congenital and acquired thrombophilias

56. Emergencies in haematology and oncology: neutropenic fever, tumour lysis syndrome, superior vena cava syndrome

57. Indications and rules of blood transfusion

58. Systemic autoimmune diseases: SLE, Sjögren's syndrome

59. Rheumatoid arthritis

60. Osteomyelitis

61. Differential diagnosis of fever. Fever of unknown origin (FUO).

62. Septicaemia

63. General aspects of the care of a poisoned patient

64. Alcohol-induced internal medicine diseases

65. Internal medicine causes of unconsciousness

66. Tumours of the oesophagus and the stomach, precancerous conditions.

67. Tumours of the colon

68. Benign and malignant tumours of the liver

69. Tumours of the pancreas and bile ducts

70. Tumours of the thyroid gland

71. Tumours of the lung

Small topics – 1 topic / student. (Brief summary / general overview rather than detailed knowledge of the topic is expected.)

1.Cardiomyopathies

2. Differential diagnosis of syncope

3. Primary and secondary pulmonary hypertension

4. Hypopituitarism

5. Anterior pituitary hyperfunction: acromegaly, prolactinoma

6. Diabetes insipidus, SIADH

7. Thyroiditis

8. Evaluation and treatment of thyroid nodules

9. Phaeochromocytoma

10. Male hypogonadism

11. Carcinoid syndrome

12. Gout

13. Nephritis syndromes: acute, rapid progressive and chronic glomerulonephritis

14. Nephrosis syndrome, kidney diseases with proteinuria

15. Acute tubulointerstitial kidney diseases: acute tubular necrosis, acute interstitial nephritis

16 Chronic diseases of the tubulointerstitium

17. Renal replacement therapies: dialysis, kidney transplantation

18. Differential diagnosis of haematuria

19. Gastritis

20. Irritable bowel syndrome

21. Malabsorption and maldigestion

22. Diverticulosis, diverticulitis

23. Clostridium difficile infection

24. Viral hepatitis

25. Autoimmune diseases of the liver and biliary tract: autoimmune hepatitis, primary biliary cirrhosis, primary sclerosing cholangitis

26. Chronic pancreatitis

27. Haemochromatosis. Wilson's disease

28. Acute leukaemias

29. Hodgkin's disease

30. Non-Hodgkin lymphomas

31. Chronic lymphocytic leukaemia

32. Myelodysplastic syndrome

33. Haemophilias

34. Thrombotic microangiopathies (TTP, HUS)

35. Autologous and allogeneic bone marrow transplantation in the treatment of malignant haematological diseases

36. Systemic autoimmune diseases: progressive systemic sclerosis, polymyositis/dermatomyositis,
37. Vasculitis

38. Seronegative spondylarthritis

39. Osteoarthritis, arthrosis, differential diagnosis of joint pain

40. Internal medicine causes and differential diagnosis of muscle weakness

41. Immunodeficiencies

42. Influenza

43. EBV and CMV infection

44. Lyme disease

45. Tuberculosis

46. Internal medicine aspects of HIV infection

47. Erysipelas, cellulitis

48. Protozoan infections: giardiasis, toxoplasmosis, amoebiasis, malaria.

49. Helminthiasis

50. Drug poisoning: digitalis, opioid, benzodiazepine and paracetamol overdose

51. Special poisonings: ethylene glycol, methanol, heavy metal and fungal poisoning.

52. Carbon monoxide and carbon dioxide poisoning

53. Internal medicine aspects of hypothermia

54. Neuroendocrine tumours

55. Internal medicine aspects of nephrolithiasis

56. Mineralocorticoid overproduction

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Complete physical examination of a patient (general assessment + respiratory / cardiovascular / gastrointestinal system): presentation of techniques, description and interpretation of findings. Ability to instruct patients in Hungarian during physical examination.

Recognition, differential diagnosis and management of acute, life-threatening conditions and common chronic diseases (see: topic list).

https://semmelweis.hu/belonko/en/education/6th-year/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The final grade is calculated from the average of the four grades obtained from the practical exam and the three oral topics.

Students must receive at least a pass (2) grade for each of the elements of the exam in order to pass the exam. In case the student fails the practical exam or any of the oral topics, the exam is terminated with a fail (1) grade, and the student must retake the entire exam.

There is not any possibility of an offered grade. Retake of a failed exam is feasible on the exam week of any subsequent block.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Not applicable.

Printed resources:

Type	Recommended
Author	Lynn S. Bickley
Title	Bates’ Guide to Physical Examination and History Taking 12th Ed
Publisher	Wolters Kluwer
Year of publication	2016

Type	Recommended
Author	Feather – Randall – Waterhouse
Title	Kumar and Clark’s Clinical Medicine 10th Ed.
Publisher	Elsevier
Year of publication	2020

Type	Recommended
Author	Jameson – Fauci – Kasper – Hauser – Longo –Loscalzo
Title	Harrison’s Principles of Internal Medicine 21st Ed.
Publisher	McGraw-Hill Education
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Neurológiai Klinika

Name of subject in Hungarian: Ideggyógyászat
Name of subject in English: Neurology
Name of subject in German: Neurologie

Credit value of the course: 3
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
120.0	0.0	120.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKNEU657_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bereczki Dániel (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Neurology, +3612100337
Course coordinator position: tanszékvezető egyetemi tanár
Course coordinator Date and number of habilitation: 12/1999. DOTE

Objectives of the course, and its place in the curriculum of the medical training program:

Acquisition of theoretical and practical neurological and neurosurgical knowledge required in general medical education and expanding and deepening knowledge gained during the fifth year.

Format of the course (lectures, group work, practical lessons, etc.):

Lecture, practical lesson.

Competencies acquired through completion of course:

The student learns the technique of neurological and neurosurgical physical examination and the interpretation of the findings. Detects when examining a patient in need of urgent care. Knows the most common neurological and borderline disorders.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Neurology and Neurosurgery

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum: 5 students/

Maximum 40 students

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Priority questions

1. Disorders of the innervation of pupils.
2. Symptoms of damage to the facial nerve
3. Differential diagnosis of vertigo and dizziness
4. Localisation in central paresis syndromes

5. Symptoms of upper and lower motor neuron damage
6. Types and localisations of aphasias
7. Classification and differential diagnosis of disorders of consciousness
8. Etiologies of the unconscious state and examination of the unconscious patient
9. Unconsciousness of metabolic origin
10. Emergency in Neurology
11. Clinical manifestation of increased intracranial pressure. Symptoms of cerebral herniations.
12. Traumatic intracranial bleedings
13. Symptoms of spinal cord injuries
14. Clinical syndromes of impaired circulation of the internal carotid artery
15. Clinical syndromes of impaired circulation of the vertebro-basilar system
16. Emergency in cerebrovascular disorders
17. Diagnostic procedures in cerebrovascular disorders
18. Disturbances of cerebral venous circulation
19. Non-traumatic cerebral bleedings
20. Diagnosis, treatment and prognosis of spontaneous subarachnoid hemorrhage
21. Status epilepticus
22. Meningitis, encephalitis
23. Symptoms and diagnosis of multiple sclerosis
24. Symptoms of intracranial tumors
25. Symptoms of space-occupying diseases of the spinal space and spinal cord
26. Diagnostic criteria of major cognitive impairment (dementia)
27. Classification of memory disorders
28. Diagnosis of Parkinson’s disease
29. Wernicke-Korsakow syndrome
30. Neurological complications of alcoholism
31. Guillain-Barre syndrome
32. Disturbance of micturition and defecation
33. Myasthenia gravis
34. Myopathies
35. Cerebrospinal fluid sampling technique and its laboratory examination
36. Symptoms and most common causes of polyneuropathies
37. Tunnel syndromes of peripheral nerves
38. Radicular syndromes (cervicobrachialgia and lumboischialgia)
39. Alzheimer’s disease
40. Primary headache syndromes

II.

1. Neurological causes of impaired visual acuity Visual field defects.
2. Disorders of ocular movement and gaze
3. Symptoms and common causes of damage to the vestibular system.
4. Syndromes of medulla oblongata damage
5. Syndromes of pons damage
6. Syndromes of midbrain damage
7. Control and disorders of muscle tone
8. Neuroanatomical basis of sensory disturbances

9. Functional systems of cerebellum. Signs of cerebellar disorders.
10. Classification of gait disorders
11. Symptoms of frontal lobe damage
12. Symptoms of temporal and occipital lobe damage
13. The limbic system
14. Symptoms of parietal lobe damage
15. Clinical significance of establishment of cerebral dominance (functional brain asymmetry)
16. Classification of speech disorders
17. Agnosia, apraxia, alexia, agraphia
18. Disorders of the basal ganglia system
19. Disorders of the thalamus
20. Localisation of memory disturbances
21. Imaging techniques (angiography, CT, MR, PET, SPECT)
22. Ultrasound examination of the cerebral vessels
23. Clinical neurophysiological diagnostic procedures (EEG, EMG, ENG, transcranial magnetic stimulation and evoked potentials - BAEP, VEP, SSEP)
24. The cerebral circulation, and its regulation
25. Classification of cerebrovascular disorders
26. TIA
27. Cerebrovascular disorders in young adults
28. Treatment of cerebral ischemia in the acute phase
29. Epileptic seizure and epilepsy disease (differential diagnosis, classification, causes)
30. Clinical management of epilepsy

III.

1. Neurological disorders caused by viral infections
2. Neurological disorders caused by Herpes viruses
3. Prion-diseases
4. Neurological consequences of AIDS
5. Clinical types and treatment of multiple scelrosis
6. Hystopathological classification of brain tumors
7. Cerebral edema
8. Metastatic tumors of the brain
9. Paraneoplasias of the nervous system (neuropathies, cerebellar degeneration, Lambert-Eaton sy.)
10. Disorders associated with parkinsonian syndrome
11. Treatment of Parkinson’s disease
12. Hyperkinetic movement disorders
13. Differential diagnosis of tremor
14. Classification of encephalopathies
15. Primary degenerative dementias
16. Disturbed cerebrospinal fluid circulation (hydrocephalus)
17. Syndrome of brachial plexus damage
18. Syndrome of radial, ulnar and median nerve damage
19. Syndrome of lumbosacral plexus damage

20. Malformation of the spine and spinal cord
21. Symptoms of spinal cord damage
22. ALS
23. Myositis and myopathies
24. The neuralgias
25. The physiological sleep and the sleep disorders
26. Autoimmun encephalitis
27. Neurological symptoms of metabolic, autoimmune and other systemic diseases

Lecturers and practical trainers

Neurology (Department of Neurology)

Dr. Arányi Zsuzsanna, Dr. Balicza Péter, Dr. Béres-Molnár Katalin (Szt.János Kórház), Dr. Bokor Magdolna (Nyírő Gy. Kórház), Dr. Böjti Péter, Dr. Bereczki Dániel, Dr. Bozsik György, Dr. Csillik Anita, Dr. Dabasi Loránd, Dr. Debreczeni Róbert, Dr. Dénes Kitti, Dr. Dobronyi Levente, Dr. Farkas Zsuzsanna, Dr. Farsang Marianna, Dr. Fazekas Ferenc (Szt.János Kórház), Dr. Folyovich András (Szt. János Kórház), Dr. Gulyás Szilvia, Dr. Gunda Bence, Dr. Hornyák Csilla, Dr. Iljicsov Anna, Dr. Ilniczky Sándor, Dr. Jakab Gábor (Uzsoki u. Kh.), Dr. Kelemen Andrea, Dr. Kollai Sarolta, Dr. Kovács Tibor, Dr. Lambertus Iván, Dr. Mezei Zsolt, Dr. Milanovich Dániel, Dr. Palotai Marcell, Dr. Pál Hanga, Dr. Pánczél Gyula, (Kistarcsai Flór F. Kh.) Dr. Rózsa Csilla (Jahn Ferenc Dél-pesti Kh.), Dr. Saftics Katalin, Dr. Simó Magdolna, Dr. Salacz Pál (Péterfy Kh.), Dr. Sipos Ildikó, Dr. Sisak Dominika, Dr. Soós Krisztina, Dr. Magyar-Stang Rita, Dr. Szatmári Szabolcs, Dr. Szőcs Ildikó, Dr. Szőke Kristóf, Dr. Szupera Zoltán (Szent Imre Kh.), Dr. Takáts Annamária, Dr. Takács Tímea Tünde, Dr. Tamás Gertrúd, Dr. Tegze Nárcisz, Dr. Tóth Adrián, Dr. Vastagh Ildikó (Bajcsy Kh.)

SE Neurosurgery and Neurointervention Clinic:

Neurosurgery:

Dr. Bagó Attila, Dr. Bagó Máté, Prof. Dr. Banczerowski Péter, Dr. Balogh Attila, Dr. Benkő Zsolt, Dr. Berényi György, Prof. Dr. Erőss Loránd, Dr. Gácsi Kristóf, Dr. Gál Erika, Dr. Halász László, Dr. Klimaj Zoltán, Dr. Kopa Miklós, Dr. Kővári Ádám, Dr. Markia Balázs, Dr. Mezei Tamás, Dr. Nagy Dávid, Dr. Nagy Gábor, Dr. Nagy Zoltán, Dr. Orbay Péter, Dr. Padányi Csaba, Dr. Papp Zoltán Attila, Dr. Pánczél András, Dr. Sipos László, Dr. Várady Péter, Dr. Vitanovics Dusán

Neurology:

Prof. Kamondi Anita, Dr. Áfra Judit, Dr. Barcs Gábor, Dr. Győrfy Orsolya, Dr. Hajnal Boglárka, Dr. Éltes Tímea, Dr. Jordán Zsófia, Dr. Kelemen Anna, Dr. Kovács Andrea, Dr. Dutkai- Papp Anikó, Dr. Sákovics Anna, Dr. Szirmai Danuta, Dr. Újvári Ákos, Dr. Benkő-Zaja Gréta, Dr. Nyerges Miklós, Dr. Damó-Csorba Borbála, Dr. Ódri Abigél, Dr. Szabó Johanna

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of

absence justification:

Attendance is compulsory. Absence may not exceed 10% of the training period. Replacement is subject to individual assessment.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the internship period, the tutor of the student examines the activities of the student on a daily basis.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Attendance at practice is mandatory.

The case report is evaluated by a senior instructor. Participation in the on-call duty is certified by the head of the on-call service. Actual attendance at a speciality clinic is certified by the clinic manager.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Oral final exam

The prerequisite for the practice exam is the ability to use the correct examination technique and the recognition of pathological symptoms. In addition to teaching in contact classes, we help the students' preparation with a book on neurological examination techniques and course material available in the e-learning system.

Priority questions

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24. The neuralgias
25. The physiological sleep and the sleep disorders
26. Autoimmun encephalitis
27. Neurological symptoms of metabolic, autoimmune and other systemic diseases

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

"Basic neuroanatomical knowledge

Abnormalities to be recognized during the neurological examination:

Meningeal signs, spine:

- Neck stiffness
- Brudzinski sign
- Kernig sign
- Lasègue sign

Visual field defects (with localization):

- Amaurosis
- Right/left hemianopia
- Bitemporal hemianopia
- Visual neglect

Eye movements and pupils:

- Oculomotor nerve palsy (CN III)
- Abducens nerve palsy (CN VI)
- Internuclear ophthalmoplegia
- Gaze palsy, conjugate eye deviation
- Nystagmus (description: direction and grade)
- Anisocoria
- Amaurotic/absolute pupillary rigidity
- Horner syndrome

Cranial nerve motor functions:

- Peripheral and central facial palsy
- Dysarthria, dysphagia
- Peripheral and central hypoglossal nerve palsy

Motor system:

- Muscle tone:
  - Spasticity
  - Rigidity, cogwheel phenomenon
  - Hypotonia
- Muscle atrophy, fasciculations

Weakness/paralysis (paresis/plegia):

- Distribution:
  - Hemiparesis, paraparesis, tetraparesis
  - Segmental: L4, L5, S1
  - Peripheral nerve lesions (e.g., radial nerve palsy, peroneal nerve palsy)
- Differentiation of central vs peripheral paresis

Pyramidal signs:

- Hoffmann sign
- Trömner sign
- Babinski sign
- Chaddock sign

Coordination and balance:

- Truncal ataxia, gait ataxia, limb ataxia
- Dysdiadochokinesis
- Lateralization in the Bárány past-pointing test
- Positive Dix–Hallpike maneuver

Movement disorders:

- Tremor
- Bradykinesia

Higher cortical functions:

- Motor, sensory, and mixed aphasia
- Frontal release signs
- Symptoms of dorsolateral prefrontal cortex dysfunction
- Agnosias (visual, auditory, tactile)
- Apraxias (ideomotor, ideational, constructional)
- Memory disorders:
  - Episodic, semantic, working memory
  - Encoding and recall deficits

Cerebrospinal fluid (CSF):

- Interpretation of CSF findings
- Differentiation of bacterial vs viral meningitis."

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Five-grade rating

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php

Printed resources:

Type	Recommended
Author	Arányi Zs., Kamondi A., Kovács T., Szirmai I.: Investigation of neurological patients.
Title	university note
Publisher	Aquincum Kiadó
Year of publication	2018

Type	Recommended
Author	Lindsay, Bone, Callender: Neurology and Neurosurgery
Title	book
Publisher	
Year of publication	

Type	Recommended
Author	Adams: Principles of Neurology

Title	book
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szülészeti és Nőgyógyászati Klinika - Baross utcai részleg

Name of subject in Hungarian: Szülészet-nőgyógyászat
Name of subject in English: Obstetrics and Gynaecology
Name of subject in German: Geburtshilfe und Frauenheilkunde

Credit value of the course: 4
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
160.0	0.0	160.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKNO1655_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ács Nándor (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Obstetrics and Gynaecology (1082 Budapest, Üllői út 78/A.) 06-1-2100290
Course coordinator position: Professor, Clinic Director
Course coordinator Date and number of habilitation: 245/2007.05.30

Objectives of the course, and its place in the curriculum of the medical training program:

The subject is taught in 4 or 5 rotations per academic year according to the rotation schedule for the academic year. The aim of the course is to deepen the knowledge of obstetrics and gynaecology acquired in year V and to learn how to apply it in clinical practice. The duration of the internship is 4 weeks. The fourth week is an examination week

Format of the course (lectures, group work, practical lessons, etc.):

Practice

Competencies acquired through completion of course:

The teaching of obstetrics and gynaecology is part of the clinical training, starting in the 5th year and continuing throughout the curriculum with the VI year final examination - as well as the elective 6 week orientation placement for students who choose to do this after completing the post-registration placement.

During this time, our main ambition is to combine the theoretical subjects and the knowledge provided by related clinical professions with obstetrics and gynaecology. Our aim is that, on completion of their university studies, newly qualified doctors will be able to practise medicine independently, with up-to-date theoretical and practical knowledge, and with the right human relations with patients and their relatives and with health professionals.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Clinical Genetics, Obstetrics and Gynecology

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Specialist practical topics (Obstetrics and Gynaecology Clinic)

The subject is taught in 4 *or 5* rotations per academic year according to the rotation schedule for the academic year. The aim of the course is to deepen the knowledge of obstetrics and gynaecology acquired in year V and to learn how to apply it in clinical practice. The duration of the internship is 4 weeks. The fourth week is an examination week.

At the Obstetrics and Gynaecology Clinic in Baross Street, students are informed of their ward rotation, on-call duties and sessions during the week before the training. On the first day of the internship, students attend an opening consultation and welcome by the Director of the Clinic and the specialist in charge of the study. Each student is assigned a personal contact tutor, with whom he or she can consult on a daily basis on the subject and can also carry out examinations which, due to the intimate nature of the gynaecological profession, can only be carried out in a small group or with a tutor. The student will also have the opportunity to participate with the tutor in on-call duties and to assist in operations (e.g. assisting in caesarean section). At the opening consultation, the students will be given a list of requirements to be fulfilled. If any of the tasks have been completed by the student, they will be certified by the instructor's signature. Students can evaluate the usefulness of each event and task during the placement, thus helping to improve the educational work of the Clinic. On the first day of practice, the keys to the lockers and the protective clothing are distributed.

The first three weeks are spent in clinical practice, rotating between the following inpatient wards:

Baross Street Obstetrics and Gynaecology Clinic leading tutor: Gyula Richard Nagy MD Ph.D MSC med.habil
Gynaecology Department (Head of Department: Ervin Hruby MD Ph.D) and Gynaecological Outpatient Clinic (Head of Department: according to current department schedule)
Oncology Department (Head of Department: Szabolcs Máté MD) and Ultrasound Ambulance (Head of Department: Gábor Szabó MD Ph.D)
Department of Pregnancy Pathology (Head of Department: according to current department schedule)
Delivery room: (Head of Department: according to current department schedule)

In the Clinic, the ward rotation involves daily rounds with the ward doctors. During the departmental work, they practice taking anamnesis, general physical examination, special examinations of pregnant women (Leopold's maneuvers, measurement of abdominal circumference, fundus height, methods of calculating gestational age), Foley catheter placement, rectal digital examination. Meanwhile, students will learn about the most important pathologies and will evaluate the cases of patients selected by the

head of the department in a case discussion with the tutors in preparation for the examination. Students can even follow the patients' in the operating theatres. Each day, one student is assigned to each surgery as a second/third assistant. Participation in the following operations is compulsory: assisting in caesarean section, assisting in gynaecological surgery, assisting in laparoscopy, assisting in small obstetric operations (at least 2 cases) and gynaecological (at least 1 case) operations (fractionated curettage, abortion, etc.). During the practical training, students should learn the principles of CTG assessment and apply them to a specific case in front of their tutor.

In addition, during the traineeship, a number of on-call duties can be performed in accordance with the University's educational regulations and the Higher Education Act. During the on-call duty, the doctors on duty may call the student for any activity, who may examine and assist the student under supervision. During the activity in the delivery room, you will have the opportunity to follow the progress of the birth and assess physiological and pathological signs. You will learn how to assess the consistency and length of the cervix and the cervical dilatation (cervical index, Bishop score). During the training, you will be required to attend at least one spontaneous delivery from the time of admission to the delivery room until the time of transfer to the Puerperal Unit. You may assist in various forms of pain relief during childbirth, e.g. epidural analgesia. After delivery of the fetus, you may examine the placenta and umbilical cord under supervision, observe the first care of the newborn baby, and practise taking Apgar scores. Examination of the puerperal patient, assessment of involution and involution and healing processes are also tasks.

At the Baross Street Clinic during the week of the Oncology Department, time will be allocated for ultrasound exam the week of the Gynaecology Department, time will be allocated for the Gynaecology Outpatient Clinic. In the Gynaecology Outpatient Clinic, students can perform supervised bimanual examinations, colposcopy, practice the steps of cytology and vaginal fluid sampling and breast examination. They can learn about contraception (hormonal, IUD), infertility screening and family planning counselling (calendar, thermometer), and methods of testing for genital infections (vaginal pH, potassium hydroxide test, microscopic examination of vaginal secretions). In the Ultrasound Laboratory, they can watch gynaecological pelvic and abdominal ultrasound and pregnancy ultrasound screening. You must be present for at least 8 ultrasound examinations to meet this requirement.

The 4 weeks of clinical practice completed in Year VI are assessed by a practical certificate with signature. During the final consultation at the Clinic of Obstetrics and Gynaecology, Baross Street, on the last day of the internship, students will present and hand in the fully completed list of requirements as a condition for passing the examination. Afterwards, the exercise will be registered in Neptun. In year VI, a specialisation in obstetrics and gynaecology is required. The examination questions will include the examination questions of year V. Students answer one question on obstetrics, and one question on gynaecology. During the exam, which will be held in the fourth week at the Obstetrics and Gynaecology Clinic. At the Clinic, the examination is based on a separate set of examination papers for the VIth year.

Competency list of the knowledge to be acquired in the practical training of obstetrics and gynaecology in year VI:

Title	Expected level of knowledge (theoretical knowledge - ET, viewing - M, participation - R.)
Physical tests	***ET, M, R***
History of previous diseases	ET, M, R
General physical examination	ET, M, R
External genital examination	ET, M, R
Vaginal examination	ET, M, R
Digital rectal examination	ET, M, R
Rectovaginal examination	ET, M, R
Amine test	ET, M, R
Vaginal pH measurement	ET, M, R
Microscopic examination of a vaginal smear	ET, M, R
Cervical sampling	ET, M, R
Oncocytology sampling	ET, M, R
Colposcopic examination	ET, M, R
Pelvic ultrasound scan	ET, M,
Vaginal ultrasound scan	ET, M,
Curettage uteri	ET, M,
Instrumental completion of abortion	ET, M,
Artificial termination of pregnancy	ET, M,
Endometrial aspiration	EN
Diagnostic laparoscopy	EN
Infertility screening	ET, M,
Awakening temperature measurement and assessment	ET, M, R
Cervical spit examination	ET, M, R
Conducting and evaluating a pregnancy test	ET, M
Hysterosalpingography	EN
Chromohydrotubing	EN
Breast examination and education	ET, M, R
Bladder catheter placement	ET, M, R
Portio electrocoagulation	ET,
Operative laparoscopy	ET, M
Contraception advice	ET, M, R
Placement of an intrauterine device	ET, M,
Laparoscopic sterilisation	ET,
Obstetrics	
Pre-conceptual education, counselling	ET, M, R
Coronary heart disease risk assessment	ET, M
Biochemical screening for genetic abnormalities (Down)	ET,
Serological screening in pregnancy	ET,
Haematological screening in pregnancy	EN
Screening for gestational diabetes	ET, M

Determining the time of delivery using the Naegele method	ET, M, R
Determination of delivery time using the Neagele method corrected for cycle length	ET, M, R
Estimating the expected time of delivery by CRL measurement	ET, M, R
Estimating the expected time of delivery based on the first movement of the fetus	ET, M, R
Examination in first trimester	ET, M, R
Diabetes advice	ET, M
Advice in case of a positive haematological screening test result	ET, M
Advice in case of a positive blood group serological result	ET, M
Advice in case of a positive syphilis serology result	EN
II-III trimester antenatal examination	ET, M, R
Leopold maneuvers	ET, M, R
Determining gestational age by measuring Sy-Fu distance	ET, M, R
Determining gestational age by measuring abdominal circumference	ET, M, R
Cervical index determination	ET, M, R
Performing CTG and evaluating the curve	ET, M, R
Conduct NST and assess the result	ET, M, R
Coronary ultrasound scan	ET, M
Amniocentesis	EN
2nd trimester ultrasound scan	ET, M
Chorionic duct biopsy	EN
Ultrasound in the third trimester	ET, M
Oxitocin exercise test OTT evaluation	ET, M
Detection of a woman in labour	ET, M, R
Obstetric physical examination	ET, M, R
Bishop-score definition	ET, M, R
Amniotomy	EN
Barrier protection	ET, M
Local anaesthesia (barrier)	ET, M
Epidural analgesia	ET, M
Episiotomy	ET, M
Newborn care in the delivery room	ET, M
Newborn nose and throat suction	ET, M
Apgar value determination	ET, M, R
Management of the placental stage of labour	ET, M
Examination of placenta and umbilical cord	ET, M, R
Estimating maternal blood loss	ET, M
Care of a perforation wound	ET, M
Medicinal induction of labour	ET, M
Conducting a spontaneous vaginal birth	ET, M
Caesarean section	ET, M, R

Examination at puerperium	ET, M, R

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the study and examination regulations, attendance is compulsory for 90 % of the sessions

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the short teaching period available, there is no intermediate formal assessment. However, the interactive nature of the exercises and visits allows students' knowledge and use of the information available to them to be monitored

Number and type of individual assignments to be completed, submission deadlines:

No such

Requirements for the successful completion of the course:

At least 90 % participation in the sessions.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination list:
Questions for oral exams (final) – Obstetrics

1. Conception, implantation and placentation
2. Obstetric and gynecologic evaluation
3. Endocrinology of pregnancy and parturition
4. Immunology of pregnancy
5. The human genome. Application to obstetrics and gynecology
6. Physiologic changes in pregnancy (cardiovasular-, respiratory system)
7. Physiologic changes in pregnancy (renal system, hormonal changes)
8. Hypertensive disorders in pregnancy. Eclampsia. HELLP-syndrome
9. Signs and symptoms of pregnancy
10. Pregnancy care, pregnancy counseling
11. Pregnancy and cardiovasular diseases
12. Pregnancy and diabetes mellitus. Gestational diabetes
13. Pregnancy and kidney diseases. Urinary tract infections
14. Pregnancy and gastrointestinal disorders
15. Pregnancy and hematologic disorders
16. Spontaneous abortion
17. Preterm labor and delivery
18. Intrauterine growth retardation (IUGR)
19. Uterine activity during labor. Characteristics of contractions, their anomalies. Treatment.
20. Dystocia caused by abnormal presentation and position
21. Dystocia caused by abnormalities of fetal structure or maternal pelvic alterations
22. Stages of delivery. Management of the first and second stage
23. Stages of delivery. Management of the third and fourth stage
24. Preparation for delivery. Obstetric anesthesia
25. Induction and augmentation of labor
26. Cephalopelvic disproportion and its consequences
27. Breech presentation
28. Malpresentations
29. Anomalies of rupture of membranes
30. Placenta previa. Other placental abnormalities
31. Multiple gestation
32. Placental abruption
33. Amniotic fluid and its disorders. Polyhydramnios and oligohydramnios
34. Postpartum hemorrhage. Inversio uteri
35. Lesions of the birth canal. Uterine rupture
36. Infectious diseases in pregnancy. Bacterial and parasite infections
37. Infectious diseases in pregnancy. Viral infections
38. Intrauterine fetal death. Postterm pregnancy
39. Detection of fetal jeopardy during pregnancy
40. Detection of fetal distress during labor
41. Prenatal genetic counseling (chorionic villus sampling, amniocentesis, cordocentesis)
42. Genetic counseling – Teratology
43. Licit and illicit drug use in pregnancy
44. Obstetrical examinations
45. Ultrasound diagnosis during gestation
46. Physiologic puerperium
47. Pathologic puerperium. Puerperal sepsis
48. Management of the newborn after delivery
49. Hemolytic disease. Rh isoimmunisation
50. Respiratory problems of newborns (resuscitation)
51. Main forms of congenital malformations
52. Obstetric operations. Cesarean section (indications)
53. Placenta and the umbilical cord. Presentation and prolapse of the umbilical cord
54. Obstetric statistics
55. The placenta
56. Anatomy of the bony female pelvis and the fetal skull
57. The mechanism of normal labor
58. Breast feeding
59. Pregnancy complicated by surgical diseases (appendicitis, ileus, cholelythiasis)
60. Advices during pregnancy

Questions for oral exams (final) – Gynecology

1. Anatomy of female genitalia
2. Development of female genitalia
3. Endocrinology of female reproductive system during, before and after reproductive stage of life
4. Primary amenorrhea
5. Secondary amenorrhea
6. Stein-Leventhal syndrome (PCOS)
7. Dysfunctional uterine bleeding
8. Dysmenorrhea. Premenstrual tension
9. Chromosomal abnormalities (Turner syndrome, Klinefelter-syndrome)
10. Causes of infertility. The infertile couple
11. Examinations and treatment in infertility
12. Hormonal contraception. Intrauterine devices
13. Barrier and chemical contraceptives. Natural contraceptive methods
14. Puberty
15. Pediatric gynecology
16. Perimenopause
17. Inflammatory disorders of the vulva and vagina
18. Sexually transmitted diseases in female
19. Benign lesions of the vulva and vagina
20. Malignant tumors of the vulva and the vagina
21. Etiology and precancerous states of cervical cancer
22. Symptoms, sings and screening of cervical cancer
23. Staging and therapy of cervical cancer. Pathology
24. Benign diseases of the uterus
25. Etiology and precancerous states of corporal cancer (hyperplasias)
26. Symptoms, sing and screening of corporal cancer
27. Staging and therapy of corporal cancer. Pathology
28. Functional cysts of ovaries
29. Benign neoplasms of ovaries
30. Etiology, clinical picture and screening of ovarian tumors
31. Staging and therapy of ovarian neoplasms. Pathology
32. Endometriosis and adenomyosis
33. Normal and abnormal positions of the vagina and uterus (genital prolapse) and their treatment
34. Urinary incontinence
35. Urinary tract infections
36. Pelvic inflammatory disease
37. Pelvic pain
38. Ectopic pregnancy
39. Malformations of the genital tract
40. Anomalies of sexual differentiation
41. Breast diseases
42. Breast cancer
43. Human sexuality
44. Gynecologic operation technics (D and C, conisation, hysterectomy, hysteroscopy)
45. Virilism and hirsutism
46. Hydatidiform mole
47. Choriocarcinoma
48. Principles of cancer therapy

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requierement for passing the course can be found on the comepence list (22.)and it is also mandatory to pass the oral exam with at least 60% success; the topic lis of Ob Gyn is available on our website and 29.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Final exam mark 100%

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Mandatory
Author	N.F. Hacker and J.G. Moore
Title	Essentials of Obstetrics and Gynecology
Publisher	Elsevier - Health Sciences Division
Year of publication	2015

Type	Mandatory
Author	Ash Monga, Stephen Dobbs, Helen Bickerstaff, Louise C Kenny
Title	Gynaecology by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	

Type	Mandatory
Author	Louise Kenny
Title	Obstetrics by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Tűzoltó utcai részleg

Name of subject in Hungarian: Gyermekgyógyászat
Name of subject in English: Pediatrics
Name of subject in German: Kinderheilkunde

Credit value of the course: 6
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKGY2849_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kovács Gábor (klinikai főorvos)
Course coordinator location of work, telephone availability: SE Pediatrics Center Tűzoltó Street Department 06-20-825-9265
Course coordinator position: professor
Course coordinator Date and number of habilitation: 02.06.2009. Number: 279.

Objectives of the course, and its place in the curriculum of the medical training program:

The main aim of the sixth-year block of paediatrics is to teach the most typical clinical symptoms and the most common diseases, as well as the special features of the specialty and its everyday routine, and to acquire practical knowledge.

Format of the course (lectures, group work, practical lessons, etc.):

Participating in ward work, ward rounds

Competencies acquired through completion of course:

Paediatrics is a specialty that deals with the problems and diseases of a large special population.

Our goal is that upon completion of university studies, newly graduated doctors with up-to-date theoretical and practical knowledge will be able to perform independent general medical activities in the field of paediatrics as well.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II.: AOKBHK118_2A

Pediatrics (5th year): AOKGY2961_1A, AOKGY21121_1A, AOKGY1960_1A, AOKGY11120_1A)

Clinical Genetics: AOKGR1966_1A

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in Neptun, maximum 24 people.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Learning the special examination of children at different ages, carrying out and observing interventions. Evaluation of laboratory results, analysis of blood and urine tests, learning the characteristics of imaging tests in childhood.

General topics:

General physical examination, examination of the throat, examination of the fontanels, signs of rickets and tetany, hip examination, elementary reflexes and movements, meningeal signs, neurological examination, assessment of vital parameters at different ages, use of percentiles. Calculating a baby's calorie need, calculating body surface area, pain and fever management. Assessment of somatic and mental development.

Treatment of priority diseases:

Resuscitation of newborns and children. Newborn care. Treatment of acute hypovolemic shock. Treatment of status asthmaticus, treatment of dyspnea. Treatment of status epilepticus, treatment of convulsive conditions

Treatment of diabetic ketoacidosis. Treatment of acute renal failure, hypertensive crisis. Care and diagnosis of a patient with bleeding from the unknown part of the gastrointestinal tract. Diagnosis and treatment of surgical patients with acute abdominal symptoms. Care of the patient with Addison's disease.

Differential diagnosis:

One of the most important elements of the training of 6th year students is learning the etiology of different symptoms and the diseases from the everyday practice. This knowledge is essential to take the initial diagnostic steps.

Daily work schedule of 6th year student

Morning (starting at 8AM):

Ward rounds: physical examination of patients, discussion of tasks for the day related to ward patients.

Ward work: check the priority patients at the ward and the interventions (individually). We consider it important to get to know the outpatient work belonging to the respective departments, so we also offer the opportunity to visit them.

Students rotate between different departments to see a variety of patients. Students are assigned to a different tutor every week.

Tutors:

Dr. Andrási Noémi, Dr. Bakó Dorottya, Dr. Balázs Dóra, Dr. Bartha Áron, Dr. Bagyuráné Dr. Frank Veronika, Dr. Benyó Gábor, Dr. Bertalan Rita, Dr. Botlik Dóra, Dr. Botos Péter, Dr. Bots Bianka, Dr. Brückner Edit Ágota, Dr. Bűdi Tamás, Dr. Constantin Tamás, Dr. Czövek

Dorottya, Dr. Csóka Monika, Dr. Csordás Katalin, Dr. Dobner Sarolta, Dr. Egyed Bálint, Dr. Erdélyi Dániel, Dr. Erdélyi-Nagy Blanka, Dr. Farkas Márk Kristóf, Dr. Felkai Luca, Dr. Frank Veronika, Dr. Garan Diána, Dr. Gács Zsófia, Dr. Garami Miklós, Dr. Goschler Ádám, Dr. Hegedűs Katalin, Dr. Hegyi Márta, Dr. Horváth Bertalan, Dr. Horváth Klára, Dr. Horváth Zsuzsanna, Dr. Hosszú Éva, Dr. Jenővári Zoltán, Dr. Juhász Orsolya, Dr. Kemény Viktória, Dr. Kiss Tamás, Dr. Klaus Laura, Dr. Koch Dóra, Dr. Kónya Sárma Sultana, Dr. Koós Olivér, Prof. Dr. Kovács Gábor, Dr. Kovács Janka, Dr. Lengvári Lilla, Dr. Lengyel Anna, Dr. Liptai Zoltán, Dr. Müller Judit, Dr. Naghizadeh Farzaneh, Dr. Nemes-Csertő Alinka, Dr. Németh Ágnes, Dr. Osztermayer Dorka Réka, Dr. Pálinkás Annamária, Dr. Papp-Bozzai Barbara, Dr. Párkányi Rebeka, Dr. Pásztor Borbála, Dr. Petes Cintia, Dr. Petró Anna, Dr. Péter Réka, Dr. Pfeffer Anita, Dr. Pinti Éva, Dr. Podráczky Noémi, Dr. Pomlényi Petra, Dr. Ponyi Andrea, Dr. Prokopp Tamás Benedek, Dr. Ranyák Márta Szilvia, Dr. Repkényi Dorottya, Dr. Sándor Réka Zsuzsanna, Dr. Sükösd Zita, Dr. Szabados Márton, Dr. Szabó András Lajos, Dr. Szabó Léna, Dr. Szabó Sándor, Dr. Szarvas Gábor Zsombor, Dr. Szikszay Orsolya, Dr. Tomsits Erika, Dr. Tóth-Szumutku Fanni, Dr. Turi Alexandra, Dr. Varga Martin István, Dr. Váncza Lóránd, Dr. Velkey Ábel, Dr. Vojnisek Zsuzsanna, Damó Eszter, Durst Anna, Bagó György, Kalmárné Rikker Zsuzsanna, Magyar Emma,

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKCSA1133_1A, AOKGRI966_1A, AOKNO1655_SA, AOKBHK785_SA

Requirements for attendance, options for making up missed sessions, and method of absence justification:

It is compulsory to bring a stethoscope and a white coat for the practices, without it the practice

will not be considered as completed. In accordance with the study and exam regulations, participation in 90% of the current total number of hours is mandatory. Replacement is possible at alternative times designated by the tutor of the student.

The evaluation of the course and its tutors by students is done through an online system during the duration of the practice.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Assessment is based on the evaluation of tutors during the 6 weeks.

Number and type of individual assignments to be completed, submission deadlines:

None.

Requirements for the successful completion of the course:

Attendance at least 90% of the total number of hours. Completing the tasks listed on the "Qualification and evaluation" page and presenting practical skills.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Students receive 3 topics from the topic list and 2 questions from the screening questions. If the student cannot answer to one of the screening questions, the exam is failed.
Topics:

Differential diagnosis (I.)
1. Differential diagnosis of lymphadenomegaly
2. Abdominal tumours – different diagnosis and treatment
3. Differential diagnosis of childhood anaemias
4. Differential diagnosis of bleeding disorders and immunthrombopenia
5. Differential diagnosis of headaches in children
6. Differential diagnosis of hypertension in children
7. Differential diagnosis of obesity in children
8. Differential diagnosis of polyuria and polydipsia
9. Differential diagnosis of oedema
10. Differential diagnosis of haematuria
11. Differential diagnosis of joint pain
12. Differential diagnosis of fever of unknown origin
13. Differential diagnosis of coughing
14. Differential diagnosis of vomiting
15. Differential diagnosis of diarrhoea
16. Differential diagnosis of bloody stool
17. Differential diagnosis of hepatomegaly, splenomegaly.
18. Differential diagnosis of constipation, Hirschprung's disease
19. Differential diagnosis of sore throat
20. Differential diagnosis of acute and chronic abdominal pain
21. Unconsciousness, altered consciousness
22. Failure to thrive in infancy and childhood
23. Neonatal jaundice

General and Emergency Paediatrics (II.)
1. Oncological emergencies (tumour lysis syndrome, neutropenic fever, hyperleukocytosis, VCS syndrome)
2. Alarming signs and necessary examinations in diseases involving the CNS, eg. elevated ICP. Lumbar puncture
3. Symptoms of primary and secondary immunodeficiency
4. The nutrition of the healthy infant and child, nutrition of preterm neonates, caloric needs, nutrition therapy
5. Definition, causes and investigation of malnutrition
6. The prevention on infectious diseases, immunisation
7. Gastrointestinal obstruction in neonates (meconium ileus, pylorus stenosis, intestinal atresia)
8. Diaphragmatic hernia, lung development disorders
9. Acute abdomen in children: ileus, volvulus, invagination, appendicitis, incarcerated hernia, complications (short bowl syndrome)
10. Acute pain and antipyretic treatment (pharmacological and non-pharmacological methods)
11. Neonatal life support. APGAR score
12. Paediatric life support (2025 ERC guideline)
13. Recognition and treatment of shock, different shock types
14. Disorders of fluid balance, treatment (severe dehydration, infusion solutions)
15. Electrolyte disorders (hypo- and hypernatraemia, hypo- and hyperkalaemia)
16. Recognition and emergency treatment of acute respiratory failure
17. Emergency treatment of seizures and status epilepticus
18. Signs of intoxication in children, decontamination
19. Sudden infant death syndrome
20. Recognition and emergency treatment of sepsis and septic shock
21. Metabolic and respiratory acidosis, metabolic and respiratory alkalosis
22. Symptoms and treatment of hypoglycaemia
23. Perinatal terminology, mortality data and concepts related to gestation and birth.
24. Newborn screening, genetical screening, prevention
25. Physiological growth, anthropometry, normal development, normal values for age from newborn to school age
26. Disorders of neonatal adaptation
27. Perinatal asphyxia
28. Obstructive bronchitis, asthma
29. Epiglottitis, croup, foreign body aspiration
30. Pertussis sy, RSV, bronchiolitis
31. Causes and treatment of acute gastroenteritis
32. Fever in infants and toddlers
33. Symptoms and signs of allergy. Anaphylaxis.

Specific diseases (III.)
1. Leukaemias
2. Tumors of the central nervous system, retinoblastoma
3. Most common solid tumors in children (Neuroblastoma, Wilms-tumor, bone- and soft tissue tumors)
4. Brain injury in neonates. Neonatal seizures, Infantile cerebral palsy
5. Infectious diseases of the CNS (meningitis, encephalitis, abscess)
6. Childhood epilepsy. Febrile seizures.
7. Neuromuscular disorders
8. Eating disorders in childhood
9. Behavioural disorders in childhood (autism spectrum disorder, ADHD, tic-disorder)
10. Congenital adrenal hyperplasia
11. Growth disorders
12. Disorders of puberty, gonadal disorders
13. Congenital hypothyreosis
14. Diabetes mellitus, hyperglycaemia, diabetic ketoacidosis
15. Congenital anomalies of the urinary tract, cystic renal disorders
16. Glomerular disorders
17. Haemolytic uremic syndrome
18. Urinary tract infections
19. Acute renal failure
20. Chronic renal failure
21. Juvenile idiopathic arthritis
22. Septic arthritis, osteomyelitis
23. Pediatric SLE
24. Vasculitis in childhood
25. Pneumonia. Most common pathogens by age
26. Cystic fibrosis
27. Malabsorption (celiac disease, lactose and fructose intolerance)
28. Inflammatory bowel diseases
29. Acute liver failure, acute hepatitis
30. Neonatal infections
31. Fever with a rash in childhood
32. Mononucleosis syndrome
33. Complications of prematurity (BPD, ROP, NEC, IVH)
34. Acyanotic congenital heart diseases
35. Cyanotic congenital heart diseases
36. Disorders of the ear
37. Vitamin-D deficiency
38. Non-accidental injury in childhood
39. Staphylococcal dideases, toxic shock syndrome

Screening questions:
1) Imaging modality of choice when evaluating a child for infantile hypertrophic pyloric stenosis: ultrasonography.
2) Typical age of intussusception in infants: 3 months - 3 years
3) What are the two typical anamnestic features of acute appendicitis? First epigastric and periumbilical pain, later the pain is localized in the right lower abdominal quadrant.
4) Standard imaging modality of polytraumatized patients- acute CT.
5) Most common cause of acute abdomen in children: appendicitis.
6) Which is the most common cause of strangulation ileus? Incarcerated hernia.
7) The most common cause of transfusion-requiring hematochezia, without abdominal pain and without diarrhea: Meckel's diverticulum
8) You find a high GGT in a patient with ulcerative colitis, what should you think about? Sclerosing cholangitis.
9) What are the typical characteristics of perianal fissures in Crohn's disease? Not in the midline, deep, not painful.
10) What is the first therapeutic choice in Crohn's disease? Exclusive enteral nutrition. 11) What are the two most frequent chest deformities? Pectus excavatum and pectus carinatum.
12) What are typical signs of bacterial otitis externa? Pain and/or tenderness of the tragus.
13) What are the 4 most important indications of adenoidectomy? Recurrent infections of the upper respiratory tract, recurrent otitis media, inhibition of nasal breathing, obstructive sleep apnea.
14) The most frequent pathogen of sinusitis and otitis media? Str. pneumoniae.
15) In which cases of middle-ear inflammatory disease should we suggest tympanostomy tubes (Grommet)? Chronic serous otitis media and/or chronic dysfunction of the Eustachian tube.
16) What is the most frequent pathogen in urinary tract infections? E. coli.
17) What are the typical abnormalities in urine analysis in glomerulonephritis? Red blood cells and red blood cell cylinders. Proteinuria can also appear.
18) What is the most frequent cause of hypertension before the adolescent age? Kidney disease. 19) Which is the most frequent glomerulonephritis type? IgA nephropathy.
20) What is the prognosis of West-syndrome or infantile spasm? Usually poor.
21) Which bacterium is the most frequent cause of childhood pneumonia? Str. pneumoniae.
22) What are the two main components of the treatment of pseudocroup? Rectal steroid, inhalation of adrenaline.
23) What is the most common cause of new onset cough? Viral infection.
24) What is the Holzknecht sign characteristic for? Airway foreign body aspiration.
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27) What is the prognosis of juvenile absence epilepsy? Usually favorable.
28) What can prevent coronary artery disease (aneurysm) in Kawasaki syndrome? IVIG.
29) What is the most serious complication of juvenile idiopathic arthritis? Macrophage activation syndrome (MAS).
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32) What kind of diseases are included in `atopic march` and in which order? Atopic dermatitis food allergy - asthma bronchiale - allergic rhinitis.
33) How is food allergy diagnosed? What is the reliability of IgE testing? IgE testing is not reliable. The diagnosis should be based on double blind oral food challenge.
34) In which case serological testing is not informative in celiac disease. In IgA deficiency.
35) What is the diagnostic basis of endocarditis? Blood culture and echocardiography.
36) What are the upper airway infections that should be treated with antibiotics? Streptococcus angina, acute otitis media and acute bacterial sinusitis.
37) What is the diagnostic basis of erythema migrans? The fact of tick bite and the clinical picture: growing erythema which is more than 5 cm in diameter.
38) What is the ideal age for closing the soft palate defect? Between 9 and 18 months.
39) What is the most likely diagnosis in the following case: patient with polyuria, polydipsia with positive urine glucose and acetone test? Diabetes mellitus.
40) A patient with typical diabetes symptoms has a 18.2 mmol/l blood sugar level in the afternoon. What is to be done? Refer the child to a pediatric diabetic center immediately.
41) What kind of hormonal changes are seen in the salt wasting form of congenital adrenal hyperplasia due to deficiency of 21-hydroxylase? Insufficient glucocorticoid and mineralocorticoid secretion, excessive androgen secretion.
42) How does the mother's iodine deficiency influence the newborn's thyroid function? It results in temporary primary hypothyroidism.
43) Which is the most common adrenocortical enzyme defect? The defect of the 21-hydroxylase enzyme.
44) What are the most typical histologic findings in ulcerative colitis? Crypt abscesses.
45) Name at least 5 extraintestinal abnormalities in celiac disease: hepatitis, osteoporosis, arthritis, isolated iron deficiency, Duhring-disease (dermatitis herpetiformis).
46) What is the definition of "graft versus leukemia"? Immunologic attack of the donor cells against the patient's leukaemic cells after allogeneic bone marrow transplantation.
47) What is a haploidentical transplant? Half matched HLA antigen stem cell transplant (from usually a family member).
48) What does allogeneic stem cell transplant mean? The patient (recipient) gets hematopoietic stem cells from another person (donor).
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52) What is the most modern therapeutic method of type-one diabetes? Insulin pump with an integrated glucose sensor.
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60) For how long can we see the shadow of the thymus on the thoracic X-ray? Until 3 years of age.
61) What radiological examinations can be done to diagnose VUR? (Name three!). MCU (Micturating cystourethrogram), Sono-cystography, Dynamic kidney-scintigraphy.
62) How can you diagnose perforation in a critically ill baby with necrotizing enterocolitis if you cannot move them in the incubator? Horizontal X-ray from side position while the baby is lying on the back.
63) In which part of the bone does osteomyelitis start? In the metaphysis.
64) How long to wait after surgery before bathing? 7-8 days.
65) What is chicken pox (varicella) reactivation called? Herpes zoster.
66) What is the sixth disease? Exanthema subitum, roseola infantum.
67) Which is the contagious disease that causes severe fetal injuries in 80 percent of its cases? Rubella.
68) Name at least five examples when pulse oximetry is not informative! Carbon-dioxide intoxication, methemoglobinemia, severe anemia, cardiac failure, cold extremities.
69) Define paradoxical breathing! The chest moves inward and the abdomen moves outward during inhalation, and vice versa.
70) How do we give oxygen to a conscious patient in an emergency situation who is breathing spontaneously? Through a face mask with a reservoir, with high flow oxygen (10-15 l/min).
71) How does the concentration of protein and glucose of CSF change in bacterial meningitis? Protein concentration is increased, glucose concentration is decreased.
72) Name of the two most common pathogens of newborn meningitis! Streptococcus agalactiae, E. coli.
73) What affects the sensitivity of blood culture? The amount of blood drawn within 24 hours after the fever.
74) Name the condition of infants associated with abdominal pain in which bowel movements are preceded by tension and crying lasting for about 10 minutes? Infantile dyschezia
75) The pathogen causing neonatal infection that can be identified by maternal vaginal secretion screening. Streptococcus agalactiae. (group B Streptococcus, GBS)
76) The amount of a simple fluid bolus required to treat septic shock: 10 ml/kg.
77) The most common endocrine disorder causing growth retardation: Thyroid dysfunction – hypothyroidism.
78) What does precocious puberty mean in the case of girls? If the secondary sexual characteristics appears before the age of 8 years
79) What changes can we see in the urine sediment in typical pyelonephritis? Leukocytes and bacteria
80) In which chromosomal abnormality is duodenal atresia common? Trisomy 21 (Down syndrome)
81) What is the radiological sign of duodenal atresia? „Double-bubble" sign
82) What are the B-symptoms in lymphoma? Fever, night sweats, weight loss. 83) At what platelet count is there major risk of bleeding? Below 10-20 G/l
84) What to do in case of neutropenic fever? Broad spectrum empiric antibiotic therapy after taking blood cultures.
85) What are the serum electrolyte disturbances in case of tumor lysis syndrome? Elevated potassium, phosphate and uric acid, decreased calcium.
86) What are the alarming signs of retinoblastoma? What examinations are required? Strabism, leukocoria - ophthalmoscopic examination.
87) What is the most common type of malignancy in childhood? ALL.
88) What are the symptoms of increased intracranial pressure? Headache, vomiting in the morning, nuchal rigidity, setting-sun sign, focal neurological signs, bradycardia, high blood pressure, irritability, bulging fontanelle.
89) What are the physical symptoms of anemia? Fatigue, paleness, tachycardia, systolic heart murmurs.
90) How does the total iron binding capacity change in case of anemia and inflammation? Increased in anemia, decreased in inflammation.
91) What is the treatment of immune thrombocytopenia (first- and second-line treatment.)? IVIG, corticosteroid
92) List the signs of increased work of breathing! Use of respiratory accessory muscles, intercostal retraction, jugular retraction, nasal flaring, paradoxical breathing, grunting.
93) At what age do the fontanelles close at the latest? Posterior fontanelle- by 3 months, anterior fontanelle- by 18 months.
94) What are the symptoms and laboratory signs of nephrotic syndrome? Proteinuria, hypoalbuminemia, hyperlipidemia, oedema.
95) What are the symptoms and laboratory signs of nephritic syndrome? Hematuria, oedema hypertension, uraemia, oliguria (kidney failure is correct instead of the latter two).
96) What factors are included in the APGAR score? Heart rate, respiratory rate, skin color, reflex irritability, muscle tone.
97) Age limits of puberty? Boys: 9-14 years. Girls: 8-13 years.
98) What are the direct and indirect signs of appendicitis? Direct sign: tenderness at the McBurney point. Indirect signs: Blumberg, Rovsing, Obturator, Psoas signs.
99) How can we estimate the body weight between the ages of 2-8 years? (2 x years) + 8.
100) What does autologous stem cell transplantation mean? A procedure in which a patient's healthy stem cells are collected from the blood or bone marrow before high dose chemotherapy, stored, and then given back to the patient after treatment.
101) What is the heart rate and respiratory rate of a healthy newborn? Respiratory rate: 50-60/min, Heart rate: 120-160/min.
102) Which cultured pathogen from throat swabs warrants antibiotic treatment? Str. pyogenes.
103) In case of maternal GBS positivity, up to what age can this bacteria cause disease in the baby? Up to six months of age.
104) What is the recommended empiric treatment of neonates with suspected sepsis? Ampicillin + Gentamycin.
105) What factors are included in the croup score? Sound of inhalation, stridor, cough, signs of dyspnea (nasal flaring, retractions), cyanosis.
106) In case of pain localized to one point in the bone, when should we order an X-ray if the pain does not stop? 1 week
107) What is the choice of imaging modality if acute osteomyelitis is suspected? MRI
108) What is the most common presentation of cow's milk protein allergy in infants? Bloody stool
109) Which disease should be suspected in case of bloody stool and vomiting in neonates? Volvulus
110) Which disease should be suspected in case of neonates with distended abdomen and severe constipation? Hirschsprung-disease

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Screening questions - see above.

The notes available on the Moodle platform cover the knowledge required for the topics.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grades are based on the oral examination. Oral examination can only be attempted if the student received at least grade 2 on the practical examination. The student's performance is evaluated using a five-grade scale: excellent (5), good (4), satisfactory (3), pass (2), and fail (1).

See above.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI-based tools for learning purposes is permitted; however, they may not be considered official sources of information or study materials, and their use is also prohibited during examinations.

Printed resources:

Type	Recommended
Author	Karen Marcdante, Robert M. Kliegman, Abigail M. Schuh
Title	Nelson Essentials of Pediatrics 9ed
Publisher	Elsevier
Year of publication	

Type	Recommended
Author	Robert C. Tasker, Carlo L. Acerini, Edward Holloway
Title	Oxford Handbook of Paediatrics

Publisher	Oxford University Press
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Bókay utcai részleg

Name of subject in Hungarian: Gyermekgyógyászat
Name of subject in English: Pediatrics
Name of subject in German: Kinderheilkunde

Credit value of the course: 6
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKGY1848_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Attila József (Klinika igazgató)
Course coordinator location of work, telephone availability: 06-1-334-3186
Course coordinator position: Head of Department of Pediatrics
Course coordinator Date and number of habilitation: Budapest, June 7.2010. , No: 310

Objectives of the course, and its place in the curriculum of the medical training program:

The main task of the students is to acquire basic skills and knowledge in the field of infant and pediatric medicine. In the 6th year, independent patient care is provided under the guidance and supervision of specialist physicians, which includes patient examination, attendance, independent patient referral, and documentation of patient care.

Format of the course (lectures, group work, practical lessons, etc.):

practice

Competencies acquired through completion of course:

Infant and pediatric medicine is a specialization dealing with special problems and diseases of a large population. Our goal for newly graduated physicians is to possess advanced theoretical and practical knowledge at the end of their university studies and to be able to practice independent medical practice in the field of infant and pediatric medicine.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Pediatrics, Clinical Genetics

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on Neptun registration, max. 20 Students/group

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

According to the curriculum, 6th year medical students should complete a 6-week Pediatric practical.

– During one half of the practical, students work in infants' wards, in the other part in children's wards. This way they can acquire and practice the following activities on both infants and children:

– Taking of pulse and blood pressure, correct weight and height measurement (also of infants) (use

of percentile tables).

– Under the supervision of the ward physician, active participation in blood sampling, taking throat swab etc.

– Under the supervision of the ward physician, practice of various injection techniques (venous, im, sc and Mantoux test).

– Preparation and control of infusion and transfusion accessories and performing these activities under the supervision of the ward physician. Determination of blood group.

– To assist to special diagnostic or therapeutic interventions and learning eventually to perform them under the supervision of the ward physician (bonemarrow sampling, lumbar puncture).

– Based on the knowledge of the necessary physiological studium: blood counting and urine analysis (also the sediment).

– Taking of case records and temperature charts.

– Participation in the daily rounds for students, where simpler differential diagnostic questions are discussed with the instructions of a full or associate professor.

– Participation in tutorials held on the most important theoretical subjects, enabling students to get acquainted with the standpoint of the hospital in debated questions.

– In addition to the above, students are expected to be able to contact children patients of various ages (to win the patients for the examination), to do basic nursing duties (feeding, drinking, bathing, changing of infants' diapers, administering of medicaments).

– Working in the wards: a) ward round (physical examination, discuss about illnesses, therapy, different diagnoses, etc.) b) follow up on patients c) paperwork (status of physical findings, decursus, discharge report, etc.) d) diagnostic procedures (venapuncture, urine collection, etc.) – Ward round participation

Agócs Róbert, Balogh Ádám, Becsei Dóra, Bednárik Mihály, Boczkó Zita, Bojtár Zsüliet, Czifrus Eszter, Cseh Áron, Elblibger Zsuzsanna, Etlinger Péter, Détár Máté, Horváth Éva, Kincs Judit, Kiss Andás, Kardics Kinga, Kossuth Laura, Legeza Balázs, Makai Márton, Mikes Bálint, Muzslay Eszter, Nagy Csilla, Pál Vanda, Pernecki Andrea, Prehoda Bence, Rohács Diána, Stark Bence, Tallós Zsuzsanna, Vámos Anna, Végh Anna, Vicenc Bonet Mateu.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Wearing a white lab coat and bringing/using a stethoscope is mandatory during practice. Students confirm their daily presence by signing in the attendance sheet.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
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-

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

Completion of rotation and practical exam. The completion of the interventions and the presentation of the attendance sheet signed by the designated tutors are a prerequisite for the oral examination. Absence and makeup are based on the Study and Examination Regulations.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Screening questions

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84) What to do in case of neutropenic fever? **Broad spectrum empiric antibiotic therapy after taking blood cultures.**

85) What are the serum electrolyte disturbances in case of tumor lysis syndrome? **Elevated potassium, phosphate and uric acid, decreased calcium.**

86) What are the alarming signs of retinoblastoma? What examinations are required? **Strabism, leukocoria - ophthalmoscopic examination.**

87) What is the most common type of malignancy in childhood? **ALL.**

88) What are the symptoms of increased intracranial pressure? **Headache, vomiting in the morning, nuchal rigidity, setting-sun sign, focal neurological signs, bradycardia, high blood pressure, irritability, bulging fontanelle.**

89) What are the physical symptoms of anemia? **Fatigue, paleness, tachycardia, systolic heart murmurs.**

90) How does the total iron binding capacity change in case of anemia and inflammation? **Increased in anemia, decreased in inflammation.**

91) What is the treatment of immune thrombocytopenia (first- and second-line treatment.)? **IVIG, corticosteroid**

92) List the signs of increased work of breathing! **Use of respiratory accessory muscles, intercostal retraction, jugular retraction, nasal flaring, paradoxical breathing, grunting.**

93) At what age do the fontanelles close at the latest? **Posterior fontanelle: by 3 months, anterior fontanelle: by 18 months.**

94) What are the symptoms and laboratory signs of nephrotic syndrome? **Proteinuria, hypoalbuminemia, hyperlipidemia, oedema**.

95) What are the symptoms and laboratory signs of nephritic syndrome? **Hematuria, oedema hypertension, uraemia, oliguria (kidney failure is correct instead of the latter two).**

96) What factors are included in the APGAR score? **Heart rate, respiratory rate, skin color, reflex irritability, muscle tone.**

97) Age limits of puberty? **Boys: 9-14 years. Girls: 8-13 years.**

98) What are the direct and indirect signs of appendicitis? **Direct sign: tenderness at the McBurney point. Indirect signs: Blumberg, Rovsing, Obturator, Psoas signs.**

99) How can we estimate the body weight between the ages of 2-8 years? **(2 x years) + 8.**

100) What does autologous stem cell transplantation mean? **A procedure in which a patient's healthy stem cells are collected from the blood or bone marrow before high**

dose chemotherapy, stored, and then given back to the patient after treatment.

101) What is the heart rate and respiratory rate of a healthy newborn? **Respiratory rate: 50-60/min, Heart rate: 120-160/min.**

102) Which cultured pathogen from throat swabs warrants antibiotic treatment? **Str. pyogenes.**

103) In case of maternal GBS positivity, up to what age can this bacteria cause disease in the baby? **Up to six months of age.**

104) What is the recommended empiric treatment of neonates with suspected sepsis? **Ampicillin + Gentamycin.**

105) What factors are included in the croup score? **Sound of inhalation, stridor, cough, signs of dyspnea (nasal flaring, retractions), cyanosis.**

106) In case of pain localized to one point in the bone, when should we order an X-ray if the pain does not stop? **1 week**

107) What is the choice of imaging modality if acute osteomyelitis is suspected? **MRI**

108) What is the most common presentation of cow's milk protein allergy in infants? **Bloody stool**

109) Which disease should be suspected in case of bloody stool and vomiting in neonates? **Volvulus**

110) Which disease should be suspected in case of neonates with distended abdomen and severe constipation? **Hirschsprung-disease**

Topics in Pediatrics for 6th year medical students

Differential diagnosis (I.)

1. Differential diagnosis of lymphadenomegaly
2. Abdominal tumours – different diagnosis and treatment
3. Differential diagnosis of childhood anaemias
4. Differential diagnosis of bleeding disorders and immunthrombopenia
5. Differential diagnosis of headaches in children
6. Differential diagnosis of hypertension in children
7. Differential diagnosis of obesity in children

8. Differential diagnosis of polyuria and polydipsia

9. Differential diagnosis of oedema

10. Differential diagnosis of haematuria

11. Differential diagnosis of joint pain

12. Differential diagnosis of fever of unknown origin

13. Differential diagnosis of coughing

14. Differential diagnosis of vomiting

15. Differential diagnosis of diarrhoea

16. Differential diagnosis of bloody stool

17. Differential diagnosis of hepatomegaly, splenomegaly.

18. Differential diagnosis of constipation, Hirschprung’s disease

19. Differential diagnosis of sore throat

20. Differential diagnosis of acute and chronic abdominal pain

21. Unconsciousness, altered consciousness

22. Failure to thrive in infancy and childhood

23. Neonatal jaundice

General and Emergency Paediatrics (II.)

1. Oncological emergencies (tumour lysis syndrome, neutropenic fever, hyperleukocytosis, VCS syndrome)

2. Alarming signs and necessary examinations in diseases involving the CNS, eg. elevated ICP. Lumbar puncture

3. Symptoms of primary and secondary immunodeficiency

4. The nutrition of the healthy infant and child, nutrition of preterm neonates, caloric needs, nutrition therapy

5. Definition, causes and investigation of malnutrition

6. The prevention on infectious diseases, immunisation

7. Gastrointestinal obstruction in neonates (meconium ileus, pylorus stenosis, intestinal atresia)

8. Diaphragmatic hernia, lung development disorders

9. Acute abdomen in children: ileus, volvulus, invagination, appendicitis, incarcerated hernia, complications (short bowl syndrome)

10. Acute pain and antipyretic treatment (pharmacological and non-pharmacological methods)

11. Neonatal life support. APGAR score

12. Paediatric life support (2025 ERC guideline)

13. Recognition and treatment of shock, different shock types

14. Disorders of fluid balance, treatment (severe dehydration, infusion solutions)

15. Electrolyte disorders (hypo- and hypernatraemia, hypo- and hyperkalaemia)

16. Recognition and emergency treatment of acute respiratory failure

17. Emergency treatment of seizures and status epilepticus

18. Signs of intoxication in children, decontamination

19. Sudden infant death syndrome

20. Recognition and emergency treatment of sepsis and septic shock

21. Metabolic and respiratory acidosis, metabolic and respiratory alkalosis

22. Symptoms and treatment of hypoglycaemia

23. Perinatal terminology, mortality data and concepts related to gestation and birth.

24. Newborn screening, genetical screening, prevention

25. Physiological growth, anthropometry, normal development, normal values for age from newborn to school age

26. Disorders of neonatal adaptation

27. Perinatal asphyxia

28. Obstructive bronchitis, asthma

29. Epiglottitis, croup, foreign body aspiration

30. Pertussis sy, RSV, bronchiolitis

31. Causes and treatment of acute gastroenteritis

32. Fever in infants and toddlers

33. Symptoms and signs of allergy. Anaphylaxis.

Specific diseases (III.)

1. Leukaemias

2. Tumors of the central nervous system, retinoblastoma

3. Most common solid tumors in children (Neuroblastoma, Wilms-tumor, bone- and soft tissue tumors)

4. Brain injury in neonates. Neonatal seizures, Infantile cerebral palsy

5. Infectious diseases of the CNS (meningitis, encephalitis, abscess)

6. Childhood epilepsy. Febrile seizures.

7. Neuromuscular disorders

8. Eating disorders in childhood

9. Behavioural disorders in childhood (autism spectrum disorder, ADHD, tic-disorder)

10. Congenital adrenal hyperplasia

11. Growth disorders

12. Disorders of puberty, gonadal disorders

13. Congenital hypothyreosis

14. Diabetes mellitus, hyperglycaemia, diabetic ketoacidosis

15. Congenital anomalies of the urinary tract, cystic renal disorders

16. Glomerular disorders

17. Haemolytic uremic syndrome
18. Urinary tract infections
19. Acute renal failure
20. Chronic renal failure
21. Juvenile idiopathic arthritis
22. Septic arthritis, osteomyelitis
23. Pediatric SLE
24. Vasculitis in childhood
25. Pneumonia. Most common pathogens by age
26. Cystic fibrosis
27. Malabsorption (celiac disease, lactose and fructose intolerance)
28. Inflammatory bowel diseases
29. Acute liver failure, acute hepatitis
30. Neonatal infections
31. Fever with a rash in childhood
32. Mononucleosis syndrome
33. Complications of prematurity (BPD, ROP, NEC, IVH)
34. Acyanotic congenital heart diseases
35. Cyanotic congenital heart diseases
36. Disorders of the ear
37. Vitamin-D deficiency
38. Non-accidental injury in childhood
39. Staphylococcal dideases, toxic shock syndrome

Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

PEDIATRICS Course material – Faculty of General Medicine 5th year

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Exam consists of a practical and an oral part. Practical exam takes place the day before the oral exam. Practical exam is not graded and it is a requirement for the oral exam.

There is an entry question for the oral exam followed by three topics, which will be graded.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of learning aids supported by artificial intelligence is permitted; however, they are not considered official sources of information or educational material and may not be used during the exams.

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	PEDIATRICS Course material – Faculty of General Medicine 5th year
Link	https://itc.semmelweis.hu/moodle/pluginfile.php/593880/mod_resource/content/1/ANGOLegyetemijegyzettiszt%C3%A1zott.pdf

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Printed resources:

Type	Recommended
Author	Tom Lissauer, Graham Clayden
Title	Illustrated Textbook of Paediatrics (Fourth Edition)
Publisher	Elsevier Mosby
Year of publication	2011

Type	Recommended
Author	William W. Hay, Jr., Myron J. Levin,Robin R. Deterding, Mark J. Abzug
Title	Current Diagnosis&Treatment Pediatrics.23rd edition,
Publisher	Lange
Year of publication	2016

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Testnevelési és Sportközpont

Name of subject in Hungarian: Testnevelés XI.; Testnevelés XII.
Name of subject in English: Physical Education XI; Physical Education XII
Name of subject in German: Körpererziehung XI; Körpererziehung XII

Credit value of the course: 0
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
1.0	0.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTSI009_11A; AOKTSI009_12A
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Várszegi Kornélia (igazgató)
Course coordinator location of work, telephone availability: 1107 Budapest, 14 Zágrábi street Tel: +36-20/825-0611
Course coordinator position: director
Course coordinator Date and number of habilitation: no

Objectives of the course, and its place in the curriculum of the medical training program:

The short-term goal of the course is to maintain and improve the students' current state of health, to create the physical conditions for a better quality of life by learning and practicing (new) branches of sports that can be practiced after graduation as well. The long-term goal is to improve the quality of life and life prospects of future physicians, and to provide students with credible preventive attitudes and lifestyle advice - so that they can represent those in their later practice, through their own health-promoting behavior.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Upon completion of the course the student will be able to carry out regular physical activity.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Physical Education (PE) IX* , Physical Education (PE) X*

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

If the subject is not passed, it can be retaken with special permission.

The number of students required to start the course (minimum, maximum), method of selecting participants:

According to the Neptun admission system (20 – 60 students)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

You can register for the “independent sports activity” course as part of the Physical Education course in the Neptune system.

Every week, a questionnaire is sent to the students through the Neptune system:

– The questionnaire can be filled in from Monday to Sunday in a semester (no entries can be made in advance or afterwards).

– Students must assure themselves that they have completed the questionnaire truthfully.

–It is a minimum requirement for the signature that a training of 1 × 60 minutes per week is completed (to be 10 times responses) and this is recorded in the questionnaire.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

The student who completes the independent sport activity course is also supposed to attend 10/7 classes and record their participation in the weekly sent UniPoll questionnaire.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no mandatory control during the term.

Number and type of individual assignments to be completed, submission deadlines:

no

Requirements for the successful completion of the course:

Active participation in practice classes 7 times

A student may be excused from attending classes if

1. as recorded in a decision in the NEPTUN system, they are granted a health exemption

or

2. a sports exemption.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

no

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

signature

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Pszichiátriai és Pszichoterápiás Klinika

Name of subject in Hungarian: Elmegyógyászat
Name of subject in English: Psychiatry
Name of subject in German: Psychiatrie

Credit value of the course: 3
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
120.0	0.0	120.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKPSI658_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Réthelyi János (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Psychiatry and Psychotherapy, 1083 Budapest, Balassa u. 6., Tel/Fax: 061 210 0336
Course coordinator position: head of the department, professor
Course coordinator Date and number of habilitation: 24/06/2015; 05/2015.

Objectives of the course, and its place in the curriculum of the medical training program:

The sixth-year course of Psychiatry aims to implement the previously learned theoretical and practical knowledge into clinical work.

Elective practice option within Psychiatry

The goal of the sixth-year Psychiatry course and practicum is to apply the theoretical knowledge and practical skills acquired in the previous year to clinical practice. By joining the daily ward rounds, students gain insight into the possibilities for differentiating psychiatric disorders, establishing diagnoses, and selecting appropriate therapeutic interventions.
A deeper understanding of practical knowledge can be facilitated if the medical student participates in a 6-week practicum in addition to the mandatory 3-week practicum. By participating in the 6-week elective internship, the student also indicates the direction of their specialization and their intention to pursue residency training in psychiatry.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

- Recording the patient's history (general, somatic, psychiatric, pharmacological and family history)
- Complex psychiatric examination (assessing the consciousness, perception, orientation, thought, intellect; emotional and memory functions; mood, and psychomotor functions of the patient; assessment of attitude towards examiner, motivation system and personality functions)
- Suicide risk assessment
- Family consultation to uncover the patient's problems
- Exploration of patients after suicide attempts or in crisis situations.
- Interpretation of the Mini Mental State Examination results
- Indication of psychiatric inpatient treatment
- First steps of emergency psychiatry care
- Identification of different intoxications
- Recognition of somatic disorders underlying psychiatric symptoms
- Management of immediately dangerous behaviours
- Psychoeducation (regarding the disorder, therapy, prodromal signs, patient care)
- Differential diagnosis of psychiatric disorders; making a diagnosis
- Mastering the administration of basic neurocognitive tests (MMSE, AKV) and symptom assessment scales (BDI, HAM-A, HCL-32)

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Psychiatry and Psychotherapy

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

We accept a minimum of 10 students, as well as the entire class of sixth-year students.

To begin the six-week elective psychiatry rotations, students must have successfully completed the three-week rotation with excellent results and demonstrate a serious commitment to specialization.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:
(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest lecturers, however, must be attached.)
Final year medical students are expected to fully participate at the medical duties of the inpatient wards, eg. rounds, staff meetings and training sessions. Students expected to perform the regular medical duties under supervision: patient examination, exploration, and writing psychiatric case reports or hospital course reports. To complete their course, students must prepare at least one detailed psychiatric case report, that will be corrected and graded by their tutors. AFTERNOON DUTY: Students are required to actively participate at one of the afternoon duties during the three-week-long mandatory rotation and two evening duties during the six-week-long elective course. During their duty day students are at work at the Outpatient unit (Ambulancia) between 1 pm-4 pm and join the night duty team until 9 pm. After 9 pm, students may opt in for the rest of the night duty if they want to. During the elective course, students will also be introduced to the foundation of the out-patient psychiatric care and the management of the most common psychiatric conditions that occur in other medical fields (eg. psychiatric emergencies). The topics of psychiatry required for this course are identical to the topics for the final exam published online at the Department's homepage.
Detailed objectives of the course
Psychiatric examination:
• Recording general history of the patient
• Recording biography
• Recording social history
• Recording family history
• Reporting family members
• Examination of consciousness
• Examination of perception
• Examination of orientation
• Assessing intellectual functions
• Assessing memory functions
• Examination of thought (formal and content)
• Examination of emotional functions
• Examination of mood and self-perception
• Examination of behaviour
• Examination of motivations
Additional examinations and skills:
• Recording the psychiatric status; drawing up global clinical impressions
• Suicidal risk assessment
• On the basis of the patient's self-report and the results of the examination, identifying the problems, (personal, existential, familial, etc.)
• Exploring problems in crisis situation
• Exploring problems after suicide attempt
• Recognizing and understanding personal emotional reactions emerging as a result of interacting with patients
• Professional way of referring observed psychiatric symptoms/disorders to colleagues (referral, consultation)
• Mini Mental State Examination
• Differential diagnosis according to the DSM-5
• Identification of psychiatric conditions requiring psychiatric hospitalization.
Clinical knowledge psychiatry:
• Emergency psychiatry: definition, conditions requiring emergency psychiatric care.
• Patients with psychomotor retardation or aggressive/agitated behavior: possible causes and the principles of examination.
• Suicidal behavior: Manifestation, prevalence in general population and in patients with mental disorders. Protective and risk factors and prevention of suicide.
• Nonsuicidal self-harm: Manifestation, etiology, examination and distinction from suicidal attempt.
• Delirium: definition, symptoms and etiology.
• Dementias: classification, symptoms, principles of examination. MMS
• Definition of mental retardation and oligophreny. Assessment of intelligence (IQ).
• Classification of mood disorders. Unipolar and bipolar disorders. Definition and clinical significance of mood episodes with mixed features.
• Signs and symptoms of depression and mania.
• Psychosis: definition, etiology, principles of examination. Classification of psychotic disorders.
• Schizophrenia: etiology and course of disorder. Positive, negative, affective and cognitive signs and symptoms.
• Classification of anxiety disorders. Signs and symptoms of a panic attack.
• Definition and classification of phobias. Signs and symptoms of obsessive-compulsive disorder. Symptoms and etiology of post-traumatic stress disorder.
• Personality disorders: definition and principles of examination. Clinical impact of personality disorders in psychiatric care.
• Borderline personality disorder: symptoms and clinical impact (self-harm, emergency care).
• Acute and chronic disorders related to alcohol use. Definition and symptoms of delirium tremens.
• Signs and symptoms of substance use disorders (cannabis, amphetamine, cocaine, heroin, hallucinogens).
• Child psychiatry: signs and symptoms of ADHD, oppositional defiant disorder, tic, Tourette-syndrome and autism spectrum disorder.
Therapeutic interventions:
• Participation in therapeutic staff meetings
• Planning pharmacotherapy
• Screening for side effects of medical treatment
• Recognizing and managing issues in therapeutic adherence
• Basic principles of psychoeducation
• Theoretical background of the electroconvulsive therapy (ECT). Assisting in one ECT treatment session.
• Basic principles and skills of crisis intervention, hospital admission of patient in crisis.
Basic principles and skills of behavior therapy (desensitization, operant conditioning).
Tutors:
Ambulancia:
Hear of the ward: Dr. Csukly Gábor
Dr. Brigitta Baran, Dr. Kinga Farkas, Dr. Csilla Bolyós, Dr. Viktória Simon, Dr. Mónika Eleméry, Dr. Boglárka Orbán-Szigeti
Nappali Kórház - Merényi Klinika:
Head of Department: Dr. László Tombor
Dr. Gyöngyi Szabó, Dr. Fanny Kupcsik
B Fszt. Addiktológia Osztály:
Hear of the ward: Dr. Zsolt Unoka
Dr. Bálint Hajduska-Dér, Dr. Imola Seres, Dr. Andrea Szegő, Dr. Júlia Markovits
A1 Organikus Pszichiátriai és rehabilitációs nappali osztály:
Hear of the ward: Dr. Zoltán Hidasi
Dr. Éva Csibri, Dr. Attila Simor, Dr. Nóra Brindza
B1 Affektív Osztály:
Hear of the ward: Dr. Tamás Treuer
Dr. Ádám Menus, Dr. Judit Tolna, Dr. Luca Egervári, Dr. Péter Szocsics
A2 Akut Pszichiátriai Osztály:
Hear of the ward: Dr. Eszter Komoróczy
Dr. Levente Hermán, Dr. Réka Zsigmond, Dr. Ádám Szentes
B2 Addiktológia Osztály:
Head: Dr. Erika Szily
Dr. Attila Pulay, Dr. Ferenc Ádám Szabó
Szent Rókus Klinikai Tömb Pszichiátriai Osztály:
Hear of the ward: Dr. György Szekeres
Dr. Andrea Sárosi, Dr. György Freschl, Dr. Brigitta Blancz, Dr. Katalin Bodnár, Dr. Irén Csala, Dr. Krisztina Seregi, Dr. Anna Báthory, Dr. Attila Zsolt Simor

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

As with other courses, the prerequisite for passing the practicum is attendance of at least 90% of the practicum sessions.

Students may make up for absences by taking extra duties suggested by their tutor, eg. night duty, admission of patients, etc. Absences owed to sickness must be confirmed with valid medical certificate.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Student’s knowledge will be evaluated during tutoring according to the topics published online on the Department’s homepage.

Number and type of individual assignments to be completed, submission deadlines:

Full completion of the tasks specified by supervisor of the internship during the Famulus internship - prescribed according to the above topic. Preparation and presentation of an exam chart to the supervisor, min. 2 days before the end of the practice.

Requirements for the successful completion of the course:

The student's active participation in patient care during the internship.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination requirements:
(*list of examination topics, subject areas of tests / examinations, lists of mandatory parameters, figures, concepts and calculations, practical skills)*

English questions for the Psychiatry and Psychotherapy final examination

Questions A

1. Diagnosis and classification in psychiatry (DSM-IV, DSM-5, ICD-10 and 11, the logic of diagnostic systems in psychiatry, diagnostic instruments)
2. Important test procedures in psychiatry (laboratory, psychological, brain imaging, electrophysiology)
3. Psychopharmacology I.: Antipsychotics and anxiolytics: mechanism of action, indications, effects and side effects
4. Psychopharmacology II.: Antidepressants, mood stabilizers, ant-dementia medications and stimulants: mechanism of action, indications, effects and side effects
5. Other biological therapies: electroconvulsive therapy, sleep, rTMS, bright light treatment.
6. Major and minor neurocognitive disorders (Dementia): etiology, diagnostic criteria and clinical management
7. Delirium-etiology, diagnostic criteria and clinical management
8. Schizophrenia-etiology, diagnostic criteria, subtypes, course and outcome, differential diagnosis
9. Schizophrenia-acute and long term treatment, rehabilitation
10. Mood (affective) disorders-etiology, diagnostic criteria, subtypes, course and outcome, differential diagnosis
11. Mood (affective)disorders-acute and long term treatment
12. Anxiety disorders: panic disorder and agoraphobia, generalized anxiety disorder, phobic disorders, etiology, epidemiology, diagnostic criteria, subtypes, course and outcome, differential diagnosis
13. Somatoform disorders, somatization and conversion disorders and hypocchondriasis- etiology, diagnostic criteria and clinical management
14. Alcohol use disorder-epidemiology, diagnostic criteria (including alcohol withdrawal and alcohol hallucinosis), course and outcome
15. Psychoactive Substance use disorders-diagnostic criteria and clinical management
16. Disorders of childhood and adolescence-diagnostic criteria of psychiatric disorders usually first evident in infancy, childhood or adolescence

Questions B

1. The neurobiological basis of mental disorders
2. Posttraumatic stress disorder: etiology, epidemiology, diagnostic criteria, subtypes, course and outcome, differential diagnosis, and treatment.
3. Obsessive-compulsive disorder: etiology, epidemiology, diagnostic criteria, subtypes, course and outcome, differential diagnosis, and treatment.
4. Alcohol use disorder (including alcohol withdrawal and alcohol hallucinosis) treatment and rehabilitation
5. Eating disorders-diagnostic criteria and clinical management
6. Old-age psychiatry
7. Sleep disorders-diagnostic criteria and clinical management
8. Sexual disorders-diagnostic criteria and clinical management
9. Personality disorders-diagnostic criteria (clusters a-b-c) and clinical management
10. Basic concepts and methods in psychotherapy.
11. Cognitive-behavioral therapy
12. Psychotherapy with special populations (addictology patients, psychotic patients)
13. Basic psychoanalytic concepts
14. Family therapy. Autogenic training. Hypnosis
15. Suicide and self-injurious behavior: etiology, epidemiology and prevention
16. Rehabilitation and community psychiatry, transcultural psychiatry

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Complete the internship according to the Study and Examination Regulations.

The list of items is available on the clinic's website at the following link:

https://semmelweis.hu/pszichiatria/files/2019/07/T%C3%A9telsor2019.pdf

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

oral exam

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI is not permitted when writing a case report or during the final exam.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Orvosi Képalkotó Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Prof. Dr. Maurovich Horvat Pál
Course coordinator location of work, telephone availability: Medical Imaging Centre, Semmelweis University, 459-1500/61626
Course coordinator position: professor, chairman
Course coordinator Date and number of habilitation: 2022, Semmelweis University

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Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the course is to: 1) introduce the role of medical imaging and interventional radiology in clinical practice, diagnostics and treatment of diseases; 2) teach the technical basis and clinical applications of the the different radiological modalities, 3) the delineation of the advantages and disadvantages of each modalities; 4) introduce the radiological appearance of most important and clinically relevant pathologies; 5) learn the professional teminology of imaging procedures; 6) discuss the preliminary preparation and scheduling of diagnostic imaging for the patients; 7)

introduce the radiological algorithms of the most frequent clinical symptoms and pathological conditions; 8) demonstrate the role of imaging examination in the patient care process and the importance of consultatons between clinician and radiologist.

Format of the course (lectures, group work, practical lessons, etc.):

group work, practical lesson

Competencies acquired through completion of course:

Knowledge of the basics of medical imaging is now an essential part of almost every clinical profession. The most important goal is to equip the students with competencies to choose the adequate imaging modalities and procedures for the patients and to properly interpret imaging diagnoses. This requires basic understanding and knowledge of radiological methodology, rediological terminology, the role of radiology in the patient care, the role of the referring physician and also the most important radiological diagnoses.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum number of students is 4.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students in 2-3 person minigroups can get practical knowledge in the following sites of the Institute: X-Ray, ultrasonography, CT, MRI, Emergency, Breast Imaging, Nuclear Medicine and Interventional radiology, spending 2-3 days in each clinical unit and work beside a radiologist or radiology resident.

Topics:

1. Basics of conventional x-ray examinations (x-ray image, fluoroscopy). Advantages,

disadvantages, clinical significance.
2. Basics of ultrasound (US). Advantages, disadvantages, clinical significance.
3. Basics of computer tomography (CT). Advantages, disadvantages, clinical significance.
4. Basics of magnetic resonance imaging (MRI). Advantages, disadvantages, clinical significance.
5. Basics of isotope diagnostics and hybrid imaging (PET/CT, PET/MRI). Advantages, disadvantages, clinical significance.
6. Vascular intervention: diagnostic and therapeutic methods. Advantages, disadvantages, clinical significance.
7. Nonvascular intervention: diagnostic and therapeutic methods. Advantages, disadvantages, clinical significance.
8. Contrast materials in radiology, physical background, types, applications and adverse reactions.
9. Interpretation of Chest X-ray.
10. Radiological diagnostics of thoracic emergencies.
11. Radiological diagnostics of abdominal and pelvic emergencies.
12. Radiological diagnostics of neurological emergencies.
13. Basics of head and neck imaging
14. Basics of musculoskeletal imaging.
15. Basics of complex breast diagnostics.
16. Role of the referring physician, preexam preparation of the patient, execution of the examinations.

Instructors involved in practical education / examination:

Dr. Barra Magdolna,Dr. Békésy-Szabó Ádám,Dr. Bérczi Viktor, Dr. Földes-Lénárd Zsuzsanna Mária, Dr. Dudás Ibolyka, Dr. Gulácsi György, Dr. Gyebnár János Norbert, Dr. Györke Tamás, Dr. Hegedűs Péter, Dr. Juharosi Gyöngyi Emese,Dr. Kalina Ildikó,Dr. Kaposi Novák Pál,Dr. Kiss Gergely,,Dr. Kristóf Emese, Dr. Magyar Máté, Dr. Marton Nikolett, Dr. Maurovich Horvat Pál, Dr. Tárnoki Ádám Domonkos, Dr. Tárnoki Dávid László, Dr. Vértes Miklós, Dr. Nádasy Tamás, Dr. Dudela Bianka Anna

Residents involved in practical education:

Dr. Csete Dániel, Dr. Al-Syed Sanad Isam, Dr. Ambrus Ágota, Dr. Balogh Hanna,, Dr. Borbély Klaudia, Dr. Csernus Emőke Anna, Dr. Csongrády Barbara, Dr. Göbl Kornélia, Dr. Gurza Kriszta Beáta, Dr. Hernyes Anita, Dr. Incze Zsuzsa, Dr. Kádár Christian Attila, Dr. Koroknai Artúr, Dr. Mohos Gábor, Dr. Munkácsi Tamás, Dr. Nagy Norbert, Dr. Póka Csenge Ágnes, Dr. Purczel Tamás, Dr. Siket Csaba Ellák, Dr. Simon Judit, Dr. Szabó István Viktor, Dr. Szeibel Leila, Dr. Szőke-Molnár Máté, Dr. Szöllősi Dávid, Dr. Szőllősi Panna, Dr. Tarján Hedvig, Dr. Teutsch Brigitta, Dr. Turtóczki Kolos György

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the current TVSZ regulations. Our educational-research unit provides sufficient opportunity for the make up on weekends and on-call times overnight. Notification of our educational site is comp

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

none

Number and type of individual assignments to be completed, submission deadlines:

2 radiology case reviews are required to be made by each student. The cases should consist radiology images with explanations and clinical summary.

Requirements for the successful completion of the course:

According to the current TVSZ regulations.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Exam teaching material: Lecture handouts, practice teaching materials and exam images, all available on Medical Imaging Centre's Moodle site.

Supplementary teaching material: Richard B. Gundermann: Essential Radiology, Thieme (2014); W. Herring: Learning Radiology (Elsevier, 2019)

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

radiology terminology

indications of iimaging studies

advantages and disadvantages of iimaging studies

chest and abdominal x-ray analysis

CT/MR anatomy

negative effects and contraindications of contrast agents

emergency radiological studies

FAST/eFAST ultrasonography

basic interpretation of CT, MRI and Nuclear Medicine images

role of the referring physician for imaging studies

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Theory test exam: 50 test questions based on the uploaded lectures and case reviews. Grades: 0-24 points: failed; 25-30 points: pass; 31-36 points: fair; 37-43 points: good; 44-50 points: excellent.

Final mark is determined by test exam result and the quality of the case reviews presented by the tudent (50-50%).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Orvosi Mikrobiológiai Intézet

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Dóra (igazgató)
Course coordinator location of work, telephone availability: Institute of Medical Microbiology
Course coordinator position: professor
Course coordinator Date and number of habilitation: 2010.06.07., száma: 311

Objectives of the course, and its place in the curriculum of the medical training program:

To increase the number of the professional medical microbiologists

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Format of the course (lectures, group work, practical lessons, etc.):

practice

Competencies acquired through completion of course:

Gain knowledge of techniques used in the detection of bacterial and viral infections.
In addition to classical microbiological tests, the student will be familiar with molecular techniques.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

final exam of Medical Microbiology II.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

none

The number of students required to start the course (minimum, maximum), method of selecting participants:

minimum 1, maximum 6

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1 week: Medium kitchen practice: preparation of culture media, reagent solutions; handling of infectious materials
Weeks 2-3: Presentation of routine microbiological diagnostic methods, interpretation of results
Weeks 4-6: Molecular methods in routine microbiological diagnostics and detection of hospital outbreaks

Teachers: Dr. Dora Szabo, Dr. Bela Kocsis, Dr. Andrea Horvath, Dr. Orsolya Dobay

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

to be present at 90% of the practices according to the Study and Examination Regulation

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

none

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

to be present at least 90% of the practices

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

- recognition and characterisation of smears, culture media, bacteria by colony morphology
- how to prepare culture media
- handling of infectious materials: autoclave, hot air steriliser parameters
- introduction to routine microbiological methods, performing biochemical reactions
- discussion of the results obtained using routine microbiological methods
- present the theoretical background of molecular methods and perform exercises

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The minimum questions are uploaded to the Moodle system:
https://itc.semmelweis.hu/moodle/course/view.php?id=10003

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and

conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

based on the presentation of the practical material

The course grade is based on the practical presentation of the course material

none

none

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Kardiológiai Tanszék - Kardiológiai Központ

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Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ - Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
magyar, német, angol

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Merkely Béla Péter (Klinika igazgató)
Course coordinator location of work, telephone availability: Heart and Vascular Centre of Semmelweis University +361458 6844
Course coordinator position: Director, Head of Department, University Professor
Course coordinator Date and number of habilitation: 26 May 2006; registration number: 234

Objectives of the course, and its place in the curriculum of the medical training program:

In the final year of training, an elective clinical practice can be completed in rotation at different invasive labs or other care locations. This includes understanding the indications, workflows, and routines at these sites. This course is primarily recommended for students with a professional interest in cardiology.

Format of the course (lectures, group work, practical lessons, etc.):

Bedside practice, participation in patient care under specialist supervision

Competencies acquired through completion of course:

During the 6-week elective cardiology practice, the student participates in outpatient and inpatient care in the chosen sub-discipline alongside their assigned mentor. This is done under the professional coordination of the mentor. As a result, the student acquires new competencies specific to the field and develops integrative professional thinking.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine I, Internal Medicine II, Radiology, Pulmonology, Cardiology, Surgery

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

NA

The number of students required to start the course (minimum, maximum), method of selecting participants:

In the order of registration in the Neptun system, with a minimum of 1 person and a maximum of 3

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Following the internal medicine final exam, students who choose the elective cardiology practice can deepen their practical cardiology knowledge in inpatient and outpatient care under medical supervision.

Tasks include:

- Structuring patient medical histories and recording the complaints
- Conducting detailed physical examinations.
- Establish preliminary diagnoses, prepare investigation and treatment plans, and explore

differential diagnosis possibilities based on the above.
- Continuously monitoring patient conditions, evaluating test results, and adjusting diagnostic and therapeutic plans accordingly.
- Actively participating in consultations.
- Actively acquiring and practicing simple and commonly used medical procedures under supervision:
    - Inserting peripheral venous cannulas,
    - Collecting venous blood samples,
    - Taking and analyzing arterial blood gas samples from the radial artery ("Astrup"),
    - Performing and evaluating ECGs,
    - Measuring non-invasive blood pressure,
    - Using acoustic mini-Doppler for peripheral circulation examination,
    - Applying and removing pressure bandages and vascular external compression devices.
- Evaluating routine laboratory results.
- Evaluating radiological findings.
- Participating in various examinations (e.g., ultrasound, CT, MRI, angiography) according to local availability.
- Learning the operation of unique cardiology workstations (hemodynamic lab, electrophysiology lab, pacemaker surgery, heart transplant unit, etc.).
- Weekend and night shifts, which count towards practical hours.
- Learning and practicing ethical and professional communication with patients, relatives, nurses, doctors, and other staff.

Tutors:

Demeterné Dr. Kiss Orsolya
Dr. Apponyi Györgyi Júlia
Dr. Bárczi György Erik
Dr. Becker Dávid
Dr. Bogdola Emese
Dr. Dohy Zsófia
Dr. Drobni Zsófia Dóra
Dr. Édes István Ferenc
Dr. Fábián Alexandra
Dr. Fülöp Gábor Áron
Dr. Gellér László Alajos
Dr. Hajas Ágota Helga
Dr. Herczeg Szilvia
Dr. Hizoh István
Dr. Horváthné Dr. Nagy Andrea
Dr. Jambrik Zoltán

Dr. Kiss Anna Réka
Dr. Kiss Dénes Zsolt
Dr. Kosztin Annamária
Dr. Kulyassa Péter Márton
Dr. Lakatos Bálint Károly
Dr. László János Marcell
Dr. Merkely Béla Péter
Dr. Mervai-Kuthi Luca Katalin
Dr. Molnár Andrea Ágnes
Dr. Nagy Anikó Ilona
Dr. Nagy Klaudia Vivien
Dr. Németh Balázs Tamás
Dr. Németh Marianna
Dr. Oláh Attila
Dr. Osztheimer István
Dr. Perge Péter
Dr. Ruppert Mihály
Dr. Sax Balázs
Dr. Sydó Nóra
Dr. Szegedi Nándor
Dr. Szilveszter Bálint
Dr. Szűcs Andrea
Dr. Tanai Edit
Dr. Tarjányi Zoltán
Dr. Vámosi Péter
Dr. Zima Endre István

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance is mandatory for 90% of the sessions. Missing sessions can be made up through duty or weekend work or by participating in the next rotation.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no formal assessment; the student receives verbal feedback from the mentor and the physician colleague teaching at the specific workstation.

Number and type of individual assignments to be completed, submission deadlines:

NA

Requirements for the successful completion of the course:

Participation in practice with the appropriate number of hours

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Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

NA

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Correct execution of a bedside physical examination, preparation and evaluation of an ECG

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

A practical grade based on the level of activity demonstrated during the practice.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Tűzoltó utcai részleg

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kovács Gábor (klinikai főorvos)
Course coordinator location of work, telephone availability: SE Gyermekgyógyászati Klinika Tűzoltó Utcai Részleg, 06-20-825-9265
Course coordinator position: tanszékvezető
Course coordinator Date and number of habilitation: 2009.06.02., Száma: 279

Objectives of the course, and its place in the curriculum of the medical training program:

The main aim of the sixth-year block of paediatrics is to teach the most typical clinical symptoms and the most common diseases, as well as the special features of the specialty and its everyday routine, and to acquire practical knowledge.

Format of the course (lectures, group work, practical lessons, etc.):

Participating in ward work, ward rounds

Competencies acquired through completion of course:

Paediatrics is a specialty that deals with the problems and diseases of a large special population.

Our goal is that upon completion of university studies, newly graduated doctors with up-to-date theoretical and practical knowledge will be able to perform independent general medical activities in the field of paediatrics as well.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pediatrics (6th year AOKGY2849_SA, AOKGY1848_SA)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in Neptun, maximum 14 people.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course syllabus: (if the course can be devided into modules, please indicate):

(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers/instructors. Ir cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Learning the special examination of children at different ages, carrying out and observing

interventions. Evaluation of laboratory results, analysis of blood and urine tests, learning the characteristics of imaging tests in childhood.

General topics:

General physical examination, examination of the throat, examination of the fontanels, signs of rickets and tetany, hip examination, elementary reflexes and movements, meningeal signs, neurological examination, assessment of vital parameters at different ages, use of percentiles. Calculating a baby's calorie need, calculating body surface area, pain and fever management. Assessment of somatic and mental development.

Treatment of priority diseases:

Resuscitation of newborns and children. Newborn care. Treatment of acute hypovolemic shock. Treatment of status asthmaticus, treatment of dyspnea. Treatment of status epilepticus, treatment of convulsive conditions

Treatment of diabetic ketoacidosis. Treatment of acute renal failure, hypertensive crisis. Care and diagnosis of a patient with bleeding from the unknown part of the gastrointestinal tract. Diagnosis and treatment of surgical patients with acute abdominal symptoms. Care of the patient with Addison's disease.

Differential diagnosis:

One of the most important elements of the training of 6th year students is learning the etiology of different symptoms and the diseases from the everyday practice. This knowledge is essential to take the initial diagnostic steps.

Daily work schedule of 6th year student

Morning (starting at 8AM):

Ward rounds: physical examination of patients, discussion of tasks for the day related to ward patients.

Ward work: check the priority patients at the ward and the interventions (individually). We consider it important to get to know the outpatient work belonging to the respective departments, so we also offer the opportunity to visit them.

Outpatient Department: once a week students have the chance to look into the work of one of the outpatient departments, to learn about patient follow-up and acute presentation of symptoms.

Tutors:

Dr. Andrási Noémi, Dr. Bakó Dorottya, Dr. Balázs Dóra, Dr. Bartha Áron, Dr. Bagyuráné Dr. Frank Veronika, Dr. Benyó Gábor, Dr. Bertalan Rita, Dr. Botlik Dóra, Dr. Botos Péter, Dr. Bots Bianka, Dr. Brückner Edit Ágota, Dr. Bűdi Tamás, Dr. Constantin Tamás, Dr. Czövek Dorottya, Dr. Csóka Monika, Dr. Csordás Katalin, Dr. Dobner Sarolta, Dr. Egyed Bálint, Dr. Erdélyi Dániel, Dr. Erdélyi-Nagy Blanka, Dr. Farkas Márk Kristóf, Dr. Felkai Luca, Dr. Frank Veronika, Dr. Garan Diána, Dr. Gács Zsófia, Dr. Garami Miklós, Dr. Goschler Ádám, Dr. Hegedűs Katalin, Dr. Hegyi Márta, Dr. Horváth Bertalan, Dr. Horváth Klára, Dr. Horváth Zsuzsanna, Dr. Hosszú Éva, Dr. Jenővári Zoltán, Dr. Juhász Orsolya, Dr. Kemény Viktória, Dr. Kiss Tamás, Dr. Klaus Laura, Dr. Koch Dóra, Dr. Kónya Sárma Sultana, Dr. Koós Olivér, Prof. Dr. Kovács Gábor, Dr. Kovács Janka, Dr. Lengvári Lilla, Dr. Lengyel Anna, Dr. Liptai Zoltán, Dr. Müller Judit, Dr. Naghizadeh Farzaneh, Dr. Nemes-Csertő Alinka, Dr. Németh Ágnes, Dr. Osztermayer Dorka Réka, Dr. Pálinkás Annamária, Dr. Papp-Bozzai Barbara, Dr. Párkányi Rebeka, Dr. Pásztor Borbála, Dr. Petes Cintia, Dr. Petró Anna, Dr. Péter Réka, Dr. Pfeffer Anita, Dr. Pinti Éva, Dr. Podráczky Noémi, Dr. Pomlényi Petra, Dr. Ponyi Andrea, Dr. Prokopp Tamás Benedek, Dr. Ranyák Márta Szilvia, Dr. Repkényi Dorottya, Dr. Sándor Réka Zsuzsanna, Dr. Sükösd Zita, Dr. Szabados Márton, Dr. Szabó András Lajos, Dr. Szabó Léna, Dr. Szabó Sándor, Dr. Szarvas Gábor Zsombor, Dr. Szikszay Orsolya, Dr. Tomsits Erika, Dr. Tóth-Szumutku Fanni, Dr. Turi Alexandra, Dr. Varga Martin István, Dr. Váncza Lóránd, Dr. Velkey Ábel, Dr. Vojnisek Zsuzsanna, Damó Eszter, Durst Anna, Bagó György, Kalmárné Rikker Zsuzsanna, Magyar Emma,

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKBHK785_SA, AOKGRI966_1A, AOKNO1655_SA, AOKCSA1133_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

It is compulsory to bring a stethoscope and white coat for the practices, without it the practice

will not be considered as completed. In accordance with the study and exam regulations, participation in 90% of the current total number of hours is mandatory. Replacement is possible at alternative times designated by the tutor of the student.

The evaluation of the course and its tutors by students is done through an online system during the duration of the practice.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

None

Number and type of individual assignments to be completed, submission deadlines:

Case presentation to be completed by the end of the practice.

Requirements for the successful completion of the course:

Attendance at at least 90% of the total number of hours. Completing the tasks listed on the "Qualification and evaluation" page and presenting practical skills.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Case presentation

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

A graduate medicine curriculum for case presentation must ensure students can deliver clear, structured, and concise presentations that accurately synthesize history, examination findings, and investigations into a coherent clinical summary with a prioritized differential diagnosis and management plan.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grades are based on the evaluation of the case presentation. The student’s performance is evaluated using a five-grade scale: excellent (5), good (4), satisfactory (3), pass (2), and fail (1).

See above

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of AI-based tools for learning purposes is permitted; however, they may not be considered official sources of information or study materials.

Printed resources:

Type	Recommended
Author	Karen Marcdante, Robert M. Kliegman, Abigail M. Schuh
Title	Nelson Essentials of Pediatrics 10. edition
Publisher	Elsevier Health Sciences
Year of publication	2026

Type	Recommended
Author	Robert C. Tasker, Carlo L. Acerini, Edward Holloway
Title	Oxford Handbook of Paediatrics
Publisher	Oxford University Press
Year of publication	2021

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Bőr-, Nemikórtani és Bőronkológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-Week Facultative Course
Name of subject in German: Wahlpflichtfach PJ-Klinische Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Holló Péter (igazgató)
Course coordinator location of work, telephone availability: Semmelweis University, Department of Dermatology-Venerology and Dermatooncology, 1085 Budapest Mária street 41. tel.: +36(1)266-0471/55727 (secretary's office)
Course coordinator position: Head of the Department
Course coordinator Date and number of habilitation: 02/2015

Objectives of the course, and its place in the curriculum of the medical training program:

To study the most common diseases, examination methods and therapies in dermatology, dermatooncology and venereology. The students can attend at the inpatient and outpatient units to deepen the knowledge acquired previously, and can participate in patient admissions and follow-ups. The students can attend at the emergency dermatology unit.

Format of the course (lectures, group work, practical lessons, etc.):

Practical exam

Competencies acquired through completion of course:

General competences: taking medical history, communicating effectively with the patients, performing a physical examination, summarising the data obtained during the examination, preparing a diagnostic and therapeutic plan.

Subject-specific competences: description of the dermatological status with primary and secondary signs, application of basic topical agents, treatment of pyoderma and ulcer, treatment of erysipelas, preparation of a dressing, recognition of chronic venous insufficiency, suspected arterial obliterative disease, treatment of herpes; HPV recognition and treatment; recognition and treatment of onychomycosis and intertigo; recognition and treatment of scabies and pediculosis; identification of clinical signs of gonorrhea, HIV diagnosis; syphilis diagnosis; recognition of the clinical signs of bacterial vaginosis, vulvovaginitis candidiosa, non-gonorrheal urethritis, recognition of suspected skin tumours (melanoma, basal cell carcinoma, squamous cell carcinoma), suspicion of psoriasis and psoriatic arthritis; recognition of the clinical picture of lichen ruber planus, rosacea, acne vulgaris; clinical differentiation of blistering skin diseases; suspect autoimmune blistering skin disease, recognise basic drug-related adverse reactions; suspect TEN by clinical examination; recognise and treat acute urticaria and Quincke's oedema; recognise burns and examination: independent, complete admission of a patient in an inpatient unit (medical history, dermatological and internal status) followed by diagnosis, formulation of an work-up and treatment plan.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Completion of the first 5 years of the university curriculum (by completing the courses taken during these years). Prerequisite is also a dermatology colloquium with a grade of 4 or 5. Undergraduate research in the field of dermatology-venereology, a completed rector’s competition or a degree thesis will be an advantage for the application.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of

selecting participants:

min.:1; max.:6

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

40 hours per week over 6 weeks.

Active participation in the daily patient care (inpatient and outpatient) of the Department

Active attendance according to the current schedule:

- General dermatology, immunology and dermatooncology inpatient units

- General dermatology and special outpatient units

- Attendance at the visits of the head of department

Gyakorlatvezetők:

Dr. Kende Lőrincz

Dr. Lajos Kemény

Dr Anikó Kovács

Dr. Eszter Müller

Dr. Ugur Cakir

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance is obligatory, and a maximum of 10% absence is allowed.

Assessment methods during semester (number, topics, and dates of midterms and reports,

method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Continous feedbacks from the attendings

Number and type of individual assignments to be completed, submission deadlines:

The patient's medical history, status, tests and therapy are presented orally or written in a form of an essay. Students may receive a grade out of 5 according to their knowledge.

Requirements for the successful completion of the course:

Active participation in the daily routine of the departmens

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical examination: independent, complete admission of a patient in an inpatient unit (medical history, dermatological and internal status) followed by diagnosis, formulation of an work up and treatment plan.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Writing a case study on a patient chosen by the student, including the medical history, physical examination, current complaints, treatment plan and epicrisis.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The patient's medical history, status, tests and therapy are presented orally or written in a form of an essay. Students may receive a grade out of 5 according to their knowledge.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Not relevant

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Recommended
Title	
Link	itc.semmelweis.hu

Type	Recommended
Title	
Link	http://cyberderm.net (DOIT)

Printed resources:

Type	Recommended
Author	Fitzpatrick
Title	Fitzpatrick’s Color Atlas and Synopsis of Clinial Dermatology
Publisher	Seventh Edition
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Urológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Nyirády Péter (Klinika igazgató)
Course coordinator location of work, telephone availability: Urológiai Klinika 20/825-8762
Course coordinator position: egyetemi tanár, igazgató
Course coordinator Date and number of habilitation: 283/2009

Objectives of the course, and its place in the curriculum of the medical training program:

Among the non-theoretical medical subjects, one of the most important is urology that based on practical training in surgery and internal medicine. Doctor of the future will definitely meet urological diseases during their everyday medical activities, as the average age increases, therefore the knowledge of urological diseases and their treatment, which occur in increasing proportion, is essential. We see the subject's place in the curriculum after the theoretical training in internal medicine and surgery, parallel to their practical training, in the final year.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lesson

Competencies acquired through completion of course:

Till the end of the 6-week practical training student learns the diagnosis and therapy of most common urological diseases. As part of the daily clinical practice the student participates in the professor's meetings and ward rounds, learns the processes of clinical administration and the basics of clinical ward work. The student also participates in urological surgeries, acquires basic surgical skills (stitching, tying, suture removal, wound treatment). In the Oncology Unit of Department students will learn about the investigation and treatment of uro-oncological diseases.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

The 6-week urology course can be choosen in the final year after successful completion of fifth year’s surgery, internal medicine and urology exams.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The 6-week urology course can be taken just in the final year.

The number of students required to start the course (minimum, maximum), method of selecting participants:

We can accept a minimum of 1 and a maximum of 4 students, in the order of application on the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

For 6 weeks, in a repeating dailiy routine:

7:00-7:45 ward visit and patient care

7:45-8:15 professor’s morning meeting

8:15-12:00 surgical assistance, outpatient clinic participation at specialized clinics

Diagnostics, therapy and follow-up of the treated diseases will be presented by an expert.

12:00-15:00 ward work, participation in the afternoon visit

15:00-15:30 professor’s afternoon meeting

EVERY MONDAY 15:30-16:00 scientific meeting

During the 6 week 3 times participation in 12-hour on-call duty.

Specialized outpatient clinics: general urology, uro-oncology, andrology, urodynamics and urethral surgery

Guest lecturers do not participate in the training.

Instructors:

Dr. Gergely Bánfi, Dr. Áron Bécsi, Dr. András Horváth, Dr. András Hüttl, Dr. Attila Keszthelyi, Dr. Zsolt Kopa, Dr. András Kubik, Dr. Attila Majoros, Prof. Péter Nyirády, Dr. Péter Riesz, Dr., Miklós Romics, Dr. János Szalontai, Dr. Tamás Széll, Dr. Miklós Szűcs, Dr. Judit Vargha

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Of the 240 hours maximum 24 hours can be missed without proof. In case of more confirmed absences, the missed hours can be replaced in 12 hours shifts on the rest days or holidays of the 6-week cycle.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course

grade, opportunities for make-up and improvement of marks)

There is no assesment during the 6 week course.

Number and type of individual assignments to be completed, submission deadlines:

During the clinical practice an interesting case should be presented by the student.

Presentation should contain symptoms, diagnostics and treatment steps of the disease, as well as the the related guidelines.

Requirements for the successful completion of the course:

Participation at least 216 hours on the course.

Prove the required independent practical skills and the signatures certifying completion.

Presented case accepted by specialist’s medical conference.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

No exam after the course.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

- Case presentation

- Attendance in the number required by the examination regulations

- The absence of any of the basic urological knowledge contained in the textbook may result in a failing grade

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of

and conditions for offered grades)

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	P. Nyirády, I. Romics
Title	Textbook of Urology
Publisher	Semmelweis Pub.
Year of publication	2009

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sebészeti, Transzplantációs és Gasztroenterológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ - Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szijártó Attila (Klinika Igazgató)
Course coordinator location of work, telephone availability: Department of Surgery, Transplantation and Gastroenterology, 1082 Budapest, Üllői út 78., +3613335343
Course coordinator position: professor, head of department
Course coordinator Date and number of habilitation: 2015.06

Objectives of the course, and its place in the curriculum of the medical training program:

The purpose of the six-week facultative surgery practice is firstly to refresh the knowledge gained in the fourth year, but also demonstrate its practical application. Now equipped with multidisciplinary knowledge, students can participate in surgical inpatient (surgical ward) and outpatient care (surgical ambulance), follow the daily activities of their tutors and perform tasks (patient examination, administration, development of treatment strategies, decision making in the clinic, operating room activities) on a daily basis.

Format of the course (lectures, group work, practical lessons, etc.):

Practice

Competencies acquired through completion of course:

By the end of the surgical rotation, students will have gained a comprehensive picture of the surgical profession and their adherent activities. They will be able to set up diagnostic algorithms and - under supervision - perform the partial tasks of clinical work.

It is important to note that a deeper understanding of everyday activities helps students in choosing their future specialty and arouses their interest towards surgical professions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II.

Sugery

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on the registration in the Neptun system, a minimum of 1 and a maximum of 20 students in a practical program.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students spend six weeks in the general surgery department according to their timetable. The daily schedule of the practice corresponds to the official working hours. In addition to practical patient care, a seminar and a case discussion are scheduled daily. The curriculum covers both general and specialized surgery.

Mandatory and recommended practical activities: (Mandatory practical activities marked in bold)

Admnistration of intramuscular injection

Admnistration of intravenous injection

Setting up and administering infusions

Blood sampling

Blood group determination

Participation in setting up a blood transfusion

Rectal digital examination (documention of negative or positive findings)

Placing a duodenal tube

Placing a urinary bladder catheter (men and women)

Observe a central venous cather palcement

Observe the placement of a Sangstaken or Linton tube

Wound dressing placement and changes

Participation in bacteriological sampling

Application of an elastic bandage

Suture removal

Staple removal

Drain removal

Suturing

Participation in rectoscopic, anoscopic (colonoscopic) examination

Participation in gastro-duodenoscopy

Participation in examination/exploration of a superficial abscess

Participation in nail sampling

Participation in abdominal (ascites) or chest puncture

Examination of carotid and peripheral vessels

Participation in Doppler examination

Tutors:

Dr. Al-Sheraji Nada Mohamed

Dr. Bánky Balázs

Dr. Bárdos Dávid

Dr. Bencze Viktória

Dr. Benke Márton

Dr. Bihari László Ádám

Dr. Csuja Nándor

Dr. Daradics Noémi

Dr. Deák-Ilkó Zoltán

Dr. Doleviczényi Levente

Dr. Drexler Tímea

Dr. Eitler Katalin

Dr. Erdélyi Péter

Dr. Fülöp András

Dr. Hamar Mátyás

Dr. Herczeg András

Dr. Huszty Gergely Dénes

Dr. Illés Kristóf

Dr. Klárik Zoltán

Dr. Kóbori László

Dr. Kokas Bálint

Dr. Kolostyák Zsuzsanna

Dr. Kovács János Balázs

Dr. Lakatos Lóránd

Dr. Lehoczki Csaba Ferenc

Dr. Lengyel Bóra Blanka

Dr. Lukász Péter

Dr. Marjai Tamás

Dr. Meltzer Anna

Dr. Mester Zsófia

Dr. Mózer Andreas Rajmund

Dr. Nyirády Loretta

Dr. Pálházy Tímea

Dr. Pekli Damján

Dr. Rózsa Balázs

Dr. Scutaru Tabita Timeea

Dr. Szabó József

Dr. Szelle Bálint Tibor

Dr. Szepesi Ágnes

Dr. Szlávik Rezső

Dr. Szőke Szilvia

Dr. Telkes Gábor

Dr. Tóth Enikő

Dr. Ulmann Lőrinc

Dr. Vass Tamás

Dr. Völcsei Norbert

Dr. Voniatis Konstantinos

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

As stated in the study and examination regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

As stated in the study and examination regulations

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical exam

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Mandatory and recommended practical activities: (Mandatory practical activities marked in bold)

Admnistration of intramuscular injection

Admnistration of intravenous injection

Setting up and administering infusions

Blood sampling

Blood group determination

Participation in setting up a blood transfusion

Rectal digital examination (documention of negative or positive findings)

Placing a duodenal tube

Placing a urinary bladder catheter (men and women)

Observe a central venous cather palcement

Observe the placement of a Sangstaken or Linton tube

Wound dressing placement and changes

Participation in bacteriological sampling

Application of an elastic bandage

Suture removal

Staple removal

Drain removal

Suturing

Participation in rectoscopic, anoscopic (colonoscopic) examination

Participation in gastro-duodenoscopy

Participation in examination/exploration of a superficial abscess

Participation in nail sampling

Participation in abdominal (ascites) or chest puncture

Examination of carotid and peripheral vessels

Participation in Doppler examination

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of

and conditions for offered grades)

Practical grade (1-5)

Practical exam at the patient room.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Pulmonológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Müller Veronika
Course coordinator location of work, telephone availability: Pulmonology Clinic, +36-1-355-9733
Course coordinator position: professor of medicine, head of department
Course coordinator Date and number of habilitation: 2010.06.07. 307/2010

Objectives of the course, and its place in the curriculum of the medical training program:

To acquire a deeper level of general medical competence in the investigation and management of pulmonary diseases. The aim is to achieve a high level of mastery of at least 2 elements of diagnostic and/or therapeutic care in pulmonary medicine during the 6-week clical training. Elements may be chosen where the acquisition of these skills will help the student to work independently as a doctor in the future. The skills will be assessed jointly by the student and the teacher at the end of the

training program.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lessons, group work.

Competencies acquired through completion of course:

More detailed knowledge on the diagnostic and/or therapeutic elements used in clinical practice than in 4th year. The aim is to acquire at least 2 diagnostic and/or therapeutic elements that are used with a high level of knowledge in general medical practice.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Pulmonology, oncology, internal medicine.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum 1 student, maximum 15 students

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Subject summary

Pulmonology is an optional 6-week block of the 6th year at the Pulmonology Clinic (1083 Budapest VIII. district, Tömő u. 25-29.). During the 6-week programs, students receive continuous practical training (6 credits) to deepen their theoretical knowledge of the subject and to acquire practical skills in the most important pulmonary diagnostic and therapeutic procedures.

The training program will take place with the supervision of an individually assigned mentor of the clinic. It is recommended that the student should acquired at least 2 diagnostic and/or therapeutic elements applied in general medical practice with a high level of knowledge.

Suggested diagnostic/therapeutic elements to be mastered according to the special pulmonary area represented by the designated mentor.

Pulmonological diagnostic elements

• Performing a blood gas test and evaluating the findings

• Evaluation of respiratory function findings: differentiation of ventilation disorders, differential diagnosis

• Evaluation of ECG in pulmonology patients for pulmonology practice

• Evaluation of ergospirometry

• Patient preparation for bronchoscopy

• Patient preparation for invasive thoracic surgery

• Evaluation of ECHO findings

• Practice of sleep diagnostic screening (polygraphy), evaluation of findings

• 6MWT

• Allergological examination and evaluation of findings

Pulmonological therapeutic elements

• NIV tools • Oxygen therapy methods

• Inhalation device practice

• Basic elements of respiratory rehabilitation

• Preparation of patient documentation and presentation in the oncology team

• Preparation and presentation of patient documentation in the ILD team

Teachers responsible for lectures and practices - Pulmonology:

Prof. Dr. Müller Veronika, Prof. Dr. Tamási Lilla, Prof. Dr. Losonczy György, Prof. Dr.med. habil. Varga János Tamás, Dr. med habil. Horváth Gábor, Dr. Bárczi Enikő, Dr. Bohács Anikó, Dr. Csoma Balázs, Dr. Csósza Györgyi, Dr. Eszes Noémi, Dr. Fekete Dorottya, Dr. Fésü Dorottya, Dr. Guth Krisztina, Dr. Hammer Dániel, Dr. Hidvégi Edit, Dr. Horváth Péter, Dr. Jalsovszky Péter Leó, Dr. Karlócai Kristóf, Dr. Kováts Zsuzsanna, Dr. Lázár Zsófia, Dr. Mák Bernadett, Dr. Mihály Júlia, Dr. Nagy Alexandra, Dr. Oroszi Dóra, Dr. Palmer Erik, Dr. Polivka Lőrinc, Dr. Südi András, Dr. Süttő

Zoltán Ágoston, Dr. Tassó Zsófia, Dr. Tóth Nóra Melinda, Dr. Varga Viktória, Dr. Varga Rita, Dr. Zsámboki Gabriella.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Training elements will be held according to the at pre-announced timetable. Absences from class are permitted

in accordance with the TVSZ. Additional absence must be made up preceedingly with the head of the department.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

(including the number, topics and scheduling of oral and written tests, their share in the overall evaluation, make-up tests and improvement tests)

Number and type of individual assignments to be completed, submission deadlines:

Practical demonstration of 2 topics-

Requirements for the successful completion of the course:

According study and examination regulations.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

According study and examination regulations.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts,

parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Active participation in exercises.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Practical grade (1-5) wiht at least grade 2 for both exams.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	Prof. Dr. Müller Veronika
Title	Respiratory Medicine
Publisher	Semmelweis Kiadó és Multimédia Stúdió Kft
Year of publication	2024

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Fül-Orr-Gégészeti és Fej-Nyaksebészeti Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Polony Gábor (klinikaigazgató)
Course coordinator location of work, telephone availability: Department of Otorhinolaringology, Head and Neck Surgery, +3613333316
Course coordinator position: associate professor, head of department
Course coordinator Date and number of habilitation: 2023.06.13., 16/2023

Objectives of the course, and its place in the curriculum of the medical training program:

Learning about ENT diseases and their therapy, learning about patient examination, recognizing and treating emergency ENT diseases.

Format of the course (lectures, group work, practical lessons, etc.):

Group work, practice, assistance in the operating room, work in inpatient ward

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Competencies acquired through completion of course:

Proficiency level introduction to the basics of ENT.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II., Surgery.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

min. 2, max.3.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

There are 5 departments at the Semmelweis University Department of Otolaryngology and Head and Neck Surgery. Students are assigned to these departments in 1-week cycles, and are involved in department work. In addition, they are assigned to assist in surgeries.

They are assigned to outpatient clinics for 1-1 day as follows:

Allergology - Dr. Helga Kraxner

Smell Clinic - Dr. Helga Kraxner

Speech Therapy - Mónika Bodroghelyi

Phoniatrics - Dr. Zoltán Fent

Sleep Clinic - Dr. Viktória Molnár

Audiology - Dr. Anita Gáborján

Oncology Clinic - Dr. Péter Prekopp

Otoneurology - Prof. Dr. Ágnes Szirmai, Dr. Beáta Bencsik

Cochlear Implant Clinic - Prof. Dr. László Tamás, Dr. Anita Gáborján

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to STUDY AND EXAMINATION REGULATIONS

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Oral reports for helping the learn the workflow.

Number and type of individual assignments to be completed, submission deadlines:

Oral reports to help to learn the work processes

Requirements for the successful completion of the course:

Personal presence

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Clinical practice in the examination room, preparation for surgical assistance

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Clinical work, preparation for surgical assistance

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

1-5 grade

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Traumatológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ - Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bodzai Tamás János (klinikaigazgató)
Course coordinator location of work, telephone availability: Semmelweis University Clinic for Traumatology, e-mail: office.trauma@semmelweis.hu, Tel: 06 20/825-8680
Course coordinator position: Head of department, associate professor
Course coordinator Date and number of habilitation: 2025.03.12. 37995/HABIZ/2025

Objectives of the course, and its place in the curriculum of the medical training program:

Traumatology as a specialty deals with the treatment of injured patients, independent of the injured organ, patient’s age or previous diseases. In developed countries, the 4-5th leading cause of death is injury, while in the actively working population, the rate of death is even higher. Morbidity in children and in the elderly is also high. Since the patient examination and therapeutic algorithm somewhat differ from the previously taught examination and treatment methods in the curriculum, our aim is to offer a general and practical approach to treating trauma patients for students. The

prerequisite for 6th year Traumatology is the material and exam from the 5th year in Traumatology, to be used in a more practical manner. Beside this, familiarization and active participation in the daily routine of a Traumatology department play a role in the students' curriculum.

Format of the course (lectures, group work, practical lessons, etc.):

The six-week practice is spent by students in active inpatient traumatology departments, where they participate in the daily activities and duties of the department.

Competencies acquired through completion of course:

During practices, students will have the opportunity to learn the following: physical examination of injured patients, bandaging, suturing, casting techniques, and the uses of orthesises and splints. Consultation of typical and the more frequent trauma cases, radiologic diagnostics, as well as shadowing, observing and/or assisting in the operating theater are also part of the curriculum. In the ER, students will have an opportunity to examine and participate in the trauma care of patients under supervision.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II., Surgery, Traumatology and Orthopedics

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum: -

Maximum: Depends on each teaching hospital's capacity

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1.) Daily attendance of morning conference. After becoming acquainted with the introduced cases, students will have the opportunity to examine the hospitalized patients and familiarize themselves with patient's documentation.

2.) Assisting or observing in the operative theater, depending on the operative program.

3.) Students shall participate in patient admission, examination, follow and help in the evaluation of the diagnostic examinations, and take part in the acute treatment of traumatized patients during on duty shifts.

4.) Participating in grand rounds, patient presentation, and following up on referrals.

5.) Consultation with attending tutor of actual clinical cases, planning the treatment and the course of patient follow up.

6.) Taking part in patient follow up examinations. Examining the range of motion, function, evaluating x-rays and CT scans. Identification and treatment of complications.

Detailed syllabus:

1. First Aid
2. Evaluation of the mental-stage/orientation with the Glasgow-score
3. Evaluating and management of external wounds
4. Termination of bleeding
5. Transportation of trauma patient
6. Transient fixating bandage of traumatic part of body
7. Preparation of the surgical area
8. Surgical scrub-in and clothing
9. Infiltrational anaesthesia
10. Incision and drainage
11. Management of infected, necrotic wound
12. Closure
13. Stitch removal
14. Applying pressure-bandage
15. Reuniting closed fractures
16. Fracture stabilization
17. Reduction of dislocation
18. Transient fixation of broken extremities
19. Pain management
20. Assisting surgical procedures

Tutors:
Dr. Abonyi Bence, Dr. Asztalos András, Dr. Balsai Tamás, Dr. Bodzay Tamás, Dr. Cséka Botond, Dr. Dobrean Levente, Dr. Faragó Bence, Dr. Fehér Milán, Dr. Gábor Áron, Dr. Gömöri Kristóf, Dr. Hangody László, Dr. Kalóz Erika, Dr. Kardos Dániel, Dr. Kassai Tamás, Dr. Keszég Miklós, Dr. Koczka Dániel, Dr. Kocsis András Bernát, Dr. Kosztin Árpád, Dr. Lányi Péter, Dr. Lepár Gábor, Dr. Lengyel Ágnes, Dr. Ludas István Tamás, Dr. Mayer Lilla, Dr. Naphegyi Andrea, Dr. Pahlavanyali Afshin, Dr. Pánics Gergely, Dr. Pap Károly, Dr. Szabó Gergely, Dr. Szabó Sándor, Dr. Szmola Dániel,

Dr. Sztrinkai Gergely, Dr. Varga Péter, Dr. Végh György, Dr. Zöld Marcell

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Duration of the practice: 6 week (240 hours)

The certificate (for students spending the practice abroad) or attendance sheet (students spending the practice in Budapest) must be handed in or scanned and emailed to the Traumatology Department upon completion of the practice.

Option for making up missed sessions: According to the TVSZ

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The interactive seminars and practices allows for the assessment of students' progress. There will be no formal test/quiz during the practice week.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Attendance of the practice (6 weeks - 240 hours), as well as the signed and stamped attendance sheet (and/or certificate) according to the directions written on the department's website (based on where the student spends their practice)

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

During the practical exam, the student is required to orally demonstrate their practical knowledge by drawing two topics from the syllabus.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Minimum requirements for assessment

1. First Aid
2. Evaluation of the mental-stage/orientation with the Glasgow-score
3. Evaluating and management of external wounds
4. Termination of bleeding
5. Transportation of trauma patient
6. Transient fixating bandage of traumatic part of body
7. Preparation of the surgical area
8. Surgical scrub-in and clothing
9. Infiltrational anaesthesia
10. Incision and drainage
11. Management of infected, necrotic wound
12. Closure
13. Stitch removal
14. Applying pressure-bandage
15. Reuniting closed fractures
16. Fracture stabilization
17. Reduction of dislocation
18. Transient fixation of broken extremities
19. Pain management
20. Referring patients between physician colleagues
21. Knowledge of medical documentation and the basic rules of maintaining it
22. Assisting surgical procedures
23. Formulating therapeutic recommendations

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

According to the participation demonstrated during the 6-week practice (activity), and the result of

the practice exam.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle

Printed resources:

Type	Mandatory
Author	Editors: Andrew B. Peitzman Michael Rhodes C. William Schwab Donald M. Yealy Timothy C. Fabian
Title	The Trauma Manual: TRAUMA AND ACUTE CARE SURGERY Third edition
Publisher	Wolters Kluwer / Lippincott Williams & Wilkins
Year of publication	1

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Gyermekgyógyászati Klinika - Bókay utcai részleg

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ - Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szabó Attila József (Klinika igazgató)
Course coordinator location of work, telephone availability: Gyermekgyógyászati Klinika, Bókay utcai részleg, 06-1-334-3186
Course coordinator position: professor, head of department
Course coordinator Date and number of habilitation: Budapest, June 7. 2010. , No: 310

Objectives of the course, and its place in the curriculum of the medical training program:

The main task of the students is to acquire basic skills and knowledge in the field of infant and pediatric medicine. In the 6th year, independent patient care is provided under the guidance and supervision of specialist physicians, which includes patient examination, attendance, independent patient referral, and documentation of patient care

Format of the course (lectures, group work, practical lessons, etc.):

practice

Competencies acquired through completion of course:

Infant and pediatric medicine is a specialization dealing with special problems and diseases of a large population. Our goal for newly graduated physicians is to possess advanced theoretical and practical knowledge at the end of their university studies and to be able to practice independent medical practice in the field of infant and pediatric medicine.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Accomplishment of the 6th year Pediatrics compulsory rotation.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

None

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on Neptun registration, maximum 12 students

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

In view of the low number of students expected to opt for a new curriculum this school year, students will be assigned to different tutors in a so-called shadowing system for the entire period. The instructor involves the student in his/her work in the wards as well as in outpatient care and participates in ward visits. In a 3x2 week block system, one student is assigned to three instructors.

Instructors: Ádámi Lilla, Agócs Róbert, Antal Zsuzsa, Antal-Kónya Violetta, Balogh Ádám, Bánki Nóra Fanni, Becsei Dóra, Bednárik Mihály, Béres Nóra, Boczkó Zita, Bojtár Zsüliet, Brandt Ferenc, Cseh Áron, Csizek Zsófia, Csekő Anna, Czifrus Eszter, Dezsőfi-Gottl Antal, Détár Máté, Elblinger Zsuzsanna, Etlinger Péter, Farkas Ferenc Balázs, Farkas Zsófia, Fülöp Lili, Gayerhosz Kata, Halász

Zita, Hartmann Alexandra, Hegedüs Péter, Horváth Éva, Horváth Erzsébet, Kálmán Attila, Kalocsai Krisztina, Kaucsár Tamás, Kardics Kinga, Kincs Judit, Kiss András, Kossuth Laura, Kovács Lajos, Krikovszky Dóra, Krivácsy Péter, Kosik Anna, Legeza Balázs, Lévai Eszter, Lódi Csaba, Lóth Szendile, Luczay Andrea, Mahdi Leina, Makai Márton, Méder Ünőke, Mészáros Bence, Mikes Bálint, Molnár Ágnes, Nagy Csilla, Pál Vanda, Pápai János, Perneczki Andrea, Pék Tamás, Prehoda Bence, Reusz György, Rohács Diána, Seidl Dániel, Stark Bence, Szász Barbara, Szaniszló Eszter, Szopori Kata, Tallós Zsuzsanna, Tél Bálint, Tóth-Heyn Péter, Ungvári-Veres Anita, Vámos Anna, Vatamány-Einbeck Adrienn, Vicenç-Bonet Mateu-Juliá, Végh Anna

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

10% absence allowed according to Semmelweis University Study and Examination Regulations

Wearing a white lab coat and bringing/using a stethoscope is mandatory during practice. Students confirm their daily presence by signing in the attendance sheet.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Not applicable

Number and type of individual assignments to be completed, submission deadlines:

Not applicable

Requirements for the successful completion of the course:

The completion of the interventions and the presentation of the attendance sheet signed by the designated tutors

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Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Graded practical exam. During the practical exam students needs to take patient history followed by a physical examination, outlining a management plan and discussion of the differential diagnosis.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Please see point nr. 29.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The practical exam assessed by a five-level mark (excellent (5), good (4), average (3), fair (2), unsatisfactory (1)

Artificial intelligence systems used in the teaching of the subject and the manner of their application

The use of learning aids supported by artificial intelligence is permitted; however, they are not considered official sources of information or educational material and may not be used during the exams.

Printed resources:

Type	Recommended
Author	Tom Lissauer, Graham Clayden:
Title	Illustrated Textbook of Paediatrics (Fourth Edition)
Publisher	
Year of publication	

Type	Recommended
Author	William W. Hay, Jr., Myron J. Levin,Robin R. Deterding, Mark J. Abzug
Title	Current Diagnosis & Treatment Pediatrics 23rd edition
Publisher	Lange, ISBN: 978-0071848541
Year of publication	2016

Type	Recommended
Author	Silver, Kempe Bryn and Fulginiti's

Title	Handbook of Pediatrics
Publisher	Appleton and Lange. ISSN 0440-192
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Ortopédiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ - Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szőke György
Course coordinator location of work, telephone availability: SE ÁOK Ortopédiai Klinika, e-mail: szoke.gyorgy@semmelweis.hu, tel.: +36-20-825-8326
Course coordinator position: tanszékvezető, egyetemi tanár
Course coordinator Date and number of habilitation: 2007.05.30., 257/2007. Semmelweis Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

The subject of orthopedics encompasses congenital abnormalities, degenerative changes and tumorous diseases of the musculoskeletal system. Almost every practitioner of any discipline encounters problems of an orthopedic nature, therefore it is essential to know the diagnostics and treatment options of basic pathologies. Equally important is the timely recognition of special, urgent, and possibly surgically requiring pathologies. The subject of orthopedics interweaves and

organically integrates the knowledge of other disciplines, therefore it requires more than average “lateral thinking” abilities and synthesizing thinking from students. This is what we want to focus on.

Format of the course (lectures, group work, practical lessons, etc.):

Students spend the six-week internship in the department, participating in daily classroom activities, and gaining insight into surgical activities.

Competencies acquired through completion of course:

During the practicals, they learn and practice patient examination. In the outpatient clinic, they have the opportunity to examine patients and participate in their treatment. In the operating room, they observe and assist in surgeries. They consult on more common cases and gain insight into the diagnostic examinations of orthopedic patients.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum: -

Maximum: The number of students varies in each educational institution.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

- participation in the morning conference

- patient admission, patient examination

- suture picking

- surgical washing, dressing, assistance

- surgical wound closure

- consultation with a tutor about current diseases

- evaluation of X-ray, MRI, CT images

Instructors:

Dr. Aczél Dóra, Dr. Antal Imre, Dr. Babiák Lilla, Dr. Bárány Tamás,,Dr. Bartha Lajos, Dr. Bejek Zoltán, Dr.
Boros Roxána, Dr. Czibere Réka, Dr. Domos Gyula, Dr. Dorony Balázs, Dr. Drajkó Balázs, Dr. Dudás Emese, Dr.
Dudics Vince, Dr. Gresits Orsolya, Dr. Hergár Luca, Dr. Holnapy Gergely, Dr. Horváth Nikoletta, Dr. Kaszap
Balázs, Dr. Kiss János, Dr. Kiss Sándor, Dr. Kocsis György, Dr. Kovács Krisztián, Dr. Moghaddam Amin
Maysam, Dr. Perge Anna, Dr. Perlaky Tamás, Dr. Poór Valentin, Dr. Posta András, Dr. Rein Péter László, Dr.
Sallai Imre, Dr. Skaliczki Gábor, Dr. Somogyi Péter, Dr. Stubnya Bence Gusztáv, Dr. Sükösd Ákos,Dr. Szabó
Miklós Károly, Dr. Szalay Krisztián, Dr. Szatmári Attila, Prof. Dr. Szendrői Miklós, Dr. Szilágyi Gábor, Prof. Dr.
Szőke György, Dr. Terebessy Tamás, Dr. Tolnay Ráchel, Dr. Varga Csaba, Dr. Vezér Mátyás, Dr. Virág-Tulassay
Eszter, Dr. Weninger Viktor

Students attend the morning conference daily. Following the case presentations, a detailed examination of the patient and documentation is conducted. Depending on the surgical program, they assist or observe surgeries.

During the practice, the student acquires proficiency in the indications of orthopedic non-physical diagnostics. They learn about the options for surgical and conservative treatment of orthopedic pathologies. They understand the relationships between the most important orthopedic pathologies.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Internship duration: 6 weeks (240 hours).

In the Departmental institutions, it is mandatory to keep an attendance sheet, which is certified by

the tutor's signature and seal at the end of the internship.

Abroad, at the end of the internship, the certificate must be signed and stamped in the manner prescribed in the appropriate forms.

Absence, replacement: according to the TVSZ.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no intermediate assessment during the educational period. However, the interactive nature of the exercises allows for continuous monitoring of students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Completion of the practical time (6 weeks - 240 hours), at the end of the practical the attendance sheet (and/or certificate) authenticated by the tutor's signature and seal.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

During the practical exam, the student gives an oral account and presents his/her practical knowledge.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

See point 29.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

According to the participation certified during the 6 weeks of practice. (activity).

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Mandatory
Author	Miklós Szendrői
Title	Orthopaedics
Publisher	Semmelweis
Year of publication	2009

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Hematológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
angol

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Masszi Tamás Pál (Klinika igazgató)
Course coordinator location of work, telephone availability: 1088 Budapest, Szentkirályi u. 46., +36 1 375-4364
Course coordinator position: egyetemi tanár, klinikaigazgató
Course coordinator Date and number of habilitation: 2010.06.07., száma: 305

Objectives of the course, and its place in the curriculum of the medical training program:

The main aim of the module is to introduce these specialties beyond the scope of the internal medicine II course. An intensive clinical experience will be provided, during which the student will be closely acquainted with the details of immunological, cardio-metabolic and haematological diagnostics and therapy, and will participate in the daily routine of outpatient care and hospital treatment. In addition to routine procedures, you will have the opportunity to gain experience in

high time factor situations. We will present available therapeutic options and clinical trials.

Format of the course (lectures, group work, practical lessons, etc.):

Internal Medicine Department, bedside practice, taking part in the general patient care under supervision.

Competencies acquired through completion of course:

The student will be able to order, perform and evaluate basic immunological, haematological, diabetological and major cardiological diagnostic tests. be familiar with the use of different therapeutic modalities.

Primary care of acute complications of diabetes, therapeutic decisions, patient education, cardiovascular risk assessment, basic ECG analysis, use of oriented cardiovascular ultrasound.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Students are registered in the NEPTUN System (min. 3 max. 25)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

During the practice the student is assigned to a Tutor or to a Medical Team and is shadowing the work
of them. Student can work only under the continuous careful supervision of a tutor who is responsible
for the student. Daily work hours for the student: 8 hours.
Activities during the practice should include the following:
- examination of patients in the department, with special emphasis to case history taking and full
physical examination.

- gain practice in patient documentation, problem-oriented medical record keeping.
- participate in the preparation of diagnostic and therapeutic plan for patients, differential diagnosis of the case.
- take an active part in medical consultations concerning their patients, as well as in the medical
conferences in the department.
- participate actively or as an observer at invasive and semi-invasive interventions, diagnostic or
imaging procedures.
- evaluation of routine laboratory results
- evaluation of imaging results
- possible participation on night or weekend duties
- get to know the work of the special sections of the department
- regular consultations with the doctor responsible for the student.
- students should also practice communication with patients and their relatives, while giving them relevant medical information on the disease but avoiding conflicts with medical confidentiality.

Dr. Agárdi Annamária, Dr. Ambrus Viktória, Dr. Babayigit Kevin, Dr. Babici Klaudia, Dr. Barsi Ádám, Dr. Bátai Bence, Dr. Bodó Imre, Dr. Farkas Péter, Dr. Fehér Ágnes, Dr. Forstreuter Vilmos, Dr. Franka János, Dr. Gráf László, Dr. Horváth Anna, Dr. Horváth Eszter, Dr. Horváth Laura, Dr. Hosszúfalusi Nóra, Dr. Huszár Máté, Dr. Illés Sarolta, Dr. Jakab László, Dr. Jenei Zsigmond, Dr. Juhász Renáta, Dr. Kalabay László, Dr. Kalabay Márton, Dr. Karádi István, Dr. Kárpáti Ágnes, Dr. Katona Gábor, Dr. Keltai Katalin, Dr. Kempler Miklós, Dr. Lohinszky Júlia, Dr. Lukács Krisztina, Dr. Mihály Emese, Dr. Müller Gábor, Dr. Műzes Györgyi, Dr. Nagy Ákos, Dr. Nagy Géza, Dr. Nagy Viktor, Dr. Nagy Zsolt, Dr. Nagy-Czirok Kálmán, Dr. Nebenführer Zsuzsanna, Dr. Nemcsics Balázs, Dr. Peskó Gergely, Dr. Pozsonyi Zoltán, Dr. Pusztai Péter, Dr. Sármán Beatrix, Dr. Sipos Ferenc, Dr. Sipter Emese, Dr. Svorenj Szabolcs, Dr. Szabó Zoltán Barnabás, Dr. Szakszon Eszter, Dr. Szél Fruzsina, Dr. Szombath Gergely, Dr. Tari Noémi, Dr. Tárkányi Ilona, Dr. Tegze Bálint, Dr. Varga Éva, Dr. Varga Gergely, Dr. Várkonyi Judit, Dr. Vereckei András, Dr. Vida Ádám, Dr. Wiedemann Ádám, Dr. Zemplényi Zsófia, Dr. Zsáry András

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the Study and Examination Regulations, students are required to participate on at least 90% of all practices

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of

marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

-

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

According to the Study and Examination Regulations, students are required to participate on at least 90% of all practices

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Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

In the exam, we ask for the practical aspects of the diagnosis and treatment of immunology, hematology, diabetology and the main cardiology pathologies, based on what was seen in the elective practice

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Complex patient examinations, taking medical histories, referrals, and documenting test results.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The grade is determined based on a combination of the work performed during the internship and the performance in the practical examination.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Printed resources:

Type	Recommended
Author	Weatherall, Ledingham, Warrel
Title	Oxford Handbook of Clinical Medicine10th ed.
Publisher	
Year of publication	2020

Type	Recommended
Author	McGraw-Hill
Title	Harrison's Principles of Internal Medicine 21st ed.
Publisher	
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Pszichiátriai és Pszichoterápiás Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Réthelyi János (Klinika igazgató)
Course coordinator location of work, telephone availability: Pszichiátriai és Pszichoterápiás Klinika 1083 Budapest Balassa u. 6., Tel/Fax: 061 210 0336
Course coordinator position: Egyetemi tanár, klinikaigazgató
Course coordinator Date and number of habilitation: 2015. június 24., anyakönyvi száma: 05/2015.

Objectives of the course, and its place in the curriculum of the medical training program:

The sixth-year course of Psychiatry aims to implement the previously learned theoretical and practical knowledge into clinical work.

The goal of the sixth-year Psychiatry course and clinical rotation is to apply the theoretical

knowledge and practical skills acquired in the previous year to clinical practice. A deeper understanding of practical knowledge can be facilitated if the medical student participates in a 6-week elective rotation in addition to the 3-week mandatory rotation. By participating in the 6-week elective practicum, the medical student also indicates the direction of their specialization and their intention to enter the psychiatry residency program. During the 6-week elective practicum, the medical student can also acquire the prerequisites for the practical portion of the board exam.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Competencies acquired through the completion of the course:

Competencies gained upon the successful completion of the subject:

- Recording the patient's history (general, somatic, psychiatric, pharmacological and family history)
- Complex psychiatric examination (assessing the consciousness, perception, orientation, thought, intellect; emotional and memory functions; mood, and psychomotor functions of the patient; assessment of attitude towards examiner, motivation system and personality functions)
- Suicide risk assessment
- Family consultation to uncover the patient's problems
- Exploration of patients after suicide attempts or in crisis situations.
- Interpretation of the Mini Mental State Examination results
- Indication of psychiatric inpatient treatment
- First steps of emergency psychiatry care
- Identification of different intoxications
- Recognition of somatic disorders underlying psychiatric symptoms
- Management of immediately dangerous behaviours
- Psychoeducation (regarding the disorder, therapy, prodromal signs, patient care)
- Differential diagnosis of psychiatric disorders; making a diagnosis
- Mastering the administration of basic neurocognitive tests (MMSE, AKV) and symptom assessment scales (BDI, HAM-A, HCL-32)

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of

selecting participants:

Min. 10 students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:
Final year medical students are expected to fully participate at the medical duties of the inpatient wards, eg. rounds, staff meetings and training sessions. Students expected to perform the regular medical duties under supervision: patient examination, exploration, and writing psychiatric case reports or hospital course reports. To complete their course, students must prepare at least one detailed psychiatric case report, that will be corrected and graded by their tutors.
During the 6-week elective rotation, each student participates in patient care within the daily routine of a specific ward; at the same time, with the guidance of their own psychiatrist tutor, they gain the broadest possible exposure to the profiles of our institution's various wards and to the specialized therapies provided in outpatient settings.
AFTERNOON DUTY: Students are required to actively participate at one of the afternoon duties during the three-week-long mandatory rotation and two evening duties during the six-week-long elective course. During their duty day students are at work at the Outpatient unit (Ambulancia) between 1 pm-4 pm and join the night duty team until 9 pm. After 9 pm, students may opt in for the rest of the night duty if they want to. During the elective course, students will also be introduced to the foundation of the out-patient psychiatric care and the management of the most common psychiatric conditions that occur in other medical fields (eg. psychiatric emergencies). The topics of psychiatry required for this course are identical to the topics for the final exam published online at the Department's homepage.
Detailed objectives of the course
Psychiatric examination:
• Recording general history of the patient
• Recording biography
• Recording social history
• Recording family history
• Reporting family members
• Examination of consciousness
• Examination of perception
• Examination of orientation
• Assessing intellectual functions
• Assessing memory functions
• Examination of thought (formal and content)
• Examination of emotional functions
• Examination of mood and self-perception
• Examination of behaviour
• Examination of motivations
Additional examinations and skills:
• Recording the psychiatric status; drawing up global clinical impressions
• Suicidal risk assessment
• On the basis of the patient's self-report and the results of the examination, identifying the problems, (personal, existential, familial, etc.)
• Exploring problems in crisis situation
• Exploring problems after suicide attempt
• Recognizing and understanding personal emotional reactions emerging as a result of interacting with patients
• Professional way of referring observed psychiatric symptoms/disorders to colleagues (referral, consultation)
• Mini Mental State Examination
• Differential diagnosis according to the DSM-5
• Identification of psychiatric conditions requiring psychiatric hospitalization.
Clinical knowledge psychiatry:
• Emergency psychiatry: definition, conditions requiring emergency psychiatric care.
• Patients with psychomotor retardation or aggressive/agitated behavior: possible causes and the principles of examination.
• Suicidal behavior: Manifestation, prevalence in general population and in patients with mental disorders. Protective and risk factors and prevention of suicide.
• Nonsuicidal self-harm: Manifestation, etiology, examination and distinction from suicidal attempt.
• Delirium: definition, symptoms and etiology.
• Dementias: classification, symptoms, principles of examination. MMS
• Definition of mental retardation and oligophreny. Assessment of intelligence (IQ).
• Classification of mood disorders. Unipolar and bipolar disorders. Definition and clinical significance of mood episodes with mixed features.
• Signs and symptoms of depression and mania.
• Psychosis: definition, etiology, principles of examination. Classification of psychotic disorders.
• Schizophrenia: etiology and course of disorder. Positive, negative, affective and cognitive signs and symptoms.
• Classification of anxiety disorders. Signs and symptoms of a panic attack.
• Definition and classification of phobias. Signs and symptoms of obsessive-compulsive disorder. Symptoms and etiology of post-traumatic stress disorder.
• Personality disorders: definition and principles of examination. Clinical impact of personality disorders in psychiatric care.
• Borderline personality disorder: symptoms and clinical impact (self-harm, emergency care).
• Acute and chronic disorders related to alcohol use. Definition and symptoms of delirium tremens.
• Signs and symptoms of substance use disorders (cannabis, amphetamine, cocaine, heroin, hallucinogens).
• Child psychiatry: signs and symptoms of ADHD, oppositional defiant disorder, tic, Tourette-syndrome and autism spectrum disorder.
Therapeutic interventions:
• Participation in therapeutic staff meetings
• Planning pharmacotherapy
• Screening for side effects of medical treatment
• Recognizing and managing issues in therapeutic adherence
• Basic principles of psychoeducation
• Theoretical background of the electroconvulsive therapy (ECT). Assisting in one ECT treatment session.
• Basic principles and skills of crisis intervention, hospital admission of patient in crisis.
Basic principles and skills of behavior therapy (desensitization, operant conditioning).
Tutors:
Ambulancia:
Hear of the ward: Dr. Csukly Gábor
Dr. Brigitta Baran, Dr. Kinga Farkas, Dr. Csilla Bolyós, Dr. Viktória Simon, Dr. Mónika Eleméry, Dr. Boglárka Orbán-Szigeti
Nappali Kórház - Merényi Klinika:
Head of Department: Dr. László Tombor
Dr. Gyöngyi Szabó, Dr. Fanny Kupcsik
B Fszt. Addiktológia Osztály:
Hear of the ward: Dr. Zsolt Unoka
Dr. Bálint Hajduska-Dér, Dr. Imola Seres, Dr. Andrea Szegő, Dr. Júlia Markovits
A1 Organikus Pszichiátriai és rehabilitációs nappali osztály:
Hear of the ward: Dr. Zoltán Hidasi
Dr. Éva Csibri, Dr. Attila Simor, Dr. Nóra Brindza
B1 Affektív Osztály:
Hear of the ward: Dr. Tamás Treuer
Dr. Ádám Menus, Dr. Judit Tolna, Dr. Luca Egervári, Dr. Péter Szocsics
A2 Akut Pszichiátriai Osztály:
Hear of the ward: Dr. Eszter Komoróczy
Dr. Levente Hermán, Dr. Réka Zsigmond, Dr. Ádám Szentes
B2 Addiktológia Osztály:
Head: Dr. Erika Szily
Dr. Attila Pulay, Dr. Ferenc Ádám Szabó
Szent Rókus Klinikai Tömb Pszichiátriai Osztály:
Hear of the ward: Dr. György Szekeres
Dr. György Freschl, Dr. Brigitta Blancz, Dr. Irén Csala, Dr. Krisztina Seregi, Dr. Szilvia Kiss, Dr. Dorottya Majlinger, Dr. László Fehér

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

As with other courses, the prerequisite for passing the practicum is attendance of at least 90% of the practicum sessions.

Students may make up for absences by taking extra duties suggested by their tutor, eg. night duty, admission of patients, etc. Absences owed to sickness must be confirmed with valid medical certificate.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Active participation in group and individual supervision sessions.

Number and type of individual assignments to be completed, submission deadlines:

To write and defend a psychiatric case report during the elective practice period on a patient of your choice**.**

Requirements for the successful completion of the course:

Participation in the practical training. Successful completion of the practical exam.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

At the end of the practicum, the student takes a practical exam with the tutor to assess their proficiency in basic psychiatric care, which includes a psychiatric patient examination and answering teoretical questions arising from the case.

The required theoretical background is based on the curriculum covered during the mandatory psychiatric practicum, specifically

the sixth-year comprehensive exam syllabus (Parts A, B, and C).

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The student actively participates in patient care during the clinical rotation; at the end of the rotation, the student takes a clinical exam with the clinical instructor (see details above), graded on a five-point scale.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Practical examinations based on the Study and Examination Regulations.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

AI may be used during preparation, but is not permitted during the practical exam.

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sürgősségi Orvostani Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Fenyves Bánk Gábor (igazgató)
Course coordinator location of work, telephone availability: Department of Emergency Medicine, 06 20 666 2060
Course coordinator position: head of department, associate professor
Course coordinator Date and number of habilitation: none

Objectives of the course, and its place in the curriculum of the medical training program:

Presentation of the role and tasks of emergency medicine in clinical practice.

During the clinical rotation, sixth-year medical students gain insight into and practical experience in the following clinical tasks:

- organization of emergency medical care
- patient assessment and determination of the urgency of care (triage)
- complaint-oriented focused examination and management, patient disposition – hands-on experience
- participation as an observer in the management of critically ill patients
- performance and interpretation of bedside diagnostic tests
- proper completion of medical documentation
- development of communication with allied healthcare professionals and the shift supervisor
- development of non-technical skills (teamwork, communication, decision-making)

Format of the course (lectures, group work, practical lessons, etc.):

Introductory training: lecture and workshop (8 hours)
Practical training: 8-hour clinical shifts

Competencies acquired through completion of course:

- triage assessment and documentation
- complaint-oriented history taking, active search for warning signs (so-called red flag symptoms)
- complaint-oriented physical examination
- ABCDE approach-based assessment of critically ill patients
- proper completion of medical documentation (past medical history, presenting complaints, recording of physical examination findings, documentation of therapy, formulation of discharge summary; basic knowledge of medical coding)
- requesting consultations (indication, formulation, coordination, evaluation of results)
- ordering and interpreting laboratory tests
- application of the SBAR communication framework
- interpretation of bedside diagnostic tests:
    - non-invasive monitoring techniques (ECG, pulse oximetry, blood pressure, body temperature, $ETCO_2$)
    - invasive monitoring techniques (blood pressure monitoring)
    - 12-lead ECG interpretation
    - blood gas analysis interpretation
    - bedside POCUS ultrasound examination
    - interpretation of the Schellong test
    - fecal occult blood testing
    - interpretation of rapid antigen tests for infectious diseases
- initiation of management of the most common emergency conditions (development of a therapeutic plan)
- organization of patient disposition
- emergency-oriented evaluation of abnormalities detected during examinations

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Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II., Surgery

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

minimum 5 participants, maximum 20 participants

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Introductory lecture syllabus: (Dr. Barbara Bukor)

1. Emergency medicine as an independent medical specialty
2. Organization of emergency care and its specific characteristics
3. Practical information and preparation for independent clinical work

From this point onward, the course consists exclusively of practical training, delivered by physicians of the Department of Emergency Medicine at Semmelweis University.

The course is conducted in shift-based clinical practice, in line with the workflow of the Emergency Department. The work of the 6th year medical students is continuously supervised and supported by the shift leader attending, as well as senior residents and advanced practice nurses assigned to the shift. The medical student’s working time is 40 hours per week, organized as 5 × 8-hour shifts. Due to the shift-based schedule, clinical practice also includes night shifts. At the end of each shift, the student receives feedback from the shift leader or a designated supervising clinician.

The tasks of the 6th year medical student are adjusted to individual progress and competence. Expected levels of participation:

1. Observer – observes the work of the designated clinician
2. Assistant – supports the designated clinician and participates in partial tasks (e.g., physical examination, documentation, therapeutic planning, etc.)
3. Under direct clinical supervision – participates in patient care (history taking, examination, ordering consultations, documentation, initiating investigations, patient placement, reporting to the shift leader), consulting the supervising clinician before each step
4. Under shift leader supervision – participates in patient care (history taking, examination, ordering consultations, documentation, initiating investigations, patient placement), consulting the responsible shift leader before each step

Instructors:

Dr. Péter Vass, Dr. Barbara Bukor, Dr. László Békefi, Dr. Eszter Békefi-Erős, Dr. Rita Szentgróti, Dr. Tamara Szulimán, Dr. Dávid Szabó, Dr. Vivien Enyedi

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Participation in shifts according to the schedule. 8-hour shifts, both day and night, based on a pre-arranged roster. During the clinical practice, an online attendance tracking system is used, and students are identified by their Neptun codes. Due to the shift-based working system and the above-described curriculum structure, make-up opportunities are only possible through shift swaps within the schedule or by taking additional shifts.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

continuous feedback during work performance

Number and type of individual assignments to be completed, submission deadlines:

none

Requirements for the successful completion of the course:

According to the Study and Examination Regulations.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

none

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Continuous assessment during the clinical practice.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Genomikai Medicina és Ritka Betegségek Intézete

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Molnár Mária Judit (igazgató)
Course coordinator location of work, telephone availability: SE Genomikai Medicina és Ritka Betegségek Intézete
Course coordinator position: intézetigazgató egyetemi tanár
Course coordinator Date and number of habilitation: 38/ 2006 Debreceni Egyetem

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Objectives of the course, and its place in the curriculum of the medical training program:

The Clinical Genetics course introduces medical students to the clinical significance of human genetic variations, covering the principles of diagnosis and treatment of rare diseases, mainly through the presentation of cases, clinical situations and demonstrating correct communication.

In addition to diagnosis of monogenic diseases and chromosomal abnormalities, genetic tests are

now used to predict susceptibility to certain diseases or the efficacy and side effects of certain therapeutic options (pharmacogenomics) or delineate disease prognosis.

Demonstration of disease models applicable to monogenic pathologies through real-life situations, in a problem-based learning framework, develops autonomous and collaborative problem-solving skills. Given the heterogeneity of rare inherited diseases, we cannot aim to cover the whole field in a single week. However, what makes the course unique is that students have the opportunity to experience new challenges and successfully dealing with situations they have not encountered before. The advantage of problem-based learning, in addition to being fun and sustaining interest, is that it prepares students for the lifelong learning that is necessary in the health professions.

The role of the physician in the management of hereditary diseases and the practice of good decision making will also be addressed. The discipline is one of the most rapidly developing field and it is presumably going to be an important component of the future medicine.

Format of the course (lectures, group work, practical lessons, etc.):

Clinical practice

Competencies acquired through completion of course:

Students meet the typical clinical scenarios requiring genetic-genomic knowledge for diagnostic, predictive, preventive and pharmacogenomic questions, as well as they are introduced into most common diagnostic, therapeutic decision-making, management and ethical dilemmas of the field.

Students gain insight into practice on how to elicit, document, and act on relevant family history pertinent to the patient’s clinical status, how to choose the right genetic or genomic testing to guide patient management and how to use genomic information to make treatment decisions.

Through problems represented by several real and synthetic clinical cases and through getting involved into the patient flow of in- and outpatient units, they will learn

- how to gather information from appropriate information resources,

- how to employ artificial intelligence-based decision-making systems for phenotype pattern recognition.

- how to communicate with the patients and families with hereditary diseases by playing the role of a counselee (genetic counselling), and

- how to work together as a team if they are encountered with real-world diagnostic challenges.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

not applicable

The number of students required to start the course (minimum, maximum), method of selecting participants:

min.1 max. 20

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Bedside practices and discussions

1, Clinical genetics in medicine, Prof. Dr. Molnár Mária Judit

2, Web-based search methods, Dr. Molnár Viktor

3, Bedside practice, inpatient / outpatient, Prof.Dr. Molnár Mária Judit, Dr. Szegedi Márta, Dr. Balicza Péter, Dr. Molnár Viktor, Dr. Varga Noémi Ágnes, Dr. Palásti Ágnes, Dr. Grosz Zoltán, Dr. Jimoh Idris János, Dr. Sági Judit, Dr. Csendes Barbara, Dr. Benedek Péter

4, Case presentation, Dr. Grosz Zoltán

5, Congenital genetic disorders, Dr. Varga Noémi Ágnes, Dr. Szegedi Márta

6, Developing genetic diagnostic skills,, Dr. Balicza Péter

7, Onco- and cardiogenetics, seminar, Dr. Csendes Barbara

8, Genetic counselling, Dr. Szegedi Márta

9, Management, of patients with a rare disease, Dr. Varga Noémi Ágnes, Dr. Jimoh Idris János

10, Team competition, decision-making simulation, problem-based learning, Dr. Molnár Viktor

11, Personalised medicine, Prof. Dr. Molnár Mária Judit

12, Ethical problems, workshop, Dr. Szegedi Márta

13, Exam, Dr. Molnár Viktor

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the study and examination regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Presentation at the end of the course

Number and type of individual assignments to be completed, submission deadlines:

Presentation at the end of the course

Requirements for the successful completion of the course:

According to the current Study and Examination Regulations and the presentation at the end of the course

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Presentation at the end of the course

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

Description and minimum assessment requirements for the Clinical Genetics course:

https://semmelweis.hu/genomikai-medicina/en/education/clinical-genomics-i/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Presentation at the end of the course

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szemészeti Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
Hungarian, English, German

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Nagy Zoltán Zsolt (igazgató)
Course coordinator location of work, telephone availability: Department of Ophthalmology (H-1085 Budapest, Mária str. 39.), Tel.: +36-1/303-9435, +36-1/267-4951
Course coordinator position: director
Course coordinator Date and number of habilitation: 28/05/2003, 207/2003.

Objectives of the course, and its place in the curriculum of the medical training program:

Pre-training in ophthalmology

Format of the course (lectures, group work, practical lessons, etc.):

Practical lessons

Competencies acquired through completion of course:

At the end of the course, the student will be able to perform the skills routinely:

Taking medical history of patients with eye disease, writing their status

Vision test (automatic refractometer, use of distance and near reading table, correction with glasses)

Examination of pupil

Examination of eye movements

Strabismus, detection of amblyopia

Palpation of intraocular pressure

Eye -opening, eyelid eversion, dropping

Slit-lamp examination

Examination of eye pressure with applanation

Fundus examination with direct and indirect ophthalmoscopy, use of Volk lens

OCT scan, fundus photo, BSCAN

Familiar in:

Duty care, sudden vision loss, ophthalmic traumatology

Examination using special contact lenses: gonioscopy, panfunduscopy

Ophthalmic instrumentation (anterior and posterior segment imaging, functional examinations)

Microsurgical procedures (assisting in operating theatre), laser procedures

Basic paediatric ophthalmology

Solution of refractive problems

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine II, Surgery, Ophthalmology

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Max 10 students at the same time

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Shadowing practical training: the student observes the daily life of an experienced doctor in patient care, appointed by the clinic manager. Aim: to obtain a basic level of proficiency in routine ophthalmic examinations

Teachers:

Dr. Barcsay György

Dr. Ecsedy Mónika

Dr. Fodor Eszter

Dr. Füst Ágnes

Dr. Knézy Krisztina

Dr. Kovács Illés

Dr. Kránitz Kinga

Dr. Maka Erika

Dr. Papp András

Dr. Récsán Zsuzsanna

Dr. Resch Miklós

Dr. Sándor Gábor

Dr. Szabó Antal

Dr. Szamosi Anna

Dr. Szentmáry Nóra

Dr. Szepessy Zsuzsanna

Dr. Takács Ágnes

The following skills are practised continuously, but the student will have a basic level of application by the end of the given week:

Week 1: Ophthalmic case history taking, automatic refractometer, spectacle cabinet, use of dioptric meter, visual acuity test, spectacle correction, dropping

Week 2: Pupil examination, eye opening, eyelid eversion, slit lamp use, learning applanation tonometry, use of direct ophthalmoscope,

Week 3: Using Volk lens, writing ophthalmic status

Week 4: Taking optical coherence tomography, fundus photography

Week 5: Ophthalmic ultrasound diagnostics, biometry, corneal foreign body removal, corneal scraping, grafting, eye movement testing, amblyopia screening

Week 6: Case report preparation

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the valid Study and Examination Regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Continous assessment of the students' progress, due to close connection between the

ophthalmologist and student in shadowing system.

Number and type of individual assignments to be completed, submission deadlines:

Continuous assessment of practical skills to be acquired. A case presentation is mandatory at the end of the course.

Requirements for the successful completion of the course:

According to the valid Study and Examination Regulations

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination of a patient. Case presentation

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Practical skills:

1. Ophthalmic case history taking,
2. Automatic refractometer,
3. Spectacle cabinet,
4. Use of dioptric meter,
5. Visual acuity test,
6. Spectacle correction,
7. Dropping
8. Pupil examination,
9. Eye opening,
10. Eyelid eversion,
11. Slit lamp use,
12. Learning applanation tonometry,
13. Use of direct ophthalmoscope,
14. Using Volk lens,
15. Writing ophthalmic status

16. Taking optical coherence tomography,
17. Fundus photography
18. Amblyopia screening

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Practical exam mark

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Aneszteziológiai és Intenzív Terápiás Tanszék

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
magyar, angol, német

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Molnár Zsolt (igazgató)
Course coordinator location of work, telephone availability: Department of Anesthesiology and Intensive Therapy (AITK), Semmelweis University
Course coordinator position: professor and head of department
Course coordinator Date and number of habilitation: 2005 University of Pécs

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Objectives of the course, and its place in the curriculum of the medical training program:

***Intensive therapy* is a comprehensive medical discipline.**

During this course, we emphasize the relevance of physiological, pathophysiological and pharmacological knowledge in a clinical and patient-oriented context at the bedside and in the operating theatre. The knowledge that students acquired in surgery and internal

medicine is also applied during the course. We will discuss, in detail, conditions requiring intensive therapy related to the fields of internal medicine, cardiology, surgery, neurology, obstetrics and gynecology and traumatology.

Intensive therapy includes intensive monitoring, intensive nursing care and intensive medical care. Under conditions requiring intensive therapy, we replace, support and restore damaged, absent or endangered vital functions, while we also use extensive monitoring, diagnostic and therapeutic systems to provide causative therapy.

This course will make students familiar with the first steps required in the assessment of a critically ill patient, the conditions causing cardiac and respiratory arrest, and also the current Hungarian and international resuscitation guidelines.

It will be demonstrated how anesthesiology maintains the homeostatic balance of the patient's organ systems during the perioperative period. This includes the assessment of potential perioperative risks, preoperative optimalization, intraoperative anesthesia, analgesia, muscle relaxation, and the reduction of possible postoperative complications.

Lectures focus on the details of specific important aspects of the subject in order to enhance each student's previous development.

During the practicals, a problem-based approach is used to represent the complexity of clinical decision-making. The stressed points of the practicals are a general therapy-oriented approach which is based on a symptom-oriented differential diagnosis-making. Equipment and devices used in intensive therapy are also introduced. Bedside practice enables students to engage in patient care, while practices in a high-fidelity simulation environment will provide opportunities for analyzing diagnostic and therapeutic options by simulating time-dependent situations. By carrying out In situational simulation practices students can also develop their non-technical skills e.g. team-work, decision-making.

Due to the nature of this course, the knowledge and experience acquired during the course can be meaningful to students choosing any medical specialty.

Location (address of lecture hall, seminar room, etc.):

1. Department of Anesthesiology and Intensive Therapy

Clinical Unit of Intensive Therapy

1082 Budapest, Üllői street 78/B.

2. Institute of Anesthesiology and Perioperative Care

1082 Budapest, Üllői street 78/B.

3. Heart and Vascular Centre

1122 Budapest, Városmajor street. 68.

4. Department of Surgery, Transplantation and Gastroenterology

1082 Budapest, Üllői street 78.

5. Division of Clinical Simulation

Semmelweis Simulation Centre

1096 Budapest, Ernő street 7.

Format of the course (lectures, group work, practical lessons, etc.):

During the sixth-year practical course, students spend most of their time in intensive care units, anesthesia outpatient clinics and operating theatres, shadowing under the supervision of designated academic tutors.

Competencies acquired through completion of course:

	Competency	Level
1.	Skills and devices required in emergency situations (airway management, venous/arterial access devices, catheters, gastric tubes etc.)	S/AP
2.	The intensive care unit: its structure, functions and areas of care	S/AP
3.	The ABCDE assessment of critically ill patients	PP
4.	Monitoring devices in intensive care and their application	S/AP
5.	The importance and limitations of point-of-care testing (PoCT) in intensive care	S/AP
6.	How to recognize medical conditions requiring intensive therapy	S/AP
7.	Fluid therapy in the care of clinically ill patients, its application; the methods, indications and application of enteral and parenteral nutrition	S/AP
8.	Competencies in preoperative assessment, risk assessment and physical assessment	S/AP/SSS
9.	The basics of preoperative assessment and premedication	S/SSS
10.	The structure and functions of general anesthetic devices	S/SSS
11.	The induction and maintenance of general anesthesia	S/AP
12.	The basics of the indications, importance, advantages and disadvantages of regional anesthetic techniques	S
13.	The aspects of postoperative care and its application	S/AP
14.	How to recognize and treat different types of respiratory failure	S/AP
15.	The aspects and main indications for non-invasive and invasive ventilation (principles, methods, devices and the structure of ventilatory devices)	S/SSS
16.	The recognition and treatment of acid-base disorders	S/AP
17.	O2 therapy and inhalational agents; the importance and forms of respiratory physiotherapy	S/AP
18.	Treatment of acute hemodynamic collapse	S/AP
19.	Options for hemodynamic monitoring, devices in pharmaceutical and mechanical circulatory support	S/AP
20.	Aspects and application of perioperative care for patients	S
21.	The relevance and importance of ultrasound in intensive care (RUSH protocol, targeted cannulation of blood vessels)	S/AP
22.	The relevance of ultrasound in anesthesiology (airway management, regional techniques)	S
23.	Indication and application of hemodialysis procedures in intensive care	S
24.	BLS algorithm in a clinical setting under simulated conditions, and its application	SSS
25.	The use of the automated external device (AED) under simulated conditions	S
26.	Safe use of a manual defibrillator in a simulational setting	SSS
27.	ALS algorithm, and its application under simulated conditions	SSS
28.	Teamwork and communication during ALS and the peri-arrest period	SSS
29.	How to use the ABCDE assessment tool with high risk patients	SSS
30.	How to recognize and treat acute, life-threatening conditions in a high-fidelity simulated environment	SSS
31.	Non-technical skills (teamwork, communication, situational awareness, decision-making, etc.) during care in lifethreatening situations in a high-fidelity simulated environment	SSS
32.	How to refer a patient using the SBAR technique	SSS

Abbreviations:
L: level of acquisition
S (Seen): students observe the procedure
AP (Active Participation): students actively participate in the procedure
SSS (Skill, Simulation or Situation): students gain experience during a skill, simulation or situation practice

PP (Procedure Performed): students perform the procedure themselves

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Completion of the Subject Intensive Therapy and Anesthesiology, 5th year

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

-

The number of students required to start the course (minimum, maximum), method of selecting participants:

A maximum of 5 students enrolled in English-programs may participate in the course, in the order of registration, based on the previously announced available capacity.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Mandatory Practices			
Activity Name	**Mandatory / Elective**	**Hours**	**Place of Completion**
Intensive Care Unit (ICU) Practice	**Mandatory**	**min. 120**	**Clinical Unit of Intensive Therapy, Heart and Vascular Centre**
Anesthesia in the Operating Room	**Mandatory**	**min. 120**	**Institute of Anesthesiology and Perioperative Care / Heart and Vascular Centre / Department of Surgery, Transplantation and Gastroenterology**
Outpatient Anesthesia	**Mandatory**	**8**	**Institute of Anesthesiology and Perioperative Care**
Anesthesiology Outpatient Clinic	**Mandatory**	**8**	**Institute of Anesthesiology and Perioperative Care**
Compulsory Elective Practices			
Simulation Course	**Electiver**	**16**	**Semmelweis Simulation Centre**
Ultrasound Practice	**Elective**	**8**	**Semmelweis Simulation Centre**
On-call Duty in the ICU	**Elective**	**16/24**	**Clinical Unit of Intensive Therapy**

Instructors of the course

Prof. Dr. Zsolt Molnár

Prof. Dr. Andrea Székely

Prof. Dr. Endre Zima

Dr. András Lorx med. habil.

Dr. Szabolcs Baglyas

Dr. Máté Berczi

Dr. Dávid Brenner

Dr. Cecília Czifra

Dr. Gergely Csikós

Dr. László Erdélyi

Dr. Gábor Élő

Dr. János Fazakas

Dr. Szabolcs Fábry

Dr. Gábor Fritúz

Dr. Balázs Füle

Dr. Gergely Göbl

Dr. Pál Gyombolai

Dr. Hajnalka Gyüszi

Dr. Balázs Hauser

Dr. Enikő Holndonner-Kirst

Dr. László Horváth

Dr. Petronella Hupuczi

Dr.Dilán Karim

Dr. Réka Kapui

Dr. Hajna Katona

Dr. András Kállai

Dr. Annamária Kis

Dr. Nikolett Kiss

Dr. Enikő Kovács

Dr. Bernadett Lonkai

Dr. Csaba Maár

Dr. Krisztina Madách

Dr. Ádám Marczin

Dr. Gábor Marics

Dr. Bence Mogyoródi

Dr. Vivien Móró

Dr. Mária Nagy

Dr. Gábor Nardai

Dr. Endre Németh

Dr. Szabolcs Nyul

Dr. Mátyás Orosz

Dr. Márton Papp

Dr. Kristóf Rácz

Dr. Zoltán Ruszkai

Dr. Ádám Soltész

Dr. Dalma Skultéti

Dr. Anikó Smudla

Dr. István Székács

Dr. Melinda Széll

Dr. Szilárd Szűcs

Dr. Eszter Tamáska

Dr. Krisztián Tánczos

Dr. Gyula Tövisházi

Dr. Zsolt Turóczi

Dr. Luca Valkó

Dr. Alexandra Vereb

Dr. László Zubek

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKANE759_1A, AOKBOK784_1A, AOKSGO891_1A

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Obligatory attendance is 90% of the total course, as provided for in Article 11 (3) of Chapter III.2,

Study and Examination Regulations, of the Operational and Organizational Regulations of

Semmelweis University

Make-up is possible in night-shifts, weekend shifts

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The evaluation is based on the following elements:

- **review article on intensive care, anesthesiology or pain therapy selected at the beginning of the course**
- **case presentation of a selected clinical case**
- **continuous assessment of student performance during the course.**

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

Attendance requirements specified in the TVSZ.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Continuous assessment and practical examination.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

A practical exam conducted in an operating room or intensive care unit at a patient's bedside, assessing knowledge acquired during the six-year training program and six-week clinical rotation. The performance of practical skills related to the items listed in the competency list, knowledge of their theoretical background, and the ability to synthesize this information are evaluated on a 5-point grading scale.

Obtaining 50% of the maximum score.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

A practical exam conducted in an operating room or intensive care unit at a patient's bedside, assessing knowledge acquired during the six-year training program and six-week clinical rotation. The performance of practical skills related to the items listed in the competency list, knowledge of their theoretical background, and the ability to synthesize this information are evaluated on a 5-point grading scale.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

We do not use artificial intelligence during education, except when creating diagrams for presentations.

Junaid Bajwa - DIGITAL TECHNOLOGY Artificial intelligence in healthcare: transforming the practice of medicine; Future Healthcare Journal 2021 Vol 8, No 2: e188–94; DOI: 10.7861/fhj.2021-0095;

Printed resources:

Type	Recommended
Author	Bersten, Andrew D; Handy, Jonathan M
Title	Oh's Intensive Care Manual
Publisher	Elsevier Limited Eighth Edition

Year of publication	2019

Type	Recommended
Author	László Zubek - Zsolt Molnár
Title	Anaesthesiology and Intensive Therapy
Publisher	Medicina Könyvkiadó
Year of publication	2026

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Idegsebészeti és Neurointervenciós Klinika - Idegsebészeti Tanszék

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Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Banczerowski Attila Péter (tanszékvezető)
Course coordinator location of work, telephone availability: SE Institute of Neurosurgery and Neurointervention, Dept. of Neurosurgery, 1145 Budapest, Amerikai út 57., +36-1-467-9325
Course coordinator position: head of department
Course coordinator Date and number of habilitation: 2010, reference number: 289

Objectives of the course, and its place in the curriculum of the medical training program:

The goal of this course is to familiarize final-year medical students with the symptoms, diagnosis, treatment, and aftercare of neurosurgical disorders. The students gain insight into the surgical and neurointerventional treatments of cerebrovascular diseases, with a particular focus on hemorrhagic and ischemic stroke. During the practical training, students learn to identify urgent neurosurgical conditions and understand their management.

Students acquire practical skills in neurosurgical patient examination, radiological assessment of neurological disorders, and invasive diagnostic techniques (e.g., stereotactic biopsy, lumbar puncture, diagnostic angiography). Final-year students participate in the daily activities of the institute's departments, including ward rounds, departmental and institutional meetings, scientific seminars, and surgical programs. Under medical supervision, they independently carry out patient-related tasks such as patient admission, medical history documentation, case management, wound care, and suture removal.

Following selected patients, they become familiar with diagnostic algorithms, surgical pre-, peri-, and postoperative periods.

Format of the course (lectures, group work, practical lessons, etc.):

practical lessons

Competencies acquired through completion of course:

Basic neurosurgical skills for general practitioners

Course outcome (names and NEPTUN ID of related subjects):
AOKSB1646_SA

Prerequisites for course registration and completion: (NEPTUN ID):

Neurology and Neurosurgery AOKNEU963_1A

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

minimum 1, maximum 5. In Neptun system, in order of application

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Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Week 1: Spine Surgery, Neurotraumatology (Prof. Dr. Péter Banczerowski)

1. Clinical anatomy of the spine

2. Surgical treatment of degenerative spinal disorders
3. Spine injuries and treatment
4. Complex neurosurgical management of oncological and inflammatory diseases
5. Basics of minimally invasive spinal surgery techniques
6. Neurosurgical aspects of the peripheral nervous system
7. Examination of the unconscious patient, prehospital care
8. Pathomechanism and treatment of increased intracranial pressure
9. Skull fractures, epidural hemorrhage, subdural hemorrhage, intracerebral hemorrhage
10. Complex care of head-injured and polytraumatized patients
11. Care and rehabilitation of spinal cord injury patients

Week 2: Neuro-oncology (Dr. Attila Bagó)

1. Classification of brain tumors
2. Surgical and oncological management of brain tumors (radiotherapy, chemotherapy, biological therapy)
3. The intraoperatively role of neuronavigation and electrophysiological methods
4. Stereotactic surgical technique, tumor biopsy
5. Stereotactic radiosurgery

Week 3: Pediatric Neurosurgery (Dr. Balázs Markia)

1. Classification and management of pediatric brain and spinal tumors
2. Congenital central nervous system malformations
3. Hydrocephalus, CFS circulation disorders
4. Neurosurgical aspects of pediatric epilepsy

Week 4: Functional Neurosurgery (Dr. Loránd Erőss)

1. Epilepsy surgery
2. Neuromodulation
3. Neurosurgical solutions for movement disorders
4. Pain management, spinal cord stimulation

Week 5: Skull Base and Vascular Neurosurgery (Dr. László Sipos)

1. Conditions affecting the skull base, surgical approaches
2. Endovascular and transcranial management of cerebral aneurysms
3. Diagnosis and treatment of other vascular malformations
4. Formation, imaging, and treatment options for dural arteriovenous fistulas
5. Surgery of pituitary tumors
6. Neurosurgical aspects of stroke management

Week 6: Neurointerventional Treatment of Vascular Disorders (Dr. Sándor Nardai)

1. Functional and radiological neurovascular anatomy
2. Imaging techniques in neurovascular disorders: MRI, MRA, CT, CTA, Catheter angiography (DSA)
3. Systemic thrombolysis: indications, contraindications
4. Endovascular treatment of acute ischemic stroke

5. Tumor embolization

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):
AOKNEU657_SA, AOKSB1646_SA

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to study and examination regulations.
Possibility of making up for absences: subject to individual consideration

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Weekly report on the student's practical activities and new knowledge: completion of a practical logbook

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Number and type of individual assignments to be completed, submission deadlines:

During the six-week practice, the duties of the final-year medical student are equivalent to the residents (their activities are carried out under the supervision of a specialist physician).

Requirements for the successful completion of the course:

According to study and examination regulations.
Attendance at a minimum of 90% of the practice sessions. Completion of a practical logbook.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Participation in the practices listed in detail in the curriculum, completion of the practical logbook

The completion of the practice is confirmed by the Department Head, based on the mentor's

assessment, with a five-point practical grade given

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Completion of the practical logbook

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Use five-point scale: excellent (5), good (4), satisfactory (3), sufficient (2), insufficient (1).
The evaluation is based on the achievement demonstrated during the practical sessions.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	S. Goldberg
Title	Clinical Neuroanatomy Made Ridiculously Simple
Publisher	
Year of publication	

Type	Recommended
Author	M. Forsting
Title	Intracranial Vascular Malformations and Aneurysms
Publisher	
Year of publication	

Type	Recommended
Author	J. Byrne
Title	Tutorials in Endovascular Neurosurgery and Interventional Neuroradiology
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Idegsebészeti és Neurointervenciós Klinika - Idegsebészeti Tanszék

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Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
english

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Kamondi Anita (egyetemi tanár)
Course coordinator location of work, telephone availability: SE- Dept. of Neurosurgery, 1145 Bp., Amerikai út 57. +36-1-467-9325
Course coordinator position: professor
Course coordinator Date and number of habilitation: 2005.05.30., Number of certificate: 222

Objectives of the course, and its place in the curriculum of the medical training program:

The acquisition of practical and theoretical neurological knowledge for students with a strong interest in neurology that goes beyond what can be obtained in general medical education. Acquiring direct practical knowledge through active participation in routine ward neurological patient care, as well as getting to know neurological general outpatient and council activities during shadowing of the mentor. The training can significantly reduce the phenomenon of neurophobia,

which has become more and more pronounced in recent decades, which is an unjustified fear of neurology-related specialties due to the complexity of the specialty and its connection to an extremely large number of overlapping medical disciplines.

Format of the course (lectures, group work, practical lessons, etc.):

practical lesson

Competencies acquired through completion of course:

Students during the practice will be able to

1. complete the knowledge acquired in the framework of the 5th and 6th years of education regarding the technique of taking a neurological anamnesis and physical examination, as well as the interpretation of the findings. They gain a greater understanding of possible differential diagnoses.
2. recognize neurological symptoms requiring urgent treatment
3. learn to interpret and refer the patient's complaints and symptoms
4. become able to propose an inspection and treatment plan
5. gain practical experience of inpatient care and examination of common neurological pathologies
6. gain practical experience of neurointerventional care for acute stroke patients.
7. gain experience in the care of patients bordering neurology and neurosurgery
8. acquire practical knowledge of neurological outpatient care
9. become able to describe a clinical case with its literature references in the form of a short reference

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Course outcome (names and NEPTUN ID of related subjects):
AOKNEU657_SA

Prerequisites for course registration and completion: (NEPTUN ID):

completion of the sixth-year neurology exam

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum: 1 person, Maximum: 10 people.
We accept students in the order in which they apply through the NEPTUN system.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered

separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1-2 weeks: Knowledge of competence (Prof. Dr. Anita Kamondi, Dr. Anikó Papp, Dr. Ákos Ujvári, Dr. Danuta Szirmai, Dr. Panka Pintér, Dr. Lőrinc Velkey, Dr. Miklós Nyerges)

1. Pupil innervation disorders
2. The symptoms of facial nerve damage
3. Differential diagnosis of dizziness
4. Localisation of lesions leading to central paresis
5. Differentiation of central and peripheral paresis
6. Basic types and localization of aphasias
7. Disorders of consciousness
8. Examination of an unconscious patient, assessment of focal symptoms
9. Disorders of consciousness of metabolic origin
10. Life-threatening conditions in neurology
11. Symptoms of increased intracranial pressure, herniations
12. Intracranial hemorrhages of traumatic origin
13. Symptoms of traumatic spinal cord injuries
14. The symptoms of internal carotid artery ischemia
15. Symptoms of circulatory disorders of the vertebrobasilar system
16. Urgency in stroke
17. Diagnosis of stroke
18. Venous circulation disorders of the brain
19. Cerebral hemorrhage
20. Diagnosis, treatment, prognosis of subarachnoid hemorrhage
21. Status epilepticus
22. Meningitis and encephalitis
23. Diagnosis of multiple sclerosis
24. Recognition of brain tumors
25. Symptoms of spinal space and spinal cord space-occupying processes
26. Brain edema
27. Diagnostic criteria of dementia
28. Classification of memory disorders
29. Diagnosis of Parkinson's disease
30. The Wernicke-Korsakow process
31. Neurological complications of alcoholism
32. Guillain-Barre syndrome
33. Neurological disorders of urination and defecation
34. Myasthenia gravis
35. Muscles' own diseases
36. Liquor collection and liquor testing methods

3-6 weeks Detailed neurological knowledge I. (Prof. Dr. Anita Kamondi, Dr. Gábor Barcs, Dr. Anikó Papp, Dr. Orsolya Györfi, Dr. Anna Sákovics, Dr. Boglárka Hajnal, Dr. Borbála Damó-Csorba)

1. Vision deterioration and vision loss
2. Eye muscle paralysis and gaze disorders

3. Disorders of the vestibular system
4. Symptoms associated with damage to the lower cranial nerves
5. Symptoms of damage to the pons and midbrain
6. Regulation and disorders of muscle tone
7. Anatomical basis of sensory disturbances
8. Functional units of the cerebellum, symptoms of its damage
9. Gait disturbances
10. Symptoms of damage to the frontal lobe
11. Symptoms of damage to the temporal lobe
12. The limbic system
13. Symptoms of damage to the parietal lobes
14. Symptoms of damage to the occipital lobe
15. Hemispheric dominance
16. Classification of speech disorders
17. Agnosia, apraxia, alexia, agraphia
18. The pathophysiology of basal ganglia
19. Symptoms of damage to the thalamus
20. Localization of memory disorders
21. Imaging procedures (angiography, CT, MR, PET, SPECT)
22. Ultrasound examination of cerebral vessels
23. EEG in neurological diagnosis
24. EMG, ENG, evoked responses
25. Blood supply to the brain and regulation of cerebral circulation
26. Classification of cerebrovascular diseases
27. TIA
28. Cerebral circulation disorders in young adulthood
29. Treatment of cerebral ischemia
30. Classification of epilepsies
31. Examination of an epileptic patient
32. Separation of hypnoid and non-hypnoid disordesr of consciousness based on neurological symptoms
33. Treatment of epilepsy

5-6 weeks: Detailed neurological knowledge II. (Prof. Dr. Anita Kamondi, Dr. Anikó Papp, Dr. Orsolya Györfi, Dr. Ákos Ujvári)

1. Nervous system diseases caused by viruses
2. Diseases caused by herpes viruses
3. Prion diseases and slow viral infections
4. Neurological consequences of AIDS
5. Clinical forms and treatment of multiple sclerosis
6. Histological classification of brain tumors
7. Childhood brain tumors
8. Metastatic tumors in the nervous system
9. Paraneoplastic nervous system diseases
10. Diseases associated with Parkinson's syndrome
11. Treatment of Parkinson's disease
12. Movement disorders associated with hyperkinesis
13. Differential diagnosis of tremor

14. Classification of encephalopathies
15. Primary degenerative dementias
16. Dementia in cerebrovascular diseases
17. Multisystem atrophy
18. Disorders of the cerebrospinal fluid circulation (hydrocephalus)
19. Symptoms of damage to the brachial plexus
20. Symptoms of damage to the median, ulnar and radial nerves
21. Symptoms of damage to the lumbosacral plexus
22. Etiology of polyneuropathies
23. Neuropathies in diabetes mellitus
24. Hereditary polyneuropathies
25. Cervicobrachialgia and lumboischialgia
26. Developmental disorders of the skull and craniocervical transition
27. Developmental abnormalities of the spine and spinal cord
28. Symptoms of damage to the spinal cord
29. Motoneuron diseases
30. Inflammatory muscle diseases and myopathies
31. Independent headache diseases
32. Neuralgias
33. Physiological sleep and sleep disorders

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Attendance is mandatory during the 6-week internship. Absence may not exceed 10% of the training time. The possibility of replacement is based on an individual assessment.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The responsibilities of the intern are the same as those of the beginning resident. His work is first checked by the ward resident involved in patient care, under the supervision of a specialist. During the visits, the student's referral is checked by the head of department. Ambulance and on-call work are certified by the doctor in charge of the particular ambulance or on-call.

Number and type of individual assignments to be completed, submission deadlines:

1. Patient admission and medical chart writing, ordering tests with supervision for at least 3

patients.
Submission deadline is continuous. Assessment is done by the specialist treating the patient.
2. Participation in special and general neurological appointments, preparing outpatient records for at least 3 patients per week.
Submission deadline is continuous. Assessment is done by the specialist treating the patient.
3. Attendance at on-call services at least 3 times.
Submission deadline is continuous. Assessment is done by the specialist on-call.
4. Participation in thrombectomy care in at least 5 cases.
Submission deadline is continuous. Assessment is done by the specialist treating the patient.
5. Presentation of cases and literature in the form of references with help of the mentor in at least 1 case.
Certification at the end of the internship by the student's mentor.

Requirements for the successful completion of the course:

Attending and completing practice with at least an "acceptable" rating Ambulance, consultation, on-call certificates. Case presentation certificate. Verification of all this in the manner specified above.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

The Mentor / head of Neurology division evaluates the 6-week performance of the trainee assigned to her with a practical mark.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

The Mentor / head of Neurology division evaluates the 6-week performance of the trainee assigned to her with a practical mark.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The Mentor / head of Neurology division evaluates the 6-week performance of the trainee assigned to her with a practical mark.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	E-learning neurology course of the Dept. Neurology
Link	https://itc.semmelweis.hu/moodle/course/view.php?id=481

Printed resources:

Type	Mandatory
Author	S. Goldberg
Title	Clinical Neuroanatomy Made Ridiculously Simple
Publisher	
Year of publication	

Type	Mandatory
Author	Szerk.: Szirmai Imre, Kamondi Anita, Kovács Tibor
Title	Neurological patient examination
Publisher	
Year of publication	

Type	Mandatory
Author	Szirmai Imre
Title	Neurológia
Publisher	Medicina
Year of publication	2017

Type	Mandatory
Author	Komoly S, Palkovits M
Title	Gyakorlati neurológia és neuroanatómia
Publisher	Medicina Kiadó
Year of publication	2018

Type	Mandatory

Author	Bereczki D, Magyar MT
Title	Neurológia a háziorvosi gyakorlatban
Publisher	SpringMed Kiadó
Year of publication	2019

Type	Mandatory
Author	Nagy Zoltán
Title	Vascularis neurológia
Publisher	Semmelweis Kiadó
Year of publication	2015

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Mellkassebészeti Klinika (Országos Onkológiai Intézet)

Name of subject in Hungarian: Választható Klinikai Gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
hungarian, english, german

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Rényi-Vámos Ferenc István (igazgató)
Course coordinator location of work, telephone availability: Thoracic Surgery Department of the Semmelweis University +36208250250
Course coordinator position: Director of the Clinic
Course coordinator Date and number of habilitation: 2019.02.21.

Objectives of the course, and its place in the curriculum of the medical training program:

The purpose of the sixth-year clinical practice is to refresh the material learned in the fourth and fifth years and to demonstrate its practical application. Equipped with their now multidisciplinary knowledge, students participate in both inpatient and outpatient thoracic surgical care, closely following the activities of their tutors on a daily and hourly basis. They carry out specific tasks such as patient examinations, administration, developing treatment strategies, decision-making in clinical

practice, and operating room activities.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lesson

Competencies acquired through completion of course:

By the end of the practice, students will have gained a comprehensive understanding of the nature of activities in thoracic surgical professions. They will be capable of establishing diagnostic algorithms and, under supervision, performing specific clinical tasks. An important aspect is that a deeper insight into daily activities will assist students in choosing a specialty and spark their interest in the profession of thoracic surgery.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

According to the Academic and Examination Regulations

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum 1, and maximun 6 students.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

It can not be divided into modules.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the Academic and Examination Regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the educational period, no assessments are conducted. The interactive nature of the practical sessions and consultations allows for the continuous monitoring of students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

Completion of the Thoracic Surgery Workbook during the internship, which has to be submitted till the last day of the internship.

Requirements for the successful completion of the course:

In the case of internships, the signature must be denied if the absence has reached 10% of the given internship.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Recommended practical activities:

- Administering intramuscular injections
- Administering intravenous injections, setting up and connecting infusions
- Drawing blood
- Determining blood type
- Participating in the setup of transfusions
- Catheterization of the urinary bladder in both females and males
- Participating in central vein puncture (observing the procedure)
- Wound care
- Changing bandages
- Participating in bacteriological sampling
- Applying elastic bandages

- Removing stitches and staples
- Removing drains
- Suturing
- Participating in thoracentesis procedures
- Independently writing patient records, perform physical examination
- Requesting computer-based tests (lab, X-ray, ultrasound, CT, histology, bacteriology, any type of consultation)
- Independently composing discharge summaries
- Participation in specialist consultations and general/specialized outpatient care
- Surgical assistance
- Knot tying, placing skin sutures, and assisting in surgeries

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Expected concepts, practical skills:

- Participation in morning rounds, referrals
- Observation and assistance in the operating room
- Assessment of chest drain removal
- Knowledge of the differences between surgical techniques and indications
- Postoperative patient assessment
- Knowledge of examinations required before lung resection surgery
- Listing of chest drainage steps
- Basic evaluation of chest X-ray and CT scan

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Thoracic surgery workbook completion

Participating in Education:

Prof. Dr. Rényi-Vámos Ferenc

Dr. Agócs László

Dr. Megyesfalvi Zsolt

Dr. Ghimessy Áron

Dr. Radeczky Péter

Dr. Gieszer Balázs

Dr. Mészáros László

Dr. Török Klára

Dr. Bogyó Levente

Dr. Csende Kristóf

Dr. Tihanyi Hanna

Dr. Tarsoly Gábor

Dr. Csaba Márton

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	ESTS
Title	ESTS Textbook of Thoracic Surgery
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Szülészeti és Nőgyógyászati Klinika - Baross utcai részleg

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Ács Nándor (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Obstetrics and Gynecology (H-1082, Budapest Üllői str. 78/A.) Tel: 0612100290
Course coordinator position: Professor, Clinic Director
Course coordinator Date and number of habilitation: 245/2007.05.30

Objectives of the course, and its place in the curriculum of the medical training program:

After the Year-VI students completed their compulsory 4-week internship, they have an opportunity to spend their 6-week elective internship at the Clinic. We are looking forward to welcome all students who wish to choose Obstetrics and Gynaecology as their profession.

Format of the course (lectures, group work, practical lessons, etc.):

Practice

Competencies acquired through completion of course:

The teaching of obstetrics and gynaecology is part of the clinical training, starting in the 5th year and continuing throughout the curriculum with the VI year final examination - as well as the elective 6 week orientation placement for students who choose to do this after completing the post-registration placement.

During this time, our main ambition is to combine the theoretical subjects and the knowledge provided by related clinical professions with obstetrics and gynaecology. Our aim is that, on completion of their university studies, newly qualified doctors will be able to practise medicine independently, with up-to-date theoretical and practical knowledge, and with the right human relations with patients and their relatives and with health professionals.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Completion of Year 5

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on registration in the Neptun system

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

During the 6 weeks, students have the opportunity to participate in routine gynecological outpatient care and pregnancy care with the help of a specialist tutor at the Clinic's outpatient departments. In the delivery room and the operation theatres, they can assist with supervised births, and obstetrical

also gynanecological surgeries

They also have the opportunity to learn and practice creating of ward patient documentation (medical record, final report) During this internship, the students can perform obstetrics and gynecology ultrasound examinations -under the supervision of licensed tutors at our Clinic.

6-week practical topics (Obstetrics and Gynaecology Clinic)

The aim of the course is to deepen the knowledge of obstetrics and gynaecology acquired in year VI and to learn how to apply it in clinical practice. The duration of the internship is 6 weeks.

At the Obstetrics and Gynaecology Clinic in Baross Street, students are informed of their ward rotation, on-call duties and sessions on the first day of the training. On the starting day of the internship, students attend an opening consultation and welcome by the Director of the Clinic and the specialist in charge of the study. Each student is assigned a personal contact tutor, with whom he or she can consult on a daily basis on the subject and can also carry out examinations which, due to the intimate nature of the gynaecological profession, can only be carried out in a small group or with a tutor. The student will also have the opportunity to participate with the tutor in on-call duties and to assist in operations (e.g. assisting in caesarean section). At the opening consultation, the students will be given a list of requirements to be fulfilled. If any of the tasks have been completed by the student, they will be certified by the instructor's signature. Students can evaluate the usefulness of each event and task during the placement, thus helping to improve the educational work of the Clinic. On the first day of practice, the keys to the lockers and the protective clothing are distributed.

The first three weeks are spent in clinical practice, rotating between the following inpatient wards:

Baross Street Obstetrics and Gynaecology Clinic leading tutor: Gyula Richard Nagy MD Ph.D MSc med.habil
Gynaecology Department and Gynaecological Outpatient Clinic
Oncology Department and Ultrasound Ambulance

Department of Paediatrics
Delivery room

In the Clinic, the ward rotation involves daily rounds with the ward doctors. During the departmental work, they practice taking anamnesis, general physical examination, special examinations of pregnant women (Leopold's maneuvers, measurement of abdominal circumference, fundus height, methods of calculating gestational age), Foley catheter placement, rectal digital examination. Meanwhile, students will learn about the most important pathologies and will evaluate the cases of patients selected by the head of the department in a case discussion with the tutors in preparation for the examination. Students can even follow the patients' in the operating theatres. Each day, one student is assigned to each surgery as a second/third assistant. Participation in the following operations is compulsory: assisting in caesarean section, assisting in gynaecological surgery, assisting in laparoscopy, assisting in small obstetric operations (at least 2 cases) and gynaecological (at least 1 case) operations (fractionated curettage, abortion, etc.). During the practical training, students should learn the principles of CTG assessment and apply them to a specific case in front of their tutor.

In addition, during the traineeship, a number of on-call duties can be performed in accordance with the University's educational regulations and the Higher Education Act. During the on-call duty, the doctors on duty may call the student for any activity, who may examine and assist the student under supervision. During the activity in the delivery room, you will have the opportunity to follow the progress of the birth and assess physiological and pathological signs. You will learn how to assess the consistency and length of the cervix and the cervical dilatation (cervical index, Bishop score). During the training, you will be required to attend at least one spontaneous delivery from the time of admission to the delivery room until the time of transfer to the Puerperal Unit. You may assist in various forms of pain relief during childbirth, e.g. epidural analgesia. After delivery of the fetus, you may examine the placenta and umbilical cord under supervision, observe the first care of the newborn baby, and practise taking Apgar scores. Examination of the puerperal patient, assessment of involution and involution and healing processes are also tasks.

At the Baross Street Clinic during the week of the Oncology Department, time will be allocated for ultrasound exam the week of the Gynaecology Department, time will be allocated for the Gynaecology Outpatient Clinic. In the Gynaecology Outpatient Clinic, students can perform supervised bimanual examinations, colposcopy, practice the steps of cytology and vaginal fluid sampling and breast examination. They can learn about contraception (hormonal, IUD), infertility screening and family planning counselling (calendar, thermometer), and methods of testing for genital infections (vaginal pH, potassium hydroxide test, microscopic examination of vaginal secretions). In the Ultrasound Laboratory, they can watch gynaecological pelvic and abdominal ultrasound and pregnancy ultrasound screening. You must be present for at least 8 ultrasound examinations to meet this requirement.

The 6 weeks of clinical practice completed in Year VI are assessed by a practical certificate with signature. During the final consultation at the Clinic of Obstetrics and Gynaecology, Baross Street,

on the last day of the internship, students will present and hand in the fully completed list of requirements. Afterwards, the exercise will be registered in Neptun. In year VI, a specialisation in obstetrics and gynaecology is required.

Competency list of the knowledge to be acquired in the practical training of Obstetrics and Gynaecology in year VI:

Title	Expected level of knowledge (theoretical knowledge - ET, viewing - M, participation - R.)
Physical tests	***ET, M, R***
History of previous diseases	ET, M, R
General physical examination	ET, M, R
External genital examination	ET, M, R
Vaginal examination	ET, M, R
Digital rectal examination	ET, M, R
Rectovaginal examination	ET, M, R
Amine test	ET, M, R
Vaginal pH measurement	ET, M, R
Microscopic examination of a vaginal smear	ET, M, R
Cervical sampling	ET, M, R
Oncocytology sampling	ET, M, R
Colposcopic examination	ET, M, R
Pelvic ultrasound scan	ET, M,
Vaginal ultrasound scan	ET, M,
Curettage uteri	ET, M,
Instrumental completion of abortion	ET, M,
Artificial termination of pregnancy	ET, M,
Endometrial aspiration	EN
Diagnostic laparoscopy	EN
Infertility screening	ET, M,
Awakening temperature measurement and assessment	ET, M, R
Cervical spit examination	ET, M, R
Conducting and evaluating a pregnancy test	ET, M
Hysterosalpingography	EN
Chromohydrotubing	EN
Breast examination and education	ET, M, R
Bladder catheter placement	ET, M, R
Portio electrocoagulation	ET,
Operative laparoscopy	ET, M
Contraception advice	ET, M, R
Placement of an intrauterine device	ET, M,
Laparoscopic sterilisation	ET,
Obstetrics	
Pre-conceptual education, counselling	ET, M, R

Coronary heart disease risk assessment	ET, M
Biochemical screening for genetic abnormalities (Down)	ET,
Serological screening in pregnancy	ET,
Haematological screening in pregnancy	EN
Screening for gestational diabetes	ET, M
Determining the time of delivery using the Naegele method	ET, M, R
Determination of delivery time using the Neagele method corrected for cycle length	ET, M, R
Estimating the expected time of delivery by CRL measurement	ET, M, R
Estimating the expected time of delivery based on the first movement of the fetus	ET, M, R
Examination in first trimester	ET, M, R
Diabetes advice	ET, M
Advice in case of a positive haematological screening test result	ET, M
Advice in case of a positive blood group serological result	ET, M
Advice in case of a positive syphilis serology result	EN
II-III trimester antenatal examination	ET, M, R
Leopold maneuvers	ET, M, R
Determining gestational age by measuring Sy-Fu distance	ET, M, R
Determining gestational age by measuring abdominal circumference	ET, M, R
Cervical index determination	ET, M, R
Performing CTG and evaluating the curve	ET, M, R
Conduct NST and assess the result	ET, M, R
Coronary ultrasound scan	ET, M
Amniocentesis	EN
2nd trimester ultrasound scan	ET, M
Chorionic duct biopsy	EN
Ultrasound in the third trimester	ET, M
Oxitocin exercise test OTT evaluation	ET, M
Detection of a woman in labour	ET, M, R
Obstetric physical examination	ET, M, R
Bishop-score definition	ET, M, R
Amniotomy	EN
Barrier protection	ET, M
Local anaesthesia (barrier)	ET, M
Epidural analgesia	ET, M
Episiotomy	ET, M
Newborn care in the delivery room	ET, M
Newborn nose and throat suction	ET, M
Apgar value determination	ET, M, R
Management of the placental stage of labour	ET, M
Examination of placenta and umbilical cord	ET, M, R
Estimating maternal blood loss	ET, M

Care of a perforation wound	ET, M
Medicinal induction of labour	ET, M
Conducting a spontaneous vaginal birth	ET, M
Caesarean section	ET, M, R
Examination at puerperium	ET, M, R

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

In accordance with the study and examination regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

No such

Requirements for the successful completion of the course:

In accordance with the study and examination regulations

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Practical exam according the Competency list of the knowledge to be acquired in the practical training of Obstetrics and Gynaecology in year VI

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirement for passing the course can be found in the competence list (point 22).

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The practical exam grades will be given at the end of the internship. The mark will be based on the completed tasks, the students attitude demonstrated during their internship and the opinion of their own tutor.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	N.F. Hacker and J.G. Moore
Title	Essentials of Obstetrics and Gynecology
Publisher	Elsevier - Health Sciences Division
Year of publication	

Type	Recommended
Author	Louise Kenny
Title	Obstetrics by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	2017

Type	Recommended
Author	Louise Kenny
Title	Gynecology by Ten Teachers 20th Edition
Publisher	Taylor & Francis Inc
Year of publication	2017

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Családorvosi Tanszék

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Torzsa Péter (tanszékvezető)
Course coordinator location of work, telephone availability: H-1095, Budapest, Üllői út 25. City Corner Office, 1st floor. Tel.: (+36-1) 355-8530; (+36-1) 214-0841 Email: titkarsag.csot@semmelweis.hu
Course coordinator position: Professor, Head of Department
Course coordinator Date and number of habilitation: 2020.07.21., 11/2020

Objectives of the course, and its place in the curriculum of the medical training program:

Healthcare is based on the family practice system in many countries, General Practitioners are the gatekeepers in most healthcare systems. It will be introduced on a one-to-one tutoring basis that family care, the GP’s work is an integrating profession. Medical students will be given an insight into the ways of approaching holistic, complex bio-psycho-social and somatic problems, prevention and

the differential diagnostics of frequent diseases. The aim is to show them through certain patient cases how and when to apply the basic diagnostic and therapeutic procedures and tools, how to develop the patient-doctor relationship, improve communication skills or work with short interventions.

Objectives of the course:

- to introduce the medical care outside the hospital giving an opportunity to study the characteristics of work in this environment.
- to help manage patients as people and as a member of a family who present with problems (not diseases) along with their physical, psychological and social points of view
- to provide an opportunity to improve clinical skills

Format of the course (lectures, group work, practical lessons, etc.):

On a one-to-one tutoring setting.
Accredited tutorial practices (with contracted GP tutors in Budapest and its agglomeration, and in foreign countries). Students are allowed to spend their clinical rotation in their home or any other foreign country on the condition that they present prior to their clinical training appropriate and sufficient information about the affiliated primary care setting they intend to work at.

Competencies acquired through completion of course:

Basics of a preventive approach, screening methods.

Approach for the holistic patient care, managing complex bio-psycho-social-health problems.

Frequent acute and chronic illness care in the primary care.

Differential diagnostics. Using basic diagnostic tools, assessing test results.

Improved skills in communication and motivation of patients.

Improved skills in physical examination, injections etc.

Patient referrals: history taking, medical notes and reports.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

1-week Family medicine rotation (AOKCSA645_SA)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

1 minimum, 30 maximum.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

6 week = 24 workdays – working together with your tutor in the practice (it means at least 4 consulting office hours/day).
Accompanying the tutor on home visits is encouraged but not required.

Topics to observe and concentrate on during the course:

– patient-doctor communication (structure and methods of interviewing)

– problem-based and person-centered care, problem oriented solutions

– medical decision making, professional responsibility

– managing common acute problems AND complex care of patients with chronic illnesses

– taking medical history, physical examination

– making medical records

– order and perform certain diagnostic tests

Examine a few patients before your tutor; then observe his/her consultation with the patient and spend a few minutes after the patient has left the room, comparing notes. Notes are recommended in a form of medical records (patient's age, gender, social background, job/retirement; actual/main complaints and problems, disorders in the physical status. Diagnosis, therapy solution/advice, referral etc.

During the rotation program you have to choose one of the most interesting cases for composing a detailed case report on it. The detailed case report should contain the basic information about the patient (patient profile: age, marital status, family, occupation, housing), the present illness or complaint, significant family or past history, the problem list, the assessment and the final solution. Please mention why you found that chosen case interesting.

At the end of the program please write a final comment and summarize your opinion and experiences about the Family Medicine practice gained during the rotation.

Your tutor have to make a short report on your work of the following aspects:

- theoretical: medical, pharmaceutical knowledge
- practical abilities – physical examination
- your attitude and communication skills

GP tutors:

Anikó Ambrus, Mihály Bak, Eszter Bánhidi, Judit Bárdos, Dalma Csatlós, Árpád Cserti, Tibor Görcs, Kornél Hintalan, Emese Kádár, Krisztián Kádár-Németh, Gábor Karai, Noémi Cintia Kis, Gabriella Kókai, Beáta Kőrösi, Beáta Lamboy, Zoltán Lakó-Futó, Annamária Leviczky, Tünde Magyar, János Nagy, Judit Nagy, János Nemcsik, Emese Németh, Károly Pecze, Ábel Perjés, Emese Rácz, Judit Simon, Éva Somos, Endre Szabó, Róbert Timár, András Terebessy, Katalin Török, Péter Torzsa, Krisztián Vörös, Gábor Xantus, János Zsuffa

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

90% of attendance is required according to the currently valid study rules.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

Completed practical diary - Logbook.

Requirements for the successful completion of the course:

Certified attendance and the completed practical diary - Logbook.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Filled Logbook with the total 10 of short cases and 1 long, detailed case the student is interested in.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

90% of attendance certified, and the completed Logbook been sent to the Department.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

As of the tutor's assessment and the completed Logbook.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Belgyógyászati és Onkológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Takács István (igazgató)
Course coordinator location of work, telephone availability: Department of Internal Medicine and Oncology, Semmelweis University, Tel: 06-1-459-1500/51520
Course coordinator position: professor, department head
Course coordinator Date and number of habilitation: 2011, 328 (Semmelweis University)

Objectives of the course, and its place in the curriculum of the medical training program:

The sixth-year elective practice can be considered as the extension of the compulsory 8-week practice in Internal Medicine, and it is particularly recommended to students who wish to work as specialists in such fields of Internal Medicine as endocrinology, diabetology, gastroenterology or nephrology. During the elective practice, students shadow and follow the instructions of a tutor on ward as well as on the outpatient unit and participate in everyday clinical work.

Format of the course (lectures, group work, practical lessons, etc.):

work on a medical ward / outpatient unit

Competencies acquired through completion of course:

Students are able to deepen and complete their knowledge and competences and learn to work with gradually increasing independence on a selected field in Internal Medicine.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Internal Medicine (final exam)

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

Not applicable.

The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on student registration in Neptun, minimum 1 student, maximum 12 students / block.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

After the successful completion of the final exam in Internal Medicine, students can deepen their theoretical and practical knowledge in a selected field (endocrinology, diabetology, gastroenterology, nephrology) of Internal Medicine, with the help of a specialist tutor. By shadowing a tutor and following instructions students participate both in inpatient and outpatient management.

Students spend 6 weeks (5 days / week, 8 hours / day, between 8:00 AM - 4:00 PM) at a medical ward.

Tasks to be performed:

· patient admission: taking patients' medical history, evaluation of signs and symptoms, physical examination

· making a preliminary diagnosis, consideration of differential-diagnostic possibilities, preparation of a diagnostic and therapeutic plan

· evaluation and interpretation of laboratory parameters and radiologic findings

· evaluation and follow-up of the patients' general condition, and changing diagnostic and therapeutic plan according to new findings

· patient referral on rounds (at least one patient / week)

· participation on consultations with specialists

· becoming familiar with special diagnostic / therapeutic techniques of the selected field through observation or performing under supervision

· management of patient documentation under supervision (daily follow-up, discharge summary, consent forms, consultation requests)

optional stay in the teaching hospital for an evening shift

Lecturers:

Dr. Studinger Péter, Prof. Dr. Horváth Csaba, Prof. Dr. Tóth Miklós, Prof. Dr. Igaz Péter, Prof. Dr. Kempler Péter, Prof. Dr. Tislér András, Dr. Putz Zsuzsanna, Dr. Tőke Judit, Dr. Reismann Péter, Dr. Putz Zsuzsanna, Dr. Szücs Nikolette, Dr. Ármós Richárd, Dr. Barkai László, Dr. Garam Nóra, Dr. Gönczi Lóránt, Dr. Horváth Viktor, Dr. Hajdú Noémi, Dr. Iliás Ákos, Dr. Istenes Ildikó, Dr. Körei Anna, Dr. Kövesdi Annamária, Dr. Jávorfi Tamás, Dr. Kollár Réka, Dr. Folhoffer Anikó, Dr. Ledó Nóra, Dr. Mészáros Szilvia, Dr. Pethő Ákos, Dr. Németh Dániel, Dr. Perge Pál, Dr. Schnabel Karolina, Dr. Sumánszki Csaba, Dr. Sümegi Liza, Dr. Szabó Gergely, Dr. Szili Balázs, Dr. Vági Orsolya, Dr. Stark Júlia

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the rules of the University, students are required to participate on at least 90% of the practice. This is evaluated through attendance sheets signed by tutors.

In case of illness or unforeseen special circumstances of the student, retake is feasible based on an individual agreement with the tutor.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no formal midterm evaluation. Throughout the practice the interaction between students and the tutor provides an opportunity to assess the knowledge of students.

Number and type of individual assignments to be completed, submission deadlines:

Not applicable

Requirements for the successful completion of the course:

Participation on at least 90% of the practice. At the end of the course, after the student has taken his/her attendance sheet to the secretariat, the Course Director grants credits to students in the Neptun system.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Not applicable

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

Complete physical examination of a patient (general assessment + respiratory / cardiovascular / gastrointestinal system): presentation of techniques, description and interpretation of findings. Ability to instruct patients in Hungarian during physical examination.

Recognition, differential diagnosis and management of acute, life-threatening conditions and common chronic diseases.

https://semmelweis.hu/belonko/en/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The practice grade is based on the student's activity and progression throughout the course, and the results of the practical exam.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	itc.semmelweis.hu

Printed resources:

Type	Recommended
Author	Lynn S. Bickley
Title	Bates' Guide to Physical Examination and History Taking. (12th Ed.,) ISBN: 97814698934.19
Publisher	Wolters Kluwer
Year of publication	2016

Type	Recommended
Author	Jameson – Fauci – Kasper – Hauser – Longo – Loscalzo
Title	Harrison's Principles of Internal Medicine. (, 21st Ed., 2022)
Publisher	McGraw-Hill Education
Year of publication	2022

Type	Recommended
Author	Feather – Randall – Waterhouse
Title	Kumar and Clark's Clinical Medicine. (, 10th Ed.,)
Publisher	Elsevier
Year of publication	2020

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Neurológiai Klinika

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bereczki Dániel (Klinika igazgató)
Course coordinator location of work, telephone availability: Department of Neurology, +361210033712/1999.
Course coordinator position: tanszékvezető egyetemi tanár
Course coordinator Date and number of habilitation: 12/1999. DOTE

Objectives of the course, and its place in the curriculum of the medical training program:

Acquire direct practical knowledge in every day neurological patient care during an optional six-week period.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lesson

Competencies acquired through completion of course:

The student learns the technique of neurological physical examination and the interpretation of the findings. Detects when examining a patient in need of urgent care. Knows the most common neurological and borderline disorders.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Fulfill the Neurology final exam.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Min. 1 student

Max. 20 student

Through the NEPTUN system

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Detailed course description:

(Theoretical and practical instruction must be broken down into lessons (weeks), numbered separately. Please provide the names of lecturers in both types of lessons, indicating guest lecturers. This information is not to be attached separately. CVs of guest lecturers, however, must be attached.)

Optional clinical practice (6 weeks) topics:

1. Emergency and intensive care in neurology - Dr. Ildikó Sipos

2. Stroke care, acute and chronic management - Dr. Bence Gunda

3. Neuroimmunological diseases, multiple sclerosis - Dr. Magdolna Simó, Dr. Zsolt Mezei

4. Movement disorders - Dr. Gertrúd Tamás

5. Dementia, headache - Dr. Tibor Kovács, Dr. Róbert Debreceni

6. Epilepsy, Neuromuscular diseases - Dr. Zsuzsanna Arányi, Dr. Anita Csillik

Daily breakdown:

8.00 - 9.00 - Patient class discussion

9.00-10.00 - Visit

10.00-11.00 - Consultation From

11.00-16.00 - Class work, patient admission

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Absences of 10% are allowed, replacement according to discussion with the tutor.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

During the six-week internship, the job of a graduate student is the same as that of a beginner resident. The work is first checked by a resident under the supervision of a specialist.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Attending and completing exercises with at least an "adequate" rating. Outpatient department, council, on-call certificate. Referral keeping.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

In the case of optional internships, the Mentor / head of department evaluates the 6-week performance of the trainee assigned to her/him in a practical exam.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department’s website referring to the minimum requirements of the course.

In the case of optional internships, the Mentor / head of department evaluates the 6-week performance of the trainee assigned to her/him in a practical exam.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Five-level practical exam grade.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important

technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle/login/index.php

Printed resources:

Type	Recommended
Author	Szirmai Imre
Title	Neurológia
Publisher	
Year of publication	

Type	Recommended
Author	Szirmai I., Kamondi A., Kovács T.: Investigation of neurological patients.
Title	university note
Publisher	
Year of publication	

Type	Recommended
Author	Lindsay,Bone,Callender: Neurology and Neurosurgery
Title	textbook
Publisher	
Year of publication	

Type	Recommended
Author	Adams: Principles of Neurology
Title	textbook
Publisher	
Year of publication	

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Laboratóriumi Medicina Intézet

Name of subject in Hungarian: Választható klinikai gyakorlat
Name of subject in English: Six-week Facultative course
Name of subject in German: Wahlpflichtfach PJ – Klinisches Praktikum

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Credit value of the course: 5
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
240.0	0.0	240.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
Angol

Course code:
AOKANG1137_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Vásárhelyi Barna
Course coordinator location of work, telephone availability: Laboratóriumi Medicina Intézet, +36 20 666 3246
Course coordinator position: Intézetvezető egyetemi tanár
Course coordinator Date and number of habilitation: 2010. március 22. száma: 29/2010

Objectives of the course, and its place in the curriculum of the medical training program:

Thoroughly familiarize yourself with the phases of laboratory work, the input requirements of the phases, which are necessary for the preparation of reliable results and findings.

Format of the course (lectures, group work, practical lessons, etc.):

Practice.

Competencies acquired through completion of course:

Better understanding of laboratory work.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

1-6 weeks. The students will be involved in the work of the Central Laboratory, where they will be given theoretical and practical training on the following topics

Week 1

- Overview of the laboratory IT system. Data protection issues.
- Data recording in the medical informatics system
- Overview of sampling methods, tools and methods.
- Major preanalytical testing factors affecting the results of routine medical laboratory tests

Practical work: Students will be actively involved in operating each laboratory instrument to validate the results obtained.

Week 2

- Routine laboratory parameter determination devices and their operation.
- Instruments used for urinalysis and their use.
- Operation and use of haematology automats.
- Apparatus used for measuring coagulation parameters and their use.

Practical work: Students will be actively involved in operating each laboratory instrument to validate the results obtained.

Week 3

- Use and operation of blood type devices.
- Instruments for measuring immunological parameters and their use.
- Point-of-Care-Testing (POCT). Use of devices in the laboratory and clinics.

Practical work: students will be actively involved in using the different automats and validating the results obtained.

Week 4

- Microbiological sampling and material processing.
- Procedures used to identify bacterial infection.

Practical work: students will actively participate in sample preparation and evaluation of results.

Week 5

- Microbiological sampling and material processing.
- Procedures used for the identification of viral infections.

Practical work: students will actively participate in sample preparation and evaluation of results.

Week 6

- Exercises in the laboratories of the Theoretical Complex in Oradea Square.
- Apparatus and its use for drug screening.
- Pre-analysis, analysis and post-analysis of hormone level tests
- Human Genetic Testing

Practical work: students will be actively involved in using the different automats and validating the results obtained.

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Participation in the practical sessions according to the prevailing Study and Examination Regulations

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Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

Continuous accountability and monitoring.

Number and type of individual assignments to be completed, submission deadlines:

It will be determined during the exercise.

Requirements for the successful completion of the course:

Participation in the practical sessions according to the prevailing Study and Examination Regulations. Completion of the internship must be certified by the head of department.

Type of assessment:
end term examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Continuous accountability and monitoring.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

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1. Aim of the Practice

By the end of the practice, the student will:

- become familiar with the **organizational, professional, and legal**

operation of a clinical laboratory
- understand the principles of **pre-analytical, analytical, and post-analytical processes**
- participate actively in routine laboratory investigations **under supervision**
- acquire the basics of **clinical interpretation of laboratory results**
- understand the role of **quality assurance, validation, and patient safety**

2. General Formal Requirements

- **Duration of the practice:** 6 weeks (≥ 180 hours total)
- **Daily attendance:** minimum 6 hours/day
- **Permitted absence:** maximum 10% (make-up mandatory)
- **Workwear:** laboratory coat, closed shoes, name badge
- **Occupational safety and data protection training:** mandatory (week 1)

3. Weekly Professional Requirements

Week 1 – Introduction, Pre-analytics, and Safety

Theoretical knowledge:

- Structure of the clinical laboratory, laboratory sections
- Types of sampling (blood, urine, cerebrospinal fluid, other body fluids)
- Pre-analytical errors and their consequences
- Biological safety levels
- GDPR and medical data protection

Practical requirements:

- Sample reception and identification checks
- Recognition of in vitro hemolysis, lipemia, and icterus
- Observation of centrifugation and aliquoting procedures

Week 2 – Clinical Chemistry and Automation

Theoretical knowledge:

- Principles of photometry, turbidimetry, and ion-selective electrodes (ISE)
- Clinical chemistry panels (liver, kidney, lipid, electrolyte)
- Reference ranges and clinical decision limits

Practical requirements:

- Familiarization with automated analyzers
- Observation of reagent and calibrator replacement
- Observation and interpretation of internal quality control (QC) runs

Week 3 – Hematology and Hemostasis

Theoretical knowledge:

- Parameters of the complete blood count
- Importance of peripheral blood smear examination
- Basic coagulation tests (PT, APTT, fibrinogen)

Practical requirements:

- Observation of hematology analyzer operation
- Recognition of abnormal instrument flags
- Microscopic examination of blood smears

Week 4 – Immunology, Serology, and Hormone Testing

Theoretical knowledge:

- Principles of ELISA, CLIA, and ECLIA methods
- Basics of autoimmune and infectious serology
- Hormonal regulation and pre-analytical sensitivity

Practical requirements:

- Familiarization with immunoanalytical platforms
- Understanding the principles of calibration curves
- Discussion of false-positive and false-negative cases

Week 5 – Molecular Diagnostics and Specialized Tests *(laboratory profile dependent)*

Theoretical knowledge:

- Principles of PCR
- Gene expression versus mutation analysis
- Sample handling at the molecular level

Practical requirements:

- Observation of nucleic acid isolation

- Prevention of contamination
- Understanding the clinical relevance of molecular results

(If molecular diagnostics are not available, this week may be replaced by toxicology or specialized chemical analyses.)

Week 6 – Quality Assurance, Interpretation, and Integration

Theoretical knowledge:

- Internal and external quality control systems
- Basics of Westgard rules
- Laboratory accreditation (ISO 15189)

Practical requirements:

- Interpretation of QC charts
- Error analysis based on case studies
- Structured clinical interpretation of laboratory reports

4. Documentation Requirements

- **Practice logbook** (signed weekly), including:
  - activities performed
  - tests observed
  - short reflective notes (learning outcomes)
- **Case study report** (1 required):
  - clinical question
  - laboratory results
  - interpretation

5. Assessment System

Component	Weight
Attendance and activity	30%
Practice logbook	20%
Case study report	20%
Oral examination / final discussion	30%

Minimum requirement for a pass: completion of all practice weeks and

submission of the logbook

6. Competencies Achieved by the End of the Practice

The student will be able to:

- critically evaluate laboratory results from a **pre-analytical perspective**
- interpret routine parameters in a **clinical context**
- identify quality assurance issues
- apply multidisciplinary thinking (laboratory–clinician interface)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Continuous attendance of exercises.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Recommended
Author	McPherson RA, Pincus MR
Title	Henry's Clinical Diagnosis and Management by Laboratory Methods 24nd Edition
Publisher	
Year of publication	2022

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Sebészeti, Transzplantációs és Gasztroenterológiai Klinika

Name of subject in Hungarian: Sebészet
Name of subject in English: Surgery
Name of subject in German: Chirurgie

Credit value of the course: 6
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
160.0	0.0	160.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKSB1646_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Szijártó Attila (Klinika Igazgató)
Course coordinator location of work, telephone availability: Department of Surgery, Transplantation and Gastroenterology. 1082 Budapest, Üllői út 78., +36208258925
Course coordinator position: professor, head of department
Course coordinator Date and number of habilitation: 2015.06

Objectives of the course, and its place in the curriculum of the medical training program:

The purpose of the sixth year's surgical practice is firstly to refresh the knowledge gained in the fourth year, but also demonstrate its practical application. Now equipped with multidisciplinary knowledge, students can participate in surgical inpatient (surgical ward) and outpatient care (surgical ambulance), follow the daily activities of their tutors and perform tasks (patient examination, administration, development of treatment strategies, decision making in the clinic, operating room activities) on a daily basis.

Format of the course (lectures, group work, practical lessons, etc.):

Practice

Competencies acquired through completion of course:

By the end of the surgical rotation, students will have gained a comprehensive picture of the surgical profession and their adherent activities. They will be able to set up diagnostic algorithms and - under supervision - perform the partial tasks of clinical work.

It is important to note that a deeper understanding of everyday activities helps students in choosing their future specialty and arouses their interest towards surgical professions.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Traumatology and Orthopedics, Urology, Ophthalmology

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Based on the registration in the Neptun system, a minimum of 1 and a maximum of 35 students in a practical program.

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

Students spend four weeks in general surgery according to their schedule.

The daily schedule of the practices corresponds to the official working hours.

In addition to practical patient care, seminars and case discussions are organized daily.

The topic covers general and organ-specific surgery.

Mandatory and recommended practical activities: (Mandatory practical activities marked in bold)

Admnistration of intramuscular injection

Admnistration of intravenous injection

Setting up and administering infusions

Blood sampling

Blood group determination

Participation in setting up a blood transfusion

Rectal digital examination (documention of negative or positive findings)

Placing a duodenal tube

Placing a urinary bladder catheter (men and women)

Observe a central venous cather palcement

Observe the placement of a Sangstaken or Linton tube

Wound dressing placement and changes

Participation in bacteriological sampling

Application of an elastic bandage

Suture removal

Staple removal

Drain removal

Suturing

Participation in rectoscopic, anoscopic (colonoscopic) examination

Participation in gastro-duodenoscopy

Participation in examination/exploration of a superficial abscess

Participation in nail sampling

Participation in abdominal (ascites) or chest puncture

Examination of carotid and peripheral vessels

Participation in Doppler examination

rticipation in the introduction of an epidural cannula

Independent writing of a medical record

Administrative tasks: Examination and consulations requests (labor., x-ray, ultrasound, etc.)

Independent editing of the final report

Examination of the breasts (and documentaion of negacitve or positive findings)

Examination ofthe armpits

Examination of nodular goiters

Examination of inguinal hernias

Examination of umbilical hernias

Examination of umbilical and abdominal wall hernias

Examination of an incarcerated hernia

Examination of appendicitis or suspition thereof

Examination of cholecystitis or suspition thereof

Examination of mechanical ileus or suspition thereof

Examination of paralytic ileus or suspition thereof

Detection of circumscribed muscular defense

Detection of diffuse peritonitis

Auscultation of mechanical ileus

Auscultation of silent abdomen

Detection of abdominal resistance

Examination of ascites

Examination of haemorrhoids

Examination of periproctal, gluteal or soft tissue abscesses

Participation in the examination and care of panaritium

Examination of lymphangitis, lymphadenitis

Examination of sacral dermoid cysta or periproctal and anal fistula

Examination of varicose veins

Examination of foot gangrene

Participation in specialist appointments, general and specialist outpatient care

Surgical assistance (appendectomy, hernia surgery, breast surgery, cholecystectomy, colon surgery, laparoscopic surgeries, and participation in the special interventions of the given institute.)

Knotting and suturing during surgeries

Tutors:

Dr. Bánky Balázs

Dr. Bárdos Dávid

Dr. Bencze Viktória

Dr. Benke Márton

Dr. Bihari László Ádám

Dr. Csuja Nándor

Dr. Daradics Noémi

Dr. Deák-Ilkó Zoltán

Dr. Doleviczényi Levente

Dr. Drexler Tímea

Dr. Eitler Katalin

Dr. Fülöp András

Dr. Hamar Mátyás

Dr. Herczeg András

Dr. Huszty Gergely Dénes

Dr. Illés Kristóf

Dr. Klárik Zoltán

Dr. Kóbori László

Dr. Kokas Bálint

Dr. Kolostyák Zsuzsanna

Dr. Kovács János Balázs

Dr. Lakatos Lóránd

Dr. Lehoczki Csaba Ferenc

Dr. Lengyel Bóra Blanka

Dr. Lukász Péter

Dr. Marjai Tamás

Dr. Meltzer Anna

Dr. Mózer Andreas Rajmund

Dr. Pálházy Tímea

Dr. Pekli Damján

Dr. Rózsa Balázs

Dr. Scutaru Tabita Timeea

Dr. Szabó József ifj.

Dr. Szelle Bálint Tibor

Dr. Szepesi Ágnes

Dr. Szlávik Rezső

Dr. Szőke Szilvia

Dr. Telkes Gábor

Dr. Ulmann Lőrinc

Dr. Vass Tamás

Dr. Völcsei Norbert

Dr. Voniatis Konstantinos

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Absences are kept by a signing presence during the practices.

Based on the Semmelweis University SZMSZ Chapter 3, § 17, § 7, participation in at least 90% of the practices is required.

In addition, general information regarding attendance at lectures and exercises can be found in the Semmelweis University "Study and Examination Regulations" (Section 17.7; Paragraph 8!).

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

There is no assessment during the education period. However, the interactive nature of the pracitces and consultations enables continuous monitoring of the students' knowledge.

Number and type of individual assignments to be completed, submission deadlines:

-

Requirements for the successful completion of the course:

At least 90% participation on the surgery practice.

Type of assessment:
comprehensive examination

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Oral and Practical exam

Oral questions: During the oral examinations the following topics can be asked based on the themes found in the relevant textbooks and lectures and practices:

GENERAL SURGERY

1. Classification of wounds, principles of wound treatment

2. Soft tissue infections, wound infections, NPWT, antiobiotic prophylaxis

3. Indications and contraindications of surgery, surgical incisions

4. Preoperative care, ERAS protocol, prehabilitation, perioperative nutrition

5. Postoperative care and complications

6. Surgical oncology (basic concepts, importance of TNM staging, neoadjuvant and adjuvant oncological treatment, concept of onco-team, importance)

7. Significance of minimally invasive surgery, common surgical techniques

8.Transplantation basic concepts (basic concepts, brain death, indications, immunosuppression)

9. Forms of surgical deviations of the intestinal system: stomas (main types, indications)

10. Types of bleeding, hemostasis, transfusion

11. Thromboembolism, thromboprophylaxis

12. Surgical diagnosis (physical signs, laboratory, imaging devices) Interventions (endoscopy, US/CT-guided interventions)

13. Anatomy of abdominal visceral vessels

SPECIAL SURGERY

1. Disease of the adrenal glands, surgical consequences

2. Benign diseases of the thyroid gland, and treatment

3. Malignant diseases of the thyroid gland and,treatment

4. Surgery of the parathyroid gland

5. Benign diseases of the esophagus, diagnostics and treatment (achalasia, diverticulosis, hiatal

hernia, GERD).

6. Malignant diseases of the oesophagus, diagnosis, treatment

7. Benign diseases of the stomach. Examination of the stomach and the duodenum, surgical aspects

08. Malignant diseases of the stomach (symptoms, diagnosis, treatment)

09. Gallstones of the gallbladder and the biliary tract: symptomatics, diagnostics, treatments

10. Gallstones complications and treatment

11. Malignant diseases of the gallbladder and the biliary tract: sypmtomatics, diagnostics and treatments

12. Benign tumours of the liver (symptoms, differential diagnosis, treatment)

13. Primary and metastatic tumours of the liver tumours (symptoms, diagnosis, treatment)

14. Acute and chronic pancreatitis (symptoms, diagnosis, treatment, complications)

15. Malignant diseases of the pancreas (curative and palliative, surgical and interventional options)

16. Colorectal polyps, polyposis syndromes (symptoms, diagnosis, treatment)

17. Anorectal tumors (symptoms, diagnosis, treatment)

18. Malignant diseases of the large intestine (symptoms, diagnosis, treatment)

19. Colon diverticulosis, diverticulitis (symptoms, diagnosis, conservative treatment, surgical indications)

20. Surgical aspects of Crohn disease

21.Surgical aspects of ulcerative colitis

22. Anorectal benign diseases (haemorrhoids, perianal fistula, anal fissure, anorectal abscesses)

23. Signs and causes of peritonitis. Perforation of luminal organs: symptomatics, diagnostics, treatments

24. Ileus: types, symptomatics, diagnostics, treatments

25. Acute appendicitis: symptomatics, diagnostics, treatments

26. Acute and chronic intestinal ischemia

27. Symptomatics, causes, and treatments of upper-gastrointestinal bleeding

28. Symptomatics, causes, and treatments of lower-gastrointestinal bleeding

29. Inguinal and femoral hernias: symptomatics, diagnostics, treatments

30. Hernias: definitions, types, symptoms, complications and types of treatment

31. Surgical aspects of the spleen. Surgical methods for the treatment of retroperitoneal diseases

32. Breast cancer: diagnostics and treatment

33. The benign diseases of the breast. Types of breast-reconstruction surgeries

34. Bariatric surgery

Practical Exam:

Physical examination of the whole body, with particular attention to the abdominal status.

Digital rectal examination and examination of the peripheral vessels with a hand-held Doppler device.

Blood sampling, iv., im., sc. injection.

Recognition of general surgical instruments.

Wound treatment, dressing changes, accurate description of the condition of wounds.

Recognition of different suture techniques, suture removal

Handling and removal of drains.

Documenting patient sheets, reviewing medical records and other patient documentation.

Surgical hand preparation (Washing, Scrubbing)

Sterility rules, isolation of the surgical area.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

To achieve a passing grade, the student must possess the following basic theoretical and practical knowledge and be able to apply it in simple clinical situations.

1. General Surgery

The student:

- Is familiar with the classification of wounds, the basics of wound healing, and the principles of wound management.
- Recognizes the signs of wound infections and soft tissue infections, and knows the basic treatment principles (including antibiotic prophylaxis and the basics of NPWT).
- Understands the basic indications and contraindications for surgical procedures.
- Knows the main steps and objectives of pre-, peri-, and postoperative care.
- Recognizes common postoperative complications.
- Is familiar with the basic concepts of surgical oncology (significance of the TNM system, basic treatment approaches).
- Has a general understanding of the role of minimally invasive surgery.
- Knows the basic concepts of transplantation (brain death, indications).
- Is familiar with the main types and indications of stomas.
- Knows the basic principles of hemostasis and the fundamentals of blood transfusion.
- Is familiar with the basics of thrombosis and embolism prevention.
- Has basic knowledge of diagnostic tools used in surgery.
- Knows the basic anatomy of the abdominal visceral vessels.

2. Specific Surgery

The student is able to:

- recognize the basic symptoms of the most common diseases,
- list the essential diagnostic steps,
- outline the principles of management (conservative vs. surgical treatment).

With particular emphasis on the following areas:

- diseases of the esophagus, stomach, and duodenum (e.g., reflux disease, peptic ulcer disease)
- cholelithiasis and its complications
- basic acute abdominal conditions (appendicitis, ileus, perforation, peritonitis)
- basics of pancreatitis
- diseases of the colon (diverticulitis, colorectal tumors at a basic level)
- rectal and anorectal diseases (hemorrhoids, fissure)
- basic types of hernias
- recognition of gastrointestinal bleeding
- basics of breast diseases

Detailed knowledge of surgical techniques is not required, but recognizing the need for intervention is expected.

3. Practical Minimum Requirements

The student:

- is able to perform a basic physical examination, especially abdominal examination
- understands the essentials of digital rectal examination (demonstration may be required)
- is able to perform or demonstrate basic procedures:
    - blood sampling
    - injections (IV, IM, SC)
- recognizes basic surgical instruments

- is able to describe wound condition and perform basic wound care
- recognizes sutures and is able to remove them
- is familiar with basic drain management
- is able to document and interpret patient records at a basic level
- follows and demonstrates aseptic technique and proper surgical scrubbing procedures

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Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Grade (1-5)

The final grade which will appear in Neptun, is calculated from the grade of both the theoretical (2/3) and practical (1/3) examinations.

The practical grade is based on the result of the practical exam and the work during the surgical rotation:

- The rigorous oral exam is preceded by a practical exam and patient examination. This is done on patients in the clinic's ward.
- Logbook: On the first day of the internship, during registration, the student will receive an operating room attendance sheet (found on the website under downloadable documents), on which they must detail in 4-6 sentences what they experienced and learned during their participation in the operating room. The students won't recieve grade for the logbook but the students have submit together with the surgery practice attendance sheet/certificate for the signature.

All students are required to participate in a surgical operation at least 10 times, and which must be confirmed with a signature.

Oral examination consists of four topics from 4 items (vascular surgery, traumatology, general surgery topic, organ-specific surgery topic):

- **Vascular surgery:** The student brings this grade from the department. The completed one-week vascular surgery internship at the Department of Vascular Surgery is followed by an exam, the result of which is the partial result of the comprehensive exam.
- **Traumatology:** The student brings this grade from the department. The completed one-week trauma practice is followed by an exam at the Department of Traumatology, the result of which is the partial result of the comprehensive exam.

- **General and organ specific surgery**: The student draws two surgical topics, one for the general and one for the organ specific surgery lists. For these topics, two separate grades will be recieved which are also part of the theoretical grade.

The strict condition for surgery final exam is the existence of sub-credits grades in traumatology and vascular surgery.

It is not possible to be admitted to surgery final exam if the traumatology and vascular surgery exams have not been completed beforehand.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Traumatológiai Klinika, Ortopédiai Klinika

Name of subject in Hungarian: Traumatológia gyakorlat
Name of subject in English: Traumatology (rotation)
Name of subject in German: Traumatologie Praktikum

Credit value of the course: 0
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
40.0	0.0	40.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):

Course code:
AOKTRA651_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Bodzai Tamás János (klinikaigazgató)
Course coordinator location of work, telephone availability: Semmelweis University Clinic for Traumatology, e-mail: office.trauma@semmelweis.hu, Tel: 06 20/825-8680
Course coordinator position: Head of department, associate professor
Course coordinator Date and number of habilitation: 2025.03.12. 37995/HABIZ/2025

Objectives of the course, and its place in the curriculum of the medical training program:

Traumatology as a specialty deals with the treatment of injured patients, independent of the injured organ, patient’s age or previous diseases. In developed countries, the 4-5th leading cause of death is injury, while in the actively working population, the rate of death is even higher. Morbidity in children and in the elderly is also high. Since the patient examination and therapeutic algorithm somewhat differ from the previously taught examination and treatment methods in the curriculum, our aim is to offer a general and practical approach to treating trauma patients for students. The

prerequisite for 6th year Traumatology is the material and exam from the 5th year in Traumatology, to be used in a more practical manner. Beside this, familiarization and active participation in the daily routine of a Traumatology department play a role in the students' curriculum.

Format of the course (lectures, group work, practical lessons, etc.):

Students spend the one-week practice in active inpatient trauma departments, participating in the daily activities, on-call duties, and surgical programs of the department.

Competencies acquired through completion of course:

During practices, students will have the opportunity to learn the following: physical examination of injured patients, bandaging, suturing, casting techniques, and the uses of orthesises and splints. Consultation of typical and the more frequent trauma cases, radiologic diagnostics, as well as shadowing, observing and/or assisting in the operating theater are also part of the curriculum. In the ER, students will have an opportunity to examine and participate in the trauma care of patients under supervision.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Traumatology and Orthopedics, Urology, Ophthalmology

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Minimum: Since Traumatology is a compulsory subject, there is no minimum number of students.

Maximum: (Depends on each teaching hospital's capacity)

Detailed course syllabus (if the course can be divided into modules, please indicate): (Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of

CV is required in all cases!)

1.) Daily attendance of morning conference. After becoming acquainted with the introduced cases, students will have the opportunity to examine the hospitalized patients and familiarize themselves with patient's documentation.

2.) Assisting or observing in the operative theater, depending on the operative program.

3.) Students shall participate in patient admission, examination, follow and help in the evaluation of the diagnostic examinations, and take part in the acute treatment of traumatized patients during on duty shifts.

4.) Participating in grand rounds, patient presentation, and following up on referrals.

5.) Consultation with attending tutor of actual clinical cases, planning the treatment and the course of patient follow up.

6.) Taking part in patient follow up examinations. Examining the range of motion, function, evaluating x-rays and CT scans. Identification and treatment of complications.

Detailed syllabus:

1. First Aid
2. Evaluation of the mental-stage/orientation with the Glasgow-score
3. Evaluating and management of external wounds
4. Termination of bleeding
5. Transportation of trauma patient
6. Transient fixating bandage of traumatic part of body
7. Preparation of the surgical area
8. Surgical scrub-in and clothing
9. Infiltrational anaesthesia
10. Incision and drainage
11. Management of infected, necrotic wound
12. Closure
13. Stitch removal
14. Applying pressure-bandage
15. Reuniting closed fractures
16. Fracture stabilization
17. Reduction of dislocation
18. Transient fixation of broken extremities
19. Pain management
20. Assisting surgical procedures
21. Formulating therapeutic recommendations
22. Knowledge of medical documentation and the basic rules of maintaining it
23. Referring patients between physician colleagues

Tutors:

Dr. Abonyi Bence, Dr. Andrónyi Kristóf, Dr. Asztalos András, Dr. Balázs Péter, Dr. Balsai Tamás, Dr. Bárdos István, Dr. Benedek Balázs, Dr. Bodzay Tamás, Dr. Bogosi Tibor, Dr. Bozsik Attila, Dr. Budai Bence, Dr. Csábi András Antal, Dr. Cséka Bence, Dr. Cséka Botond, Dr. de Jonge Róbert, Dr. Dobrean Levente, Dr. Dózsai Dávid, Dr. Faragó Bence, Dr. Fehér Milán, Dr. Gábor Áron, Dr. Gál Tamás, Dr. Galisz Levente, Dr. Gámán Görgy, Dr. Gömöri Kristóf, Dr. Hangody György Márk, Dr. Hargitai Gergely, Dr. Hável János, Dr. Hevesi Adrienn, Dr. Kalóz Erika, Dr. Kardos Dániel, Dr. Kardos Tamás, Dr. Kassai Tamás, Dr. Kiss Dániel, Dr. Koczka Dániel, Dr. Kocsis András Bernát, Dr. Kosztin Árpád, Dr. Kotán Krisztián, Dr. Kőnig Károly, Dr. Köröndi Bernát, Dr. Léderer Szilvia, Dr. Lepár Gábor, Dr. Lestár Péter, Dr. Ludas István Tamás, Dr. Máté Miklós, Dr. Mátyás Viktor, Dr. Mayer Lilla, Dr. Merényi Gábor, Dr. Molnár Szabolcs, Dr. Nagyhegyi Andrea, Dr. Német Péter, Dr. Nikli Balázs, Dr. Nyiri Péter, Dr. Pahlavanyali Afshin, Dr. Pap Károly, Dr. Rábai Kálmán, Dr. Ragályi Attila, Dr. Reha Gábor, Dr. Sinkovits Bence, Dr. Soproni István, Dr. Szabó Gergely, Dr. Szabó Sándor, Dr. Szalay István, Dr. Szalay Zoltán, Dr. Szebeny Miklós, Dr. Szmola Dániel, Dr. Szőcs Gyula Ferenc, Dr. Sződy Róbert, Dr. Sztrinkai Gergely, Dr. Varga Péter, Dr. Várhelyi Levente, Dr. Werling József, Dr. Wille Jörg, Dr. Zöld Marcell

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Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

Duration of the practice: 1 week (40 hours)

The certificate (for students spending the practice abroad) or attendance sheet (students spending the practice in Budapest) must be handed in or scanned and emailed to the Traumatology Department upon completion of the practice.

Absences:

According to the Study and Examination Regulations

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

The interactive seminars and practices allows for the assessment of students' progress. There will be no formal test/quiz during the practice week.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Completion of the practical training (40 hours per week – with the last Friday designated as the exam day).
At the end of the practice, the attendance sheet and/or certificate (depending on the type/location of the training site – as specified on the department's website) must be authenticated with the tutor's signature and stamp, and submitted to the department's central email address in accordance with the instructions published on our website.

Absences:

According to the Study and Examination Regulations

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Online test examination. One of the following topics is chosen by the student. The knowledge of the topic is based on material of the textbook, lecture material uploaded in Moodle, and knowledge acquired during practices from both 4th and 6th years.

Topic list

1. Treatment of the open fractures, guidelines, methods
2. Nonoperative treatment methods of fractures (traction, functional treatment, external fixation, guidelines of the treatment of fractures)
3. Osteosynthesis, methods
4. Mechanism, diagnosis and treatment of joint dislocations
5. Clinical symptoms of fractures, diagnosis
6. Primary and immediate care of skull and brain injuries, in-hospital diagnostic examination methods
7. Classification of skull fractures, and treatment principles
8. Concussion and contusion of the brain and their treatment
9. Epidural, subdural and intracerebral hematoma; symptoms, diagnosis and treatment
10. Examination of spinal injuries; diagnosis. Surgical indications in the management of spinal injuries
11. Fixation of vertebral fractures. Rehabilitation of spinal injuries
12. Rib fracture classification, treatment and prognosis

13. Treatment and diagnosis of hemo- and pneumothorax
14. Guidelines for observing patient with blunt abdominal injuries, diagnosis and treatment of parenchymal and bowel injuries
15. Types and treatment of the injuries of the shoulder girdle (soft tissue and bony lesions)
16. Treatment of humeral fractures (humerus neck and diaphysis)
17. Diagnosis and treatment of olecranon fractures
18. Treatment of forearm factures in adults
19. Typical radial bone fracture (distal radius fracture) principals and treatment methods
20. Perilunal luxation and fracture of the scaphoid bone. Therapy of Bennett's fracture. Metacarpal and phalangeal fractures.
21. Soft tissue and tendon injuries of the hand. Septic hand.
22. Types, treatment and associated injuries of pelvic fractures.
23. Types, therapy and probable complications of hip fractures (femoral neck and intertrochanteric fractures)
24. Diagnosis, treatment, complications and prognosis of intracapsular fractures of the femoral neck
25. Principles of endoprothesis replacement (arthroplasty) surgery
26. Diaphyseal fractures of the femur
27. Intraarticular fractures of the knee and treatment methods
28. Diagnosis and treatment of patellar fractures
29. Ligament injuries of the knee – injury mechanism, diagnosis and treatment
30. Cartilage injuries of the knee joint (including meniscus injuries). Principles of arthroscopy
31. Open and closed tibia fractures – treatment and rehabilitation
32. Ankle sprain injuries – examination and treatment methods. Complications of ankle fractures and their treatment methods.
33. Types and treatment of ankle fractures
34. Calcaneal fracture and its therapy
35. Symptoms and therapy of Achilles tendon ruptures
36. Compartment syndrome of the lower extremity – diagnosis and treatment

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

See 29. Exam requirements.

Grades:

0% - 49% Fail (1)

50% - 63% Pass (2)

64% - 75% Satisfactory (3)

76% - 87% Good (4)

88 - 100% Excellent (5)

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Online test exam

On the last day of the one-week trauma practice, which is part of the 6-week surgical training in the 6th year, the Department of Traumatology at Semmelweis University organizes an online test exam. Passing exams in both traumatology and vascular surgery and obtaining partial grades in these subjects are prerequisites for taking the final surgery exam.
The three partial grades (traumatology, vascular surgery, and surgery) together form the final grade for the surgery exam.
The test exam is evaluated on a 5-grade scale.

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Artificial intelligence systems used in the teaching of the subject and the manner of their application

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List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:
Online resources:

Type	Mandatory
Title	
Link	https://itc.semmelweis.hu/moodle

Printed resources:

Type	Mandatory
Author	Editors: Andrew B. Peitzman Michael Rhodes C. William Schwab Donald M. Yealy Timothy C. Fabian

Title	The Trauma Manual: TRAUMA AND ACUTE CARE SURGERY Third edition
Publisher	Wolters Kluwer / Lippincott Williams & Wilkins
Year of publication	1

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine
Name of the host institution (and any contributing institution):
Városmajori Szív- és Érgyógyászati Klinika - Érsebészeti és Endovaszkuláris Tanszék

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Name of subject in Hungarian: Érsebészet gyakorlat
Name of subject in English: Vascular surgery practice
Name of subject in German: Gefäßchirurgie Praktikum

Credit value of the course: 0
Semester: 11th semester, 12th semester
(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Semester hours	Lecture	Practice	Seminar
40.0	0.0	40.0	0.0

Type of course:
obligatory

Academic year:
2026/27

Language of instruction (for optional and elective subjects):
English

Course code:
AOKSBE650_SA
(in the case of a new course, to be completed by the Dean’s Office, following approval)

Course coordinator name: Dr. Sótonyi Péter (klinikai főorvos)
Course coordinator location of work, telephone availability: Városmajori Heart and Vascular Centre - Department of Vascular and Endovascular Surgery
Course coordinator position: tanszékvezető egyetemi tanár
Course coordinator Date and number of habilitation: June 30th of 2014., 06/2014.

Objectives of the course, and its place in the curriculum of the medical training program:

Vascular surgical pathologies include a number of diseases with a high mortality rate, which are increasing nowadays. In our country, the number of limb amputations performed for non-traumatic reasons is three times higher than the average of Western European countries. This data also draws attention to the importance of vascular medicine.

The purpose of the exercise is to describe chronic and emergency, life- and limb-threatening vascular diseases, and to present their differential diagnosis. Knowledge of the patient's symptoms and complaints is still important in the accurate diagnosis of vascular surgical diseases, and the emphasis is on the outpatient examination at the patient's bedside, where questioning the patient is essential for establishing the correct diagnosis. The students also receive a general training where they learn to ask patients questions that enable them to effectively investigate the patient's complaints. The physical examination is the basis of vascular examinations. It may be sufficient to establish a diagnosis even without other imaging tests. Perhaps there is no other specialty where the patient's general condition, co-morbidities, and age have such an influence on the burden of surgery and intervention. Students learn that establishing a diagnosis is not the same as establishing a therapy plan.

Format of the course (lectures, group work, practical lessons, etc.):

Practical lesson

Competencies acquired through completion of course:

As a general practitioner, students will be able to assess the most important emergency cases of vascular origin (stroke, dissection, aneurysm rupture, acute limb ischemia) and perform the first steps. They learn the basics of the physical examination of the vascular system, the forms of imaging examinations, and the indications for its request. After evaluating the results of the physical and imaging tests, they take the necessary therapeutic steps and direct the patients to the appropriate type and level of specialist care. In the field of vascular diseases, they learn the place and role of primary and secondary prevention.

Course outcome (names and NEPTUN ID of related subjects):

Prerequisites for course registration and completion: (NEPTUN ID):

Anatomy of the vascular system, regional anatomy of the neck, abdomen, and extremities.

Vascular pathology, pathophysiology. Completed Cardiology-angiology course.

In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

The number of students required to start the course (minimum, maximum), method of selecting participants:

Subject and course enrollment in Neptun according to the block schedule.

Detailed course syllabus (if the course can be divided into modules, please indicate):

(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)

General Information

The practice takes place in five locations: vascular surgery outpatient clinic, vascular surgery department, vascular surgery operating room, angiography laboratory, ultrasound diagnostic laboratory. Each student spends 1 day at each location, in a rotating system.

Monday morning briefing (important information related to the internship: tour of locations, explanation of rotation schedule, distribution of necessary documents, information about the test exam).

The tutor present at the practice locations confirms attendance with his signature. The signed attendance sheet must be submitted to the departmental secretariat on the last day of the practical week.

Knowledge assessment:

On the last day of the internship, the test will take place, which will be conducted using the Moodle system. The test is evaluated with a five-point grade, by converting the achieved percentage values:

100-90%: excellent, 89-80%: good, 79-70%: moderate, 69-60%: sufficient, <60%: insufficient.

The exam ticket obtained in this way will NOT be included in Neptun. The results are sent to the education secretariat of the Surgery, Transplantation and Gastroenterology Clinic (STéG) in the form of an official notification. The result of the test is counted as one-third of the theoretical grade of the surgery examination in the examination result.

Absence, substitution:

A certified absence can only be made up at a time agreed with the department's education administrator. It is sufficient to make up the practice according to the day of absence.

Only students who have completed the practical at each location and who have submitted a completely filled out and fully signed attendance sheet to the departmental secretariat may take the test exam.

Due to the large number of students and the severely limited capacity of individual practice locations, you may have to wait several weeks for a replacement, so it is recommended to complete the practice with your own group according to the block schedule.

External vascular surgery practice:

In accordance with faculty regulations, internships can only be carried out at external training sites officially accepted (accredited) by the faculty. The documents for reporting and authorizing this and certifying the fulfillment must be used in accordance with the faculty regulations. In the case of an internship completed at an external training location, it is also mandatory to write the test. This will

take place at a specific time, according to the consultation with the department's education administrator.

Appearance at practice locations:

A white coat is mandatory at all locations (use of your own coat is allowed) and other equipment according to current regulations (e.g. face mask). A guarded changing room is provided at the clinic.

Practice in the ward begins at 7:00 a.m. with the morning visit. The student must participate in the visit.

Practice at the outpatient clinic starts at 9:00.

At the other locations, practice starts at 8:00 a.m.

Knowledge and competences that can be acquired at each practice location:

I-II. Students' ward and outpatient activities:

In the ward and the outpatient clinic, the primary focus is meeting the patient, the examination, and the specific questioning of the patient's vascular system problem. We usually hold a morning meeting at 7:30 a.m., which the student assigned to the class must also attend. Our goal is to provide assistance with a thorough knowledge of emergency, life, limb, or other target organ (stroke) cases.

Under the guidance of the tutor, the student participates in ward visits, where he learns about the medical history of the inpatient patients, the types of operations that have already been performed, or the planned surgical options. When taking an anamnesis, the student learns what the specific questions are that help to find out to what extent the patient's complaints may stem from a vascular lesion. What are the dynamics of the lesion, how acute or emergency care is needed. In the physical examination, palpation of the vascular status, examination with a mini-doppler device, and recognition of signs of acute blockage are the primary goals. The student can participate in bandaging operated patients, setting up injection and infusion treatments, and can use and observe computer systems.

III. Getting to know the diagnostic possibilities of vascular patients:

The student spends at least one day in the angiography lab. One of the goals of the consultations in the department and the outpatient clinic, as well as in the operating room, is for the student to learn about the most common invasive and non-invasive diagnostic options and to be able to choose from them if necessary. In addition to all this, they have the opportunity to get to know the ultrasound diagnostic laboratory operating at the vascular surgery outpatient clinic.

IV. Operating theater activity:

In the operating room, observation is primarily carried out, but you can even actively participate in some processes. During the time between operations, information related to the operations can be discussed, especially the explanation of the algorithm for setting up the indication for the operation. In certain surgeries, it may be possible to perform assistant activities in the surgeries, depending on the nature of the surgery.

V. Vascular surgery outpatient clinic:

The student participates with the assigned specialist in the examination of vascular patients. You yourself perform a patient examination (palpation, auscultation, doppler, and participation in the evaluation of the findings), the patient's admission to care, the treatment decision mechanism, and aspects of the control of operated patients are discussed. You see a large number of acute and chronic patients in a relatively short period of time. At the ambulance, you can really learn about real diagnostic and therapeutic algorithms in actual cases. The student can often follow these patients in the ward, in the angiography lab and in the operating room.

Teaching staff of the course: Prof. Dr. Peter Sótonyi, Prof. Dr. Zoltán Szeberin, Dr. Péter Vince Banga, Dr. Anikó Berencsi, Dr. László Hidi, Dr. Péter Tamás Legeza, Dr. Zsuzsanna Mihály, Dr. Zsuzsa Nagy, Dr. Zoltán Oláh, Dr. Gábor Viktor Szabó

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimalize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

According to the Study and Examination Regulations (TVSZ), 10% absence is allowed, however, missed practice elements must be made up.

Confirmed absences can only be made up at a time agreed with the departmental education administrator by joining the designated group. It is sufficient to make up the practice according to the day of absence.

Only students who have completed the practical at each location and who have submitted a completely filled out and fully signed attendance sheet to the departmental secretariat may take the test exam.

Due to the large number of students and the severely limited capacity of individual practice locations, you may have to wait several weeks for a replacement, so it is recommended to complete the practice with your own group according to the block schedule.

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):
(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

On the last day of the internship, the test will take place, which will be administered using the Moodle system. The test is evaluated with a five-point grade, by converting the achieved percentage values:

100-90%: excellent, 89-80%: good, 79-70%: satisfactory, 69-60%: pass, <60%: fail.

Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

Conditions for signature: completing the practice at each of the practice locations and writing the test exam. 10% absence is allowed, however, missed practice elements must be made up.

Confirmed absences can only be made up at a time agreed with the departmental education administrator by joining the designated group. It is sufficient to make up the practice according to the day of absence.

Only students who have completed the practical at each location and who have submitted a completely filled out and fully signed attendance sheet to the departmental secretariat may take the test exam.

Due to the large number of students and the severely limited capacity of practice locations, you may have to wait several weeks for a replacement, so it is recommended to complete the practice with your own group according to the block schedule.

Type of assessment:
completion-based course

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

Examination topics:

- Epidemiology and risk factors of arterial and venous diseases

- Screening, prevention and conservative treatment of arterial diseases

- General symptoms and physical examination of arterial and venous diseases

- Vascular ultrasound diagnostics

- Vascular CT and MR diagnostic methods

- Angiography and intervention

- Basic vascular surgery techniques. Vascular grafts

- Lower extremity obliterative arterial diseases

- Supraaortic branches and upper limb arteries

- Aortic aneurysms, peripheral arterial aneurysms

- Renal and visceral occlusive diseases and aneurysms

- Aortic dissections

- Chronic venous insufficiency. Deep vein thrombosis

- Vascular access: surgically created arteriovenous fistulas

- Malformations

- Vasculitis in the clinical practice of vascular surgery/interventional radiology/angiology

- Diabetic foot, amputations

- Chronic peripheral lymphedema.

Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade, as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

https://semmelweis.hu/ersebeszet/english/vascular-surgery-practice-informations/

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

Moodle test exam, evaluated with a five-point grade, by converting the achieved percentage values:

100-90%: excellent, 89-80%: good, 79-70%: satisfactory, 69-60%: pass, <60%: fail.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

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Printed resources:

Type	Mandatory

Author	Dr. Sótonyi Péter, Dr. Szeberin Zoltán
Title	Vascular Medicine
Publisher	Semmelweis Kiadó
Year of publication	2019

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission: